

STRAIN, PERSONALITY TRAITS, AND DELINQUENCY: EXTENDING GENERAL STRAIN THEORY

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Although Agnew's (1992) general strain theory (GST) has secured a fair degree of support since its introduction, researchers have had trouble explaining why some individuals are more likely than others to react to strain with delinquency. This study uses data from the National Survey of Children to address this issue. Drawing on Agnew (1997) and the psychological research on personality traits, it is predicted that juveniles high in negative emotionality and low in constraint will be more likely to react to strain with delinquency. Data support this prediction.

General strain theory (GST) has secured a fair degree of empirical support since its introduction in 1992 (Agnew, 1992). Research suggests that many types of strain falling under the theory are related to delinquency, with certain studies indicating that strain affects subsequent delinquency and that the impact of strain on delinquency is at least partly mediated by negative emotions like anger (Agnew, 1985; Agnew and Brezina, 1997; Agnew and White, 1992; Agnew et al., 1996; Aseltine et al., 2000; Baron and Hartnagel, 1997; Brezina, 1998, 1999; Broidy, 2001; Burton and Dunaway, 1994; Cernkovich et al., 2000; Colvin, 2000; Hagan and McCarthy, 1997; Hoffmann and Cerbone, 1999; Hoffmann and Miller, 1998; Hoffmann and Su, 1997; Katz, 2000; Mazerolle, 1998; Mazerolle and Maahs, 2000; Mazerolle and Piquero, 1997, 1998; Mazerolle et al., 2000; Paternoster and Mazerolle, 1994; Piquero and Sealock, 2000). At the same time, the research poses a major challenge for GST.

GST recognizes that only some strained individuals turn to delinquency, and it predicts that several factors condition the impact of strain on delinquency. There is little support for such predictions, however. This severely limits the explanatory power of GST. Most forms of strain have only small to moderate overall effects on delinquency, reflecting the fact

that only some people respond to strain with delinquency. If GST is to better explain delinquency, it must identify the factors that influence the reaction to strain. Identifying such factors also has important policy implications. As Agnew (1995a) notes, we can reduce crime not only by reducing strain, but also by addressing the factors that influence the reaction to strain. This paper uses data from the National Survey of Children to examine the extent to which certain major personality traits condition the effect of strain. Such traits have been neglected in the previous research, but there is good reason to believe that they have a fundamental effect on the experience of and reaction to strain.

BACKGROUND

GST focuses on negative relationships with others; that is, "relationships in which others are not treating the individual as he or she would like to be treated" (Agnew, 1992:48). There are three major types of strain or negative relationships: others may (1) prevent individuals from achieving their positively valued goals, including monetary, status, and autonomy goals; (2) remove or threaten to remove positively valued stimuli that individuals possess (e.g., the death of friends or family members, the loss of romantic partners); and (3) present or threaten to present individuals with noxious or negatively valued stimuli (e.g., verbal insults, physical assaults). These strains increase the likelihood that individuals will experience a range of negative emotions. These emotions create pressure for corrective action, and delinquency is one possible response. Anger is said to be especially conducive to delinquency, because it energizes the individual for action, lowers inhibitions, and creates a desire for revenge. Delinquency may be used to reduce or escape from strain (e.g., stealing money, running away from abusive parents), seek revenge against those who have inflicted the strain (e.g., assault, vandalism), or reduce the negative feelings that result from strain (e.g., illicit drug use). Only some strained individuals turn to delinquency, however, making it critical to specify those factors that influence the reaction to strain.

GST predicts that several factors condition the effect of strain on delinquency, with these factors influencing the experience of strain, the ability to engage in criminal versus noncriminal coping, the costs of criminal versus noncriminal coping, and the disposition for criminal versus noncriminal coping. Such factors include the importance attached to the goals, values, or identities that are threatened; coping skills; coping resources like money, self-esteem, and self-efficacy; conventional social supports; level of social control; and association with delinquent peers. Many of these factors have been examined in the empirical literature, including coping skills, self-esteem, self-efficacy, family attachment, moral beliefs,

and association with delinquent peers (Agnew and White, 1992; Aseltine et al., 2000; Hoffmann and Miller, 1998; Mazerolle and Maahs, 2000; Mazerolle and Piquero, 1997; Mazerolle et al., 2000; Paternoster and Mazerolle, 1994; Piquero and Sealock, 2000). Most studies find little evidence for the conditioning effects predicted by GST (although see Mazerolle and Maahs, 2000). At present, then, there is much uncertainty regarding the factors that condition the effect of strain on delinquency. The research on conditioning effects, however, has neglected what may be the most important set of conditioning variables: the personality traits of the individual.

This neglect of personality traits is understandable: Personality traits were not emphasized in Agnew's original statement of GST, the role of personality traits was discounted by mainstream criminologists until recently (see Andrews and Wormith, 1989; Caspi et al., 1994; Walsh, 2000), and most data sets do not allow for the examination of personality traits. Agnew (1997), however, placed much emphasis on such traits in a later work, and much recent work in psychology suggests that personality traits may have a fundamental effect on the experience of and reaction to strain. In particular, the impact of such traits may be far more pervasive than that of the conditioning variables typically examined in the research. Such traits may have a major impact on the emotional reaction to strain, the ability to respond to strain in a noncriminal manner, the awareness of and concern for the costs of criminal coping, and the disposition for criminal coping.

PERSONALITY TRAITS AS CONDITIONING VARIABLES

"Traits" refer to relatively stable ways of perceiving, thinking about, and behaving toward the environment and oneself (Blackburn, 1993). Psychological research over the past 20 years has made much progress in identifying the major traits that comprise the human personality (for overviews, see Block, 1995; Caspi, 1998; Lilienfeld, 1999; Prior, 1992; Rothbart and Bates, 1998; Watson et al., 1994). Much data indicate that these traits tend to cluster together into several "master" or "supertraits," with some researchers arguing that personality can be adequately described in terms of five master traits ("the Big Five"), and others arguing that it can be described in terms of three master traits (the "Big Three"). Recent research, however, suggests that there is much overlap between the master traits described by different researchers (Block, 1995; Church, 1994; Lilienfeld, 1999; Watson et al., 1994). Regardless of the perspective one adopts, there is widespread agreement that certain master traits have a dramatic impact on the experience of and reaction to strain. This paper

employs the conception of personality advanced by Tellegen (1985), which focuses on the master traits of negative emotionality, constraint, and positive emotionality. This conception is well grounded in empirical research, it is widely accepted in psychology, and the master traits of negative emotionality and constraint have already been linked to delinquent behavior (Caspi et al., 1994; Colder and Stice, 1998; Henry et al., 1996; Rothbart and Bates, 1998; Wright et al., 2001).

The master trait perhaps most relevant to GST is negative emotionality. Individuals high in negative emotionality are much more likely than are others to experience events as aversive, to attribute these events to the malicious behavior of others, to experience intense emotional reactions to these events—particularly the key emotion of anger—and to be disposed to respond to such events in an aggressive or antisocial manner. Although such individuals are more likely to engage in crime and delinquency, no research that we are aware of has examined whether negative emotionality conditions the effect of strain on delinquency. There is good reason to expect such a conditioning effect, however. Individuals high in negative emotionality have stronger emotional reactions to strains and are more disposed to aggressive/antisocial coping.

The master trait of “constraint” may also condition the effect of strain on crime. Individuals low in constraint are more likely to act on their impulses, including impulses of a delinquent nature. Such individuals, in particular, are impulsive, are risk-taking/sensation-seeking, reject conventional social norms, and are unconcerned with the feelings or rights of others. Researchers have not examined whether constraint conditions the effect of strain on delinquency. It is reasonable to expect such a conditioning effect because individuals low in constraint should be less aware of and concerned with the negative consequences of delinquent behavior, less able to cope through noncriminal means, and more disposed to criminal coping given their attraction to risky behavior.

Thus, there is good reason to believe that strain will be especially likely to lead to crime among individuals high in negative emotionality and low in constraint. Agnew (1997) makes a similar set of arguments; in particular, he lists several specific traits that may increase the likelihood of a delinquent reaction to strain for certain of the reasons indicated above. Agnew, however, does not recognize that the traits he mentions are part of the master traits of negative emotionality and constraint.

THE SOURCES OF NEGATIVE EMOTIONALITY AND CONSTRAINT

Data from the psychological literature indicate that negative emotionality and constraint are caused by biological and environmental factors

(Caspi, 1998; Caspi et al., 1994; Krueger, 2000; Lilienfeld, 1999; Luu et al., 2000; McGue et al., 1993; Rothbart and Bates, 1998; Wright et al., 1999). There is good evidence that these traits are inherited to some degree, and recent research has begun to explore the physiological underpinnings of such traits. The incorporation of such traits into GST, then, represents an integration between strain theory and the rapidly growing research on behavioral genetics and crime (see Walsh, 2000). This integration, in particular, reflects the "diathesis-stress model," which frames much of the recent biological research on crime. According to this model, certain biological factors make individuals especially vulnerable to environmental stressors (see Fishbein, 2001:12–13).

These traits, however, are also influenced by environmental factors. Theory and limited data suggest that the traits of negative emotionality and low constraint are partly caused by mistreatment from others, like harsh/erratic parental discipline and residence in economically deprived, inner-city communities (e.g., Agnew, 1997; Anderson, 1999; Bernard, 1990; Caspi et al., 1994; Colvin, 2000), and low constraint may be partly caused by poor bonding with and supervision by conventional others. In particular, individuals must be taught how to exercise self-restraint, and this occurs as parents and others provide clear rules, monitor behavior, and consistently sanction rule violations in a fair, nonabusive manner (Caspi et al., 1994; Colvin, 2000; Gottfredson and Hirschi, 1990).

THE RELATIONSHIP AMONG STRAIN, NEGATIVE EMOTIONALITY, AND CONSTRAINT

The relationship among strain, negative emotionality, and constraint extends beyond the conditioning effects indicated above. As just suggested, the experience of strain or mistreatment from others may foster negative emotionality and low constraint. Also, negative emotionality and low constraint increase the likelihood that individuals will experience strain. In particular, these traits increase the likelihood that individuals will perceive events as aversive or stressful. They also increase the likelihood that individuals will experience "objective strains," or events and conditions that are widely experienced as aversive (see Agnew, 2001a, for a discussion of "subjective" and "objective" strains). Individuals high in negative emotionality and low in constraint are not pleasant people; they tend to elicit negative reactions from others in particular situations; transform their environments in ways that increase the likelihood of negative treatment, for example, by alienating parents and teachers; and select themselves into environments where negative treatment is more common, like delinquent peer groups and lower academic tracks at school (see Agnew, 1997; Caspi, 1998). Further, they have more difficulty achieving

conventional goals like monetary success through legitimate channels (see Walsh, 2000).

The relationship between strain and negative emotionality/low constraint is therefore complex. Strain and negative emotionality/low constraint have reciprocal effects on one another, and each conditions the effect of the other on delinquency. This study is primarily interested in the conditioning effect, which can be readily tested with the cross-sectional data at hand. The reciprocal causal effects cannot be examined with such data, but we would expect strain to be positively correlated with negative emotionality/low constraint given such effects.

NEGATIVE EMOTIONALITY, CONSTRAINT, AND SELF-CONTROL

There is clearly much overlap between Gottfredson and Hirschi's (1990) concept of self-control and negative emotionality and constraint (see Caspi et al., 1994; Wright et al., 1999). Low self-control includes many of the specific traits that comprise negative emotionality and low constraint, such as impulsivity, a preference for risk-taking, irritability, and insensitivity to others. One could plausibly argue that low self-control will condition the impact of strain on delinquency for many of the same reasons listed above. We prefer, however, to focus on the traits of negative emotionality and constraint for two reasons. First, this allows us to draw on the extensive psychological research on the nature and origin of these traits. Second, the impact of low self-control on crime is interpreted largely in terms of control theory. That is, low self-control is said to result in crime because it reduces the ability of individuals to restrain themselves from acting on their immediate impulses and desires, including those of a delinquent nature. Although this is a very reasonable interpretation, the impact of those traits that comprise low self-control can also be explained in terms of strain and social learning theories. Such traits, in particular, increase the likelihood that individuals will react to strain with strong negative emotions, will have trouble coping with such strain through legitimate channels, and will find crime an attractive option. The traits of negative emotionality and low constraint do not carry the theoretical connotations of low self-control and are preferred for that reason.

In sum, there is good reason to believe that the impact of strain on delinquency may be heavily dependent on the traits of the person experiencing the strain.

DATA AND MEASURES

Data are from the second wave of the National Survey of Children, which focuses on the well-being of children. The first wave of the survey

was conducted in 1976 and involved interviews with a nationally representative sample of 2,300 children between the ages of 7 and 11. The second wave was conducted five years later in 1981. A subsample of the wave 1 children were selected, with children in high-conflict or disrupted families being oversampled. Interviews were completed with 1,423 children, or 82% of those selected for participation. Interviews were also completed with the child's main teacher and the "parent who would be most capable of providing information about the child," usually the mother (Furstenberg et al., 1983). The wave 2 data are weighted so that they "constitute a national sample of children aged 12 to 16 in 1981" (see Furstenberg et al., 1983; Zill et al., 1992, for more sample information). The National Survey of Children is particularly well suited for testing GST; in fact, it is the only nationally representative data set that we are aware of that contains measures of strain, personality traits like negative emotionality and low constraint, and delinquency.¹

It should be noted that although the National Survey of Children contains three waves of data, it is not possible to do a longitudinal analysis examining the effects of prior strain and negative emotionality/low constraint on subsequent delinquency. There is at least a five-year lag between each wave of data, which makes it difficult to examine the effect of prior strain on subsequent delinquency. As Agnew (1992) states, we would expect strain to have a relatively contemporaneous effect on delinquency. Also, it is not possible to construct good measures of delinquency with the wave 1 and wave 3 data. The wave 1 data only contain parent and teacher reports on a few select forms of delinquency, and there is very little variation in the wave 3 delinquency measures. Other research, however, indicates that strain and negative emotionality/low constraint have an effect on subsequent delinquency (e.g., Agnew and White, 1992; Colder and Stice, 1998; Henry et al., 1996; Paternoster and Mazerolle, 1994; Sampson and Laub, 1993; Wright et al., 1999). Also, a recent study by Wright et al. (2001) found that personality traits of the type considered here condition the effect of social ties on crime, and these conditioning effects emerge both when traits are measured contemporaneously with crime and when they are measured about a decade earlier in childhood. Although these results cannot necessarily be generalized to the measures of strain in this study, Wright et al.'s measures of school, family, work, and partner ties do index goal-blockage and interpersonal strain to some extent.² Nevertheless, subsequent research should verify the results of this

1. The Youth in Transition data set used by Agnew (1985) and others is limited to males, whereas the National Youth Survey used by Paternoster and Mazerolle (1994) and others does not contain good measures of personality traits.

2. Most of the social tie measures in Wright et al. (2001) focus on "prosocial ties," like educational achievement and positive family ties. If these measures are reverse

study with longitudinal data.

STRAIN MEASURES

Several strain measures are examined, including certain family, school, and peer strains that Agnew (2001a) states are especially likely to be related to delinquency. Neighborhood strain is also examined; unfortunately, the general nature of the neighborhood strain measure makes it difficult to predict whether it will be related to delinquency using the criteria listed by Agnew (2001a). Although the measures neglect certain types of strain, particularly those involving goal blockage, they provide some indication of the amount of strain in the three major domains of adolescent life: family, school, and peer group. They also include certain types of strain neglected by previous researchers, most notably, peer abuse. Data suggest that peer abuse is common and that it often has a devastating impact on its victims (e.g., Ambert, 1994; Lockwood, 1997). Further, recent media accounts suggest that peer abuse is an important cause of delinquency, particularly school violence. It is therefore important to examine the consequences of this type of strain.

Most of the strain measures were created in two sets of oblique factor analyses: The first factored all family-related items, and the second factored all school-related items. Strain items were factored with social control items in order to help ensure that the strain measures were distinct from the social control measures. A third factor analysis focused on a small group of items that measured peer relations. All items in the scales listed below load at least .35 on that scale, with most loadings in the .6 to .7 range (full factor results are available from the lead author).

(1) Family Strain. The juveniles in the sample were asked whether several statements described their family life "in the past six months." High scorers on this six-item scale state that their family life was "tense and stressful," "disorganized and unpredictable," "complicated and complex," not "relaxed and easygoing," not "cooperative," and not "well-organized." High scorers, in short, lived in stressful, chaotic families (alpha reliability = .70).

(2) Conflict with Parents. High scorers on this four-item scale state that their parents often yell at them when they do something wrong and that they often argue with their parents (alpha = .56). Conflict with both mother and father was measured for juveniles in two-parent families,

coded, however, they can be taken as measures of negative social ties, with high scores indicating low levels of educational achievement, poor relations with family, and so on. These reverse-coded measures would have a positive effect on crime, with this effect being strongest among individuals who are low in self-control.

whereas conflict with the sole parent, usually the mother, was measured in one-parent families.

(3) **Parents Lose Control of Feelings.** Parents were asked, "Do you have times when you lose control of your feelings and feel you might hurt your child," with response categories ranging from never to often (12.2% of the parents state that they "sometimes" or "often" feel this way). It seems reasonable to suppose that such parents are more likely to verbally and perhaps physically mistreat their children.

(4) **School Hatred.** Juveniles were asked whether they "love, like, dislike, or hate going to school." High scorers state that they hate going to school (8.7% of the juveniles state that they "hate" school, and 12.2% state that they "dislike" school).

(5) **Picked On by Kids.** High scorers on this two-item measure of peer abuse state that they are "sometimes picked on or bothered by" older kids and by kids their age or younger in their neighborhood ($\alpha = .60$).

(6) **Neighborhood Strain.** Juveniles were asked, "How is your neighborhood as a place for kids to grow up," with five response categories ranging from "excellent" to "poor." High scorers state that their neighborhood is poor (7.4% of the sample).

Certain of these strain measures refer to the juvenile's current situation, whereas the delinquency measure refers to offenses committed in the last year. This raises the possibility that any association between strain and delinquency is due to the effect of delinquency on strain. Several factors, however, make this an unlikely possibility. Juveniles and parents probably drew on their experiences over the past several months in responding to the strain items. For example, juveniles who state that their parents "often yell at them when they do something wrong" are likely generalizing from numerous experiences over a period of time (see Agnew, 1991:140-141). Also, certain data suggest that at least some of the strain measures considered here are relatively stable and that strain has a larger causal effect on delinquency than delinquency has on strain (Agnew, 1989).

SOCIAL CONTROL AND SOCIAL LEARNING MEASURES

As Agnew (1995c) states, it is important to control for social control and social learning measures when examining the effect of strain measures. The failure to do so may cause us to overestimate the effect of the strain measures, because strain is frequently correlated with social control and the social learning of delinquency. Most notably, family strain is likely correlated with parental attachment and school strain is likely correlated with school attachment and commitment.³ At the same time, it should be

3. Part of this correlation may be due to the effect of strain on social control and the social learning of delinquency (see Agnew, 1995c; Paternoster and Mazerolle, 1994).

noted that it is sometimes difficult to distinguish "strain" from "social control" measures (see Agnew, 1995b, c). Grades, for example, can be taken as a measure of both strain and level of social control. Following Agnew and White (1992), we provide a conservative test of GST by classifying as social control measures those variables that are usually treated as control measures in the literature.

Measures for all of the major social control and social learning variables are listed below.

(1) Attachment to Parent(s). High scorers on this ten-item scale state that they want to be like their mother and/or father, they love their mother/father, they feel extremely close to their mother/father, they get all of the affection they want from their mother/father, and they often engage in enjoyable activities with their mother/father ($\alpha = .82$). Attachment to both mother and father is measured for juveniles in two-parent families, whereas attachment to the sole parent is measured for juveniles in one-parent families.⁴

(2) Parental Firmness. High scorers on this four-item indicator of direct control state that their mother and/or father makes rules for them that are "clear and consistent" and that their mother and/or father is "firm" with them and gets them "to do what [they] want you to do" ($\alpha = .66$).

(3) School Commitment. This four-item scale includes questions asked of the juvenile, the juvenile's primary parent, and the juvenile's main teacher. Juveniles with high scores on this scale state that they are "one of the best students in [their] class" and that they are "very satisfied" with their schoolwork. The juvenile's primary parent states that the juvenile is one of the best students in class, and the juvenile's main teacher states that the juvenile is one of the best students in class ($\alpha = .72$).

(4) Educational Goals. High scorers on this two-item scale state that they would like to obtain a college plus education and that they think they will obtain a college plus education ($\alpha = .55$).

(5) Time Spent on Homework. This is a one-item measure of the number of minutes spent on homework "on a usual school day."

(6) School Attachment. High scorers on this one-item measure state that they are "interested in [their] schoolwork" most of the time.

(7) Conscience. High scorers on this one-item measure state that they

This is difficult to determine with cross-sectional data, however. As a consequence, this study focuses on the direct effects of strain on delinquency.

4. The mother and father items loaded on separate factors, but were combined into a single scale because these separate factors were strongly correlated with one another (.4). Combining them into a single scale did not reduce the amount of explained variance in delinquency, and treating them as separate scales resulted in a large reduction in sample size, because those respondents without fathers were excluded from the analysis.

feel “ashamed” when they have “done something that [they] know is wrong.”

(8) Troublesome Friends. Juveniles were not asked whether their friends engage in delinquency, but their primary parent was asked whether their child “hangs around with kids who get into trouble.” High scorers report that this is “often true” of their child, with the other response categories being “sometimes true” and “not true” (13.6% of the parents report that their child often or sometimes hangs around with troublesome friends).

SOCIODEMOGRAPHIC MEASURES

The following sociodemographic variables are controlled in all analyses:

- (1) Total family income, measured in eight categories from <\$5000 to \$50,000+, in 1981 dollars.
- (2) Education of the primary parent, in years.
- (3) Family status, with dummy variables for divorced/separated and widowed/never married, with currently married being the reference category.
- (4) Age of the child, in years.
- (5) Sex of the child (1 = male, 2 = female).
- (6) Race/ethnicity of the child, with dummy variables for African-American and Hispanic-American, with non-Hispanic whites being the reference category (all other race/ethnic groups were excluded from the analysis).

NEGATIVE EMOTIONALITY/LOW CONSTRAINT

The juvenile’s primary parent and main teacher were asked a number of questions designed to measure the juvenile’s personality traits, with many of these questions focusing on the dimensions of negative emotionality and low constraint (as indicated above, these dimensions overlap with low self-control to a considerable extent). The juveniles were also asked questions designed to measure these traits, but our measure of negative emotionality/low constraint is based on the teacher and parent reports for two reasons. The juvenile questions are not as comprehensive as are the teacher/parent questions (e.g., the juveniles were not asked about their impulsivity, and most of the juvenile questions employ “yes or no” response categories that do not do a good job of distinguishing between juveniles who possess the trait to varying degrees). A recent analysis by Piquero et al. (2000) suggests that personality traits of the type considered here influence the validity of survey responses, thus biasing the trait measures (also see Wright et al., 1999). Piquero et al. (2000:923) suggest that researchers measuring such traits try to collect “external measures,” like “teacher, parent, and neutral observer reports.” This strategy has been successfully employed by numerous others in the criminology and psychology literatures (e.g., Caspi et al., 1994; Eisenberg et al., 2000; Moffitt et al.,

1996; Murphy et al., 1999; Tremblay et al., 1995; Wright et al., 1999; see Rothbart and Bates, 1998, for an overview), and it is used in this study.

Parents and teachers were asked to indicate whether a number of descriptive statements applied to the juvenile. Parents, in particular, were asked whether these statements were "often true, sometimes true, or not true" of the juvenile "during the past three months." Teachers were presented with the statements and asked "how much like that the student was in 1980–1981," with six response categories ranging from "not at all" to "exactly like." The parent and teacher statements are similar and encompass many of the specific traits that make up the dimensions of negative emotionality and low constraint, such as "is impulsive, acts without thinking" and "has a very strong temper and loses it easily." Although these trait items refer to the past three months (for parents) or the academic year (for teachers), data suggest that general traits of the type considered in this study are reasonably stable over time, which makes it unlikely that these traits are a function of the juvenile's delinquency in the past year (Caspi, 1998; Roberts and DelVecchio, 2000; Wright et al., 2001). Those trait items that seemed to overlap with delinquency were eliminated from consideration (e.g., "bullies, or is cruel or mean to others," "is disobedient at school," "cheated, told lies, was deceitful"). The remaining 26 items were factor analyzed using an oblique method of rotation (which allows factors to be correlated).

Two factors measuring negative emotionality/low constraint emerged, one made of the parent items and the other of the teacher items. The two factors had a correlation of .26, which is typical of the correlation between parent and teacher ratings of traits such as those examined here (e.g., Rothbart and Bates, 1998; Tremblay et al., 1995; see the meta analysis in Achenbach et al., 1987). This low correlation should not be taken to mean that the parent and teacher ratings are unreliable. To the contrary, much data suggest that parent and teacher ratings of these sorts of traits have acceptable levels of reliability (Achenbach et al., 1987; Rothbart and Bates, 1998). Rather, the low correlation is likely because the display of negative emotionality/low constraint is, to some extent, situationally specific (see Achenbach et al., 1987; Caspi, 1998; Epstein and O'Brien, 1985; Harkness et al., 1995). For example, some juveniles may be more inclined to express negative emotions around parents than around teachers. It has also been suggested that teachers are less biased observers than are parents (e.g., Murphy et al., 1999), although data suggest that parents provide reasonably valid reports of traits like those examined here (see the discussion in Rothbart and Bates, 1998).

The low correlation between the parent and teacher reports does not mean that we should abandon or discount these reports. As Achenbach et al. (1987:213) state, "because we lack definitive criteria against which to

validate measures of childhood problems, it is essential to preserve the contributions of different informants, even if they do not correlate well with each other." In particular, we should measure traits like negative emotionality and constraint with data from a variety of sources, placing greatest confidence in those results that hold up across data sources. This study employed two strategies. First, the hypothesis of an interaction between strain and negative emotionality/low constraint was tested with the parent measures and again with the teacher measures. Similar results were obtained for the two sets of measures, although the interaction with the teacher measure was somewhat stronger. This may be because the teacher reports are less biased. Second, the hypothesis was tested by averaging the parent and teacher reports, with these reports being standardized so that they contribute equally to the overall measure of negative emotionality/low constraint. This combined measure provides an indication of the extent to which juveniles exhibit the traits of negative emotionality/low constraint across situations (see Harkness et al., 1995; Tremblay et al., 1995). This measure produced results similar to those of the separate parent and teacher measures, and this combined measure is used in all of the analyses described below because our interest is in cross-situational traits.

Juveniles scoring high on the 11-item combined measure are described by their parents or teachers as "impulsive or acts without thinking" (parent), "restless or overly active, cannot sit still" (parent, teacher), having "a very strong temper and loses it easily" (parent, teacher), "stubborn, sullen, or irritable" (parent), "argu[ing] too much" (parent), "rather high strung, tense, or nervous" (parent, teacher), having "sudden changes in mood or feelings" (parent), and "often unhappy, sad, or depressed" (teacher). Although these items do not tap all of the dimensions of negative emotionality/low constraint, they strongly tap the dimension of negative emotionality and suggest that the juvenile has trouble controlling himself or herself.⁵ (The fact that most items index negative emotionality likely

5. One potential problem with the negative emotionality/low constraint scale is that it overlaps a great deal with trait anger, which is said to be one of the consequences of strain and one of the factors explaining the effect of strain on delinquency. Including this measure in the regression equation, then, may reduce the impact of the strain measures on delinquency. This is not a serious problem, however. Negative emotionality/low constraint should only reduce the effect of the strain measures on delinquency by a small amount, because these measures should affect delinquency primarily by increasing situational anger and other negative emotions, like frustration. Data analyses confirm this: Controlling for negative emotionality/low constraint only causes a slight reduction in the effect of the strain measures on delinquency. Further, this problem does not interfere with the central goal of this paper, determining whether negative emotionality/low constraint conditions the effect of strain on delinquency.

explains why separate factors indexing negative emotionality and constraint did not emerge.)

DELINQUENCY

The juvenile's self-reported delinquency is measured with a five-item scale. Juveniles were asked how many times in the last year they had (1) "hurt someone badly enough to need bandages or a doctor" (13% report at least once); (2) "taken something from a store without paying for it" (8.7% report at least once); (3) "damaged school property on purpose" (7.2% report at least once); (4) "skipped a day of school without permission" (14.9% report at least once); and (5) "gotten drunk" (16.1% report at least once). Response categories for each item are "never," "once," "twice," and "more than twice." This scale allows us to roughly distinguish juveniles according to the extent to which they engage in a range of self-reported offenses, including fighting, theft, vandalism, truancy, and drinking. These offenses may be used to reduce strain, seek revenge, or alleviate the negative emotions that result from strain.

Future research, however, should employ broader measures to maximize the variation in delinquency. Strain and negative emotionality/low constraint may result in a wide range of delinquent acts. Attempts to link strain and these traits to one or a few measures of delinquency will likely result in lower effect sizes (see Epstein and O'Brien, 1985). Also, it is easier to explain more common than less common events. The use of the five-item delinquency measure, therefore, makes it more difficult to support the hypothesis of an interaction between strain and negative emotionality/low constraint.

PRIOR AGGRESSION/VANDALISM

Although it is not possible to conduct a longitudinal analysis with these data, the juvenile's prior or wave 1 levels of aggression and vandalism are controlled in all analyses. It is important to control for wave 1 delinquency because it may cause wave 2 delinquency (a "state dependent" effect) and may contribute to both wave 2 strain and wave 2 negative emotionality/low constraint (see Agnew, 1997; Matza, 1964). Parents and teachers at wave 1 rated the extent to which the juvenile fights, teases, picks on, and bullies others; and parents rated the extent to which the juvenile deliberately breaks and destroys things. Such ratings were combined to develop an overall measure of prior aggression/vandalism.

RESULTS

Table 1 reports selected correlations among the variables (the full correlation matrix is available from the lead author). Most of the independent

variables are significantly related to delinquency in the expected direction. Five of the six strain variables have a significant positive relationship with delinquency ($p < .01$); "picked on by kids" is the only strain variable not related to delinquency. All seven of the eight social control and social learning variables are significantly correlated with delinquency in the expected direction, and the negative emotionality/low constraint measure has a significant positive correlation with delinquency. Further, the negative emotionality/low constraint measure is significantly correlated with all of the strain, social control, and social learning measures in the expected direction. In particular, adolescents high in negative emotionality/low constraint experience more strain, are lower in social control, and are more likely to associate with troublesome friends. We would expect such correlations because negative emotionality/low constraint may be a consequence of high strain, low social control, and possibly association with troublesome friends. Also, negative emotionality/low constraint may increase strain (see above), reduce social control, and promote association with troublesome friends (see Gottfredson and Hirschi, 1990).

Table 2 shows the results of regressing delinquency on all independent variables. Although most of the independent variables have significant zero-order correlations with delinquency, many do not have significant direct effects on delinquency in the regression analysis. However, four of the six strain variables have significant positive effects on delinquency: family strain, parents lose control of feelings, school hatred, and neighborhood strain. The fact that conflict with parents is not significantly related to delinquency is partly because this variable is correlated with family strain, so its effect on delinquency is reduced when family strain is controlled. The fact that being "picked on by kids" is not significantly related to delinquency is surprising and will be discussed shortly. Taken as a whole, these data provide good support for GST. In fact, four of the seven variables that are significantly related to delinquency are strain variables (excluding the sociodemographic variables and prior aggression/vandalism).

Negative emotionality/low constraint also has a significant positive effect on delinquency. School attachment and troublesome friends are significantly related to delinquency in the expected direction, and prior aggression/vandalism is significantly related to delinquency, as are several of the control variables. The independent variables explain 19% of the variation in delinquency, which is comparable to other studies employing similar measures of delinquency (e.g., Agnew and Brezina, 1997).

Those strain variables having a significant effect on delinquency were combined into a single scale to facilitate the examination of interaction

Table 1. Selected Correlations Between the Variables

Strain Variables	Delinquency	Negative Emotionality/ Low Constraint
Family Strain	.18*	.17*
Conflict with Parents	.15*	.12*
Parents Lose Control Feelings	.14*	.20*
School Hatred	.15*	.08*
Picked on by Kids	.01	.13*
Neighborhood Strain	.12*	.14*
Negative Emotionality/Low Constraint	.22*	—
Social Control/Social Learning Variables		
Attachment to Parents	-.16*	-.16*
Parental Firmness	-.11*	-.08*
School Commitment	-.21*	-.37*
Educational Goals	-.02	-.07**
Time Spent on Homework	-.07**	-.06**
School Attachment	-.25*	-.21*
Conscience	-.10*	-.05**
Troublesome Friends	.25*	.34*
Sociodemographic Variables		
Family Income	-.00	-.13*
Parent Education	-.00	-.14*
Divorced/Separated	.08*	.10*
Widowed/Never Married	-.01	.02
Age of Child	.19*	-.02
Sex of Child	-.10*	-.08*
African-American	-.10*	.03
Hispanic	.00	.05
Prior Agg/Vandalism	.17	.39

$N = 1031$; * $p < .01$; ** $p < .05$.

effects. Each strain variable was standardized, and the mean of these variables was then computed. The effect of this overall strain scale on delinquency was estimated, with the results shown in Column A of Table 3. Combining the strain variables into a single scale does not result in a reduction in explained variance. The standardized effect of this combined scale on delinquency is .16. This is not large in absolute size, although the strain measure has an effect comparable to that of age and "troublesome

Table 2. Delinquency Regressed on the Strain, Negative Emotionality/Low Constraint, Social Control, Social Learning, and Sociodemographic Variables (Standardized Effects Shown, With Unstandardized Effects in Parentheses)

Strain Variables	
Family Strain	.08(.12)*
Conflict with Parents	.03(.03)
Parents Lose Control Feelings	.08(.05)*
School Hatred	.06(.03)**
Picked on by Kids	-.01(-.01)
Neighborhood Strain	.06(.02)**
Negative Emotionality/Low Constraint	.07(.05)*
Social Control/Social Learning Variables	
Attachment to Parents	-.02(-.02)
Parental Firmness	-.02(-.02)
School Commitment	.00(.00)
Educational Goals	.04(.00)
Time Spent on Homework	-.04(-.00)
School Attachment	-.12(-.08)*
Conscience	-.04(-.04)
Troublesome Friends	.16(.15)*
Sociodemographic Variables	
Family Income	.03(.01)
Parent Education	.02(.00)
Divorced/Separated	.09(.08)*
Widowed/Never Married	.03(.05)
Age of Child	.19(.05)*
Sex of Child	-.06(-.06)*
African-American	-.13(-.13)*
Hispanic	-.02(-.05)
Prior Agg/Vandalism	.05(.03)**
Adjusted $R^2 = .19$	

$N = 1031$; * $p < .01$; ** $p < .05$.

friends" and larger than that of any other independent variable. The small size of the absolute effect may reflect the fact that although strain increases the likelihood of a delinquent response, most strained individuals do not respond with delinquency. We would expect strain to have a much larger effect on delinquency among those high in negative emotionality and low in constraint.

The interaction between the overall strain scale and negative emotionality/low constraint was examined by creating a product term between the two variables. Following Aiken and West (1991:40–47), all variables were first standardized. The interaction term was then created by multiplying the standardized value of the strain scale by the standardized value of the negative emotionality/low constraint scale. The interaction term was then added to the regression equation. The unstandardized regression results are roughly equivalent to standardized results because all variables were standardized prior to the regression. This procedure has the advantage of reducing multicollinearity between the interaction term and its component parts and allowing us to examine standardized effects—something that otherwise cannot be done when examining interaction terms. An examination of the variance inflation factors for the interaction and its component parts suggests that multicollinearity is not a problem, with all inflation factors well under 2 (see Fox, 1991). It should be noted that although the creation of product terms is the standard method for examining interactions in regression analysis, this method provides an extremely conservative test for interactions, for reasons described by McClelland and Judd (1993; also see Mazerolle and Maahs, 2000).

The interaction between strain and negative emotionality/low constraint is nevertheless significant at the .01 level (see Column B of Table 3). We can estimate the standardized effect of strain on delinquency when negative emotionality/low constraint is set at various levels using the following equation (see Aiken and West, 1991):

Delinquency = .16 (Strain) + .06 (Strain) (Negative Emotionality/Low Constraint).

We find that the standardized effect of strain on delinquency ranges from .04 when negative emotionality/low constraint is two standard deviations below its mean to .28 when negative emotionality/low constraint is two standard deviations above its mean (that is, juveniles are very high in negative emotionality and very low in constraint). Strain has an effect of .16 on delinquency when negative emotionality/low constraint is at its mean level or zero (recall that all variables are standardized with a mean of zero and a standard deviation of one). These data support the central hypothesis of this study: People high in negative emotionality and low in constraint are much more likely than are others to react to strain with

delinquency.⁶

OTHER INTERACTIONS

We also examined whether the effect of the strain measure on delinquency was conditioned by other key variables, specifically, the other independent variables that have a significant effect on delinquency: school attachment, troublesome friends, age, sex, race, and divorce/separation. Agnew (1992, 1997) and Broidy and Agnew (1997) suggest that such interactions are likely, because these variables may influence such things as the ability to cope in a noncriminal manner, the costs of criminal versus noncriminal coping, and the disposition for criminal versus noncriminal coping. Interaction terms among these variables and the strain measure were created using the procedure described above. These terms were then added to the regression equation individually and then collectively (along with the strain $\times$ negative emotionality/low constraint interaction). The only other interactions to emerge as significant were those involving school attachment and age (they were significant when added individually and when added with all other interactions). Strain is more likely to lead to delinquency among juveniles with low school attachment and among older juveniles. The interaction between strain and negative emotionality/low constraint remained significant after all other interaction terms were added to the regression equation.

PICKED ON BY KIDS

The failure of the "picked on by kids" measure to affect delinquency is surprising. It may be due to the gross manner in which this variable was measured (respondents simply replied "yes" or "no" to the questions of whether they were "sometimes picked on or bothered by" older kids and by kids their age or younger). Certain research, however, points to another explanation. Data suggest that the victims of peer abuse react very differently to such abuse; some victims do not retaliate, and some aggressively retaliate (Coie et al., 1991, 1995). This difference in reaction is understandable when one considers the different forms that peer abuse may assume. In some cases, peers or "bullies" deliberately select smaller, weaker, or passive others to victimize, knowing that such others are unlikely to retaliate. In other cases, disputes between delinquent peers or gang members lead one peer to abuse another. Retaliation is likely here. This suggests that the characteristics of the victim may strongly condition

6. Separate analyses were run for males and females, and the results suggest that the findings for the full sample generally apply to both males and females.

Table 3. Delinquency Regressed on the Composite Strain, Negative Emotionality/Low Constraint, Social Control, Social Learning, Sociodemographic, and Strain X Negative Emotionality/Low Constraint Variables (Standardized Effects Shown, With Unstandardized Effects in Parentheses for the Regression Without the Strain $\times$ Negative Emotionality/Low Constraint Interaction)

	A	B
	Without Interaction	With Interaction
Strain	.16(.11)*	.16*
Negative Emotionality/Low Constraint	.07(.05)**	.07*
Social Control/Social Learning Variables		
Attachment to Parents	-.02(-.02)	-.02
Parental Firmness	-.02(-.02)	-.02
School Commitment	.00(.00)	.01
Educational Goals	.04(.00)	.04
Time Spent on Homework	-.04(-.00)	-.03
School Attachment	-.11(-.08)*	-.11*
Conscience	-.04(-.04)	-.03
Troublesome Friends	.16(.15)*	.15*
Sociodemographic Variables		
Family Income	.03(.01)	.03
Parent Education	.02(.00)	.02
Divorced/Separated	.09(.08)*	.08*
Widowed/Never Married	.03(.05)	.04
Age of Child	.19(.05)*	.18*
Sex of Child	-.06(-.05)*	-.06*
African-American	-.13(-.12)*	-.13*
Hispanic	-.02(-.05)	-.01
Prior Agg/Vandalism	.05(.03)**	.05**
Strain $\times$ Negative Emotionality/Low Constraint	—	.06*
Adjusted R^2	.19	.20

$N = 1031$; * $p < .01$; ** $p < .05$.

the effect of peer abuse on delinquency. Following this lead, we determined whether the effect of the "picked on by kids" measure on delinquency was conditioned by negative emotionality/low constraint, age, sex, troublesome friends, and school attachment. We found significant interactions with negative emotionality/low constraint and age. In particular, the "picked on by kids" measure has a standardized effect of .29 on delinquency when negative emotionality/low constraint and age are at two standard deviations above their means, an effect of .15 when these variables are at one standard deviation above their means, an effect of .01 when they are at their means, and negative effects when they are below their means, so being picked on by kids does promote delinquency among older juveniles who are high in negative emotionality/low constraint. This is understandable; older juveniles may be better able to successfully retaliate, they have more opportunities for delinquent coping (e.g., easier access to alcohol), parents are less likely to cope on their behalf, and they are more disposed to delinquent coping (see Agnew, 1997). Juveniles high in negative emotionality/low constraint may be more bothered by peer harassment and less able to restrain themselves from criminal coping. These findings are important because they help us better understand why some juveniles respond to peer abuse in a passive manner and others respond with aggression. More generally, these findings are important because they suggest that although some types of strain are unrelated to delinquency on average, they affect delinquency among certain subgroups of respondents. Researchers, then, should not automatically discount the importance of those strain measures that fail to affect delinquency in the full sample.

SUMMARY AND CONCLUSION

Most of the strains examined have a significant relationship with delinquency. In particular, delinquency is higher among those who experience family, school, and neighborhood strain; it is higher among certain categories of juveniles experiencing peer abuse. The effect of the strain variables is particularly noteworthy because this is perhaps the only study to examine the impact of strain while controlling for negative emotionality/low constraint, as well as a range of social control and social learning variables. It should also be noted that this study tests strain theory with a nationally representative data set that has not been examined in the previous strain research: the National Survey of Children.

More importantly, the data reveal that the key personality traits of negative emotionality/low constraint condition the effect of strain on delinquency, such that strain is much more likely to lead to delinquency among those high in negative emotionality/low constraint. This interaction makes

much sense, because we would expect those high in negative emotionality/low constraint to be more likely to experience intense emotional reactions to strain, less able to engage in noncriminal coping, less aware of and concerned with the costs of crime, and more disposed to criminal coping. This finding is important because it sheds light on what has been a very difficult issue for GST: explaining why some people are more likely than are others to react to strain with delinquency.

This finding also has implications for the research on personality traits and delinquency, because it suggests that the impact of traits like negative emotionality and low constraint may be strongly conditioned by the level of strain. In this study, negative emotionality/low constraint has virtually no effect on delinquency when strain is low (the strain measure is at one standard deviation below its mean), but a substantial effect when strain is high. Additional research should further explore the linkages between strain and personality traits like negative emotionality/low constraint. Among other things, researchers should verify the above results with other measures of negative emotionality/low constraint, including measures that more fully measure the dimension of constraint. Also, researchers should examine the extent to which strain contributes to these personality traits and the extent to which these traits contribute to strain. The positive correlations between the strain measures and negative emotionality/low constraint in this study provide some support for such linkages (see Agnew, 1997, for a fuller discussion).

Such work is essential for the development of an integrated theory that combines biopsychological and sociological variables, including but not limited to strain variables. In this area, Wright et al. (2001) explored the relationship among crime, those psychological traits that comprise self-control, and a range of variables related to social control and differential association theories (although certain of these variables may also index strain). They found that low self-control reduces social control and increases association with delinquent peers, that self-control and social variables have independent effects on crime, and that self-control and social variables interact in their effect on crime. They did not explore the effect of social variables on self-control, although other data suggest that such an effect exists (see Caspi, 1998). These data and the results of this study suggest that any complete explanation of crime must consider the reciprocal effects of traits and social variables on one another, and the "main" and interactive effects of these variables on crime. Agnew (unpublished) provides an example of such an integrated theory, with the theory focusing on the traits of negative emotionality and constraint and a range of family, school, and peer variables derived from the leading delinquency theories.

This study also found several additional interactions of some importance. The interactions involving the peer abuse measure ("picked on by kids") shed light on the impact of a major source of juvenile strain that has been largely neglected by researchers. The few studies that have explored the impact of peer abuse on delinquency have produced mixed results (Agnew and Brezina, 1997; Aseltine et al., 2000). The data from this study suggest that the impact of peer abuse on delinquency depends on the characteristics of the abused juveniles. Peer abuse increases delinquency among older juveniles who are high in negative emotionality/low constraint, but has no effect on or reduces delinquency among other juveniles. (These other juveniles may react to peer abuse with deviance of a more internalized nature, like depression.)

This study also found that strain in general was more likely to lead to delinquency among older adolescents (the age range in this study is 12 to 16). This finding supports Agnew (1997), who claims that the peak in delinquency during mid-to-late adolescence is partly because adolescents in this age range are more likely than are children and adults to cope with strain through crime. Agnew claims that there are several reasons for this: Adults often cope on behalf of children, reducing the likelihood of delinquent coping in this group; adults have more coping skills and resources than do adolescents; adolescents are lower in social control than are children and adults; adolescents have more opportunities for delinquent coping than do children and adults; and adolescents are more disposed to delinquent coping.

Overall, then, these data help advance GST by pointing to those types of individuals most likely to respond to strain with delinquency and by laying the foundation for an integration between strain theory and biopsychological approaches to crime.

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