



A comparative analysis of general strain theory

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ABSTRACT

Purpose: Since its introduction in 1992, general strain theory (GST) has garnered much empirical support. The large share of this support, however, derives from studies conducted in the United States. There is little comparative research on GST, particularly research that examines the effect of the same or similar strains on crime across countries. Thus, we know little about the generalizability of GST. This study attempts to fill this gap by testing GST in five different cities across Europe: Bucharest in Romania, Sofia in Bulgaria, Riga in Latvia, Kaunas in Lithuania and Reykjavik in Iceland.

Methods: We examine the relationship between five strain measures and violent- and property crime among samples of adolescents in each city using regression techniques.

Results: The data are generally supportive of GST, with most of the strains having significant associations with property and violent crime in all or most of the cities.

Conclusion: GST is generalizable to a range of European cities. Implications and examples for future comparative research on GST are discussed.

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Introduction

Numerous studies in the United States (US) provide support for General Strain Theory (GST), suggesting that certain strains increase the likelihood of crime (see Agnew, 1992; 2001; 2006, for an overview). More recently, GST has been tested in several countries outside the US, including China, Korea, the Philippines, Italy, Israel, Greece, the Ukraine, Russia, Canada, and Iceland (Baron, 2004; Botchkovar & Hughes, 2010; Botchkovar, Tittle, & Antonaccio, 2009; Cheung & Cheung, 2008, 2010; Bao, Haas, & Pi, 2004; Bao & Haas, 2009; Froggio & Agnew, 2007; Landau, 1998; Liu & Lin, 2007; Maxwell, 2001; Morash & Moon, 2007; Moon, Blurton, & McCluskey, 2008; Moon, Hays, & Blurton, 2009; Moon, Morash, McCluskey, & Hwang, 2009; Sigfusdottir, Farkas, & Silver, 2004; Sigfusdottir & Silver, 2009). These tests suggest that GST is applicable across a range of societies, with selected strains affecting crime in most countries. There are, however, certain notable exceptions in the cross-national support for GST. Botchkovar et al. (2009) found that strains affect crime in their Ukrainian sample, but not in their Greek and Russian samples. Further, certain strains appear to have larger effects in some countries than in others. For example, this appears to be

the case with certain family- and school-related strains (e.g., Cheung & Cheung, 2008; Maxwell, 2001; Moon, Hays, et al., 2009; Moon, Morash, et al., 2009; Hollist, Hughes, & Schaible, 2009). So while GST has some support in most of the countries examined, there is nevertheless some question about the generalizability of general strain theory.

It is difficult, however, to draw firm conclusions about the cross-national applicability of GST from the above studies. Only a few countries outside the US have been examined; the studies only examine certain of the strains predicted to affect crime; they sometimes examine strains not predicted to affect crime; they focus on somewhat different types of strain; they measure similar types of strain in different ways; they sometimes employ overly general measures of strain, such that it is unclear what particular strains are being examined; they employ different types of samples (e.g., juveniles versus adults), and they employ different analytic techniques. This is not to fault those studies of GST conducted outside the US. With the exception of Botchkovar et al. (2009), such studies were not intended to provide comparative data on GST. Rather, they were intended to test GST or portions of the theory in particular countries, and most reflect great effort and skill on the part of the researchers. Nevertheless, these studies highlight the need for comparative data on GST – particularly data that includes a range of countries, that examines many of the strains predicted to affect crime, that measures these strains in the same manner, and that employs the same types of samples. Such research will allow us to gain a better sense of how applicable GST is to countries outside the US and, related to this, whether there are cross-national differences in the effects of particular strains on crime.

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This paper presents a comparative test of this type, examining the effect of five strains on delinquency among similar samples of youth in five countries. The paper first draws on Agnew (1992; 2001; 2006) to briefly describe the foundation for a comparative general strain theory. It then briefly reviews the research on GST conducted outside the US, with a focus on the study by Botchkovar et al., (2009). This is the only comparative study of GST, as well as the only study to suggest that GST is not applicable in certain countries. Next, the data and measures are described, followed by the presentation of the results. While this study is of course limited in the number of countries and the particular strains it examines, it represents the most comprehensive comparative analysis of GST to date and, as described below, overcomes the problems listed above.

Applying GST to the Comparative Study of Crime

GST defines strains as events and conditions which are disliked (see Agnew, 1992; 2001; 2006 for an overview). A distinction is made between objective strains (events and conditions disliked by most people in a given group) and subjective strains (events and conditions disliked by the people experiencing them). Strains may involve the failure to achieve valued goals (e.g., monetary success, status), the threatened or actual loss of valued stimuli (e.g., loss of romantic partner, financial loss), or the presentation of negative stimuli (e.g., family conflict, victimization). Those specific strains most conducive to crime are high in magnitude, are seen as unjust, are associated with low social control, and provide some pressure or incentive for crime. Examples include parental rejection; harsh, erratic parental discipline; child abuse and neglect; negative secondary school experiences (e.g., low grades, negative relations with teachers); peer abuse; chronic unemployment; the failure to achieve selected goals (e.g., masculine status, much money in a short period of time); criminal victimization; homelessness; and discrimination based on race/ethnicity and gender. Such strains increase the likelihood of crime for several reasons; most notably, they lead to negative emotions such as anger, frustration, and resentment. These emotions create pressure for corrective action, and crime is one possible response. Crime may be used to escape from or reduce strains (e.g., running away from abusive parents, stealing money), seek revenge against the source of strain or related targets, or alleviate negative emotions (e.g., through illicit drug use). Not all individuals respond to strains with crime, however. A criminal response is more likely when individuals have poor coping skills and resources, the costs of crime are low, and individuals are disposed to crime.

GST was developed with the United States in mind, but can be used to explain crime in other societies. Drawing on Agnew (1992; 2001; 2006), we would predict that GST would have some applicability in all societies. As Agnew (2006:165) notes, certain events or conditions are “extreme stressors;” they seriously disrupt routine activities and jeopardize the pursuit of most major goals. They should therefore be strongly disliked or function as severe strains in most societies. Such stressors include severe physical and sexual assaults, parental rejection, severe family conflict, the loss of livelihood, and dispossession. Further, such stressors are likely to be seen as unjust if they are the result of the voluntary and deliberate acts of others. In addition, they frequently reduce the individual’s level of social control (e.g., individuals who lose their livelihoods have less to lose by engaging in crime). And they often create some pressure or incentive to engage in crime. For example, the victims of physical assault are exposed to criminal models and often develop beliefs favorable to crime (e.g., crime is necessary to protect oneself from attack). As such, these strains should increase crime in all or most societies.

At the same time, Agnew recognizes that the effect of other strains may vary across societies. There are several reasons for this. First, societies differ in the magnitude of particular strains, so certain strains may have more severe consequences in some societies than others.

For example, poor academic performance is said to have more severe consequences in China and Korea than in many other countries (Bao & Haas, 2009; Liu & Lin, 2007; Moon, Hays, et al., 2009; Moon, Morash, et al., 2009). Among other things, those who perform poorly in school dishonor their families; jeopardize the future welfare of their parents (especially given the one child policy in parts of China); are widely viewed as “disgraces;” are subject to much negative treatment by family, teachers, and others, including some physical abuse; and lose virtually all chance for monetary success and status. Consequently, we might expect poor performance to have a larger effect on crime in China and Korea. To give a related example, there is some evidence that teacher abuse is especially severe in Korea. Teachers commonly engage in behaviors such as hitting students, beating them with a stick or rope, slapping them, calling them derogatory names, and shouting at them when they perform poorly. Teacher abuse is said to be much less severe in most Western countries, and so we might expect it to have a smaller effect on crime (Morash & Moon, 2007; Moon, Hays, et al., 2009). To give a final example, Cheung and Cheung (2008) argue that certain parent-related strains will have smaller effects on delinquency in parts of Mainland China than in more capitalist areas, such as Hong Kong and Western countries. This is partly because the extended family is more important in these Mainland communities, diluting the effect of parents. Also, these communities place more emphasis on support from work units, the neighborhood, and the larger community; again diluting the effect of parents. Further, women are more likely to be employed in these communities and less likely to be involved in household activities – such as childcare. Cheung and Cheung (2010) find some support for these arguments in their study of youth in Guangzhou, Mainland China and in Hong Kong – with certain parent-related strains having a larger effect on crime in Hong Kong.

Second, people in different societies may differ in their subjective interpretation of strains because of cultural differences. As such, given strains may be seen as more severe or unjust in certain societies than others. Strains are to some extent socially constructed; the cultural system influences what people define as strains by affecting such things as they goals they pursue and the events/conditions they define as undesirable. Likewise, it exerts some influence on what is defined as unjust. For example, strict parental control may be seen as a severe strain in societies that value self-direction in children, but not in societies that value subordination to parental authority. In fact, such control may be viewed as a sign of parental concern. To give another example, Maxwell (2001) finds that parent-to-child aggression (being slapped, spanked, beaten) is *not* related to delinquency among Filipino youth, a finding at odds with much of the research in Western countries. She argues that the “cultural acceptance of spanking and physical forms of punishment in the Philippines” may account for the lack of an effect (Maxwell, 2001: 287; also see Cheung & Cheung, 2010; Moon et al., 2008; Moon, Hays, et al., 2009; Moon, Morash, et al., 2009).

Third, differences in the subjective interpretation of strains may also reflect differences in the structure as well as culture of societies. Most notably, the extent and distribution of strains such as economic deprivation may influence their interpretation. People determine the severity and injustice of their strains partly through a process of social comparison. If people are surrounded by privileged others, they are more likely to interpret their poverty as severe. Further, if they are similar to these privileged others on certain relevant characteristics (e.g., education), they are more likely to interpret their poverty as unjust. There is some support for this idea. Crime rates are higher in societies with high levels of economic inequality, particularly when such inequality is the result of race, ethnic, or religious discrimination (Agnew, 2006; Messner, 1989). Also, individuals who are economically deprived are more likely to turn to crime when they live in communities where most others are privileged (Bernburg, Thorlindsson & Sigfusdottir, 2009).

Fourth, individuals in different societies may differ in their tendency to cope with strains through crime. Again, this may reflect cultural and structural differences. For example, some societies may place greater emphasis on self-control, the subordination of individual interests, and concern for the common good. Individuals in such societies will therefore be less likely to respond to given strains with crime. This is said to be the case in many Asian societies, although such societies are starting to become more individualistic (see Bao & Haas, 2009; Cheung & Cheung, 2010). To give another example, some societies provide more social support than others, also reducing the likelihood of a criminal response to strains. For example, data suggest that economic deprivation is less likely to lead to crime in societies with more generous welfare policies – such as health insurance and unemployment compensation (Agnew, 2006). Finally, as Botchkovar et al. (2009) and others suggest, individuals in countries where they are routinely exposed to strains may be better able to cope with strains in a noncriminal manner, if only because they become more habituated to such strains.

In sum, we would expect certain strains to affect crime in all or most societies, while the effect of other strains may differ across societies. A general strain theory that explains differences in criminal offending will systematically list all of those strains that function as “extreme stressors,” as well as those societal factors that affect the magnitude of given strains, the interpretation of such strains (e.g., their *perceived* magnitude and injustice), and the likelihood of criminal coping. Further, such approach will describe how influential factors vary across types of societies (e.g., individualistic versus collectivistic orientation) and across particular societies. Finally, this theory will be sensitive to group differences within societies. For example, it will note the critical role that gender, race/ethnicity, age, class, religion, and sexual orientation often play in shaping the nature and magnitude of strains experienced in particular societies, the interpretation of strains, and coping (e.g., Botchkovar & Hughes, 2010; Cheung & Cheung, 2010; Landau, 1998; Liu & Lin, 2007; Morash & Moon, 2007). For example, the emphasis on academic success in China and Korea apply more to males than females (Liu & Lin, 2007).

Comparative research in GST

Studies on GST in countries other than the US are starting to accumulate and, as suggested above, they have an important contribution to make in a comparative GST approach. They point to strains that are and are not important in particular societies, suggest reasons for the varied importance of such strains, and provide a rough sense of the applicability of GST across societies. But, again, it is difficult to estimate the relative importance of particular strains across societies from such studies. This is a recurrent problem in many comparative international studies and makes data difficult to interpret. Comparisons are often affected by differences in assessment methods, including the use of different questions to measure “same” study items. Studies on strain have examined somewhat different strains, measured similar strains in different ways, employed different samples (e.g., adults versus juveniles), as well as used different analytic techniques (e.g., code variables differently, control for somewhat different variables, employ different statistical analysis techniques). To illustrate, many studies examine the impact of family-conflict on crime. But these studies define and measure family conflict somewhat differently, employ different types of samples, and analyze their data differently. For example, Maxwell (2001) examines the impact of “familial strain” on antisocial behavior among grade school students in rural and urban areas in the Philippines. Familial strain is measured by two items: parents/guardians “slap/spank you or hit you with something” and “bite/beat you with belt and other things resulting in wounds.” Cheung and Cheung (2008) examine the impact of family conflict on delinquency among secondary students in Hong Kong and Guangzhou, Mainland China. Family conflict includes “parental agitation” (parents/guardians “make me unhappy” and “lose their temper with me”) and “family problems” (“quarrels within family

and worry over finances”). Overall delinquency is analyzed separately from violent delinquency. Moon, Hays, et al. (2009) and Moon, Morash, et al. (2009) examine the effect of “family conflict” and “parent’s emotional and physical punishment” on delinquency using longitudinal data from middle school students in three Korean cities. “Family conflict” is measured by three items, dealing with “verbal argument and tension among family members and conflict and tension between the respondent and his or her parents.” The “parent’s emotional and physical punishment” is measured by four items dealing with name calling, negative comparisons with others, and hitting or attempting to hit the respondent. There are separate analyses for violent delinquency, property delinquency, and status offenses. Each of these studies finds that their measure(s) of family conflict affect at least certain types of delinquency in at least some cases. This is an important finding, suggesting that family conflict has some applicability in all three societies. But at the same time, the impact of the family conflict measures appears to differ somewhat across the studies, and in certain cases the family conflict measures do not have significant effects on delinquency (e.g., “family problems” does not affect delinquency in Hong Kong, “parent’s emotional and physical punishment” does not affect property delinquency in Korea). Given the many differences between these studies, we are not in a position to describe the relative effects of a particular type of family conflict across societies.

A comparative test of GST requires a study that focuses on a range of societies, examines the same strains in these societies, measures strain and delinquency in the same manner, employs similar samples within each society (e.g., urban high school students in public schools), and employs similar analytic techniques. Such a study will allow us to compare the effect of similar strains across societies, better estimating the generality of GST. And if the effect of particular strains differs, such a study will provide a foundation for investigating the reasons behind these differences. Only one comparative study of GST has been conducted to date, that by Botchkovar et al. (2009) – which tests GST in Greece, the Ukraine, and Russia. This study, however, suffers from several methodological problems. The strain measures employed are quite general (e.g., respondents are asked how frequently they are experiencing “bad conditions” or “failing to achieve some goal that is important to you”). As such, it is not clear what specific strains the respondents are experiencing and whether respondents in different countries are reporting the same strains when they reply to given strain questions. Also, the questions measuring strain use as examples certain strains that GST states are unrelated to crime (e.g., “becoming seriously ill”). Further, the study examines the effect of strains on intentions to offend, while controlling for prior crime. This strategy is likely to underestimate the effect of the strains. GST predicts that strains have a relatively contemporaneous effect on crime, so the control for the measure of prior crime may therefore substantially reduce the effect of the strains on subsequent crime or intentions to offend (the strains reported likely refer to events and conditions experienced in the past several months or longer and so overlap temporally with prior crime). Furthermore, the measure of intentions to offend is not well suited for a test of GST, since the theory states that crime often arises from negative emotions, reflecting angry outbursts, etc. As such, crime is often (but not always) unplanned.¹ These limitations may account for the fact that no support was found for GST in the Greek and Russian samples and only weak support in the Ukrainian sample. As noted above, this lack of support is an anomaly in the research on GST. There is clearly a need for more comparative work on GST.

The current study

In the current paper, we discuss ways in which GST might explain comparative differences in offending by testing portions of the theory with data from five cities in Europe. We draw on the Youth in Europe data to focus on several major strains known to be conducive to

delinquency, and examine a) the level of these strains across societies; and b) the extent to which these strains are associated with crime in these societies.

We examine five societies across Europe, all of which are constitutional republics; Bucharest in Romania, Kaunas in Lithuania, Reykjavik in Iceland, Riga in Latvia and Sofia in Bulgaria. Similar to Botchkovar et al. (2009) the current study examines a range of cities in Eastern and Western Europe. However, the countries and cities included in the current study differ from one another in important ways. For example, the annual gross domestic productivity (GDP) per capita, estimated by the *International Monetary Fund* in US dollars, was almost 37,000 in Iceland in 2010 (ranking 16th world wide out of 183 countries), just over 17,000 in Lithuania (49th world wide), almost 14,500 in Latvia (58th world wide), a little less than 13,000 in Bulgaria (65th world wide) and almost 12,000 in Romania (69th world wide). Also, the country profiles on the Human Development Index by the United Nations, which is a worldwide comparative measure of education, literacy, life expectancy, employment and standards of living ranked Iceland number 17 out of 135 countries in 2010, Bulgaria number 58, Latvia at 48, Lithuania number 44, and Romania at 50. Iceland is the only country out of these five to receive a “very high” grade on the index whilst the remaining four receive a “high” score on the index (United Nations, 2011).

We focus on five major types of strain: physical victimization, family conflict, school strain, peer rejection and economic deprivation. These events and conditions should be strongly disliked in these societies; in fact, certain might be classified as “extreme stressors” (e.g., physical victimization). The effect of certain of these strains, however, might vary across societies. It is difficult to predict such variation in detail, given the number of societies and strains. But to illustrate, a strain such as school problems should have a greater effect in societies that place more value on education, as reflected in the higher average levels of education. In our study, Bulgaria has the lowest average level of education (9.9 years versus a high of 10.9 in Lithuania) and the lowest “expected years of schooling” by children (13.7 years versus a high of 18.2 in Iceland; see United Nations, 2011). So we might expect school problems to have a smaller effect on delinquency in Bulgaria. At this early stage of analysis, however, our primary focus is on determining whether these strains affect crime in the societies examined, thus providing support for the generality of GST. If the relative impact of these strains differs across societies, further research should focus on determining the reasons for such differences – drawing on and extending the arguments presented above. Therefore, the main hypothesis we test is that:

Strain experienced by adolescents in the form of physical victimization, family conflict, school strain, peer rejection and economic deprivation are positively associated with violent and property delinquency.

Method and Data

Sample

The data is from the 2008 *Youth in Europe* Survey, a set of cross-sectional surveys of representative samples of 14- to 15-year-old adolescents in 11 cities across Europe in October and November of 2008.² Participants were students attending the compulsory 9th and 10th grades of the local secondary school systems (predominantly 14 and 15 years of age). For this analysis the five cities were selected for three reasons: 1. Sufficiency of data (number of participants). 2. High response rate. 3. All the questions for this analysis were included in the local version of the questionnaire. Unfortunately, the data from the other six cities that participated in the study suffered from limitations to the above which necessitates us to limit our comparative data analysis to these five cities. The procedures for the data collection in

the Youth in Europe study were analogous to the *Youth in Iceland* surveys (Sigfusdottir et al. 2008; 2009; 2010; Sigfusdottir, Kristjansson, et al., 2008). Classroom-based samples, clustered within the cities that participated in the study, were drawn. All classes from all schools within each city were randomly sampled for participation. Data collection in the classes was supervised by teachers, guided by a strictly uniform methodological protocol developed by the ICRA. A prior study by Bjarnason (1995) revealed no teacher effects of this method of data collection on adolescent reports of alcohol, tobacco, and other substance use in the Icelandic setting. The combined response rate for these 5 cities was over 90%. The respective number of respondents within each city, response rate and gender ratio is shown in Table 1. A total 12,682 students are in the samples examined.

The participating cities

Bucharest is the capital of Romania, its industrial and financial central point, and has a population of about 2 million people. Crime rates in Bucharest are generally low in comparison to other Eastern European cities. Kaunas is located in the very centre of Lithuania and has close to 400,000 inhabitants. It is the second largest city in Lithuania after the capital Vilnius and its centre of industry, business, academy and culture. Riga is the capital of Latvia and the largest city in the three Baltic countries, which also consist of Estonia and Lithuania, with about 700,000 inhabitants. Lithuanian and Latvian history continues to be heavily marked by the Soviet occupation and coercion from the Second World War which continued in many ways until 1989 when the iron curtain collapsed and a process of democratization began. Sofia is the capital of Bulgaria and its largest city with about 1.4 million inhabitants in the capital area. Sofia is highly divided between the rich and the poor but the majority of the population consists of ethnic Bulgarians but large minority groups exist such as Turks and the Roma people with a population of over 100,000. Reykjavik is the capital of Iceland and the countries' only city with about 180,000 inhabitants living in the wider capital area. Around 95% of the inhabitants of Reykjavik are Icelanders.

Overall, the participating cities differ from the US cities where most studies of GST have been conducted. Most notably, four of the cities are located in former post-communist countries that have gone through rapid social changes to a market society since the collapse of the iron curtain in 1989 (Bucharest, Kaunas, Riga, and Sofia). Further, certain of these cities continue to experience a range of social problems, such as high levels of inequality and unemployment. These cities are similar to two of the societies that Botchkovar et al. (2009) examined; Russia and Ukraine. Given that the Botchkovar et al. (2009) found very weak support for GST, it is critical to examine the association between strains and crime in these cities, correcting for the methodological problems in Botchkovar et al. described above. The fifth city Reykjavik, in Iceland, is the capital of a Nordic welfare state. Reykjavik has lower inequality than the other cities and an overall higher level of well-being. As such, the inclusion of Reykjavik will give us a better sense of whether the results are generalizable beyond the post-communist cities that dominate the sample.

Table 1
Number of Participants in Each City, Response Rate, and Gender Ratio

| City | N | Response rate (%) | % girls |
|-----------|--------|-------------------|---------|
| Bucharest | 2,657 | 95 | 58.7 |
| Kaunas | 2,567 | 92 | 48.2 |
| Reykjavik | 2,111 | 75 | 49.8 |
| Riga | 2,679 | 96 | 54.7 |
| Sofia | 2,668 | 95 | 55.7 |
| Total | 12,682 | 91 | 53.7 |

Measures

The core questionnaire, prepared by the ICSRA at Reykjavik University and colleagues from the University of Iceland, was the same in all participating cities and included several locally developed and international scales and individual questions (see Kristjansson (2008) for a full discussion). Along with questions on substance use and delinquency, a set of core questions covers a wide array of demographic and social variables, including family structure, parental and peer support, structured and unstructured activities, academic achievement, negative life events, chronic strain and psychosocial adjustment (Sigfusdottir et al., 2009, 2010). The core questionnaire was translated and then back-translated in the participating cities for accuracy of interpretation.

Outcome variables

Following Ostrowsky and Messner (2005) and others, we examine both property and violent crime – since the effects of strains sometimes differ across the two types of crime.

Violent crime

Violent crime was measured with 9 items headed by the sentence “How often (if ever) have you done any of the following during the last 12 months?” The questions were 1) Punched somebody, 2) Knocked somebody over, 3) Kicked somebody, 4) Hit/slapped somebody, 5) Held somebody by their neck, 6) Threatened somebody with violence, 7) Used physical violence in order to rob or steal, 8) Forced somebody to have sexual relations with you, and 9) Forced somebody to have sexual intercourse with you.³ Response categories ranged from 1 = “Never”, 2 = “Once”, 3 = “2–5 times”, 4 = “6–9 times”, 5 = “10–13 times”, 6 = “14–17 times”, and 7 = “18 times or more”. Due to heavy positive skew and high kurtosis the scores for this variable were transformed with a natural logarithm. The combined measure has a scale range from 2.20 to 4.14. Between 59% and 80% of youth across the five cities reported at least one violent act and between 36% and 51% reported two acts or more. The most common act of violence is hitting or slapping with a range from 39–63% across the five cities; the least common act is sexual violence, with a range of 1–3% across the five cities.

Property crime

Property crime was measured with four questions headed by the sentence “How often (if ever) have you done any of the following during the last 12 months?” The questions were 1) Stolen something worth less than 3 normal movie tickets, 2) Stolen something worth more than 3 normal movie tickets, 3) Broken into a building or a car to steal, 4) Damaged or vandalized things that did not belong to you. The scores for the variables were the same as in violent crime. Due to heavy positive skew and high kurtosis the scores for this variable were transformed by taking their inverse and then reflecting them to become positive again. As with most data transformations this manipulation is conducted to make the data comply better with the normality assumptions of regression analysis. For this variable it results in a greater alternation to the skew and kurtosis coefficients than the more traditional natural logarithmic transformation. The combined measure has a scale range from 0.98 to 1.19. Between 18% and 36% of youth across the five cities reported at least one property crime act and between 8% and 23% reported two or more.

Strain Measures

Physical victimization

This strain was measured by the question “Have you been a victim of physical violence during the last 12 months?” Response categories were the same as in the outcome variables. Due to the small percentage of victimized respondents, this variable was dummy coded with

0 = “No” and 1 = “Yes, once or more often”. The percentage victimized at least once during the last twelve months ranges from 10% in Riga to 23% in Kaunas.

Economic deprivation

Economic deprivation was measured with the following four questions: 1) My parents are bad-off financially, 2) My parents can't afford to have a car, 3) My parents hardly have enough money to pay for necessities (e.g. food, housing, phone), 4) My parents do not have enough money to pay for the extracurricular activities that I would most like to participate in (e.g. learn to play a musical instrument or practice sports). The response categories range from 1 = “Almost never”, 2 = “Seldom”, 3 = “Sometimes”, 4 = “Often”, and 5 = “Almost always”. Due to heavy positive skew the scores for this variable were transformed with a natural logarithm calculation. The scores produce a combined scale with a range from 1.39 to 3.00.

School strain

School strain was measured with the following nine items: 1) I find the school studies pointless, 2) I am bored with the studies, 3) I am poorly prepared for classes, 4) I feel I do not put enough effort into the studies, 5) I find the studies too difficult, 6) I feel bad at school, 7) I want to quit school, 8) I want to change schools, 9) I get on badly with the teachers. The response categories range from 1 = “Applies almost never to me”, 2 = “Applies seldom to me”, 3 = “Applies sometimes to me”, 4 = “Applies often to me”, and 5 = “Applies almost always to me”. The scores were summed to form a scale ranging from 0 to 36. In order to distinguish this measure from the academic grade measure (see below), the school strain items were factor analyzed along with the grade items. This analysis revealed separate factors for these variables for all five city data.

Family conflict

Strain in families was measured with count data on family conflicts and assessed with the following three questions that were headed by the sentence “Have you experienced any of the following”: 1) A serious argument with your parents, 2) Witnessed a serious argument by your parents, and 3) Witnessed a physical violence in your home where an adult was involved. Response categories for these variables were coded on a multi-response format with 0 = “No”, 1 = “Yes, during the last 30 days”, 1 = “Yes, during the last 12 months”, and 1 = “Yes, more than 12 months ago” resulting in a maximum score of 3 and a minimum of 0 for each variable. The scores for all the variables were then summed to form a cumulative scale and transformed with natural logarithm due to heavy positive skew. The scores for the transformed scale range from 0 to 2.30.⁴

Peer rejection

Peer rejection was measured with count variables that were headed by the following sentence “Have you experienced any of the following”: 1) A break up with a girlfriend/boyfriend, 2) Having been rejected by your friends, and 3) Separation from a friend(s). Response categories were the same as for family conflicts and were summed to form a scale as before. Due to heavy positive skew the scale was transformed with a natural logarithm calculation resulting in a range from 0 to 2.30.⁵

Control Variables

Violent conduct norms

Violent conduct norms were measured with four questions that were headed by the sentence “How well do the following statements apply to you?”: 1) Sometimes there are situations that justify people being beaten up or hit, 2) When someone treats me badly I think it is okay to beat him/her up or hit him/her, 3) Sometimes you need to hit or punch people in order to protect your honor in your peer group,

and 4) He/she who does not respond to a personal attack by hitting or beating up the person is considered a coward in my group of friends. The response categories for these questions were 1 = “Strongly disagree”, 2 = “Disagree somewhat”, 3 = “Agree somewhat” and 4 = “Strongly agree”. The scores were summed to form a scale with a span of 4 to 16.

Peer delinquent norms

To assess delinquent norms in the peer group we asked the following five questions that were headed with the sentence: “What do you consider important to do to gain respect from your friends?” 1) To drink alcohol, 2) To smoke cigarettes, 3) To smoke cannabis substances, 4) To be against the rules of adults, and 5) To steal from shops. The response categories for these questions were 1 = “Decreases respect a lot”, 2 = “Decreases respect somewhat”, 3 = “Has no effect”, 4 = “Increases respect somewhat” and 5 = “Increases respect a lot”. The scores were summed together to form a scale with a range from 5 to 25.

Parental supervision

The supervision of parents was assessed with twelve questions. First we used the question “Do your parents know where you spend Saturday evenings?” with the response categories: 1 = “Almost never”, 2 = “Seldom”, 3 = “Sometimes”, 4 = “Often”, and 5 = “Almost always”. Then we used the following eleven questions headed by the sentence “How well do the following statements apply to you?”: 1) My parents find it important that I do well in my studies, 2) My parents set definite rules about what I can do at home, 3) My parents set definite rules about what I can do outside the home, 4) My parents set definite rules about when I should be home in the evening, 5) My parents know whom I am with in the evenings, 6) My parents know where I am in the evenings, 7) My parents know my friends, 8) My parents know the parents of my friends, 9) My parents often talk to the parents of my friends, 10) My parents and the parents of my friends sometimes meet to talk to one another, and 11) My parents follow what I do in my recreational time. The response categories ranged from 1 = “Applies very poorly to me”, 2 = “Applies rather poorly to me”, 3 = “Applies rather well to me” and 4 = “Applies very well to me”. The scores for all 12 items were summed to form a scale with a range from 12 to 49.

Grades

School performance was assessed with three questions about average grades in the following subjects during the current school year: 1) Mathematics, 2) Native language, and 3) Second language. Response categories range from 1 = “less than 4”, 2 = “About 4”, 3 = “About 5”, 4 = “About 6”, 5 = “About 7”, 6 = “About 8”, 7 = “About 9”, and 8 = “About 10”. For grades in the US these items can be compared with A+ = 9.5–10.0, A = 9.0–9.5, A- = 8.5–9.0 and so on. The questions were summed to form a scale with a range from 3 to 24. As reported above, to distinguish this measure from the school strain measure above its items were factor analyzed along with the school strain items. This analysis revealed separate factors for these variables for all five cities.

Peer delinquency

Peer delinquency was measured with six questions that were headed by the sentence “How many of your friends do you think do the following?”: 1) Smoke cigarettes, 2) Drink alcohol, 3) Become drunk at least once per month, 4) Smoke hash or marijuana, 5) Pick fights, and 6) Search out for fights. The response categories range from 1 = “None”, 2 = “A few”, 3 = “Some”, 4 = “Most”, and 5 = “Almost all”. The responses were summed to form a scale with a range from 6 to 30.

Sociodemographic Controls

Gender

Participants' gender was coded with 1 for girls and 0 for boys.

Family structure

Respondents were divided into two groups, with 0 = “Lives with both parents” and 1 = “Other arrangements”.

Parental education

Parental educational background was assessed with separate questions about mothers and fathers. The response categories were 1 = “Completed primary school or less”, 2 = “Began high school but has not graduated”, 3 = “High school graduate”, 4 = “Began junior college or trade school but has not graduated”, 5 = “Graduated from a junior college or trade school”, 6 = “Began university education but has not graduated”, and 7 = “University graduate”. The scores for both mothers and fathers were mean centered to form a scale of -4.60 to 4.40 and -4.64 to 4.36 respectively.

Age

The Youth in Europe survey was performed in the respective 9th and 10th grades in all participating cities with a great majority of students being 14 or 15 years of age. Nevertheless, age ranges between 12 and 18 and is therefore controlled for.

For all measures, missing cases were replaced with the respective mean score prior to scale building. Replaced cases within each variable were less than 2.5% of the total number of responses in all instances. Table 2 outlines the descriptive statistics for all study variables within each city data as well as the alpha coefficient for internal consistency of scales. Of the 10 measure scales used in the analysis, alpha is .70 or above for all cities on all occasions but two. The property crime measure has an alpha of .51 in Bucharest and .63 in Riga.

Analyses

We used Ordinary Least Squares regression (Gujarati, 2004) to assess the relationship between the independent and dependent variables for each city. The data are run in hierarchical models with socio-demographic variables only in the first model, measures of strain are added in the second model, and the third and final model includes other potential mediators and other confounders to strain. This allows us to examine the extent to which the strain variables add to explained variance, and the extent to which the strain variables impact delinquency with variables from other major theoretical perspectives controlled. Since our models incorporate measures that are of related dimensions we checked for possible complications: First, the Variance Inflation Factor is in all instances below 2.0 indicating that multi-collinearity should not be a problem in our data. Second, the Durbin-Watson test for autocorrelation is within suggested limits on every occasion. And third, the Cook's distance test for influential outliers reveals none to impact the respective findings in a particular manner (Gujarati, 2004). In order to compare the respective coefficients across cities, we used the method recommended by Paternoster et al. (1998).

Results

Violent crime

The frequency of violent acts is similar across the 5 cities, with the exception of the Lithuanian city of Kaunas. In Kaunas over 60% of the respondents have engaged in punching, kicking, and/or hitting/slapping, versus 30–40% of the respondents in the other cities. Other acts of violence are similar in frequency across the five cities.

Table 2
Descriptive Statistics for All Study Variables within Each City Data

| | Mean (SD), and Alpha (for scaled measures) | | | | |
|------------------------|--------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| | Bucharest | Kaunas | Reykjavik | Riga | Sofia |
| Gender | .59 (.49) | .48 (.50) | .50 (.50) | .55 (.50) | .56 (.50) |
| Family structure | .22 (.41) | .32 (.47) | .30 (.47) | .55 (.50) | .56 (.50) |
| Mothers education | .73 (2.50) | -.01 (1.77) | -1.38 (1.46) | .19 (1.69) | .03 (1.88) |
| Fathers education | .73 (2.58) | .04 (1.87) | -1.42 (1.43) | .19 (1.74) | -.07 (1.98) |
| Age | 15.93 (.49) | 16.02 (.45) | 14.99 (.15) | 13.58 (.70) | 15.58 (.54) |
| Violent crime | 2.48 (.36), .85 | 2.65 (.40), .87 | 2.55 (.43), .87 | 2.54 (.38), .82 | 2.63 (.44), .87 |
| Property crime | 1.00 (.04), .51 | 1.00 (.04), .74 | 1.02 (.06), .73 | 1.00 (.03), .63 | 1.00 (.04), .75 |
| Physical victimization | .14 (.35) | .23 (.42) | .14 (.35) | .10 (.30) | .11 (.31) |
| Economic deprivation | 1.84 (.41), .79 | 1.80 (.39), .78 | 1.64 (.34), .78 | 1.78 (.40), .78 | 1.72 (.40), .79 |
| School strain | 11.28 (5.23), .75 | 11.08 (5.49), .76 | 9.28 (5.70), .83 | 10.57 (5.24), .75 | 12.94 (6.49), .81 |
| Family conflict | .61 (.52) | .58 (.57) | .44 (.51) | .72 (.74) | .42 (.50) |
| Peer rejection | 1.61 (.46) | .50 (.59) | .52 (.54) | .81 (.75) | .54 (.53) |
| Violent conduct norms | 7.21 (2.86), .76 | 9.14 (2.97), .74 | 6.61 (2.94), .84 | 8.34 (2.86), .74 | 9.93 (3.28), .73 |
| Peer delinquent norms | 11.82 (4.15), .85 | 12.73 (4.23), .86 | 12.73 (4.23), .87 | 12.43 (3.98), .84 | 13.34 (4.07), .80 |
| Parental supervision | 33.87 (5.89), .78 | 33.00 (5.51), .77 | 35.77 (6.18), .84 | 31.67 (5.61), .77 | 33.62 (6.14), .77 |
| Grades | 17.82 (3.85), .70 | 14.44 (4.39), .79 | 17.51 (3.70), .70 | 12.60 (3.67), .70 | 16.15 (4.47), .71 |
| Peer delinquency | 14.16 (5.01), .86 | 15.98 (4.92), .86 | 11.79 (4.96), .90 | 15.19 (5.13), .86 | 16.13 (5.68), .87 |

Table 3 shows the standardized Beta coefficients from OLS regression models predicting violent crime for all five city-based datasets. The first model indicates that the background variables explain 8% (Sofia) to 14% (Kaunas) of the variance in violence. Females are much less likely to engage in violence in all cities. The effect of the other socio-demographic variables is generally insignificant or small.

The second model adds the strain measures to the equation. Physical victimization and school strain have the strongest relationship to violence in all cities. The standardized betas for physical victimization range from .11 for Bucharest to .23 for Reykjavik, while those for school strain range from .15 (Riga) to .22 (Reykjavik). Peer rejection is also significantly related to violence in all cities, although the betas here range from .06 to .14. Family conflict has a significant relationship in three of the five cities. Interestingly, economic deprivation is negatively associated with violence in four of five cities – although the size of the relationship is very small. The addition of the strain variables increases explained variance in all cities, with the explained variance ranging from 19% in Bucharest and Sofia to 31% in Reykjavik. Overall, these data suggest that most of the strain measures have an important role to play in the explanation of violence across these five relatively diverse cities.

The third and final model adds control variables associated with other leading theories to the analysis. The cross-sectional nature of the data prevents us from determining whether these variables partly mediate the effect of strain on delinquency, as suggested by Agnew (2006). Explained variance increases across the spectrum and is between 30% (Riga and Sofia) and 43% (Reykjavik). The variables with the strongest effect on violent crime are violent conduct norms (ranging from a standardized beta of .21 Sofia to .32 for Bucharest) and peer delinquency (ranging from .20 for Bucharest and Riga to .24 in Sofia). The other added variables in model 4 have little or no relation to violent crime. The strength of the relationship between the measures of physical victimization and school strain and to violent crime decreases for all the city datasets from model 2 but remains statistically significant.

Finally, we use the formula by Paternoster et al. (1998) to compare the regression coefficients in model 3 across the 5 cities. A large number of comparisons are possible, 10 for each variable, since we estimate the relationship of five strain variables to delinquency. We find that the strain coefficients are generally not significantly different across the cities. An examination of these seven variables between all 5 cities found only six instances where effects significantly differed. Physical victimization has a significantly stronger relationship with violent crime in Riga (beta = .11), Reykjavik (beta = .16) and Kaunas (beta = .18) than in Bucharest (beta = .08). Family

conflict has a stronger relationship with violence in Reykjavik (beta = .07) than in Kaunas (beta = .00), and Peer rejection has stronger impact on violence in Sofia (beta = .10) than Kaunas (beta = .04), and Reykjavik (beta = .03). Despite our earlier prediction, the relationship between school strain and violence is not significantly different across cities.

Property crime

The frequency of property crimes is similar across the five cities for the most part. However, Reykjavik in Iceland stands out on the measure on stealing something worth less than 3 normal movie tickets and the measure on property damage/vandalism, with both items having frequencies over 20% whereas the other cities are below 14% on these items. Other acts of property crime are much less common in all the cities and similar in frequency across the cities.

Table 4 shows the standardized Beta coefficients from OLS regression models predicting property crime for all five cities. The data is run in hierarchical mode in the same order as before. In the first model, the background variables explain from 2% (Riga) to 4% (Bucharest, Kaunas, Reykjavik) of the variance in property crime, with gender again the key variable. Females are less likely than males to engage in property crime across all 5 cities. However, the gender coefficient is not as large as it is in the violence model, suggesting that females are more likely to engage in property crime than violent crime. The explained variance is also considerably smaller in the first round of models for property crime (2–4%) than for violent crime (8–14%).

The second model adds the strain measures to the equation. The strain measures with the strongest relationships to property crime are school strain (standardized betas range from .11 for Riga to .21 for Reykjavik), physical victimization (standardized betas range from .10 (Riga and Sofia) to .18 (Reykjavik), peer rejection (.05 for Riga to .16 for Reykjavik), and family conflicts (.08 for Kaunas and Reykjavik to .12 for Bucharest and Sofia). Explained variance varies from 8% (Riga) to 21% (Reykjavik).

As before, the third and final model adds potential meditational and confounding variables to the equation from other leading theories. Explained variance increases across the spectrum and is between 13% (Riga) and 33% (Reykjavik). The strongest impact is from peer delinquency (ranging from a standardized beta of .09 for Sofia to .30 for Reykjavik) and to a lesser extent for violent conduct norms (ranging from .06 for Sofia to .13 for Reykjavik) and parental supervision (ranging from -.04 for Bucharest to -.08 in Riga and Sofia). The other added variables in model 4 have little or no relations with

Table 3
Standardized and Unstandardized Beta Coefficients from OLS Regression Models within Each City, Predicting Violent Crime (SEs in parenthesis)

| | Model 1: Background | | | | | Model 2: + Strain measures | | | | | Model 3: + Other measures | | | | |
|-----------------------|---------------------|--------|-----------|--------|--------|----------------------------|--------|-----------|--------|--------|---------------------------|--------|-----------|--------|--------|
| | Bucharest | Kaunas | Reykjavik | Riga | Sofia | Bucharest | Kaunas | Reykjavik | Riga | Sofia | Bucharest | Kaunas | Reykjavik | Riga | Sofia |
| Gender | -.33** | -.37** | -.33** | -.36** | -.27** | -.30** | -.31** | -.32** | -.36** | -.25** | -.21** | -.22** | -.22** | -.28** | -.20** |
| | (.014) | (.015) | (.018) | (.014) | (.017) | (.014) | (.015) | (.017) | (.014) | (.017) | (.013) | (.015) | (.017) | (.014) | (.016) |
| Family Structure | .03 | .01 | .10** | .05** | .06** | .02 | .01 | .01 | .04* | .03 | .02 | -.00 | -.02 | .03 | .02 |
| | .025 | .011 | .088 | .037 | .057 | .020 | .010 | .005 | .030 | .032 | .018 | -.001 | -.015 | .021 | .017 |
| | (.016) | (.016) | (.019) | (.014) | (.018) | (.016) | (.016) | (.019) | (.014) | (.018) | (.014) | (.014) | (.017) | (.013) | (.017) |
| Mothers education | -.01 | -.03 | -.01 | .03 | .00 | -.01 | -.03 | .02 | .03 | -.00 | -.01 | -.02 | .02 | .03 | .00 |
| | -.002 | -.007 | -.002 | .007 | .001 | -.002 | -.007 | .006 | .006 | -.001 | -.001 | -.004 | .007 | .006 | .001 |
| | (.003) | (.005) | (.007) | (.004) | (.005) | (.003) | (.005) | (.006) | (.004) | (.005) | (.003) | (.004) | (.006) | (.004) | (.005) |
| Fathers education | -.03 | -.03 | -.06** | .01 | .00 | -.03 | -.02 | -.05** | .01 | .01 | -.00 | -.01 | -.04* | .01 | .01 |
| | -.004 | -.006 | -.018 | .001 | .000 | -.004 | -.005 | -.016 | .001 | .002 | .000 | -.003 | -.011 | .003 | .002 |
| | (.013) | (.005) | (.007) | (.004) | (.005) | (.003) | (.004) | (.006) | (.004) | (.005) | (.003) | (.004) | (.006) | (.004) | (.005) |
| Age | -.00 | -.06** | -.01 | -.03 | -.02 | -.00 | -.06** | -.03 | -.04* | -.03 | -.01 | -.06** | -.04* | -.05** | -.03 |
| | -.000 | -.051 | -.009 | -.015 | -.013 | -.003 | -.050 | -.069 | -.021 | -.021 | -.009 | -.050 | -.113 | -.026 | -.025 |
| | (.000) | (.017) | (.057) | (.010) | (.015) | (.013) | (.016) | (.052) | (.010) | (.015) | (.012) | (.015) | (.048) | (.009) | (.014) |
| Phys. victimization | | | | | | .11** | .22** | .23** | .13** | .12** | .08** | .18** | .16** | .11** | .09** |
| | | | | | | .110 | .215 | .290 | .169 | .180 | .077 | .175 | .199 | .143 | .136 |
| | | | | | | (.019) | (.018) | (.025) | (.023) | (.027) | (.017) | (.016) | (.024) | (.022) | (.025) |
| Economic deprivation | | | | | | -.08** | -.06** | -.02 | -.06** | -.05* | -.06** | -.04* | -.03 | -.04* | -.01 |
| | | | | | | -.069 | -.060 | -.023 | -.058 | -.054 | -.050 | -.043 | -.031 | -.039 | -.015 |
| | | | | | | (.016) | (.019) | (.026) | (.017) | (.021) | (.015) | (.018) | (.024) | (.016) | (.020) |
| School strain | | | | | | .21** | .16** | .22** | .15** | .21** | .08** | .05** | .07** | .06** | .10** |
| | | | | | | .015 | .011 | .017 | .011 | .015 | .005 | .004 | .006 | .005 | .007 |
| | | | | | | (.001) | (.001) | (.002) | (.001) | (.001) | (.001) | (.001) | (.002) | (.001) | (.001) |
| Family conflict | | | | | | .07** | .04 | .11** | .08** | .03 | .04* | .00 | .07** | .05** | .00 |
| | | | | | | .046 | .025 | .096 | .043 | .028 | .025 | .003 | .055 | .028 | .003 |
| | | | | | | (.013) | (.015) | (.018) | (.010) | (.018) | (.012) | (.013) | (.017) | (.009) | (.017) |
| Peer rejection | | | | | | .08** | .06** | .06** | .12** | .14** | .04* | .05** | .03 | .09** | .10** |
| | | | | | | .064 | .040 | .046 | .060 | .115 | .030 | .036 | .021 | .047 | .083 |
| | | | | | | (.015) | (.059) | (.017) | (.010) | (.017) | (.014) | (.013) | (.015) | (.009) | (.016) |
| Violent conduct norms | | | | | | | | | | | .32** | .26** | .28** | .22** | .21** |
| | | | | | | | | | | | .040 | .036 | .041 | .030 | .029 |
| | | | | | | | | | | | (.002) | (.003) | (.003) | (.003) | (.003) |
| Peer delinquent norms | | | | | | | | | | | -.06** | .00 | -.03 | -.01 | -.02 |
| | | | | | | | | | | | -.005 | .000 | -.003 | -.001 | -.002 |
| | | | | | | | | | | | (.002) | (.002) | (.002) | (.002) | (.002) |
| Parental supervision | | | | | | | | | | | .01 | -.06** | -.08** | -.02 | -.11** |
| | | | | | | | | | | | .001 | -.004 | -.006 | -.001 | -.008 |
| | | | | | | | | | | | (.001) | (.001) | (.001) | (.001) | (.001) |
| Grades | | | | | | | | | | | -.06 | .04* | .00 | .03 | .02 |
| | | | | | | | | | | | -.005 | .004 | .000 | .003 | .002 |
| | | | | | | | | | | | (.002) | (.002) | (.002) | (.002) | (.002) |
| Peer delinquency | | | | | | | | | | | .20** | .21** | .23** | .20** | .24** |
| | | | | | | | | | | | .014 | .017 | .019 | .015 | .019 |
| | | | | | | | | | | | (.001) | (.001) | (.002) | (.001) | (.001) |
| R ² | .11 | .14 | .12 | .13 | .08 | .19 | .24 | .31 | .22 | .19 | .33 | .37 | .43 | .30 | .30 |

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

property crime. As was the case with violent crime, the addition of these variables generally reduces the impact of the strain variables on property crime – although most of the previously significant impacts remain so.

Finally, we compared the strain coefficients in model 3 across the 5 cities. There are 15 significant differences, out of a total of 50 possible comparisons. Most of these differences, although statistically significant, are small in absolute size. First, economic deprivation has a stronger impact on property crime in Riga (beta=.05) than Kaunas (beta=-.02). Second, school strain is more strongly related with property crime in Sofia (beta=.12) than in Riga (beta=.05). Third, family conflict has a stronger relationship with property crime in Sofia (beta=.10) than in Kaunas (beta=.05), Reykjavik (beta=.02) and in Bucharest (beta=.10) than in Kaunas (beta=.05), Reykjavik (beta=.02) and Riga (beta=.08). Fourth, peer rejection has a significantly stronger relationship with property crime in Reykjavik (beta=.11) than Riga (beta=.03), Kaunas (beta=.06), Sofia (beta=.05) and Bucharest (beta=.07). Peer rejection in Bucharest (beta=.07) is also more strongly associated with property crime than in Riga (beta=.03) and in Kaunas (beta=.06)

over Riga (beta=.03). It is beyond the scope of this paper to try to account for these differences, most of which are small in size. And such differences should be confirmed by further research before a serious effort is made to explain them. Further, as noted below, what is most striking about the data is the similarity across cities, rather than the differences.

Discussion

In this study we carry out the most comprehensive comparative test of general strain theory to date. The study examines the effect of five strains on delinquency among representative samples of youth in five cities in Europe, with a broad range of control variables. The same measures are used in all five cities, and the data are collected using the same procedures at similar dates in each city. By following these strict methodological procedures, the study overcomes some of the problems of prior comparative studies on GST, allowing us to gain a better sense of how applicable GST is to countries outside the US and to highlight any cross-national differences that exist in the relations between particular strains and crime and delinquency.

Table 4
Standardized and Unstandardized Beta Coefficients from OLS Regression Models within Each City, Predicting Property Crime (SEs in parenthesis)

| | Model 1: Background | | | | | Model 2: + Strain measures | | | | | Model 3: + Other Measures | | | | |
|-----------------------|---------------------|------------------|------------------|------------------|------------------|----------------------------|------------------|------------------|------------------|------------------|---------------------------|------------------|------------------|------------------|------------------|
| | Bucharest | Kaunas | Reykjavik | Riga | Sofia | Bucharest | Kaunas | Reykjavik | Riga | Sofia | Bucharest | Kaunas | Reykjavik | Riga | Sofia |
| Gender | -.19** (.001) | -.19** (.001) | -.14** (.002) | -.15** (.001) | -.17** (.001) | -.18** (.002) | -.16** (.001) | -.14** (.002) | -.16** (.001) | -.15** (.002) | -.14** (.002) | -.11** (.002) | -.08** (.002) | -.12** (.001) | -.14** (.002) |
| Family Structure | .04* (.002) | .01 (.002) | .14** (.003) | .03 (.001) | .06** (.002) | .02 (.002) | .01 (.002) | .05* (.003) | .00 (.001) | .03 (.002) | .02 (.002) | -.00 (.002) | .02 (.002) | -.01 (.001) | .02 (.002) |
| Mothers education | .04 (.000) | -.03 (.000) | -.04 (.001) | .02 (.000) | .00 (.000) | .05* (.000) | -.03 (.000) | -.01 (.001) | .02 (.000) | .00 (.000) | .04 (.000) | -.03 (.000) | -.00 (.000) | .02 (.000) | .00 (.000) |
| Fathers education | -.02 (.000) | -.03 (.000) | -.04* (.001) | .02 (.000) | -.01 (.000) | -.02 (.000) | -.02 (.000) | -.03 (.001) | .02 (.000) | .02 (.000) | -.01 (.000) | -.01 (.000) | -.01 (.000) | .02 (.000) | .02 (.000) |
| Age | .05** (.001) | -.02 (.002) | -.01 (.008) | -.03 (.001) | .01 (.001) | .04* (.001) | -.02 (.002) | -.03 (.007) | -.04* (.001) | .01 (.001) | .03 (.001) | -.02 (.002) | -.04* (.002) | -.05** (.001) | .01 (.001) |
| Phys. victimization | | | | | | .12** (.002) | .13** (.002) | .18** (.004) | .10** (.002) | .10** (.002) | .10** (.002) | .10** (.002) | .11** (.002) | .09** (.002) | .09** (.002) |
| Economic deprivation | | | | | | -.00 (.002) | -.02 (.002) | .01 (.004) | .04 (.002) | -.01 (.002) | .01 (.002) | -.02 (.002) | .01 (.002) | .05** (.002) | .01 (.002) |
| School strain | | | | | | .16** (.001) | .14** (.001) | .21** (.001) | .11** (.001) | .17** (.001) | .08** (.001) | .08** (.001) | .07** (.001) | .05** (.000) | .12** (.001) |
| Family conflict | | | | | | .12** (.001) | .08** (.001) | .08** (.003) | .11** (.001) | .12** (.002) | .10** (.001) | .05* (.001) | .02 (.001) | .08** (.001) | .10** (.002) |
| Peer rejection | | | | | | .09 (.001) | .05 (.001) | .008 (.003) | .005 (.001) | .009 (.002) | .007 (.001) | .003 (.001) | .002 (.001) | .004 (.001) | .008 (.002) |
| Violent conduct norms | | | | | | .11** (.002) | .06** (.001) | .16** (.002) | .05* (.001) | .07** (.002) | .07** (.002) | .06** (.001) | .11** (.001) | .03 (.001) | .05* (.001) |
| Peer delinquent norms | | | | | | .001 (.000) | .001 (.000) | .003 (.000) | .01 (.000) | .01 (.000) | .01 (.000) | .01 (.000) | .03 (.000) | .01 (.000) | .06** (.000) |
| Parental supervision | | | | | | -.04 (.000) | -.07** (.000) | -.06** (.000) | -.08** (.000) | -.08** (.000) | -.08** (.000) | -.08** (.000) | -.08** (.000) | -.08** (.000) | -.08** (.000) |
| Grades | | | | | | .00 (.000) | .05* (.000) | .03 (.000) | .07** (.000) | .03 (.000) | .01 (.000) | .01 (.000) | .01 (.000) | .03 (.000) | .03 (.000) |
| Peer delinquency | | | | | | .16** (.000) | .15** (.000) | .30** (.000) | .14** (.000) | .09** (.000) | .01 (.000) | .003 (.000) | .001 (.000) | .001 (.000) | .001 (.000) |
| R ² | .04 | .04 | .04 | .02 | .03 | .13 | .10 | .21 | .08 | .12 | .17 | .16 | .33 | .13 | .14 |

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

In general, GST receives strong support. Four of the five strains examined are significantly associated with violent and property delinquency in the cities, even after controls for several socio-demographic variables. These strains are physical victimization, school strain, family conflict, and peer rejection. Controlling for a range of variables associated with other theories reduces the impact of the strain variables, but most of the relationships remain significant. The cross-sectional nature of the data does not allow us to determine whether these other variables play a mediational role (e.g., strain affects delinquency partly through its effect on delinquent peer association) or a confounding role (the association between strain and delinquency is partly spurious). Certain research provides support for the mediational argument (see Agnew, 2001; 2006), but it is beyond the scope of the present study to address this issue.

One of the strain measures is unrelated or has a weak relationship to crime: economic deprivation. The insignificant or weak relationship between economic deprivation and crime may be due to the fact that the level of inequality is low in the five cities examined. The Gini coefficient, a commonly used measure of inequality, ranges

from 0 (total equality) to 1 (maximal inequality) (Gini, 1909). Worldwide, Gini coefficients for income range from approximately 0.23 (Sweden) to 0.70 (Namibia); with the participating cities in the current study ranging from 0.28 in Iceland (Reykjavik), 0.30 in Bulgaria (Sofia), 0.32 in Romania (Bucharest), and 0.36 in Latvia and Lithuania (Riga and Kaunas). Reflecting this fact, the percentage of adolescents who are very deprived in each city is quite low (data not shown). Data suggest that economic deprivation is more likely to lead to crime when inequality is high (Agnew, 2006; Bernburg et al., 2009). High level of inequality leads to feelings of relative deprivation, which generate the anger and frustration that lead to crime. Also, the relationship between our measure of economic deprivation and crime may be weak because our samples are comprised of adolescents. Prior research has indicated that the correlation between SES indicators and crime is stronger among adults, who are directly responsible for meeting needs and others financial obligations (Hagan, 1997).

The results of this study are somewhat at odds with those of Botchkovar et al. (2009), the only other comparative test of GST.

Botchkovar et al., (2009) found that the strain measures they analyzed had weak effects on crime in one country and no effects in the remaining two countries they examined. As noted above, the failure of Botchkovar et al., (2009) to find strong support for GST may have stemmed from several factors, including the use of very general measures of strain (experiencing “bad conditions” or failing to achieve an important but unspecified goal), the examination of strains that GST states are not related to crime (e.g. becoming seriously ill), and the questionable control for prior crime. At the same time, it is important to note that Botchkovar et al., (2009) examined a different set of countries than those in this analysis, and that there are other differences between the studies that might account for the difference in results. Most notably, they examined adults rather than juveniles, and there is good reason to believe that adults are less likely than adolescents to cope with strains through crime (see Agnew, 2006). Also, it should be noted that the explained variance accounted for by the strain variables was somewhat lower in the post-communist cities we examined than in Reykjavik, suggesting that GST may well be somewhat applicable in these societies. Nevertheless, our findings suggest that GST is generalizable across a range of societies, including societies of the type examined by Botchkovar et al. (2009).

The differences between our study and that of Botchkovar et al., as well as the fact that certain of our strain measures had different effects across the cities in our sample, highlight the need for more comparative research on GST. This study provides a rough template for such research by examining similar strains, similar samples, and employing similar data collection procedures in five reasonably diverse cities. Future research, however, can build on this study in several ways. Ideally, such research should collect data from a sample of countries that differ along a range of key dimension that may affect exposure to strains, the interpretation of strains, and the reaction to them. Such dimensions include structural features, such as levels of inequality and social welfare supports, and cultural features, such as the emphasis on individualism versus collectivism. While the societies in this sample differed from one another in many ways, they were quite similar in terms of variables such as inequality. Such research should also examine a broad range of well-defined strains, including those criminogenic strains listed by Agnew (2006). At the same time, researchers should be sensitive to the fact that particular strains may be especially relevant in certain countries – such as the strain associated with university examinations in China – and should be sure to include such strains among those examined. Researchers should also measure the subjective interpretation of strains, including their perceived magnitude and injustice. Such information may help explain any differences in the effects of strains that emerge across societies. Further, researchers should attempt to measure those structural, cultural, and social-psychological factors that may influence differences in the level of, interpretation of, and reaction to strains across societies. Many such factors were listed above (also see Agnew, 2006). With regards to limitations we acknowledge that several of our violent crime measure items may overlap. In order to assess if this potentially impacted the study findings we ran the data again with only items 4 and 6 in the violent crime measure, therefore omitting any items that may overlap. This procedure resulted in findings very similar to the reported ones. Also, our data did not include a suitable measure of anger or other negative emotions. Future comparative research on GST should lay emphasis on exploring the mediating role of emotions. Finally, researchers should employ longitudinal data so as to better determine the direction of causal influence between strains and crime (e.g. Jang & Rhodes, in press). Because of the cross-sectional nature of our data we may exaggerate the effect of strains on crime by failing to take account of the effect of crime on strains. For the present, we conclude that our data suggests that general strain theory is in fact generalizable across a range of moderately diverse societies.

Notes

1. Certain studies have tested GST using vignettes, with the vignettes describing situations where people have experienced particular strains and then responded with crime (e.g., Ganem, 2010; Mazerolle & Piquero, 1997). Respondents are asked how likely they would be to respond with crime if they were in the same situation. This measure of intentions to offend, however, differs from that in the Botchkovar et al. (2009), in that the vignettes are specifically designed to elicit the negative emotions that GST states generate crime.

2. The participating cities are affiliated with the European Cities against Drugs (ECAD) foundation, located in Stockholm, Sweden but their participation in the surveys is voluntary. The project began in the fall of 2006 when the Icelandic Centre for Social Research and Analysis (ICSRA) at Reykjavik University, along with colleagues from the University of Iceland, the City of Reykjavik, the Icelandic Office of the President, and the ECAD foundation consolidated their efforts in an ongoing collaboration. The aim of the project was to replicate the Icelandic success in reducing substance use among adolescents over the last decade (Sigfusdottir et al. 2008, 2009, 2010). The president of Iceland is the patron of the study that is still ongoing and is sponsored by the pharmaceutical company Actavis. All data collection was in line with personal protection laws on human research subjects and operates with passive parental consent. In each of the participating cities a review panel assessed the local version of the questionnaire and on some occasions suggested a removal or an alternation of items for legal or cultural reasons.

3. The authors realize that the first four items on the violent crime scale may overlap to some extent. We therefore ran separate analyses using each of the first three with the remaining one variable as well as all possible combinations of the first three with the remaining one variable in the respective regression models. These analyses revealed no major deviations from the reported findings.

4. We also ran the models with this combined variable excluding the “more than 12 months ago” category. It revealed no major differences to the findings.

5. Authors realize that this is an “ever experienced” measure. We would not expect peer rejection several years ago to affect delinquency today.

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