

Bullying Victimization and Adolescent Self-Harm: Testing Hypotheses from General Strain Theory

Carter Hay · Ryan Meldrum

Received: 2 October 2009 / Accepted: 22 December 2009 / Published online: 14 January 2010
© Springer Science+Business Media, LLC 2010

Abstract Self-harm is widely recognized as a significant adolescent social problem, and recent research has begun to explore its etiology. Drawing from Agnew's (1992) social psychological strain theory of deviance, this study considers this issue by testing three hypotheses about the effects of traditional and cyber bullying victimization on deliberate self-harm and suicidal ideation. The data come from a school-based survey of adolescents in a rural county of a southeastern state ($n = 426$); 50% of subjects are female, their mean age was 15 years, and non-Hispanic whites represent 66% of the sample. The analysis revealed that both types of bullying are positively related to self-harm and suicidal ideation, net of controls. Moreover, those relationships are partially mediated by the negative emotions experienced by those who are bullied and partially moderated by features of the adolescent's social environment and self. Regarding the latter, exposure to authoritative parenting and high self-control diminished the harmful effects of bullying victimization on self-harm and suicidal ideation. The article concludes by discussing the implications of these conclusions for future research and for policy efforts designed to reduce self-harm.

Keywords Self-harm · Suicidal ideation · Bullying · General strain theory

Introduction

Deliberate self-harm among adolescents—including such things as cutting or burning oneself, jumping from heights, poisoning, and self-battery—has been studied extensively since the 1960s, with many studies finding higher than expected incidence rates in many industrialized nations (Hawton et al. 2006). In the US, multiple data sources indicate that rates of nonfatal and fatal deliberate self-harm are notably high (Kerr et al. 2008; Vajani et al. 2007; US Centers for Disease Control and Prevention 2008). Indeed, Vajani and colleagues found that nearly 18,000 early adolescents (28 per 100,000) are treated each year in US hospitals for incidents of self-harm, with poisonings and acts of cutting/piercing representing the most common type of case. And although the estimates vary widely, community-based self-report studies also reveal notably high levels of self-harm. For example, Ross and Heath (2002) and Laye-Gindhu and Schonert-Reichl (2005) find the prevalence of self-harm to be ~15%. In light of these patterns, deliberate self-harm is now recognized as a significant social problem facing adolescents.

This recognition has prompted considerable research on self-harm, with recent studies beginning to assess its etiology (e.g., Coll et al. 2001; Laye-Gindhu and Schonert-Reichl 2005; Patton et al. 2007). This research reveals, for example, that self-harm is most likely among adolescents who are doing poorly at school or who have experienced physical or sexual abuse. Additionally, individual characteristics like low self-esteem, impulsivity, and feelings of depression and anxiety contribute to self-harm. Taken together, this research offers significant insight on the social, emotional, and biological experiences that lead an adolescent to commit or contemplate an act of self-harm.

C. Hay (✉) · R. Meldrum
College of Criminology and Criminal Justice, Florida State
University, Tallahassee, FL 32306-1127, USA
e-mail: chay@fsu.edu

R. Meldrum
e-mail: rmeldrum@fsu.edu

One limitation, however, in this etiological research is that few studies have derived their hypotheses or connected their conclusions to some broader theory of behavior (although see Ross and Heath 2003, and Nixon et al. 2002, for recent exceptions). This is problematic, given that theory is the central tool used in science to organize accumulated knowledge. Thus, attention to theory can help systematically arrange the broad array of empirical findings in self-harm research into explanations that help satisfy intellectual curiosity about its origins and variations.

This study addresses this need for theory by drawing upon Agnew's (1992) social psychological strain theory of crime and deviance to examine self-harm among adolescents. The main premise of this theory—referred to as general strain theory (GST)—is that strainful social relationships and events pressure individuals into committing criminal and deviant acts. Importantly, GST provides a nuanced set of predictions that can guide a theoretically precise examination of self-harm. We draw from GST to derive and test three hypotheses about the about relationship between strainful social interactions with peers (in the form of bullying) and involvement in self-harm.

Our first task, however, is to consider important issues regarding prior theory and research. Specifically, we discuss GST in terms of its central hypotheses and the empirical research that has tested them. Next, we describe the case for applying GST to the study of self-harm. Last, we discuss the important role that bullying victimization should play in such research. The harmful effects of bullying have been featured prominently both in recent research on GST (Agnew et al. 2002) and in broader discussions of adolescent social problems (Hinduja and Patchin 2009), and there is much that can be gained from considering its implications for self-harm.

Prior Theory and Research on the General Strain Theory of Adolescent Behavior

An Overview of GST

Like other strain theories (e.g., Cohen 1955), GST emphasizes that strainful circumstances pressure individuals into deviance. GST is unique, however, with respect to its conceptualization of strain—rather than seeing strain as arising primarily from economic deprivation, it sees strain as resulting from any relationship or event in which the individual is not treated as he or she would like or experiences undesired outcomes (Agnew 1992). This could include such things as hostility from parents, rejection by peers, negative experiences at school, and physical or criminal victimization. Agnew (2001) has suggested, however, that researchers devote special attention to strains

that satisfy several important conditions. For example, strains that are perceived as unjust (rather than merely unfortunate) and high in magnitude (rather than merely annoying) should have the greatest consequences for deviance. By making predictions about which strains should be most consequential, Agnew (2001) has addressed the concern expressed by some that GST is too general in its conceptualization of strain.

GST also specifies the variables that should mediate the effects of strain on deviance. Specifically, strain should increase deviance by producing negative emotional states that energize the individual for corrective action that may include crime or deviance (Agnew 1992). Agnew (1992:59) emphasized that “anger...is the most critical emotional reaction for the purposes of general strain theory.” This emphasis likely follows from the frequent use of GST to explain “externalizing” acts committed against other individuals (i.e., violent and property crime). In the rare instances in which GST has been used to consider victimless “internalizing” deviance (e.g., eating disorders), negative emotions like guilt, depression, and anxiety have been featured prominently (Broidy and Agnew 1997; Sharp et al. 2001).

The third main hypothesis of GST involves factors that should condition the effects of strain. In short, strain does not always result in deviance—many variables should influence whether an individual uses deviant adaptations to cope with strain. Deviant adaptations are most expected for individuals with low personal coping resources (e.g., low self-control or low self-efficacy), low conventional social support (e.g., attachment to parents), or a high predisposition for deviance, as indicated by such things as association with a deviant subculture or significant prior involvement in deviance.

These arguments have received significant empirical scrutiny, and three important generalizations can be quickly summarized. First, there is consistent support for a positive relationship between strain and deviance (e.g., Agnew and White 1992; Broidy 2001; Moon et al. 2009; Simons et al. 2003). Second, the effects of strain on delinquency are at least partially mediated by negative emotions (e.g., Brezina 1998; Hay 2003; Mazerolle and Piquero 1997; Simons et al. 2003). Third, and less supportive of GST, strain's effects have not consistently depended on the theory's hypothesized conditioning factors. This includes such things as self-efficacy, delinquent peers, moral beliefs, and social support (e.g., Hoffmann and Miller 1998; Mazerolle and Piquero 1997). There are, however, important and recent exceptions to this pattern. Agnew et al. (2002), for example, found that abusive peer relations increased crime only for those with personality characteristics (such as impulsivity) conducive to delinquency [also see Baron (2004), Hay and Evans (2006), and

Mazerolle and Maahs (2000)]. Taken as a whole, this body of evidence supports GST and justifies its prominence.

Applying GST to the Study of Self-Harm

Although empirical tests of GST have been favorable, use of the theory has been limited in an important way. Specifically, tests of it have focused largely on externalizing, criminal responses in which strained individuals harm other people with violence or the theft or damage of property. Thus, an entire class of internalizing responses to strain—aggression against oneself with acts of deliberate self-harm—has been ignored. This includes such things as cutting or burning oneself, jumping from heights, running into traffic, poisoning, and self-battery, with each of these acts sometimes resulting in suicide (Hawton et al. 2006).

Ignoring self-harm is a significant omission in GST research for several reasons. First, prior studies may have misclassified some strained individuals. Specifically, in studies focused exclusively on crime, some adolescents may have been seen as coping with strain in prosocial ways simply because they did not respond with crime. They may, however, have committed acts of self-harm that were ignored by researchers. Indeed, an important premise of GST is that different individuals will cope with strain in different ways, and deviant adaptations themselves can come in many forms (Agnew 1992). This can include acts of deliberate self-harm, many of which are quite injurious or even fatal (Vajani et al. 2007).

A second reason to consider self-harm is that these acts are more common than has been recognized in the past. One common indicator comes from hospital admissions data. These data almost certainly underestimate the frequency of self-harm, thus making the incidence rates that they reveal especially concerning. For example, in the UK, there are more than 20,000 adolescent hospital admissions each year from self-inflicted overdoses, poisonings, or injuries (Hawton et al. 2006). A comparable figure is seen in the US even when considering those who are just between the ages of 10 and 14 (Vajani et al. 2007). High rates of adolescent self-harm also have been observed in such countries as France, Ireland, and Australia (Hawton et al. 2006). Moreover, recent self-report data from the US Centers for Disease Control and Prevention (2008) reveal how commonly US adolescents contemplate serious acts of self-harm—nearly 14% of high school students had seriously contemplated suicide in the prior year, and roughly half of these had developed plans for how this act would be carried out.

A final reason to apply GST to the study of self-harm is that there has been an absence of theoretical tests in this area. Much of the research to date has sought to determine

the scope of the problem by considering its prevalence, the forms in which it commonly occurs, and the demographic groups who are at greatest risk. Although this epidemiological information is important, new research also should shed light on the etiology of self-harm; in short, what leads an adolescent to commit or contemplate an act of self-harm? Moreover, this research must be guided by theory if it is to help build a cumulative, organized body of knowledge on the causes of self-harm. Although largely not yet applied to this issue, GST is in fact well suited for this, given its emphasis on the nexus between exposure to stressful circumstances, negative emotional states, and deviant adaptations to strain. This is especially relevant in light of research that links the etiology of self-harm to stress and anxiety (Ross and Heath 2003).

We should emphasize, however, that we are not suggesting that GST is the only relevant theoretical perspective. Some have suggested, for example, an affect regulation model in which self-harm serves to mentally and physiologically interrupt a crisis of anxiety, therefore “resetting” the individual to a more normal emotional state (Favazza 1998; Ross and Heath 2003). A related view—what can be termed the hostility model (Bennum 1984)—also sees self-harm as a coping response to anxiety, but emphasizes that individuals who are incapable of expressing hostility to others direct it to a more acceptable source: the self. These models have received at least some degree of support (Ross and Heath 2003; Nixon et al. 2002), and we see continued empirical attention to them as important.

Although these alternative perspectives are relevant to self-harm, we continue to frame our analyses in terms of GST. We do so for three reasons. First, the basic causal chain of GST in many ways incorporates the arguments that these models make regarding the implications of stressful life events and negative emotions for the etiology of deviance. Indeed, as Agnew (1992) emphasized, the theory was explicitly designed to include insights from the stress and coping literature. Second, as we discuss in the next section, GST has devoted comparatively greater attention to identifying the types of stressful events and relationships that are most likely to trigger acts of deviance. And last, GST is appealing in terms of its potential scope—in addition to the theory possibly explaining self-harm (an example of internalizing deviance), it has been strongly supported as an explanation for externalizing deviance, including violent and property crimes committed against others. Indeed, in the field of criminology, GST has “moved to the forefront of criminological theory” (Hoffmann and Miller 1998:83). Thus, GST has the potential to be a quite general behavioral theory.

Investigating Bullying as an Important Source of Strain

In tests of GST, an important issue involves the question of how strain should be conceptualized. GST's view of strain as any relationship or event in which "others are not treating the individual as he or she would like to be treated" (Agnew 1992:48) leaves a virtually unlimited set of social events and interactions that could be strainful. Agnew (2001) recently provided more precise direction on this issue by identifying the specific forms of strain that should be most consequential for deviance. One of these is bullying, or what Agnew (2001) referred to as "peer abuse." Agnew (2001) contended that bullying should be an important cause of deviance because it satisfies four conditions that should characterize consequential strains: (1) It should be perceived as unjust (because bullying often will violate basic norms of justice), (2) it should be perceived as high in magnitude (because peer relations often are central in the lives of adolescents), (3) it should not be associated with conventional social control (because bullying often will occur away from adult authority), and (4) it should expose the strained individual to others—the bullies themselves—who model deviant behavior. In light of these features, Agnew (2001) identified bullying as a neglected type of strain that should be given greater priority in research on the causes of deviance.

Despite these suggestions of an important effect, exposure to bullying largely has been ignored in GST research, much of which has sought to explain criminal deviance in particular. This dearth of criminological research stands in contrast to the extensive scholarship revealing effects of bullying on many forms of social psychological maladjustment, including depression (Crick and Grotpeter 1996), loneliness (Boivin and Hymel 1997; Kochenderfer and Ladd 1996), anxiety (Olweus 1978; Slee 1994), and eating disorders (Rittakerttu et al. 2000). These results were summarized in Hawker and Boulton's (2000) meta-analysis, which examined 23 studies published between 1978 and 1997. Their analysis revealed average correlations between bullying and various forms of maladjustment that ranged from .25 to .45. All correlations were significant at the .0001 level, leading Hawker and Boulton (2000:453) to conclude that "it is clear...that [bullying] victims are distressed." What is needed, however, is greater attention to the effects of bullying on specific behavioral outcomes during adolescence, including acts of self-harm. Indeed, one recent large-scale study of self-harm suggests the value of considering this issue—in a study of 5000 English school students, Hawton et al. (2006:79–80) observed that those who reported being bullied were at least two times more likely to have engaged in an act of self-harm. In light of these patterns, Agnew's (2001) recent attention to bullying as a consequential source of strain is important.

Hypotheses

GST offers a clear, testable view of the causation of self-harm. Strainful social dynamics should increase one's feelings of negative emotionality, which in turn should increase the likelihood of committing or contemplating an act of self-harm, especially under particular circumstances. From this perspective, we derive three hypotheses.

Our first hypothesis is that being a victim of bullying should be significantly and positively associated with self-harm. As discussed below, in testing this hypothesis, our data allow us to examine the implications not only of traditional notions of bullying (e.g., physical and verbal harassment), but also cyber bullying, which has garnered significant recent attention (Hinduja and Patchin 2009; Wang et al. 2009). Cyber bullying involves the use of the Internet or cell phones to mistreat others. It has attracted significant attention, in part because of reports of its rising prevalence (Hinduja and Patchin 2009; Ybarra and Mitchell, 2004), but little is known about how it may affect behavior. There is reason for concern. Its electronic nature may allow it to occur without attracting the attention of teachers or parents. Also, because many adolescents—for legitimate reasons—carry their cell phones at all times and frequently use the Internet, they can be exposed to cyber bullying even when physically removed from bullies.

Our second hypothesis involves the variables that may mediate the relationship between bullying and self-harm. Drawing from GST, we predict that this relationship will be mediated by the negative emotional experiences of those who are bullied, including their experiences of anxiety, depression, and low self-worth. Accounting for these emotions should help explain any previously observed association between being a victim of bullying and engaging in self-harm.

Our third hypothesis involves the variables that may moderate the relationship between bullying and self-harm. Agnew's (1992:70–74) original statement of the theory cited many variables that should affect the magnitude of strain's effects. We examine two of these: The child's exposure to prosocial, authoritative parenting and the child's level of self-control. In both instances, our prediction is that these qualities should help minimize the harmful effects of bullying on self-harm. We should emphasize that this hypothesis is consistent not only with Agnew's GST, but with the broader social scientific literature that seeks to explain the "resilience" of some individuals who are at risk for problematic outcomes (Masten and Coatsworth 1998).

Authoritative parenting is important to consider as a moderating variable because it is an indicator of the child's access to prosocial family support. Authoritative

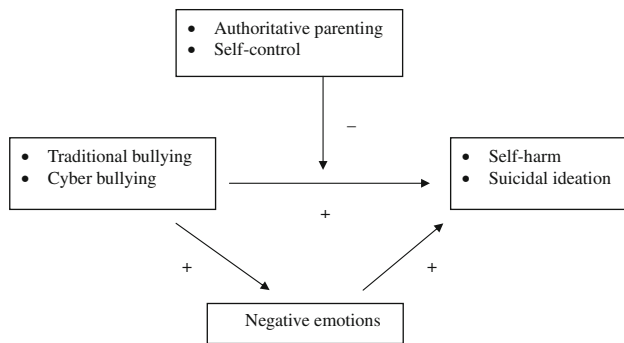


Fig. 1 Proposed empirical model

parents are those who are involved in their children's lives, interact with them in warm and respectful ways, set reasonable limits on behavior, and keep track of their children's whereabouts. This approach to parenting is associated with positive adolescent outcomes (Baumrind 1991; Gray and Steinberg 1999), and it may be helpful in discouraging harmful responses to strain—authoritative parents will know when their children are struggling and will comfort them and give advice regarding appropriate responses.

For different reasons, high self-control in the child also should limit the harmful effects of bullying. Self-control is indicative of a child's individual coping resources—instead of responding to strain in impulsive, short-sighted, and emotional ways, those with high self-control can deliberate on their situation and pursue a more prosocial, constructive response. Indeed, Agnew and his colleagues (Agnew et al. 2002) suggested that stable, individual traits such as self-control may be the most potent moderators of relationships between strain and deviance. (The overall causal model for these hypotheses is displayed in Fig. 1).

Method

Participants

Participating in the study were 426 students who attended one of two selected schools (one middle school and one high school) in a rural, relatively poor county of a south-eastern state. The average age of subjects was 15 (range 10–21, SD = 2.18). The sample was split evenly between males and females. Non-Hispanic whites were the most represented racial/ethnic group (66% of the sample); 11% of the sample was African-American and 13% Hispanic or Latino. Additionally, family disruption was common in the sample—only 50% of subjects reported living in a household with both their mother and father.

Procedure

Subjects were recruited because of their attendance at two schools that were participating in a large-scale funded project concerned with improving the quality of data collection and reporting by public schools in the state. Using the standards set by the school district, a passive consent procedure was followed. Permission forms were distributed to all students 1 week prior to the survey administration, and students were excluded from the study if parents returned the form asking that their child be excluded. Overall, this procedure allowed for a near complete census of the two schools' populations, with 93% of attending students participating in the study. Each participating student then completed an anonymous, self-administered, pencil-and-paper questionnaire during normal school hours. The survey could be completed in ~30 min, was limited to closed-ended questions (most of which had ordinal or nominal response categories), and used optical scanning technology that allowed for machine coding. Each subject was given a small reward (a candy bar) for completion.

Measures

Self-Harm

Self-harm was measured by asking respondents how often "you purposely hurt yourself without wanting to die," with "cutting or burning" offered as examples. Subjects chose from responses of "never," "rarely," "sometimes," and "often." This item is quite similar to those in recent self-report studies of self-harm (Almeida et al. 2009; Hawton et al. 2006; Laye-Gindhu and Schonert-Reichl 2005).

Suicidal Ideation

Suicidal ideation was measured by asking respondents how often "you think about killing yourself." Subjects chose from responses of "never," "rarely," "sometimes," and "often." This item is similar to that used in the Youth Risk Behavior Surveillance questionnaire administered by the US Centers for Disease Control and Prevention (2008).

Traditional Bullying Victimization

Our first measure of bullying captures the traditional emphasis on physical and verbal harassment. This was measured with a six-item scale ($\alpha = .85$) in which subjects indicated how frequently during the prior 12 months (never, rarely, sometimes, or often) they were (1) the target of lies or rumors; (2) the target of attempts to get others to dislike them; (3) called names, made fun of, or teased in a

hurtful way; (4) hit, kicked, or pushed by another student; (5) physically threatened by other students; and (6) picked on by others. These items are quite similar to other recent studies of bullying or peer abuse (see Agnew et al. 2002). Confirmatory factor analyses revealed that all six items loaded significantly on the same factor, and analyses of internal reliability indicated that removing any of the items lowered the Cronbach's alpha.

Cyber Bullying Victimization

Cyber bullying victimization was measured with a three-item scale ($\alpha = .80$) in which respondents were asked to indicate how frequently during the previous 12 months (never, rarely, sometimes, or often) they were (1) the target of "mean" text messages; (2) sent threatening or hurtful statements or pictures in an e-mail or text message; and (3) made fun of on the Internet. These items are similar to prominent recent studies on cyber bullying (Hinduja and Patchin 2009; Wang et al. 2009), and the three forms of victimization upon which we focus are included among the most commonly experienced forms of cyber bullying (see Hinduja and Patchin, 2009). Similar to the measure of traditional bullying, confirmatory factor analyses revealed that all items loaded significantly on the same factor. Moreover, removal of any of the items lowered the Cronbach's alpha.

Negative Emotions

Negative emotions were measured with a composite, six-item scale ($\alpha = .84$) that captured feelings of anxiety, depression, and low self-worth. Respondents indicated how often (never, rarely, sometimes, or often) they (1) worry too much; (2) feel fearful or anxious; (3) are unhappy, sad, or depressed; (4) have sudden changes in mood or feeling; (5) feel nobody loves them; and (6) feel worthless or inferior. These items are quite similar to those used in other recent studies concerned with capturing a range of negative emotional states (e.g., Kaufman 2009). Factor analysis indicated the appropriateness of a composite scale—a one-factor solution emerged, and all items had loadings of .56 or above.

Authoritative Parenting

Exposure to authoritative parenting was measured with a 12-item scale ($\alpha = .90$) in which subjects were asked to indicate their agreement (strongly disagree, disagree, agree, strongly agree) with various statements about their social interaction with parents. These items are quite similar to those found in other studies that have examined the effects of authoritative parenting on adolescent outcomes (Gray

and Steinberg 1999; Lamborn et al. 1991) and they pertain to such things as the consistency of rule-setting and supervision (e.g., "She/he knows where I am when I am not at home"), the use of discipline that is fair and well explained (e.g., "the punishments I receive are fair"), and the amount of parent–child involvement (e.g., time spent "doing something fun" with the parent).

Self-Control

Self-control was measured with an eight-item scale ($\alpha = .85$) drawn from Grasmick et al. (1993). Specifically, we use the eight *impulsivity* and *risk-seeking* items, in light of prior research indicating the importance of these two elements of low self-control (see Longshore et al. 1996; Piquero and Rosay 1998). These items asked respondents to indicate how much they agree (strongly disagree, disagree, agree, strongly agree) that they prioritize the short run over the long run, do things on the spur of the moment, neglect thoughts about preparing for the future, emphasize pleasure in the "here and now," enjoy testing oneself with things that are risky, take risks just for the fun of it, find it exciting to do things that can create trouble, and prioritize excitement and adventure over security. All items were coded so that high values indicate high self-control.

Control Variables

A number of control variables were included to protect against concerns about spuriousness. This includes five demographic variables: Age (measured in years), sex (female = 0, male = 1), race (non-Hispanic white = 0, all others = 1), nonintact family structure (living with the mother and father = 0, all others = 1), and place of birth (native born = 0, foreign-born = 1). Also, to better isolate the independent relationships between exposure to bullying and the outcomes of interest, controls were included to capture key aspects of respondents' school, family, and personal characteristics. This included the measures of authoritative parenting and self-control described above as well as a measure of self-reported school grades for the last report card (1 = mostly A's, 2 = mostly B's, 3 = mostly C's, 4 = mostly D's, 5 = mostly F's). (The appendix provides a correlation matrix for all variables included in the analysis).

Results

The Prevalence of Self-Harm and Suicidal Ideation

Table 1 provides descriptive statistics for the variables used in this study, as well as frequencies for the study's two

Table 1 Descriptive statistics

Variable	N	Mean	SD	Min	Max
Age	424	14.99	2.18	10.00	21.00
Male	420	0.50	0.50	0.00	1.00
Non-white	422	0.34	0.48	0.00	1.00
Foreign-born	423	0.07	0.26	0.00	1.00
Nonintact family	407	0.50	0.50	0.00	1.00
Poor school grades	391	2.02	1.04	1.00	5.00
Self-control	422	2.79	0.64	1.00	4.00
Authoritative parenting	416	3.04	0.72	1.00	4.00
Negative emotions	420	2.01	0.71	1.00	4.00
Cyber-bullying victimization	417	1.33	0.64	1.00	4.00
Traditional bullying victimization	419	1.74	0.72	1.00	4.00
Self-harming behavior	418	1.31	0.75	1.00	4.00
Never: 82.30%					
Rarely: 8.85%					
Sometimes: 4.55%					
Often: 4.31%					
Suicidal ideation	417	1.33	0.76	1.00	4.00
Never: 81.53%					
Rarely: 8.15%					
Sometimes: 6.47%					
Often: 3.84%					

principal dependent variables. Prevalence rates for self-harm and suicidal ideation were approximately 18% (17.7% for self-harm and 18.5% for suicidal ideation). The majority of individuals who reported involvement in these behaviors indicated that it occurred “rarely” or “sometimes,” with only four percent of the sample (4.3% for self-harm and 3.8% for suicidal ideation) rating their involvement as “often.” Notably, the prevalence rate of 18% is comparable to the roughly 15% rate observed in other recent self-report studies (Laye-Gindhu and Schonert-Reichl 2005; Ross and Heath 2002), although as Laye-Gindhu and Schonert-Reichl (2005) note, prevalence rates have varied greatly, perhaps because of conceptual and methodological variations across studies.

Hypotheses One and Two

Our first two hypotheses consider whether traditional and cyber bullying are significantly related to self-harm and suicidal ideation and, additionally, whether the observed relationships are mediated by negative emotions. To examine these possibilities, we began by assessing the relationship between our bullying measures and negative emotions—if negative emotions mediate the relationship between bullying and self-harm/suicidal ideation, we must first observe an association between bullying and negative emotions. This was considered with two ordinary least

Table 2 Regressions of negative emotions on bullying victimization

Variable	Model 1 (<i>n</i> = 371)			Model 2 (<i>n</i> = 370)		
	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>
Age	.02	.01	.06	-.02	.02	-.05
Male	-.24***	.06	-.17	-.21**	.06	-.15
Non-white	.19**	.07	.13	.15*	.07	.10
Foreign-born	.25*	.12	.09	.29*	.13	.11
Nonintact family	.16*	.06	.11	.22**	.07	.16
Poor school grades	-.04	.03	-.07	-.04	.03	-.06
Self-control	-.20***	.05	-.18	-.28***	.05	-.25
Authoritative parenting	-.07	.05	-.07	-.08	.05	-.08
Traditional bullying	.46***	.04	.47	—	—	—
Cyber bullying	—	—	—	.39***	.05	.35
Constant	1.73	.33		2.72	.32	
Adjusted <i>R</i> ²		.37			.29	

* *p* < .05 (2-tailed); ** *p* < .01 (2-tailed); *** *p* < .001 (2-tailed)

squares (OLS) regression equations—one each for traditional and cyber bullying. Both equations take negative emotions as the dependent variable and include all of the controls.

The results for these equations are shown in Table 2, and they reveal significant and substantively large relationships between bullying and the experience of negative emotions. Specifically, the standardized effects of traditional and cyber bullying are .47 and .35, respectively. Several of the controls have significant effects as well; most notably, negative emotions are higher among females, nonwhites, those who were born outside of the US and who live in nonintact households, and those low in self-control. In no instance, however, do the relationships between these variables and negative emotions match the observed associations between bullying and negative emotions.

Our next step was to consider whether bullying and negative emotions were associated with self-harm and suicidal ideation in the predicted manner. This was considered with four OLS regression equations for both dependent variables. The first two models include as predictors all of the control variables and the specific bullying measure of interest (either traditional or cyber bullying); these models establish the baseline effects of bullying. The next two models add the negative emotions measure to assess its relationship with the outcomes and to determine the extent to which its inclusion eliminates any direct relationships between bullying and self-harm/suicidal ideation.

The results for these equations are shown in Table 3, with the top panel displaying results for self-harm and the bottom panel displaying results for suicidal ideation. Several patterns are evident. First, the baseline models establish that there are significant, positive relationships between

Table 3 Regressions of self harm and suicidal ideation on bullying victimization and negative emotions

Variable	Panel A: Self-harm											
	Model 1 (N = 371)			Model 2 (N = 370)			Model 3 (N = 371)			Model 4 (N = 370)		
	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>
Age	.01	.02	.03	−.02	.02	−.06	.00	.02	.01	−.01	.02	−.04
Male	−.19**	.07	−.13	−.15*	.07	−.10	−.12	.07	−.08	−.09	.07	−.06
Non-white	.20**	.08	.13	.18*	.07	.11	.15	.08	.09	.14	.07	.09
Foreign-born	.07	.14	.02	.10	.14	.04	−.01	.14	−.00	.02	.13	.01
Nonintact family	.10	.07	.07	.14*	.07	.09	.05	.07	.03	.08	.07	.05
Poor school grades	−.01	.04	−.01	−.00	.03	−.00	.01	.03	.01	.01	.03	.01
Self-control	−.23***	.06	−.20	−.25***	.06	−.22	−.17**	.06	−.15	−.18***	.06	−.15
Authoritative parenting	−.13*	.05	−.12	−.13**	.05	−.13	−.11*	.05	−.11	−.11*	.05	−.11
Negative emotions	—	—	—	—	—	—	.30***	.06	.29	.28***	.05	.26
Traditional bullying victimization	.32***	.05	.32	—	—	—	.19**	.05	.18	—	—	—
Cyber bullying victimization	—	—	—	.45***	.05	.38	—	—	—	.34***	.06	.29
Constant	1.63	.38		2.05	.34		1.11	.38		1.30	.36	
Adjusted <i>R</i> ²	.23			.28			.28			.33		

Variable	Panel B: Suicidal ideation											
	Model 1 (N = 369)			Model 2 (N = 369)			Model 3 (N = 369)			Model 4 (N = 369)		
	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>
Age	.01	.02	.04	−.02	.02	−.05	.01	.02	.02	−.01	.02	−.04
Male	−.10	.07	−.06	−.05	.07	−.03	−.01	.07	−.00	.03	.07	.02
Non-white	.20*	.08	.12	.16*	.08	.10	.12	.08	.08	.11	.07	.07
Foreign-born	.28*	.14	.10	.32*	.14	.11	.19	.14	.07	.21	.13	.07
Nonintact family	.12	.07	.08	.17*	.07	.12	.06	.07	.04	.09	.07	.06
Poor school grades	−.06	.04	−.08	−.05	.04	−.07	−.04	.03	−.06	−.04	.03	−.05
Self-control	−.14*	.06	−.11	−.18**	.06	−.15	−.06	.06	−.05	−.07	.06	−.06
Authoritative parenting	−.16**	.05	−.15	−.17**	.05	−.16	−.14**	.05	−.13	−.14**	.05	−.13
Negative emotions	—	—	—	—	—	—	.38***	.06	.35	.39***	.05	.36
Traditional bullying victimization	.41***	.05	.39	—	—	—	.23***	.05	.23	—	—	—
Cyber bullying victimization	—	—	—	.48***	.05	.39	—	—	—	.32***	.06	.27
Constant	1.30	.38		1.98	.35		.65	.38		.93	.36	
Adjusted <i>R</i> ²	.26			.27			.33			.36		

* $p < .05$ (2-tailed); ** $p < .01$ (2-tailed); *** $p < .001$ (2-tailed)

bullying and both outcomes. Models 1 and 2 for self-harm (Panel A) reveal that traditional and cyber bullying have standardized coefficients of .32 and .38. A similar pattern is observed for suicidal ideation (Models 1 and 2 in Panel B)—both types of bullying have standardized coefficients of .39. Thus, in these data, bullying is strongly related to both actual and contemplated self-harm.

Models 3 and 4 for both outcomes add the negative emotions measure to the equations, and these results indicate that the relationship between bullying and deviance is partially mediated by negative emotions. First, negative emotions are significantly related both to self-harm and suicidal ideation in each equation that was estimated. The

coefficients are substantively large, with betas ranging in magnitude from .26 to .36. Additionally, adding this variable to the equations reduces the direct associations between bullying and the two outcomes. With respect to self-harm (Panel A), the beta for traditional bullying is reduced by 44% (from .32 in model 1 to .18 in model 3), while the beta for cyber bullying is reduced by 24% (from .38 in model 2 to .29 in model 4). A similar pattern is observed for suicidal ideation in panel B. An initial beta for traditional bullying of .39 in model 1 is reduced by 41% to .23 in model 3 when the negative emotions variable is introduced. For cyber bullying, the reduction is ~30% (from .39 in model 2 to .27 in model 4). To determine

whether these mediated relationships are statistically significant, we conducted a Sobel test (Sobel 1982), which revealed that across the different combinations of independent (traditional or cyber bullying) and dependent (self-harm or suicidal ideation) variables, between 24 and 43 of the total effects of bullying were mediated by negative emotions. These mediated relationships were significant in each instance at a level of $p < .001$.

Hypothesis Three

Attention then turned to considering whether the relationships between bullying and self-harm/suicidal ideation depend on youths' exposure to authoritative parenting and their level of self-control. This was examined with OLS product-term analysis in which we computed interaction terms that are the product of the predictor variable and the hypothesized moderating variable (to avoid problems with multicollinearity, the predictors and moderators were standardized prior to computing the product terms). The coefficient for this interaction term indicates how much the relationships increase or decrease in response to a change in the moderating variable (Cohen and Cohen 1983; Jaccard et al. 1990). GST predicts that the interaction coefficients will be negative—the effects of bullying should be *reduced* when authoritative parenting and self-control are high.

For the present analysis, we had eight interactive effects to consider, given that we have two independent variables (traditional and cyber bullying), two moderators

(authoritative parenting and self-control), and two dependent variables (self-harm and suicidal ideation). Each interaction was considered with an equation that included either self-harm or suicidal ideation as the dependent variable and predictors for the bullying variable of interest, the moderator of interest, the relevant interaction term, and all of the control variables.

Table 4 provides the coefficients and standard errors for the variables of substantive interest. The pattern of results strongly supports the hypothesis that the relationships between bullying and the two outcomes are partially conditional—seven of the eight interaction terms are significant and in the predicted negative direction. The one exception involves the relationship between cyber bullying and self-harm, in which the interaction coefficient ($B = -.09$) is negative but falls short of statistical significance. In all other instances, however, the presence of high authoritative parenting or high self-control reduces the harmful effects of bullying, with the standardized coefficients for the interactions ranging between $-.12$ and $-.23$. We used the SSLOPE procedure in Stata to examine the simple regression slopes (Aiken and West 1991:13–22), and this reveals the substantive importance of these interactions. For example, with respect to cyber bullying, its relationship with suicidal ideation is $.40$ ($p < .001$) when authoritative parenting is low (-1 SD). This relationship, however, is greatly reduced (to $.13$, $p < .05$) when authoritative parenting is high ($+1$ SD). Thus, high quality parenting appears to help children cope with bullying in ways that reduce their thoughts about suicide. A similar

Table 4 Interactions between bullying and authoritative parenting/self-control

Traditional bullying	Self-harm			Suicidal ideation		
	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>
Traditional bullying	.31***	.05	.31	.39***	.05	.38
Authoritative parenting	-.11*	.05	-.11	-.14*	.05	-.13
Traditional bullying × authoritative parenting	-.11*	.03	-.16	-.12***	.03	-.17
Traditional bullying	.27***	.05	.26	.34***	.05	.33
Self-control	-.20***	.06	-.18	-.11	.06	-.09
Traditional bullying × self-control	-.13***	.03	-.21	-.14***	.03	-.23
Cyber bullying	Self-harm			Suicidal ideation		
	<i>b</i>	SE	<i>B</i>	<i>b</i>	SE	<i>B</i>
Cyber bullying	.42***	.05	.36	.42***	.06	.35
Authoritative parenting	-.12*	.05	-.12	-.15**	.05	-.14
Cyber bullying × authoritative parenting	-.06	.03	-.09	-.12***	.03	-.18
Cyber bullying	.37***	.06	.31	.42***	.06	.35
Self-control	-.23***	.06	-.20	-.17**	.06	-.14
Cyber bullying × self-control	-.12***	.03	-.22	-.07*	.03	-.12

* $p < .05$ (2-tailed); ** $p < .01$ (2-tailed); *** $p < .001$ (2-tailed)

pattern is observed for the interaction between traditional bullying and self-control in the causation of self-harm. The relationship between traditional bullying and self-harm is .33 ($p < .001$) when self-control is low (-1 SD); however, at high levels of self-control ($+1$ SD), the coefficient is reduced to nonsignificance ($b = .04$, $p < .412$). This is consistent with the idea that those who have high self-control are better able to deliberate on their strainful situation and avoid responses that are harmful to their long-term health and interests.

Additional Analyses

We conducted several additional analyses to consider how sensitive our results were to various modifications in measurement or modeling. First, we considered whether the relationships between bullying and self-harm/suicidal ideation were different if the dependent variables were measured dichotomously to distinguish those who reported *any* involvement (coded 1) from those who reported no involvement (coded as 0). Such an approach is theoretically informative, given that there may be substantive differences between these two groups that are not captured with our original coding. Also, from a methodological perspective, this approach allows us to address a limitation of our OLS regressions (they were estimated with ordinaly-measured dependent variables that have positively skewed distributions). Logistic regression was used to estimate the relationships, and these equations produced nearly identical results to those obtained through OLS regression. Specifically, just as with the OLS results, this analysis revealed relationships between bullying and self-harm/suicidal ideation and between negative emotions and self-harm/suicidal ideation that were significant in every instance. Also, the pseudo r -squared values for each of the logistic regression equations closely resembled the r -squared values for the OLS equations and, consistent with a mediation hypothesis, the coefficients for both traditional and cyber bullying were reduced when negative emotions were included in the model.

Next, we considered whether verbal and physical bullying—which were combined in our traditional bullying measure—had effects that differed from one another. We found that the effects of physical bullying on negative emotions and self-harm/suicidal ideation were stronger in many instances. However, both measures were significantly related to the dependent variables in every instance, and support for the mediating hypothesis was observed for both physical and verbal bullying.

Last, we considered whether the effects of traditional and cyber bullying could be estimated in the same equation. The two have a correlation of .63, and including them in the same model produced variance inflation factors that

often approached 2.00, a level seen as problematic by some standards (Fox 1991). Also, the overlap between the two measures has a unique feature—in order for one to have been cyber bullied at high levels (above the scale's midpoint), one almost had to be exposed to traditional bullying at high levels (above the midpoint). We uncovered only ten subjects who were exposed to high cyber bullying but not high traditional bullying. In light of these patterns, and given that the nexus between traditional and cyber bullying has been considered only minimally to date (see Hinduja and Patchin 2009 and Wang et al. 2009), we opted against trying to identify independent effects from the same model. That task would be better accomplished by future studies with larger samples that enable greater disentangling of these effects.

Discussion

As much as 15% of US adolescents commit or contemplate acts of self-harm each year, and many acts of self-harm are serious enough to produce a hospital admission (Ross and Heath 2002; Vajani et al. 2007; US Centers for Disease Control and Prevention 2008). These patterns call for greater attention to understanding the etiology of self-harm. This study addressed this need by testing relevant hypotheses from Agnew's theory of social psychological strain. Our analysis generated three important findings. We elaborate on these three findings and discuss their theoretical implications. We then consider the implications of these findings for policy, followed by a discussion of the study's limitations.

Overview of Findings

The first conclusion from the analysis is that bullying victimization was significantly and positively associated with self-harm and suicidal ideation. These relationships were far from trivial, with standardized coefficients ranging from .32 to .39. Indeed, these relationships were the strongest observed for any variables, despite the fact that many of the control variables in multivariate models had effects that were just as strong as expected (self-harm was higher among females, nonwhites, and those with low self-control and low exposure to authoritative parenting). These results therefore support GST's prediction that abusive treatment from peers has an important relationship not just with externalizing aggression (which has been the typical focus of tests of GST), but also with aggression directed against the self.

This finding also supports the broader line of research regarding the harmful consequences of bullying (Hawker and Boulton 2000). Also, consistent with recent research

from Hinduja and Patchin (2009), we found support for the idea that cyber bullying—not just traditional bullying—is consequential for deviance. In contrast to the overt verbal and physical harassment that occurs with traditional bullying, cyber bullying has raised concerns because its electronic nature may make it less likely to attract the attention of teachers or parents. Moreover, it may be more difficult to gain a reprieve from cyber bullying, given that adolescents can be exposed to it even when physically removed from bullies. Our analysis was not able to consider these possibilities, but the important relationships between cyber bullying and self-harm observed here suggest the importance of future research on its effects.

The second conclusion from the study is that the relationship bullying and self-harm was partially mediated by negative emotions. Specifically, between 24 and 43% of the total effects of bullying were mediated by negative emotions. These results are consistent with the basic causal chain proposed by GST and consistent with other tests of GST that find an important mediating role of negative emotions (Kaufman 2009; Simons et al. 2003). We emphasize, however, that even after controlling for negative emotions, significant relationships between bullying and our two outcomes persisted. This may indicate that our measure of negative emotions is incomplete and that more elaborate measures of emotions are needed in future research. Also possible, however, is that additional mediating variables—including those not related to emotions—should be considered. Thus, although our analysis reveals a mediating role played by negative emotions, additional theorizing certainly is warranted.

The final conclusion from our analysis is that the relationships between bullying and self-harm/suicidal ideation were highly conditional. Specifically, we considered the moderating role of one feature of the social environment (exposure to authoritative parenting) and one feature of the adolescents themselves (the level of self-control). We found consistent evidence that bullying was less associated with the dependent variables for adolescents who were exposed to authoritative parenting and had high levels of self-control. In some instances, the interactions were such that bullying continued to have a positive association with self-harm and suicidal ideation, but this association was lower in magnitude when these features were present; in other instances, however, high authoritative parenting and self-control largely eliminated the relationship between bullying and our two outcomes. Tests of GST have not always found the effects of strain to be conditional on other factors, but the findings presented here are consistent with recent analyses (e.g., Agnew et al. 2002; Baron 2004) that have supported this aspect of GST. Taken together, these studies suggest an important possibility: Exposure to strain does not have to increase deviance (including self-harm).

Instead, important features of the social environment or of individuals can help minimize the harmful consequences of these strains.

Policy Implications

These findings have implications for policy efforts to reduce self-harm. First, they suggest the value of programs that can reduce adolescent bullying. Anti-bullying programs often have been implemented in the school context, in part because this is where bullying often occurs and in part because the school is an efficient setting for reaching adolescents. Among school-based anti-bullying programs, the most elaborate ones take a “whole-school” approach—rather than targeting only those accused of bullying, they seek to alter the school culture such that bullying is no longer tolerated (Hawkins et al. 1998). This involves providing students, teachers, and parents with information about the definition of bullying, the extent of the problem in that school, and the role that each person can take in reducing its incidence and helping those who are victims. The most influential of these programs is the Olweus Bullying Prevention Program that was initially implemented in Bergen, Norway. Rigorous evaluations reveal that it significantly reduces bullying (Olweus 1988; Smith and Sharp 1994), and similar programs are now being implemented and evaluated in the US (Ferguson et al. 2007; Frey et al. 2005; Limber 2004). One point to emphasize is that, if they are to accomplish their maximum potential, these programs must devote significant attention to newer forms of bullying that involve cyber bullying.

In addition to reducing the overall prevalence of bullying, our findings also suggest the need to assist those who, despite anti-bullying efforts, still become victims. In short, our finding that the effects of bullying depended in part on the child’s self-control and exposure to authoritative parenting directs attention to protective factors that can diminish the harm that results from bullying victimization. Many types of interventions could enhance these protective factors (and other relevant ones), including family therapy and peer-based group therapy (see Hawton et al. 2006). However, cognitive behavioral therapy (CBT) provides perhaps the most promising approach. CBT is based on the idea that deviant and maladaptive behavior can be reduced by helping people change how they interpret and experience aversive events. This involves training individuals to recognize their maladaptive responses, and then make behavioral changes accordingly. CBT has been found to reduce both internalizing and externalizing deviance (see Landenberger and Lipsey 2005), including suicide (Brown et al. 2005). Thus, although CBT may not eliminate one’s exposure to bullying, it may hold promise for minimizing the harmful effects of this exposure. School and social

service personnel, therefore, may consider referring bullying victims and their families to community-based CBT.

Limitations

These findings and their implications should be viewed in the context of the study's limitations, all of which point to important priorities for future research. First, our analyses were based on cross-sectional data gathered at one point in time. Thus, rather than assessing acts of self-harm that necessarily followed exposure to bullying, our incidents of self-harm and bullying occurred during the same time period (the prior 12 months). Our study, therefore, offers no guarantee of capturing the appropriate causal order—self-harm could have occurred prior to bullying, and perhaps even could have triggered bullying, given that emotional maladjustment may prompt social ostracism. To address this possibility, future studies may use longitudinal data to examine lagged effects of bullying on deviance. It should be noted, however, that with temporal lags in longitudinal research often amounting to 1 year or more, this approach provides a less than ideal match with theoretical arguments about the relatively short-term or instantaneous effects of strain (Agnew 2001).

An additional limitation involves our sample, which included students from just two schools in a non-metropolitan county of a southeastern state. Different results could emerge with samples that are more representative of the national population of adolescents. Our study also was

limited by its reliance on data that came exclusively from one source (the adolescents). This may have contributed to the strong relationships we observed between many of our variables. As others have noted (Larzelere and Patterson 1990), alternative measurement sources for key variables should be used when possible, but it was not possible with these data.

Conclusion

The findings presented here support a basic theoretical framework for studying the causes of self-harm: Strainful social relations are positively associated with negative emotions; these emotions, in turn, are positively associated with deliberate self-harm; and the potency of these relationships depends on other features of the adolescent's social environment and self. This framework reflects a straightforward application of Agnew's GST, which appears to be a promising perspective for considering this issue. Importantly, however, theorizing in this area has in some sense just begun. The results presented here suggest the potential value of new scholarship on this issue.

Appendix

See Table 5.

Table 5 Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Age												
2. Male	−.00											
3. Non-white	.03	.01										
4. Foreign-born	.17***	−.08	.35***									
5. Nonintact family	.09	−.05	−.06	−.11*								
6. Poor school grades	.06	.13*	.11*	.08	.26***							
7. Self-control	−.06	−.15**	−.01	−.04	−.11*	−.27***						
8. Authoritative parenting	.01	−.11*	−.12*	−.01	−.15**	−.24***	.29***					
9. Negative emotions	.03	−.11*	.11*	.12*	.19***	.08	−.30***	−.17**				
10. Traditional bullying victimization	−.13**	.03	−.06	−.00	.12*	.15***	−.28***	−.13**	.49***			
11. Cyber bullying victimization	.08	−.05	.02	.04	.06	.07	−.16***	−.08	.37***	.63***		
12. Self-harm	.02	−.08	.13**	.10*	.14**	.15**	−.31***	−.22***	.47***	.37***	.41***	
13. Suicidal ideation	.02	−.02	.15**	.15**	.13**	.08	−.26***	−.23***	.52***	.41***	.41***	.67***

* $p < .05$ (2-tailed); ** $p < .01$ (2-tailed); *** $p < .001$ (2-tailed)

References

- Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, 30, 47–87.
- Agnew, R. (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, 319–361.
- Agnew, R., & White, H. R. (1992). An empirical test of general strain theory. *Criminology*, 30, 475–499.
- Agnew, R., Brezina, T., Wright, J. P., & Cullen, F. T. (2002). Strain, personality traits, and delinquency: Extending general strain theory. *Criminology*, 40, 43–72.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park: Sage.
- Almeida, J., Johnson, R. M., Corliss, H. L., Molnar, B. E., & Azrael, D. (2009). Emotional distress among LGBT youth: The influence of perceived discrimination based on sexual orientation. *Journal of Youth and Adolescence*, 38, 1001–1014.
- Baron, S. W. (2004). General strain, street youth and crime: A test of Agnew's revised theory. *Criminology*, 42, 457–483.
- Baumrind, Diana. (1991). The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence*, 11, 56–95.
- Bennum, I. (1984). Psychological models of self-mutilation. *Suicide and Life-Threatening Behavior*, 14, 166–186.
- Boivin, M., & Hymel, S. (1997). Peer experiences and social self-perceptions: A sequential model. *Developmental Psychology*, 33, 135–145.
- Brezina, T. (1998). Adolescent maltreatment and delinquency: The question of intervening processes. *Journal of Research in Crime and Delinquency*, 35, 71–99.
- Broidy, L. (2001). A test of general strain theory. *Criminology*, 39, 9–36.
- Broidy, L., & Agnew, R. (1997). Gender and crime: A general strain theory perspective. *Journal of Research in Crime and Delinquency*, 34, 275–306.
- Brown, G. K., Have, T. T., Henriques, G. R., Xie, S. X., Hollander, J. E., & Beck, A. T. (2005). Cognitive therapy for the prevention of suicide attempts: A randomized controlled trial. *Journal of the American Medical Association*, 294, 563–570.
- Cohen, Albert. K. (1955). *Delinquent Boys*. Glencoe, IL: Free Press.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression: Correlation analysis for the social sciences*. Hillsdale, NJ: L. Erlbaum Associates.
- Coll, X., Law, F., Tobias, A., Hawton, K., & Tomas, J. (2001). Abuse and deliberate self-poisoning in women: A matched case control study. *Child Abuse and Neglect*, 25, 1291–1302.
- Crick, N. R., & Grotpeter, J. K. (1996). Children's treatment by peers: Victims of relational and overt aggression. *Development and Psychopathology*, 8, 367–380.
- Favazza, A. R. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental Disease*, 186, 259–268.
- Ferguson, C. J., San Miguel, C., Kilburn, C. J., Jr., & Sanchez, P. (2007). The effectiveness of school-based anti-bullying programs: A meta-analytic review. *Criminal Justice Review*, 32, 401–414.
- Fox, J. (1991). *Regression diagnostics*. Newbury Park, CA: Sage.
- Frey, K. S., Hirschstein, M. K., Snell, J. L., & Van Schoiack Edstrom, L. (2005). Reducing playground bullying and supporting beliefs: An experimental trial of the steps to respect program. *Developmental Psychology*, 41, 479–491.
- Grasmick, H. G., Tittle, C. R., Bursik, R. J., & Arneklev, B. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, 30, 5–29.
- Gray, M. R., & Steinberg, L. (1999). Unpacking authoritative parenting: Reassessing a multidimensional construct. *Journal of Marriage and the Family*, 61, 574–587.
- Hawker, D. S. J., & Boulton, M. J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *The Journal of Child Psychology and Psychiatry*, 41, 441–445.
- Hawkins, J. D., Farrington, D. P., & Catalano, R. (1998). Reducing violence through the schools. In D. S. Elliott, B. A. Hamburg, & K. R. Williams (Eds.), *Violence in American schools*. New York, NY: Cambridge University Press.
- Hawton, K., Rodham, K., & Evans, E. (2006). *By their own hand*. Philadelphia, PA: Jessica Kingsley Publishers.
- Hay, C. (2003). Family strain, gender, and delinquency. *Sociological Perspectives*, 46, 107–135.
- Hay, C., & Evans, M. (2006). Violent victimization and involvement in delinquency: Examining predictions from general strain theory. *Journal of Criminal Justice*, 34, 261–274.
- Hinduja, S., & Patchin, J. W. (2009). *Bullying beyond the schoolyard: Preventing and responding to cyberbullying*. Thousand Oaks, CA: Corwin Press.
- Hoffmann, J. P., & Miller, A. S. (1998). A latent variable analysis of general strain theory. *Journal of Quantitative Criminology*, 14, 83–110.
- Jaccard, J., Turrisi, R. R., & Wan, C. K. (1990). *Interaction effects in multiple regression*. Newbury Park, CA: Sage.
- Kaufman, J. M. (2009). Gendered responses to serious strain: The argument for a general strain theory of deviance. *Justice Quarterly*, 26, 410–444.
- Kerr, D. C. R., Owen, L. D., Pears, K. C., & Capaldi, D. M. (2008). Prevalence of suicidal ideation among boys and men assessed annually from ages 9 to 29 years. *Suicide and Life-Threatening Behavior*, 38, 390–402.
- Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Cause or consequence of school maladjustment. *Child Development*, 67, 1305–1317.
- Lamborn, S. D., Mounts, N. S., Steinberg, L., & Dornbusch, S. M. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development*, 62, 1049–1065.
- Landenberger, N. A., & Lipsey, M. W. (2005). The positive effects of cognitive-behavioral programs for offenders: A meta-analysis of factors associated with effective treatment. *Journal of Experimental Criminology*, 1, 451–476.
- Larzelere, Robert. E., & Patterson, Gerald. R. (1990). Parental management: Mediator of the effect of socioeconomic status on early delinquency. *Criminology*, 28, 301–324.
- Laye-Gindhu, A., & Schonert-Reichl, K. A. (2005). Nonsuicidal self-harm among community adolescents: Understanding the 'whats' and 'whys' of self-harm. *Journal of Youth and Adolescence*, 34, 447–457.
- Limber, S. P. (2004). Implementation of the Olweus Bullying Prevention Program in American schools: Lessons learned from the field. In D. L. Espelage & S. M. Swearer (Eds.), *Bullying in American Schools* (pp. 351–363). Mahwah, NJ: Lawrence Erlbaum Associates.
- Longshore, D., Turner, S., & Stein, J. A. (1996). Self-control in a criminal sample: An examination of construct validity. *Criminology*, 34, 209–228.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist*, 53, 205–220.
- Mazerolle, P., & Maahs, J. (2000). General strain and delinquency: An alternative examination of conditioning influences. *Justice Quarterly*, 17, 753–778.

- Mazerolle, P., & Piquero, A. (1997). Violent responses to strain: An examination of conditioning influences. *Violence and Victims*, 12, 323–343.
- Moon, B., Morash, M., McCluskey, C. P., & Hwang, H. (2009). A comprehensive test of general strain theory: Key strains, situational and trait-based negative emotions, conditioning factors, and delinquency. *Journal of Research in Crime and Delinquency*, 46, 182–212.
- Nixon, M. K., Cloutier, P. F., & Aggarwal, S. (2002). Affect regulation and addictive aspects of repetitive self-injury in hospitalized adolescents. *Journal of American Academy of Child and Adolescent Psychiatry*, 41, 1333–1341.
- Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere.
- Olweus, D. (1988). Bullying in the schools: How educators can help. *The Educational Digest*, 53, 30–34.
- Patton, G. C., Hemphill, S. A., Beyers, J. M., Bond, L., Toumbourou, J. W., McMorris, B. J., et al. (2007). Pubertal stage and deliberate self-harm in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 46, 508–514.
- Piquero, A. R., & Rosay, A. B. (1998). The reliability and validity of Grasmick et al.'s self-control scale: A comment on Longshore et al. *Criminology*, 36, 157–173.
- Rittakerttu, K., Rimpela, M., Rantanen, P., & Rimpela, A. (2000). Bullying at school: An indicator of adolescents at risk for mental disorders. *Journal of Adolescence*, 23, 661–674.
- Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence*, 31, 67–77.
- Ross, S., & Heath, N. (2003). Two models of adolescent self-mutilation. *Suicide and Life-Threatening Behavior*, 33, 277–287.
- Sharp, S. F., Terling-Watt, T. L., Atkins, L. A., Gilliam, J. T., & Sanders, A. (2001). Purging behavior in a sample of college females: A research note on general strain theory and female deviance. *Deviant Behavior*, 22, 171–188.
- Simons, R. L., Chen, Y. F., Stewart, E. A., & Brody, G. H. (2003). Incidents of discrimination and risk for delinquency: A longitudinal test of strain theory with an African-American sample. *Justice Quarterly*, 20, 827–854.
- Slee, P. T. (1994). Situational and interpersonal correlates of anxiety associated with peer victimization. *Child Psychiatry and Human Development*, 25, 97–107.
- Smith, P. K., & Sharp, S. (1994). *School bullying*. London: Routledge.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology* (pp. 290–312). Washington DC: American Sociological Association.
- United States Centers for Disease Control and Prevention. (2008). Youth risk behavior surveillance—United States, 2007. Surveillance Summaries, June 6, 2008. *Morbidity and Mortality Weekly Report* 2008, 57(No. SS-4), 1–131.
- Vajani, M., Annet, J. L., Crosby, A. E., Alexander, J., & Millet, L. M. (2007). Nonfatal and fatal self-harm injuries among children aged 10–14 years—United States and Oregon, 2001–2003. *Suicide and Life-Threatening Behavior*, 37, 493–506.
- Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health*, 45, 368–375.
- Ybarra, M., & Mitchell, K. (2004). Online aggressor/targets, aggressors, and targets: A comparison of associated youth characteristics. *Association for Child Psychology and Psychiatry*, 45, 1308–1316.

Author Biographies

Carter Hay is an Associate Professor in the College of Criminology and Criminal Justice at Florida State University in Tallahassee. His research examines the causes and prevention of individual involvement in crime and delinquency. His recent publications have appeared in such journals as *Criminology*, the *Journal of Research in Crime and Delinquency*, and *Justice Quarterly*. His research interests include theories of crime and deviance, families and deviance.

Ryan Meldrum is a doctoral candidate in the College of Criminology and Criminal Justice at Florida State University in Tallahassee. His research examines the relationship between family factors and involvement in delinquency. His recent publications have appeared in such journals as the *Journal of Research in Crime and Delinquency*, the *Journal of Criminal Justice*, and *Youth Violence and Juvenile Justice*. His research interests include theories of crime and deviance, peers and deviance, families and deviance.