Journal of Research in Crime and Delinquency
Volume XX Number X
Month XXXX xx-xx

10.1177/0022427808330873
http://jrc.sagepub.com
hosted at
http://online.sagepub.com

A Comprehensive Test of General Strain Theory

Key Strains, Situational- and Trait-Based Negative Emotions, Conditioning Factors, and Delinquency

Byongook Moon
The University of Texas at San Antonio
Merry Morash
Michigan State University
Cynthia Perez McCluskey
The University of Texas at San Antonio
Hye-Won Hwang
Cheongju University

Using longitudinal data on South Korean youth, the authors addressed limitations of previous tests of general strain theory (GST), focusing on the relationships among key strains, situational- and trait-based negative emotions, conditioning factors, and delinquency. Eight types of strain previously shown most likely to result in delinquency, including delinquency in the South Korean context, were measured. To better understand how trait- and situational-based negative emotions mediate the connection of strains to delinquency, trait and situational measures were used for anger and depression, emotions commonly expected to promote delinquency. Overall, the findings support GST's key propositions. Most of the eight strains and some interaction terms between strains and conditioning variables had significant effects on various types of delinquency. Furthermore, situational-based negative emotions operated differently than trait-based negative emotions in mediating the relationship between strain and delinquency. These findings raise questions about the assumption that trait-based negative emotions accurately represent situational-based negative emotions in response to strains.

Keywords: *general strain theory; Korean youth; delinquency*

Authors' Note: This work was supported by a Korea Research Foundation Grant funded by the Korean Ministry of Education and Human Resources Development to Dr. Hwang. The authors thank all the anonymous reviewers for their constructive and helpful comments.

Agnew (1992), who developed the elaborated and increasingly researched general strain theory (GST), hypothesized that various strains affect youth by producing negative emotions, notably anger and depression, which can in turn result in delinquency. Whether the strains produce negative emotions and the negative emotions lead to delinquent behavior depend on several conditioning factors, for example, a youth's relationship to parents, association with delinquent peers, and coping skills. The theory represents an advance over prior strain explanations, which did not recognize the variety of stressors for youth and did not explain how strains influenced some, but not all, youth to engage in illegal behavior.

Numerous empirical studies have generated results that are supportive of key GST propositions (Agnew and Brezina 1997; Agnew et al. 2002; Agnew and White 1992; Aseltine, Gore, and Gordon 2000; Bao, Haas, and Pi 2004; Baron 2004; Broidy 2001; Hoffmann and Su 1997; Mazerolle and Maahs 2000; Mazerolle, Piquero, and Capowich 2003; Moon and Morash 2004; Morash and Moon 2007; Paternoster and Mazerolle 1994; Piquero and Sealock 2000, 2004). Studies have consistently shown that individuals exposed to various types of strain are more likely to engage in delinquent behaviors. Several tests of a full model of GST have additionally shown that negative emotions, especially anger, moderately mediate the connection of strain to delinquency (Aseltine et al. 2000; Mazerolle and Piquero 1997; Mazerolle et al. 2003; Piquero and Sealock 2000). Specifically, research has documented that strain predicts anger, which predicts deviance (Agnew et al. 2002; Mazerolle and Maahs 2000; Mazerolle and Piquero 1997).

Most previous GST research, however, suffers from several limitations. One is that some key strain variables are often not considered, mainly because of the use of existing secondary data (Agnew 2001, 2006a, 2006b; Baron 2004). Another is that emotions proximate in time to a particular experience of strain (called "emotional states" or "situational-based negative emotions") are not usually measured. The current study was designed to address the limitations. Using longitudinal data on 659 South Korean youth, we focused on the relationships of key strains, trait-based negative emotions, situational-based negative emotions related to each key strain, and conditioning factors to delinquency. Eight key types of strain shown in prior research to be most likely to result in delinquency were considered. To better understand how trait-based and situational-based emotions mediate the connection of strains to delinquency, both were measured for anger and depression, the emotions commonly expected to promote delinquency.

This study is also important in establishing that GST can be generalized widely, even outside of the U.S. context. A strength of GST is its specification

of a broad range of strains. It will further the development of GST to identify strains and their interactions with or mediation by conditioning factors and emotions that hold across national settings or, alternatively, are unique within a national context.

GST, Strain, and Negative Emotions

Criticizing a narrow conceptualization of strain as defined in classical strain theory, Agnew (1992) expanded the sources of strain and grouped them into three categories: the failure to achieve positively valued goals, the possible or actual loss of positively valued stimuli, and the presentation of noxious stimuli to individuals. The significant number of studies with diverse populations and research designs that have examined the relationship between strain and delinquency have generally produced results that support GST (Agnew et al. 2002; Agnew and White 1992; Aseltine et al. 2000; Baron 2004; Broidy 2001; Mazerolle 1998; Mazerolle and Maahs 2000; Mazerolle and Piquero 1997; Mazerolle et al. 2003; Moon and Morash 2004; Paternoster and Mazerolle 1994; Piquero and Sealock 2000, 2004). Negative life events (e.g., divorce, criminal victimization), negative relationship with adults (e.g., parents, teachers), physical and emotional abuse, and neighborhood strain were significantly and positively related to various types of delinquency (Agnew and White 1992; Paternoster and Maszerolle 1994; Piquero and Sealock 2000). A study of Korean youth (Moon and Morash 2004) also showed that juveniles experiencing negative relationships with parents and teachers were more likely to engage in delinquency. Baron (2004), sampling homeless youth in Canada, found that homelessness, monetary dissatisfaction, and property victimization were significantly and positively related to delinquent behaviors. In general, research has revealed that exposure to several different sources of strain, including problems with parents, teachers, and peers and negative life events and victimization, were predictive of delinquency.

The other main proposition of GST is that strains create negative emotions (e.g., anger, anxiety, depression) that influence delinquency. According to GST (Agnew 1992), individuals experience negative emotions, especially anger, when they are treated unjustly and unfairly or exposed to negative stimuli. To correct situations that produce strain or to alleviate resulting negative emotions, some youth break the law. For example, strained youth may be aggressive toward individuals causing the strain, may try to handle their emotions by using illicit drugs and alcohol, or may try to escape strain by running away, which can lead to other illegal behaviors when they try to

survive on the streets. The studies that have examined the role of negative emotions have revealed a medium or weak mediating effect of negative emotions on the relationship of strains to delinquency (Aseltine et al. 2000; Bao et al. 2004; Baron 2004; Broidy 2001; Jang and Johnson 2003; Mazerolle and Piquero 1997; Mazerolle et al. 2003; Piquero and Sealock 2004).

The few tests of GST that considered situational-based rather than trait-based anger (Broidy 2001; Jang and Johnson 2003; Mazerolle et al. 2003) found moderate mediating effects on the connection of strain to delinquency. For example, consistent with GST, Jang and Johnson (2003), using data from the National Survey of Black Americans, found a strong and significant mediating effect of situational-based negative emotions on the relationship between strain and deviance. Strain, which had a significant direct effect on deviance before the inclusion of situational-based negative emotions, was not significantly related to deviance after situational-based negative emotions were included in the model. In contrast, using vignettes to collect data, Mazerolle et al. (2003) showed that trait-based anger did not have any mediating effect on the connection of strain to intentions to assault. Trait-based anger was more likely to have a significant direct effect on intentions to assault regardless of strain, but situational-based anger was related to intentions to assault, and it mediated the influence of strain on intentions to assault. Inconsistencies between study findings may be due to slightly different variables (e.g., intention to assault and self-reports of instances of assault) or to different study populations. Thus, there is a need for additional replication of GST tests, particularly for hypotheses about trait-based and situational-based emotions.

GST in the Context of South Korea

There is research evidence (Cho 1995; Lee and Larson 2000) that compared with Western youth, Korean youth have especially high levels of stress, manifested in complaints about school and home and mental health problems that include aggressive impulses, feelings of helplessness, and loss of interest in life. Stress among youth has been attributed to traditional Confucian values emphasizing academic achievement as the sole means for achieving financial success, a good job, a good marriage, and social status (Cho 1995). Even elementary school students are pressured to succeed by spending much of their time studying in school and in after-school private academies (Lee and Larson 2000). As children get older, they spend even less time with their parents and more with teachers, who traditionally tried

to discipline and motivate low-achieving students with physical and emotional punishment, including slapping, name calling, and humiliation in front of other students (Cho 1995; Hahm and Guterman 2001). Since the 1990s, there has been public (including student) criticism of such practices, and the resulting negative and antagonistic student-teacher relationships have become a significant source of strain to Korean students (Seth 2002). Research (Moon and Morash 2004; Morash and Moon 2007) found support for the connection of school-related strains, specifically physical punishment by teachers, to delinquency in Korea.

Unfortunately, the few studies of GST in Asia tested models that omitted theoretically important variables. Studying Korean youth, Morash and Moon (2007) and Moon and Morash (2004) did not measure or test for the effects of negative emotions. In research on another East Asian country (China), Bao et al. (2004) included emotions in the explanatory model, but the strains were limited to negative relationships with parents, teachers, and peers, and conditioning factors were not studied.

Thus, although empirical findings have increased understanding of the relationships among strains, negative emotions, conditioning factors, and delinquency, they have important limitations. To summarize, most studies failed to include a range of key strains (Agnew 2001, 2006a, 2006b). The other significant limitation is that most previous research has measured trait-based negative emotions, on the basis of the assumption that individuals reporting a persistent trait of having negative emotions are more likely to show negative emotions in response to strains (see Agnew 2006a; Mazerolle et al. 2003). Agnew (2006a), however, differentiated "emotional states" (or situational-based negative emotions) from "emotional traits" (or trait-based negative emotions), noting that emotional states indicate the negative emotions in response to strains, but emotional traits indicate "the general tendency to experience certain emotions." Empirical research (see Mazerolle et al. 2003) also indicated that situational anger operates differently than trait-based anger in linking strain to delinquency. Thus, both the logic of the theory and prior findings suggest the need to design research to compare the influence of situational-based and trait-based negative emotions.

The present research, therefore, had three objectives. First, the individual effects of eight strains relevant to delinquency were examined to clarify which types of strain have significant effects (Baron 2004). Two types of strain, examination-related strain and teachers' use of physical or emotional punishment, were included to increase the relevance of the research to South Korea. Second, we included and compared the mediating roles of both situational-based and trait-based anger and depression. Third, five

additional variables (positive relationship with parents, parental supervision, problem-solving ability, legitimacy of violence, and association with delinquent peers) were examined as conditioning effects. According to GST (Agnew 1992), youth with high levels of problem-solving ability and positive relationships with parents are more likely to alleviate strains through nondelinquent behaviors, but those associating with delinquent peers and having weak moral beliefs are more likely to respond to strains with delinquency.

Method

Data

The data for the current study were taken from the first two waves of ongoing longitudinal research supported by a Korea Research Foundation Grant funded by the Korean Ministry of Education and Human Resources Development. In 2005 and 2006, at a one-year interval, longitudinal data were collected from a panel of South Korean students at three middle schools. Students with written parental consent were asked to voluntarily complete a questionnaire.

The three middle schools were located in three cities (Incheon, Daegu, and Cheongju). In South Korea, one of the most densely populated countries in the world, the population is heavily concentrated in metropolitan areas in the north and south (U.S. Department of State 2007). Therefore, the large cities, Incheon and Daegu, were selected as research sites. Incheon (population 2.6 million) is in northern South Korea, and Daegu (population 2.5 million) is in southern South Korea. To include students not residing in large cities, we selected the medium-sized city, Cheongju (population 600,000), located in central South Korea, a less populated part of the country.

Indicators of social economic status available from the census (i.e., rates of vehicle ownership, college degree completion, divorce, economic activity, personal computer ownership, and residence rental) were compared for districts in the three study sites and in the other major metropolitan cities and provinces across South Korea. The districts had similar characteristics regardless of whether they were in the study areas or other major metropolitan areas. For example, according to 2000 Korean census data, the household rental rates for Dongbu district (in the research site of Daegu) and Bupyong district (in the research site of Incheon) were 48 percent and 41 percent, respectively, while the average rate for the other five major

cities in the country (32 districts in total) was 48 percent. The economic activity rates for the Dongbu and Bupyong districts were 51 percent and 54 percent, respectively, while the average rate for the 32 districts in the other major cities was 52 percent. Also, the college degree completion rates for both research site districts were 17 percent, identical to the rate for the other major city districts.

The years with available data varied by study area, but in general, there seemed to be nothing remarkable about the number of delinquency cases investigated in the areas sampled. The numbers of delinquency cases reported and investigated by the police were 4,677 in Daegu in 2005 (Korean Statistical Information Service 2007), 4,902 in Incheon in 2002 (Incheon Statistical Yearbook 2005), and 1,300 in Cheongju in 2001 (Cheongju Statistical Yearbook 2005). The numbers are similar to those for comparably sized cities (e.g., Gumi Statistical Yearbook 2005).

One middle school was randomly selected from lists of each of the following: 90 middle schools in Incheon, 108 middle schools in Daegu, and 30 middle schools in Cheongju. Middle schools in South Korea are very homogeneous. Secondary education before high school is free and compulsory, and there is no entrance examination for particular schools (Ministry of Education and Human Resources Development 2007). For both public and private schools, the country has a national curriculum overseen by the national Ministry of Education and Human Resources Development. Typically, there are no advanced programs, there is automatic advancement between grades, and regardless of elementary school achievement, students are assigned to middle schools (including private schools) nearest their homes (Ministry of Education and Human Resources Development 2007). There is little reason to expect that the youth in the sample would differ from the youth in the general population, except that rural youth may have been underrepresented. Note, however, that the urbanization rate in South Korea is extremely high (88.3 percent as of 2002), so only a small proportion of juveniles reside in rural areas.

In 2005, 900 questionnaires were distributed to eighth graders (usually 13 years old), and parental consent and youth assent resulted in 817 being returned. Thirty incomplete questionnaires were discarded, yielding a final response rate of 87 percent. In 2006, 664 of the original participants, who were then in ninth grade, completed questionnaires, and a total of 659 individuals had usable data. The attrition rate was 16 percent. For students who did and did not remain in the study, *t* tests were used to compare mean scores on each wave 1 variable. The two groups had no significant differences in the levels of strains, negative emotions, conditioning factors, or delinquency.

Among the 787 students in the sample at wave 1, 61.5 percent ($n = 484$) were female, and 39.5 percent ($n = 303$) were male. The gender breakdown for the three schools combined was 56 percent female and 44 percent male. Female youth were overrepresented in the total sample, partially because of the inclusion of an all-female school in the study. To address the issue of disproportionate sampling by gender across schools, all analyses were conducted using the cluster subcommand in Stata 8. This process adjusts standard errors and takes into account within-school variance.

Measurement

Independent variables. Eight types of strain most likely to lead to delinquency and relevant to unique aspects of South Korean adolescents' educational experiences were measured at wave 1. These were family conflict, emotional and physical punishment by parents, emotional and physical punishment by teachers, financial stress, examination-related stress, being bullied, gender discrimination, and criminal victimization. The scales were coded so that a higher score indicated a higher level of each strain, negative emotion, conditioning factor, or delinquency (Table 1).

The family conflict scale consisted of three items adapted from Aseltine et al. (2000). The scale (Cronbach's $\alpha = .75$) measured the extent of verbal argument and tension among family members and conflict and tension between a respondent and his or her parents at wave 1.

The four-item parents' emotional and physical punishment scale was adapted from Piquero and Sealock (2000). It measured the frequency of parents' emotional and physical punishment of respondents, such as name calling, negative comparisons with others, and hitting or attempting to hit respondents during the past six months (Cronbach's $\alpha = .72$). A parallel set of items reflected teachers' emotional and physical punishment of the respondents[1] (Cronbach's $\alpha = .77$).

The financial strain scale (Cronbach's $\alpha = .62$) was developed by summing values reflecting agreement with three statements: "I am not satisfied with the amount of money I have," "My family has too little money for clothing or food," and "My family does not have enough money to support me."

The examination-related strain scale (Cronbach's $\alpha = .64$) was created by summing levels of agreement with three items: "I feel a lot of stress about studying," "I am not satisfied with my grades," and "My parents stress studying too much."

The experience of being bullied scale (Cronbach's $\alpha = .81$) was adapted from Kim, Koh, and Leventhal (2004). Examples of specific experiences of

Table 1
Descriptive Statistics of Independent and Dependent Variables (n = 659)

Variables	*M*	*SD*	Minimum	Maximum
Gender (0 = female, 1 = male)	.39	.49	0	1
Family conflict	2.59	2.01	0	9
Parental punishment	1.97	2.58	0	15
Teachers' punishment	1.67	2.73	0	16
Financial strain	2.70	2.19	0	9
Examination-related strain	6.02	2.20	0	9
Being bullied	.96	2.23	0	21
Gender discrimination	.93	1.87	0	12
Criminal victimization	.32	1.29	0	20
Trait-based anger	1.78	2.35	0	9
Trait-based depression	2.04	2.60	0	9
Situational-based anger to family conflict	1.98	2.20	0	9
Situational-based depression to family conflict	2.66	2.59	0	9
Situational-based anger to parental punishment	1.33	2.08	0	9
Situational-based depression to parental punishment	1.91	2.54	0	9
Situational-based anger to teachers' punishment	1.19	2.22	0	9
Situational-based depression to teachers' punishment	1.10	2.16	0	9
Situational-based anger to financial strain	.70	1.56	0	9
Situational-based depression to financial strain	1.25	2.03	0	9
Situational-based anger to examination-related strain	1.62	2.35	0	9
Situational-based depression to examination-related strain	2.47	2.80	0	9
Situational-based anger to being bullied	1.35	2.48	0	9
Situational-based depression to being bullied	1.42	2.54	0	9
Situational-based anger to gender discrimination	.96	2.01	0	9
Situational-based depression to gender discrimination	1.02	2.15	0	9
Situational-based anger to criminal victimization	.39	1.52	0	9
Situational-based depression to criminal victimization	.28	1.24	0	9
Relationship with parents	10.68	3.02	4	16
Parental control	16.14	3.47	6	24
Problem-solving ability	8.01	2.07	3	12
Legitimacy of violence	8.64	3.66	5	20
Delinquent peers	2.40	3.46	0	28
General delinquency at wave 1	1.07	3.78	0	56
Violent delinquency at wave 2	.38	1.38	0	21
Property delinquency at wave 2	.53	2.08	0	30
Status delinquency at wave 2	.59	1.55	0	12
General delinquency at wave 2	1.51	4.36	0	63

physical and emotional bullying by fellow students include being left out by peers at lunchtime, being isolated, and being physically attacked.

The gender discrimination scale (Cronhach's $\alpha = .76$) was adapted from the study of Landrine and Klonoff (1996) and consisted of four items initially developed to measure African Americans' experience of racial discrimination by teachers, police officers, and strangers. The items were slightly rephrased to measure respondents' experiences of gender discrimination during the past six months. Agree-or-disagree ratings were used with items reflecting such experiences as being treated with less courtesy, being treated with less respect, being insulted, and being threatened because of gender. Although there is common recognition that girls may feel that they experience gender discrimination because of assumptions about appropriate roles and typical abilities, boys also may feel that they are not treated fairly because they do not fit stereotypes.

The victimization scale (Cronbach's $\alpha = .66$) was created by summing reported frequency of five types of crimes (theft, robbery, burglary, sexual assault, and physical assault) against respondents and/or family members. A possible criticism of the scale is that a person's own victimization is distinct from that person's family's victimization. However, the conceptualization of the scale is consistent with the Korean collective culture, which strongly emphasizes close family ties, collective responsibility, mutual trust, and family members' interdependency. Therefore, family members are very concerned about one another's well-being and could have strong emotional responses when any family members are criminally victimized.

Negative emotions. Both trait-based and situational-based negative emotions (for both anger and depression) were measured at wave 1. The trait-based anger scale (Cronbach's $\alpha = .89$) was adapted from items used by Derogatis (1977). The three items tapped information on uncontrollable outbursts of temper, urges to beat and harm someone, and urges to break things. The trait-based depression scale, based on work by Piquero and Sealock (2000), asked youth to rate their levels of feeling worthless or depressed (Cronbach's $\alpha = .89$).

The same items were adapted to create measures of situational-based anger and depression. For each of the eight strains they reported experiencing, respondents were asked whether they reacted with anger (uncontrollable outbursts of temper, urges to beat or harm someone, and urges to break things) and/or depression (sadness, worthlessness, and depression). The responses provided eight measures of situational-based anger and eight measures of situational-based depression. Each of the eight measures was associated with one of the specific strains. The response options for each item ranged from 0 (*never*) to 3 (*always*).

Conditioning variables. Five conditioning variables were measured at wave 1: positive relationship with parents, parental supervision, problem-solving ability, legitimacy of violence, and association with delinquent peers. The positive relationship with parents scale (Cronbach's $\alpha = .78$) was the sum of agreement ratings for four items reflecting the degree of parents' understanding, interest, openness and closeness toward respondents. The items were "My parents are interested in what I do," "My parents try to understand my problems and worries," and "I am closer to my parents than a lot of kids are to theirs."

The parental supervision scale was created by summing five items (Cronhach's $\alpha = .76$). It measured parents' knowledge of a youth's whereabouts, associates, and deviant behavior. Example items include "My parents know where I am when I am away from home," "My parents know who I am with when I am away from home," "My parents usually know if I commit deviant behaviors," and "If my parents found out that I had done something that was strongly disliked, they would definitely do something to try to stop me from doing it again."

The measure of problem-solving ability reflected a respondent's ability to find ways to effectively solve problems in his or her life (Cronbach's $\alpha = .78$). The items were "If I should find myself in a jam, I could think of many ways to get out of it," "There are lots of ways around any problem that I am facing now," and "I can think of many ways to reach my current goals."

Legitimacy of violence was the sum of agree-or-disagree ratings for statements that violence can be justified to defend one's rights, achieve respect, obtain fair treatment, resist exploitation, or avoid appearing weak (Cronbach's $\alpha = .89$).

The association with delinquent peers scale was adapted from the study by Mazerolle and Maahs (2000) to measure whether close friends engaged in delinquent behaviors, such as smoking, drinking, stealing money, and destroying property (Cronbach's $\alpha = .84$).

Dependent variables. At wave 2, respondents were asked how often they had committed various types of delinquent behaviors during the past year. Because previous research (Piquero and Sealock 2000, 2004) found that strains have unique effects on different types of delinquency, in the current study, we considered three dependent variables: violence, property, and status delinquency.

The wave 2 violent delinquency scale was created by summing the frequencies of 6 items and some of these are "used force or strong-arm methods to get money or things from others," "thrown objects such as rocks or

bottles at people," or "hit or threatened to hit fellow students" (Cronbach's $\alpha = .71$). The wave 2 property delinquency scale (Cronbach's $\alpha = .86$) was created from responses to 11 items, including "stolen or tried to steal something of worth," "broken or tried to break into a building or vehicle to steal something or just to look around," and "sold or tried to sell a stolen good to others." The status delinquency scale reflected the frequency of behaviors such as "drinking," "smoking," "running away," and "skipping classes without a reason" (Cronbach's $\alpha = .68$).

Because the delinquency measures were skewed in the positive direction, and many youth fell into the zero category for each delinquency outcome, ordinary least squares regression was not the ideal method of estimation. Therefore, negative binomial models were estimated on dependent variables (Osgood, Finken, and McMorris 2002).

Control variables. Three individual characteristics measured at wave 1, and previously found to be significant predictors of delinquency (Bao et al. 2004; Moon and Morash 2004; Morash and Moon 2007), were used as control variables. Gender was dichotomized as a dummy variable (1 = male, 0 = female). Academic achievement in school (grades) was measured and coded so that a higher score indicated higher grades. Control variables for prior delinquency included violent delinquency, property delinquency, and status delinquency at wave 1.

Results

Table 2 presents the zero-order correlations among eight strain variables, trait-based negative emotions, conditioning factors, and wave 2 violent, property, and status delinquency.[2] All of the eight strains were significantly related to trait-based anger and depression in the expected directions. The bivariate relationships between various strains and three types of delinquency were statistically significant (except for financial strain and gender discrimination). Trait-based anger was significantly and positively related to all types of delinquency, but trait-based depression was not significantly related to any. As expected, a positive relationship with parents and high parental control were negatively related to all types of delinquency, and legitimacy of violence and association with delinquent peers were positively related to various delinquent behaviors.

A series of negative binomial regression analyses were conducted to separately examine predictors of violent, property, and status delinquency.[3]

Table 2
Correlation Matrix among Strains, Trait-Based Negative Emotions, Conditioning Factors, and Delinquency Outcomes (n = 659)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Family conflict	1																	
2. Parental punishment	.44**	1																
3. Teachers' punishment	.24**	.35**	1															
4. Financial strain	.19**	.15**	.06	1														
5. Examination-related strain	.31**	.31**	.22**	.05	1													
6. Bullied	.25**	.26**	.31**	.06	.16**	1												
7. Gender discrimination	.21**	.30**	.25**	.09*	.12**	.33**	1											
8. Criminal victimization	.12**	.09*	.18**	.12**	.03	.42**	.23**	1										
9. Trait-based anger	.26**	.23**	.15**	.08*	.19**	.26**	.19**	.21**	1									
10. Trait-based depression	.28**	.24**	.10*	.09*	.21**	.21**	.20**	.13**	.21**	1								
11. Positive relationship with parents	−.27**	−.32**	−.17**	−.15**	−.21**	−.11**	−.06	−.08*	.13**	−.13**	1							
12. Parental control	−.14**	−.14**	−.08*	−.22**	−.02	−.16**	−.05	−.09*	−.08*	−.09*	.56**	1						
13. Problem-solving ability	−.15**	−.08*	.01	−.12**	−.03	−.09*	−.05	−.08*	−.09*	−.11**	.30**	.34**	1					
14. Legitimacy of violence	.13**	.12**	.17**	.04	.08*	.18**	.17**	.19**	−.08*	.10*	−.08*	−.07	−.02	1				
15. Association with delinquent peers	.22**	.16**	.28**	.11**	.11**	.31**	.26**	.35**	.19**	.17**	−.11**	−.10**	.02	.25**	1			
16. Violent delinquency at wave 2	.15**	.13**	.19**	.05	.11**	.09*	.10*	.23**	.35**	.03	−.11**	−.08*	.05	.23**	.17**	1		
17. Property delinquency at wave 2	.10**	.15**	.11**	.07	.07	.09*	.02	.21**	.23**	−.04	−.09*	−.09*	.03	.14**	.13**	.74**	1	
18. Status delinquency at wave 2	.18**	.16**	.16**	.04	.08*	.09*	.08	.19**	.21**	.01	−.12**	−.16**	−.01	.13**	.24**	.55**	.50**	1

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

Tables 3 through 5 (one table for each type of delinquency) present the results of three different models estimated for each of the eight types of strain. For each of the eight types of strain, the first model tested included one type of strain, the second model tested included the strain and trait-based emotions, and the third model tested included the strain and situational-based emotions. At every step, control variables were included in the model. Thus, for each type of strain, there was a test of its direct effect, a test for the mediating and direct effects of trait-based emotions, and a test for the mediating and direct effects of situational-based emotions.

Table 3 presents the results of negative binomial regression analyses of the independent variables on violent delinquency measured at wave 2. When just one type of strain was included in the baseline models (submodel 1), five of eight strains were significantly related to violent delinquency in the expected direction. Youth who experienced family conflicts, parental punishment, teachers' punishment, examination-related strain, or gender discrimination were more likely to engage in violent delinquency. Trait-based negative emotions were then added to the baseline models (submodel 2). All of the measures of trait-based anger were significantly related to violent delinquency. Trait-based negative emotions, however, did not have any mediating effects on the relationships between strains and delinquency, in that all of strains that were significant predictors continued to exert significant direct effects on violent delinquency, even after the inclusion of trait-based negative emotions.

In a third step for each strain, situational-based negative emotions were added and trait-based negative emotions were removed from the baseline models (submodel 3). Six of the eight measures of situational-based anger had positive effects on violent delinquency. Specifically, youth who experienced anger in response to strain were more likely to engage in violent delinquency. However, two of the eight measures of situational-based depression were significantly related to violent delinquency in the negative direction. Depressed youth were less likely than those who were not depressed to commit violent delinquency. Consistent with GST, situational-based negative emotions had some mediating effects on the relationship between strains and deviance. Three of six strains that had been significantly related to violent delinquency were not significantly related after the inclusion of the situational-based anger and depression.

Table 4 presents parallel results for property-related delinquency measured at wave 2. The steps followed were parallel to those presented in Table 3. Four of eight strains (teachers' punishment, financial strain, examination-related strain, and victimization) had significant effects on property delinquency in

Table 3
Negative Binomial Regression Models Predicting Violent Delinquency

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Gender	1.17* (.38)	1.14* (.47)	1.15* (.37)	1.07* (.39)	1.04* (.51)	1.09* (.44)	1.10* (.37)	1.10* (.49)	1.13* (.37)	1.15* (.37)	1.16* (.49)	1.22* (.35)	1.10* (.34)	1.09* (.47)	1.072* (.443)	1.15** (.34)	1.17** (.45)	1.22** (.37)	1.15** (.38)	1.14* (.48)	1.12** (.35)	1.11** (.35)	1.14* (.46)	1.12** (.39)
Grades	–.08* (.04)	–.06 (.04)	–.05 (.03)	–.10* (.04)	–.07* (.03)	–.10* (.04)	–.11** (.04)	–.08** (.02)	–.10** (.04)	–.09 (.06)	–.06 (.05)	–.07 (.07)	–.08* (.04)	–.05 (.03)	–.078* (.039)	–.09* (.04)	–.06* (.03)	–.08 (.04)	–.10 (.05)	–.06 (.03)	–.08 (.06)	–.10* (.04)	–.07** (.02)	–.08** (.03)
Time 1 violence	.39 (.26)	.32 (.17)	.28 (.19)	.44 (.26)	.35* (.17)	.45 (.28)	.40 (.25)	.30 (.16)	.33* (.16)	.43 (.24)	.34* (.17)	.35 (.19)	.43 (.27)	.34 (.18)	.345 (.192)	.43 (.24)	.35* (.16)	.37 (.19)	.42* (.21)	.35* (.14)	.36** (.12)	.41 (.27)	.33 (.18)	.48 (.26)
Family conflict	.18** (.05)	.15** (.05)	.11 (.07)																					
Parental punishment				.08** (.01)	.09** (.03)	.08** (.02)																		
Teachers' punishment							.05** (.01)	.06* (.03)	.02 (.03)															
Financial strain										.01 (.10)	.02 (.09)	–.00 (.09)												
Examination-related strain													.10** (.01)	.10* (.04)	.08 (.05)									
Bullied																.03 (.09)	.01 (.07)	–.01 (.09)						
Gender discrimination																			.13** (.01)	.13** (.01)	.16** (.04)			
Criminal victimization																						.16 (.10)	.14 (.12)	.33* (.16)
Trait anger		.15** (.05)			.18** (.06)			.18** (.07)			.17** (.06)			.17** (.06)			.17** (.05)			.18** (.05)		.17* (.07)	
Trait depression		–.09 (.10)			–.10 (.10)			–.08 (.10)			–.07 (.10)			–.08 (.10)			–.07 (.09)			–.08 (.08)		–.06 (.10)	
Sanger1			.23** (.03)																					
Sdepres1			–.09** (.03)																					
Sanger2						–.04 (.12)																		
Sdepres2						.30 (.07)																		

(continued)

Table 3 (continued)

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Sanger3									.16** (.44)															
Sdepres3									–.08 (.06)															
Sanger4												.15* (.59)												
Sdepres4												.00 (.06)												
Sanger5															.13** (.03)									
Sdepres5															–.05 (.09)									
Sanger6																		.11** (.01)						
Sdepres6																		–.02 (.07)						
Sanger7																					.14* (.07)			
Sdepres7																					–.19 ** (.09)			
Sanger8																								.01 (.04)
Sdepres8																								–.43 (.28)
Constant	–2.01** (.19)	–2.19** (.35)	–2.25** (.18)	–1.55** (.13)	–1.91** (.35)	–1.56** (.17)	–1.39** (.17)	–1.80** (.38)	–1.49** (.08)	–1.46** (.41)	–1.94** (.14)	–1.68** (.54)	–2.05** (.13)	–2.43** (.11)	–2.12** (.09)	–1.45** (.14)	–1.84** (.38)	–1.63** (.24)	–1.57** (.14)	–1.97** (.35)	–1.63** (.15)	–1.43** (.17)	–1.85** (.47)	–1.57** (.20)
Pseudo-R^2	.15	.16	.17	.14	.16	.14	.13	.15	.14	.13	.15	.14	.13	.15	.15	.13	.15	.14	.14	.16	.15	.13	.15	.15
Model χ^2	75.58	83.06	87.39	7.43	81.91	7.79	67.23	78.46	72.77	65.88	75.82	71.16	68.95	79.81	76.53	66.27	76.69	7.87	72.20	83.39	79.34	68.51	78.75	77.18

Note: Values in parentheses are robust standard errors. S = submodel; Sanger1 = Situational-based anger in response to family conflict; Sdegress1 = Situational-based depression in response to family conflict; Sanger2 = Situational-based anger in response to parental punishment; Sdegress2 = Situational-based depression in response to parental punishment; Sanger3 = Situational-based anger in response to teachers' punishment; Sdegress3 = Situational-based depression in response to teachers' punishment; Sanger4 = Situational-based anger in response to financial strain; Sdegress4 = Situational-based depression in response to financial strain; Sanger5 = Situational-based anger in response to examination-related strain; Sdegress5 = Situational-based depression in response to examination-related strain; Sanger6 = Situational-based anger in response to being bullied; Sdegress6 = Situational-based depression in response to being bullied; Sanger7 = Situational-based anger in response to gender discrimination; Sdegress7 = Situational-based depression in response to gender discrimination; Sanger8 = Situational-based anger in response to criminal victimization; Sdegress8 = Situational-based depression in response to criminal victimization
*$p < .05$. **$p < .01$.

Table 4
Negative Binomial Regression Models Predicting Property Delinquency

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Gender	1.98** (.48)	1.81** (.43)	1.83** (.45)	1.85** (.63)	1.64** (.59)	1.82** (.59)	1.87** (.48)	1.70** (.42)	1.82** (.42)	1.90** (.53)	1.76** (.45)	1.85** (.49)	1.94** (.46)	1.76** (.39)	1.81** (.44)	1.93** (.45)	1.78** (.37)	1.96** (.53)	1.93** (.45)	1.79** (.38)	1.84** (.401	1.81** (.46)	1.68** (.39)	1.84** (.50)
Grades	–.04 (.05)	–.03 (.04)	–.03 (.05)	–.05 (.05)	–.04 (.05)	–.05 (.05)	–.04 (.05)	–.04 (.05)	–.03 (.07)	–.03 (.06)	–.02 (.06)	–.03 (.07)	–.03 (.04)	–.02 (.04)	–.04 (.06)	–.03 (.05)	–.03 (.05)	–.04 (.05)	–.03 (.05)	–.03 (.05)	–.03 (.06)	–.03 (.06)	–.03 (.06)	–.02 (.07)
Time 1 property	1.07 (.73)	.91 (.68)	.89 (.73)	1.13 (.70)	.90 (.67)	1.13 (.69)	1.11 (.66)	.90 (.62)	.92 (.5)	1.16 (.71)	.95 (.67)	1.05 (.72)	1.14 (.68)	.93 (.66)	.95 (.68)	1.13 (.63)	.92 (.58)	1.07 (.70)	1.14 (.65)	.94 (.62)	.80 (.47)	1.13 (.74)	.93 (.68)	1.23 (.75)
Family conflict	.14 (.08)	.17** (.06)	.13** (.05)																					
Parental punishment				.08 (.08)	.11 (.08)	.10 (.06)																		
Teacher punishment							.07** (.01)	.08** (.01)	.04** (.01)															
Financial strain										.11* (.05)	.11* (.05)	.12** (.04)												
Examination-related strain													.08* (.04)	.11** (.02)	.08 (.05)									
Bullied																.01 (.06)	.03 (.07)	–.01 (.03)						
Gender discrimination																			.01 (.02)	.01 (.04)	.00 (.02)			
Criminal victimization																						.24* (.12)	.23 (.14)	.46* (.19)
Trait anger		.07** (.01)			.12** (.04)			.10** (.01)			.11** (.02)			.10** (.03)			.10** (.01)			.10** (.02)			.10** (.02)	
Trait depression		–.14 (.08)			–.16* (.07)			–.13 (.08)			–.12 (.08)			–.15* (.07)			–.12 (.08)			–.11 (.08)			–.11 (.08)	
Sanger1			.15** (.26)																					
Sdepres1			–.11* (.05)																					
anger2						–.01 (.05)																		
Sdepres2						–.03 (.07)																		
Sanger3									.17 (.87)															
Sdepres3									–.09 (.10)															

(continued)

Table 4 (continued)

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Sanger4 S												.07 (.05)												
Sdepres4												–.01 (.12)												
Sanger5															.14* (.07)									
Sdepres5															–.12** (.04)									
Sanger6																		.05 (.03)						
Sdepres6																		.01 (.09)						
Sanger7																					.25** (.05)			
Sdepres7																					–.29** (.06)			
Sanger8																								–.25** (.07)
Sdepres8																								–.14 (.10)
Constant	–2.34** (.59)	–2.27** (.60)	–2.36** (.62)	–2.01** (.62)	–1.93** (.64)	–1.97** (.61)	–2.00** (.64)	–1.91** (.67)	–2.13** (.76)	–2.33** (.66)	–2.26** (.69)	–2.23** (.75)	–2.48** (.79)	–2.54** (.70)	–2.31** (.78)	–1.98** (.68)	–1.92** (.79)	–2.03** (.76)	–1.97** (.64)	–1.90** (.67)	–1.92** (.61)	–2.02** (.78)	–1.96* (.82)	–2.15* (.87)
Pseudo-R^2	.14	.15	.15	.14	.15	.14	.14	.14	.15	.14	.15	.14	.14	.15	.15	.14	.14	.14	.34	.14	.15	.14	.15	.16
Model χ^2	77.05	81.15	82.24	76.71	82.08	77.01	74.47	78.24	79.91	76.45	79.93	78.40	74.33	78.82	83.34	72.79	76.16	73.70	72.56	75.77	83.49	77.38	80.49	85.26

Note: Values in parentheses are robust standard errors. S = submodel;.Sdegress1 = Situational-based depression in response to family conflict; Sanger2 = Situational-based anger in response to parental punishment; Sdegress2 = Situational-based depression in response to parental punishment; Sanger3 = Situational-based anger in response to teachers' punishment; Sdegress3 = Situational-based depression in response to teachers' punishment; Sanger4 = Situational-based anger in response to financial strain; Sdegress4 = Situational-based depression in response to financial strain; Sanger5 = Situational-based anger in response to examination-related strain; Sdegress5 = Situational-based depression in response to examination-related strain; Sanger6 = Situational-based anger in response to being bullied; Sdegress6 = Situational-based depression in response to being bullied; Sanger7 = Situational-based anger in response to gender discrimination; Sdegress7 = Situational-based depression in response to gender discrimination; Sanger8 = Situational-based anger in response to criminal victimization; Sdegress8 = Situational-based depression in response to criminal victimization

*$p < .05$. **$p < .01$.

the expected direction. At the second step for every type of strain, trait-based anger was significantly and positively related to property delinquency, and for two types of strain, trait-based depression was negatively related to property delinquency. However, trait-based negative emotions did not mediate the relationships between strains and property related delinquency. At the third step, four measures of situational-based anger had significant positive effects on property delinquency (with the exception of anger in response to victimization). For three types of strain, situational-based depression was significantly related to property related delinquency in the negative direction. Three of the four strains (teachers' punishment, financial strain, and victimization) remained significant even after the inclusion of situational-based anger and depression.

The only individual strains related to status delinquency were family conflict and parent punishment (see Table 5). Adding measures of trait-based emotions revealed a consistent, positive impact of trait-based anger on status delinquency. Trait-based depression, however, had no impact on status delinquency. Among measures of situational-based negative emotions, anger in response to parental punishment, teachers' punishment, and examination-related strain were positively related to status offenses.

Consistent with findings for violence and property offenses, depression in response to gender discrimination and victimization was negatively related to status offenses. When measures of situational-based emotions were included, the significant effect of teachers' punishment disappeared, suggesting that situational anger mediated the effect of teacher punishment.

To provide a theoretically appropriate examination of conditioning factors, a series of interaction terms were constructed and included in an additional set of analyses. For the interaction analyses, composite indices of strain, situational-based anger, and situational-based depression were used because of the potential for multicollinearity problems with multiple types of strain and multiple situation-related negative emotions. The composite strain index captured the total number of types of strain experienced, and the situational-based emotion indices represented additive measures of situational anger and situational depression. In constructing interaction terms, total strain and each of the conditioning factors were first centered, because mean-centering continuous variables prior to creating product terms can reduce the potential for multicollinearity (Aiken and West 1991).

Negative binomial regression was used to estimate interactions between conditioning factors and total strain. Ai and Norton (2003) pointed out that

Table 5
Negative Binomial Regression Models Predicting Status Delinquency

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S3	S1	S2	S3	S1	S2	S1	S2	S3	S1	S2	S3	S1	S2	S1	S2	S3	S1	S2	S3	S1	S2
Gender	.75* (.29)	.76* (.37)	.77* (.36)	.65* (.28)	.66 (.34)	.70 (.36)	.62** (.19)	.69* (.33)	.63** (.18)	.64** (.20)	.71* (.31)	.63** (.21)	.64* (.26)	.68* (.34)	.63* (.27)	.64** (.21)	.74* (.33)	.63** (.20)	.65** (.22)	.68* (.29)	.62** (.21)	.62** (.20)	.70* (.31)	.65** (.25)
Grades	−.14 (.08)	−.14 (.08)	−.14 (.08)	−.15 (.08)	−.15 (.08)	−.15* (.07)	−.15 (.09)	−.15 (.09)	−.15 (.09)	−.15 (.09)	−.15 (.08)	−.15 (.08)	−.15 (.08)	−.15 (.08)	−.15 (.08)	−.15 (.09)	−.15 (.08)	−.15 (.08)	−.15* (.08)	−.15* (.08)	−.16* (.08)	−.15 (.08)	−.15 (.08)	−.15* (.07)
Time 1 status delinquency	.53** (.18)	.52** (.17)	.52** (.16)	.55** (.17)	.53** (.15)	.55** (.16)	.54** (.20)	.53** (.17)	.52** (.19)	.56** (.19)	.54** (.16)	.55** (.17)	.56** (.19)	.54** (.17)	.54** (.19)	.56** (.18)	.55** (.16)	.56** (.18)	.56** (.19)	.55** (.17)	.56** (.20)	.54** (.19)	.54** (.16)	.56** (.18)
Family conflict	.18** (.05)	.16** (.04)	.12** (.03)																					
Parental punishment				.10* (.05)	.08 (.04)	.05 (.05)																		
Teacher punishment							.03 (.03)	.02 (.03)	.01 (.02)															
Financial strain										−.00 (.01)	−.01 (.01)	−.00 (.01)												
Examination-related strain													.09 (.05)	.08* (.03)	.06 (.04)									
Bullied																.01 (.05)	−.03 (.03)	.01 (.05)						
Gender discrimination																			.09 (.09)	.08 (.09)	.11 (.10)			
Criminal victimization																						.09 (.21)	.03 (.19)	.021 (.15)
Trait anger		.05 (.03)			.08* (.03)			.10** (.03)			.10** (.03)			.09** (.03)			.10** (.02)			.10** (.03)			.09* (.04)	
Trait depression		−.00 (.04)			−.02 (.03)			.01 (.05)			.01 (.04)			−.00 (.04)			.01 (.04)			−.01 (.01)			.01 (.06)	
Sanger1			.09 (.05)																					
Sdepres1			−.00 (.04)																					
Sanger2						.10** (.03)																		
Sdepres2						−.01 (.06)																		
Sanger3									.10* (.04)															
Sdepres3									−.06 (.05)															

(continued)

Table 5 (continued)

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8		
Variable	S1	S2	S 3	S1	S2	S3	S1	S2	S1	S2	S3	S1	S2	S3	S1	S2	S1	S2	S3	S1	S2	S3	S1	S2
Sanger4												.05												
												(.07)												
Sdepres4												–.03												
												(.03)												
Sanger5															.08**									
															(.01)									
Sdepres5															–.00									
															(.01)									
Sanger6																		.01						
																		(.05)						
Sdepres6																		–.02						
																		(.04)						
Sanger7																					.03			
																					(.06)			
Sdepres7																					–.06*			
																					(.03)			
Sanger8																								.11
																								(.06)
Sdepres8																								
–.20*																								
																								(.08)
Constant	–1.04	–1.05	–1.09	–.64	–.73	–.73	–.44	–.66	–.47	–.44	–.65	–.42	–.98	–1.05	–.95	–.45	–.67	–.43	–.49	–.67	–.55	–.46	–.68	–.41
	(.80)	(.84)	(.81)	(.73)	(.75)	(.68)	(.63)	(.75)	(.59)	(.64)	(.74)	(.63)	(.90)	(.86)	(.87)	(.65)	(.74)	(.65)	(.70)	(.74)	(.69)	(.64)	(.72)	(.61)
Pseudo-R^2	.16	.16	.16	.15	.16	.16	.13	.14	.14	.13	.14	.13	.14	.15	.15	.13	.14	.13	.14	.15	.14	.13	.14	.14
Model χ^2	94.89	96.47	98.65	90.11	93.83	94.15	78.44	85.84	81.58	77.84	85.46	78.5	82.94	88.53	86.71	77.29	85.41	77.44	81.82	88.74	82.39	78.66	85.31	82.51

Note: Values in parentheses are robust standard errors. S = submodel;.Sdegress1 = Situational-based depression in response to family conflict; Sanger2 = Situational-based anger in response to parental punishment; Sdegress2 = Situational-based depression in response to parental punishment; Sanger3 = Situational-based anger in response to teachers' punishment; Sdegress3 = Situational-based depression in response to teachers' punishment; Sanger4 = Situational-based anger in response to financial strain; Sdegress4 = Situational-based depression in response to financial strain; Sanger5 = Situational-based anger in response to examination-related strain; Sdegress5 = Situational-based depression in response to examination-related strain; Sanger6 = Situational-based anger in response to being bullied; Sdegress6 = Situational-based depression in response to being bullied; Sanger7 = Situational-based anger in response to gender discrimination; Sdegress7 = Situational-based depression in response to gender discrimination; Sanger8 = Situational-based anger in response to criminal victimization; Sdegress8 = Situational-based depression in response to criminal victimization

*$p < .05$. **$p < .01$.

interaction effects in nonlinear models are difficult to interpret and "cannot be evaluated simply by looking at the sign, magnitude or statistical significance of the coefficient of the interaction term" (p. 129). Given the difficulty in testing for interactions in nonlinear models, interaction terms were also examined using ordinary least squares regression to facilitate the interpretation of interactions. Findings across both methods of estimation were consistent, particularly with regard to the interaction between total strain and delinquent peer association, and findings from negative binomial regression models are presented in Table 6.

Three multiple regression equations were estimated for each of the conditioning factors: The base model included total strain, the second model included total strain and the conditioning factors, and the third model introduced the product interaction terms in addition to main effects. To facilitate the presentation of findings, results from the full model are presented in Table 6 along with model fit statistics. In each of the three models examining product interaction terms, there was a significant model χ^2 change. For violent and status delinquency, the interaction between total strain and positive relationship with parents was significant and in the expected direction. A positive relationship with parents significantly moderated the impact of total strain on two of three delinquency outcomes. The interaction between total strain and problem-solving ability was significantly related to property delinquency in the expected direction; strained youth were less likely to engage in property delinquency when they reported higher problem-solving ability. The significant interactions between total strain and delinquent peers for violent, property, and status delinquency, however, were not in the expected direction. Contrary to GST's prediction, association with delinquent peers reduced the impact of total strain on various types of delinquent behaviors.[4]

Discussion and Conclusion

Using longitudinal data on 659 Korean youth, we tested hypotheses deduced from key GST propositions, focusing on the relationships among eight important and context relevant strains, negative emotions, conditioning factors, and delinquency. To better understand whether situational-based and trait-based negative emotions were similar in their mediating effects on the connection between strains and delinquency, both were measured. We also attempted to address the question of whether GST is useful in understanding the etiology of delinquency and deviance in South Korea.

Table 6
Negative Binomial Regression Models Predicting Delinquency Outcomes with Interactions (n = 659)

Variable	Violence	Property	Status
Gender	1.21*	1.70**	.51
	(.59)	(.63)	(.27)
Grades	–.08	–.03	–.14*
	(.04)	(.06)	(.06)
Time 1 delinquency[a]	.23**	.53	.36**
	(.08)	(.50)	(.12)
Trait anger	.01	.02	.01
	(.01)	(.01)	(.02)
Trait depression	–.02	–.03	–.00
	(.02)	(.02)	(.02)
Total strain[b]	.05**	.06**	.04**
	(.01)	(.00)	(.00)
Positive parent relationship[b]	.05**	–.04*	.09
	(.01)	(.02)	(.05)
Parental control[b]	–.02	–.02	–.12*
	(.04)	(.02)	(.06)
Problem-solving ability[b]	.08	.11*	.04
	(.05)	(.04)	(.04)
Legitimacy of violence[b]	.08**	.03**	–.01
	(.00)	(.01)	(.03)
Delinquent peers[b]	.14**	.16**	.14**
	(.01)	(.01)	(.03)
Total Strain × Parent Relationship	–.00*	.00	–.01*
	(.00)	(.00)	(.00)
Total Strain × Parental Control	–.00	.00	.01
	(.00)	(.00)	(.00)
Total Strain v Problem-Solving Ability	–.01	–.01**	–.01
	(.00)	(.00)	(.01)
Total Strain × Legitimacy of Violence	–.00	.00	–.00
	(.00)	(.00)	(.00)
Total Strain × Delinquent Peers	–.01**	–.01**	–.01**
	(.00)	(.00)	(.00)
Constant	–1.62**	–1.76*	–.58
	(.22)	(.79)	(.61)
Pseudo-R^2	.23	.22	.23
Model χ^2	126.53**	124.57**	143.63**

Note: Values in parentheses are robust standard errors.
a. Time 1 delinquency is consistent with the dependent variable in each model.
b. Mean-centered variable.
*$p < .05$. **$p < .01$.

Consistent with GST, all measured strains (except being bullied) were significantly and positively related to at least one of three deviant behaviors. For example, family conflict and parental punishment were significantly related to both violent and status delinquency, while teachers' physical and emotional punishment and examination-related strain were significant predictors of both violent and property-related deviant behaviors. As expected, youth reporting financial strain were more likely to engage in property-related delinquency than violent or status delinquency as a way to acquire some financial gain. These findings are supportive of Agnew's (1992) prediction that strains such as those examined in the current study are significant predictors of delinquency because they may be more likely to be perceived as unjust, high in magnitude, and/or creating incentives for deviant coping.

An interesting finding is that Korean youth who experienced school-generated strains, especially teachers' physical and emotional punishment, were more likely to commit various deviant behaviors. Consistent with other research (Bao et al. 2004; Moon and Morash 2004; Morash and Moon 2007), there is evidence that strain caused by teachers' physical and emotional punishment is useful in explaining the etiology of delinquency in the East Asian context. It would be useful to consider whether the significant relationship between teacher punishment and delinquency is unique to East Asian countries or can be generalized to the Western context. A small number of studies in the educational field (Brendgen, Wanner, and Vitaro 2006; Brendgen et al. 2007; Casarjian 2000) have shown that teachers' verbal punishment has a negative effect on U.S. and Canadian youth. Future research to test GST should include teachers' emotional punishment as a possible predictor of negative emotions and deviance in a variety of cultural contexts.

Inconsistent with GST, being bullied was not significantly related to any delinquency outcomes. Perhaps youth who become victims of school bullying are more likely to be isolated, depressed, nonassertive, and physically weak or disabled (Besag 1989; Olweus 1994, 1997; Sweeting and West 2001). Therefore, bullied juveniles may be more unpopular among schoolmates, which makes it difficult for them to acquire peer support for delinquency (Moon and Morash 2004). Also, bullied students with passive, nonassertive, and timid personalities may not have the option of responding to bullying by engaging in delinquent behaviors. It is known from the bullying research (Haynie et al. 2001; Juvonen, Graham, and Schuster 2003) that some youth who are victimized also act as bullies, but perhaps this occurs more often when youth are older, or perhaps it happens relatively rarely, particularly in Korea.

As expected, both situational-based and trait-based anger were significantly and positively related to delinquency. However, situational-based and trait-based negative emotions affected the relationship between strain and delinquency differently. Situational-based negative emotions mediated the connection of several strains (i.e., parental punishment, teachers' punishment, examination-related strain) to delinquency, especially violent delinquency. In contrast, trait-based negative emotions had minimal mediating effects. These findings raised questions about the traditionally held assumption that trait-based negative emotions can accurately represent situational-based negative emotions in response to strains. Although the direct effects of trait and situational angers are consistent, only the situational-based negative emotions that are linked with the strain experience seem to be both theoretically and empirically supported. Future research should measure situational-based negative emotions in response to strain to examine mediating effects.

According to Agnew (1992:59-60), "anger is the most critical emotional reaction" that links strains to outer-directed deviant behaviors such as violent and property delinquency, but depression influences inner-directed deviant behaviors (or self-destructive behaviors) such as drug use. However, in the current study, we found minimal effects of both situational- and trait-based depression on delinquent behaviors, including those considered inner directed (i.e., running away, smoking, and drinking). Although more research is necessary to better understand the mediating role of depression (especially its impact on illegal drug use), it may be that depressed youth are more likely to be isolated from peers who would support delinquent behaviors. Or depression might have more influence on older adolescents, who are allowed to spend more time with peers or who might have more access to alcohol, cigarettes, or other material needed to commit status offenses. Considering the relatively young age of the youth in the current sample (typically 13 years old), future research needs to explore the mediating effect of depression on outer- as well as inner-directed deviant behaviors among youth in later adolescence.

The current findings provide some support for the hypothesized moderating effects of conditioning factors. Consistent with GST, youth who experienced various strains were less likely to commit violent and status delinquency if they had more positive relationships with parents. In addition, strained juveniles were less likely to engage in property delinquency when they had higher levels of problem-solving ability. An unexpected finding was that strained youth were less likely to commit various types of delinquency when they were associated with delinquent peers. When the

interaction was examined further, it appeared that the negative sign might be an artifact; at all levels of delinquent peers, the relationship between strain and delinquency was consistent, which suggests no interaction effect.

Consistent with prior research (see Baron 2004; Morash and Moon 2007), the current analysis revealed that gender has a consistent significant effect on both violent and property delinquency, even after controlling for strains, negative emotions, and conditioning factors. Theory might be developed in two different ways to explain this finding. Within the GST framework, qualitative research could reveal previously overlooked conditioning factors and understudied emotions and strains that would explain the connection of gender to the various types of delinquency. Alternatively, theoretical explanations that have been more successful in explaining gender differences in delinquency could be integrated with GST, and relevant models could be tested. It is beyond the scope of the present article to provide a full review of theories relevant to gender differences in delinquency, but gender-related parental practices (Bottcher 2001) and learned and practiced masculinity and femininity within particular contexts (Morash 2006:89-94) are candidates for explanatory concepts. Additionally, the implications of the patriarchal and patrilineal society, as found in South Korea (Cho 2004: Nam 1996), where boys have special status in the family and where gender role expectations can markedly limit girls' opportunities and inclination to break the law (Kim and Kim 2005), could usefully be explored.

Although the current study was designed to address limitations in prior work, several issues were not fully addressed. Situational measures of negative emotions were not assessed in response to particular incidents but instead captured negative emotions in response to any experience with each strain. Items widely used in previous GST research were used to measure both trait-based and situational-based negative emotions, but better measures may be available in the psychological literature, for instance, the Beck Depression Inventory (Sharp and Lipsky 2002). In exploring mediating effects of negative emotions, we focused on anger and depression, but additional negative emotions, such as anxiety, shame, or frustration, should be measured, and their mediating effects could be examined (Agnew 2006a). The expansion of types of negative emotions might be particularly relevant to international work, because culture could affect the acceptance of certain emotions as appropriate. For instance, a study (Yang et al. 2006) of Korean youth found that female youth experienced anxiety in response to bullying, and this may trigger defensive, aggressive, and delinquent behaviors. Even though we used longitudinal data to better understand the time order of strains, negative emotions, and delinquency, it may be necessary to have

more detailed information on smaller time segments, for example, collected with diaries or frequent interviews. Finally, future research should test for reciprocal effects of strains (i.e., parents and teachers' punishment) and deviant behaviors, in that parents and teachers punish in response to the misbehavior or delinquent acts of youth, consequently having a magnifying negative effect on deviant behaviors.

Despite its limitations, the current study advances the empirical development and generality of GST by comprehensively examining key propositions in a culturally unique setting. The results provide support for GST's core propositions, that strains, situational-based negative emotions, and the interactions between strains and conditioning effects are predictive of delinquency in expected directions outside of the U.S. context. More research is necessary to further assess the generality of GST, with the adequate measurement of key strains and negative emotions in culturally diverse settings. It also is critical to identify culturally unique and influential types of strain for the large number of immigrants with different cultural backgrounds in the United States and to understand the effects of strains on delinquency in these groups. Importantly, future research needs to better measure key characteristics of strains (i.e., injustice, magnitude, duration, and centrality) and theoretically important key strains (i.e., negative life events, negative neighborhood environment, homeless, and part-time work in the secondary labor market), which are known to have significant effects on deviance (Agnew 2001). There is also a need for more research on how strains work together or separately to stimulate delinquent behavior and whether the GST model works consistently for different age groups.

Notes

1. It should be noted that physical and emotional punishment are allowed in South Korean schools.

2. For simplicity of presentation, we did not include eight situational-based anger measures and eight situational-based depression measures in Table 2. As expected, the measures of trait-based anger were significantly related to all eight situational-based anger variables, with correlation coefficients ranging from .21 to .56. Similarly, trait-based depression was significantly correlated with the eight types of situational-based depression, with correlations ranging from .25 to .57. Consistently, all situational-based anger measures (except anger in response to gender discrimination) had significant effects on all types of deviance, but most situational-based depression measures were not significantly related to deviant behaviors.

3. Because of the complexity of the approach and the focus on the central propositions of GST, we do not present the results for the effects of the situational-based and trait-based negative emotions on deviance after including conditioning factors. Using individual situational-based negative emotion for each of the strains and negative binominal regression, some trait- and/or

situational-based angers had significant effects on various types of delinquency, even after the inclusion of conditioning factors.

4. On the basis of the work of Aiken and West (1991), an analysis of slopes was conducted to investigate the meaning of the negative interaction terms for delinquent peers. ModGraph estimates of simple slopes for low, medium, and high levels of delinquent peers (not shown) indicated that although the impact of strain on delinquent outcomes was not as pronounced for youth with highly delinquent peers, there was a consistent impact of strain on violent, property, and status delinquency regardless of peer delinquency. The parallel lines for the three groups suggested no interaction between strain and delinquent peers. The significant negative interaction coefficients in multiple regression equations (Table 6) were likely an artifact of creating the interaction term, because there were many individuals in the zero category for delinquent peers and many with low strain.

References

Agnew, Robert. 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30:47-87.

Agnew, Robert. 2001. "Building on the Foundation of General Strain Theory: Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency." *Journal of Research in Crime and Delinquency* 38:319-61.

Agnew, Robert. 2006a. "General Strain Theory: Current Status and Directions for Further Research." Pp. 101-23 in *Taking Stock: The Status of Criminological Theory—Advances in Criminological Theory*, edited by Francis T. Cullen, John P. Wright, and Kristie Blevins. New Brunswick, NJ: Transaction.

Agnew, Robert. 2006b. *Pressured into Crime: An Overview of General Strain Theory*. Los Angeles: Roxbury Publishing.

Agnew, Robert and Timothy Brezina. 1997. "Relational Problems with Peers, Gender, and Delinquency." *Youth & Society* 29:84-111.

Agnew, Robert, Timothy Brezina, John Paul Wright, and Francis T. Cullen. 2002. "Strain, Personality Traits, and Delinquency: Extending General Strain Theory." *Criminology* 40:43-71.

Agnew, Robert and Helen Raskin White. 1992. "An Empirical Test of General Strain Theory." *Criminology* 30:475-99.

Ai, C. and E. C. Norton. 2003. "Interaction Terms in Logit and Probit Model s." *Economics Letters* 80:123-29.

Aiken, Leona S. and Stephen G. West. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.

Aseltine, Robert H., Susan Gore, and Jennifer Gordon. 2000. "Life Stress, Anger and Anxiety, and Delinquency: An Empirical Test of General Strain Theory." *Journal of Health and Social Behavior* 41:256-75.

Bao, Wan-Ning, Ain Haas, and Yijun Pi. 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* 48:281-97.

Baron, Stephen W. 2004. "General Strain, Street Youth and Crime: A Test of Agnew's Revised Theory." *Criminology* 42:457-83.

Besag, Valerie E. 1989. *Bullies and Victims in School*. Milton Keynes, UK: Open University Press.

Bottcher, Jean. 2001. "Social Practices of Gender: How Gender Relates to Delinquency in the Everyday Lives of High-Risk Youths." *Criminology* 39:893-932.

Brendgen, Mara, Brigitte Wanner, and Frank Vitaro. 2006. "Verbal Abuse by the Teacher and Child Adjustment from Kindergarten through Grade 6." Pediatrics 117:1585-98.

Brendgen, Mara, Brigitte Wanner, Frank Vitaro, William Bukowski, and Richard Tremblay. 2007. "Verbal Abuse by the Teacher during Childhood and Academic, Behavioral, and Emotional Adjustment in Young Adulthood." *Journal of Educational Psychology* 99:26-38.

Broidy, Lisa. 2001. "A Test of General Strain Theory." *Criminology* 39:9-35.

Casarjian, Bethany. 2000. "Teacher Psychological Maltreatment and Students' School-Related Functioning." *Dissertation Abstracts International Section A: Humanities and Social Sciences* 60:4314.

Cheongju Statistical Yearbook. 2005. "Juvenile Delinquency." Retrieved September 6, 2007, from http://stat.cjcity.net/homepage/statistical_sub04.htm.

Cho, Hae-Joang. 1995. "Children in the Examination of War in South Korea: A Cultural Analysis." Pp. 141-68 in *Children and the Politics of Culture*, edited by S. Stephens. Princeton, NJ: Princeton University Press.

Cho, Uhn. 2004. "Gender Inequality and Patriarchal Order Reexamined." *Korea Journal* 44:22-41.

Derogatis, Leonard R. 1977. *SCL 90: Administration, Scoring, and Procedures Manual for the Revised Version*. Baltimore, MD: Johns Hopkins University.

Gumi Statistical Yearbook. 2005. "Juvenile Delinquency." Retrieved September 6, 2007, from http://gumi.go.kr/tonggye/2005/02/02_15_13.html.

Hahm, Hyeouk C. and Neil Guterman. 2001. "The Emerging Problem of Physical Child Abuse in South Korea." *Child Maltreatment* 6:169-79.

Haynie, Denise L., Tonja Nansel, Patricia Eithel, Aria D. Crump, Keith Saylor, Kai Yu, and Simons-Morton Bruce. 2001. "Bullies, Victims, and Bully/Victims: Distinct Groups of At-Risk Youth." *Journal of Early Adolescence* 21:29-49.

Hoffmann, John P. and Susan S. Su. 1997. "The Conditional Effects of Stress on Delinquency and Drug Use: A Strain Theory Assessment of Sex Differences." *Journal of Research in Crime and Delinquency* 34:46-78.

Incheon Statistical Yearbook. 2005. "Juvenile Delinquency." Retrieved September 7, 2007, from http://www.incheon.go.kr/statistics/html_2005/htm12005/index.html.

Juvonen, Jaana, Sandra Graham, and Mark Schuster. 2003. "Bullying among Young Adolescents: The Strong, the Weak, and the Troubled." *Pediatrics* 112:1231-37.

Jang, Sung Joon and Byron R. Johnson. 2003. "Strain, Negative Emotions, and Deviant Coping among African Americans: A Test of General Strain Theory." *Journal of Quantitative Criminology* 19:79-105.

Kim, Hun-Soo and Kim, Hyun-Sil. 2005. "Gender Differences in Delinquent Behavior among Korean Adolescents." *Child Psychiatry and Human Development* 35:325-45.

Kim, Young Shin, Yun-Joo Koh, and Bennett L. Leventhal. 2004. "Prevalence of School Bullying in Korean Middle School Students." *Archives of Pediatrics & Adolescent Medicine* 158:737-41.

Korean Statistical Information Service. 2007. "Crime, Accidents, and Calamities." Retrieved September 7, 2007, from http://www.kosis.kr/eng/e_kosis.jsp?listid=S&lanType=ENG.

Landrine, Hope and Elizabeth A. Klonoff. 1996. "The Schedule of Racist Events: A Measure of Racial Discrimination and a Study of Its Negative Physical and Mental Health Consequences." *Journal of Black Psychology* 22:144-68.

Lee, Meery and Reed Larson. 2000. "The Korean 'Examination Hell': Long Hours of Studying, Distress, and Depression." *Journal of Youth and Adolescence* 29:249-71.

Mazerolle, Paul. 1998. "Gender, General Strain, and Delinquency: An Empirical Examination." *Justice Quarterly* 15:65-91.

Mazerolle, Paul and Jeff Maahs. 2000. "General Strain and Delinquency: An Alternative Examination of Conditioning Influences." *Justice Quarterly* 17:753-78.

Mazerolle, Paul and Alex Piquero. 1997. "Violent Responses to Strain: An Examination of Conditioning Influences." *Violence and Victims* 12:323-43.

Mazerolle, Paul, Alex Piquero, and George E. Capowich. 2003. "Examining the Links between Strain, Situational and Dispositional Anger, and Crime: Further Specifying and Testing General Strain Theory." *Youth & Society* 35:131-57.

Ministry of Education and Human Resources Development. 2007. "Education System." Retrieved September 7, 2007, from http://english.moe.go.kr/main.jsp?idx=020101.

Moon, Byongook and Merry Morash. 2004. "Adaptation of Theory for Alternative Cultural Contexts: Agnew's General Strain Theory in South Korea." *Journal of International and Comparative Criminal Justice* 28:77-104.

Morash, Merry. 2006. *Understanding Gender, Crime, and Justice*. Thousand Oaks, CA: Sage.

Morash, Merry and Byongook Moon. 2007. "Gender Differences in the Effects of Strain on Three Types of Delinquency: A Test of Theory outside of the United States." *Youth & Society* 38:300-21.

Nam, Jeong-Lim. 1995. "Reforming Economic Allocation in the Family: The Women's Movement and the Role of the State in South Korea." *Women's Studies International Forum* 18:113-23.

Olweus, Dan. 1994. "Bullying at School: Long-Term Outcomes for the Victims and an Effective School-Based Intervention Program." Pp. 97-130 in *Aggressive Behavior: Current Perspectives*, edited by Lowell R. Huesmann. New York: John Wiley.

Olweus, Dan. 1997. "Bully/Victim Problems in School: Knowledge Base and an Effective Intervention Program." *Irish Journal of Psychology* 18:170-90.

Osgood, D. W., L. L. Finken, and B. J. McMorris. 2002. "Analyzing Multiple-Item Measures of Crime and Deviance II: Tobit Regression Analysis of Transformed Scores." *Journal of Quantitative Criminology* 18:319-47.

Paternoster, Raymond and Paul Mazerolle. 1994. "General Strain Theory and Delinquency: A Replication and Extension." *Journal of Research in Crime and Delinquency* 31:235-63.

Piquero, Nicole L. and Miriam D. Sealock. 2000. "Generalizing General Strain Theory: An Examination of an Offending Population." *Justice Quarterly* 17:449-84.

Piquero, Nicole L. and Miriam D. Sealock. 2004. "Gender and General Strain Theory: A Preliminary Test of Broidy and Agnew's Gender/GST Hypotheses." *Justice Quarterly* 21:125-58.

Seth, Michael. 2002. *Education Fever: Society, Politics, and the Pursuit of Schooling in South Korea*. Honolulu: University of Hawaii Press.

Sharp, Lisa and Lipsky, Martin. 2002. "Screening for Depression across the Lifespan: A Review of Measures for Use in Primary Care Settings." *American Family Physician* 66:1001-1008.

Sweeting, Helen and Patrick West. 2001. "Being Different: Correlates of the Experience of Teasing and Bullying at Age 11." *Research Papers in Education* 16:225-46.
U.S. Department of State. 2007. "Background Note: South Korea." Retrieved September 2, 2007, from http://www.state.gov/r/pa/ei/bgn/2800.htm.
Yang, Su-Jin, Jae-Min Kim, Sung-Wan Kim, Il-Seon Shin, and Jin-Sang Yoon. 2006. "Bullying and Victimization Behaviors in Boys and Girls in South Korean Primary Schools." *Journal of the American Academy of Child and Adolescent Psychiatry* 45:69-77.

Byongook Moon is an assistant professor in the Department of Criminal Justice at The University of Texas at San Antonio. He is a 2004 graduate of the School of Criminal Justice at Michigan State University. His research focuses on the application of criminological theories to explaining delinquency in South Korea. He also has been involved in research on bullying, community policing, stress in policing and on the process of recruiting police in South Korea.

Merry Morash is a professor of criminal justice at Michigan State University. Her recent book *Understanding Gender, Crime, and Justice* (Sage, 2006) reflects her interest in gender arrangements. Past publications consider delinquency, domestic violence, and policing in the South Korean context. She is the founder and director of the Michigan Victim Assistance Academy and of the Michigan Regional Community Policing Institute.

Cynthia Perez McCluskey is an associate professor in the Department of Criminal Justice at The University of Texas at San Antonio. She earned her PhD in criminal justice in 1999 from the University at Albany, State University of New York. Her research interests include life-course criminology, adolescent substance use, and school achievement. Her work focuses on Latino/a youth and families and the experience of Latinos in the criminal justice system.

Hye-Won Hwang is an assistant professor of social welfare at Cheongju University in South Korea. She is a graduate of the College of Human Ecology at Michigan State University. Her research focuses on the healthy development of South Korean youth and finding effective intervention strategies for improving their quality of lives. She has been involved in research on a longitudinal study for understanding the delinquent behavior of South Korean youth and the monitoring of United Nations Convention on the Rights of the Child implementation in Korea.