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Emotional Reactions to Stress Among Adolescent Boys and Girls

An Examination of the Mediating Mechanisms Proposed by General Strain Theory

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This study examines the effects of negative life events on anger and depressed mood among a sample of 7,758 Icelandic adolescents, measured as part of the National Survey of Icelandic Adolescents (Thorlindsson, Sigfusdottir, Bernburg, & Halldorsson, 1998). Using multiple linear regression and multinomial logit regression, we find that (a) girls and boys tend to experience different negative life events, (b) negative life events are associated with comparable levels of anger among boys and girls, (c) negative life events predict depressed mood more strongly among girls than among boys, and (d) conflict with family and friends predicts anger and depressed mood more strongly than other negative life events among boys and girls. These results raise questions about the role of anger and depressed mood in explaining gender differences in stress-related delinquent behavior.

Keywords: *stress; depressed mood; anger; general strain theory*

Numerous studies have found that experiencing negative life events (NLEs) is associated with negative emotional reactions, including anger and depressed mood (see, e.g., Aseltine, Gore, & Gordon, 2000; Pearlin, 1989; Thoits, 1995). According to Agnew's (1992) general strain

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theory (GST), negative emotions such as these produce a pressure for corrective action that may include delinquency. Most prior studies of the effects of NLEs on emotions have employed cumulative measures of NLEs. As a result, little is known about the specific types of NLEs that are most likely to lead to particular types of negative emotions. Recently, Agnew (2005) addressed this concern by calling for researchers to be more precise in measuring the specific types of NLEs that may lead to particular negative emotions. For decades, researchers in mental health have argued that the effects of NLEs on emotional outcomes may differ for boys and girls (Aneshensel, Rutter, & Lachenbruch, 1991; De Coster, 2005). Understanding gender differences in emotional responses to NLEs has important implications for GST because of the theory's emphasis on anger as the primary link between exposure to NLEs and subsequent delinquency. According to GST, gender differences in behavioral outcomes are due to boys' greater tendency to respond to NLEs with anger (an externalizing emotion) and girls' greater tendency to respond to NLEs with depressed mood (an internalizing emotion; Broidy & Agnew, 1997). Thus, a clearer understanding of boys' and girls' emotional responses to NLEs is needed in order to examine the core assumptions of GST. This study examines the effects of different NLEs on anger and depressed mood and uses data from a population sample of 7,758 adolescent boys and girls gathered as part of the National Survey of Icelandic Adolescents (Thorlindsson et al., 1998).

Prior Research

Measuring Emotional Responses to Stress

Researchers in both the mental health and GST traditions have used NLE scales as indicators of stress in people's lives (Agnew, 1992; Aneshensel, 1992; Aseltine et al., 2000; Lantz, House, Mero, & Williams, 2005; Thoits, 1995). Within mental health, researchers have shown that as the number of NLEs in people's lives increases, their ability to cope is reduced, thus increasing the probability that psychological distress will occur (Aseltine et al., 2000; Pearlin, 1989; Thoits, 1995, 2006). Based on these findings, early researchers in the GST tradition advocated the use of cumulative scales to measure the effects of stress on delinquent behavior (Agnew, 1992).

More recently, however, researchers within both traditions have begun to argue that by using cumulative scales of NLEs by and examining them in

relation to a single outcome measure (e.g., anger or depressed mood), scholars run the risk of missing important linkages that may exist between specific NLEs and people's emotional response to them (Agnew, 2005; De Coster, 2005). In other words, studies have begun to suggest that the links between particular NLEs and certain emotional reactions may be more complex than was initially thought. An early example of this is found in Avison and Turner's (1988) study, which showed that ongoing conflict in the family was a special type of stressful experience that affected depressed mood among adolescents, more so than other types of NLEs.

In a recent contribution to GST, Agnew (2005) suggested that the use of cumulative scales to test GST may have led researchers to underestimate the effects of NLEs on negative emotions. Based on a review of research conducted in the GST tradition, Agnew (2001) concluded that most cumulative measures of stress have only a moderate effect on delinquent outcomes among adolescents. Agnew suggested that a likely explanation for these weak effects is that cumulative measures encompass a wide range of NLEs, some of which may contribute to delinquency through their effects on emotions and some of which may not. As a result, Agnew (2001, 2005) argued that it is crucial for researchers in the GST tradition to better specify the types of NLEs that are most likely to lead to negative emotions, such as anger and depressed mood, in order to better understand their linkages. A few empirical studies have attempted to discover which NLEs precede which of the emotional reactions (anger or depressed mood) posited by GST as predictors of delinquent behavior (Conger et al., 1993; Dohrenwend et al., 1992; Hoffman & Miller, 1998; Thaxton & Agnew, 2004).

This study adds to existing knowledge by examining the effects of different types of NLEs on anger and depressed mood among a large sample of adolescent boys and girls. Our measures on NLEs include both exposure to what has been termed communal stressors (conflict and problems within family and friendship groups, as well as sicknesses and deaths within one's network), as well as self events (accidents, illnesses; De Coster, 2005).

Differential Effects of NLES Among Boys and Girls

Several researchers have pointed out an important corollary to the discussion above, namely, that a particular stressor may precipitate different emotional reactions among adolescent boys and girls (Aneshensel et al., 1991; Broidy & Agnew, 1997). Although considerable attention has been given in the literature to the higher rates of depressed mood typically observed among adolescent girls, strain theories—especially traditional

strain theories (Cloward & Ohlin, 1960; Cohen, 1955; Merton, 1938/1996) but also to some extent contemporary strain theory (Agnew, 1992)—have emphasized boys as the group most likely to become delinquent in response to negative emotions. In the mental health literature, girls' and boys' depression rates are often compared, and the higher rates of depression among girls are usually attributed to greater communal stress in their lives (De Coster, 2005; Gore, Aseltine, & Colton, 1992), including their vulnerability to NLEs occurring among individuals in their social network, a phenomenon that has been referred to in the literature as the "high cost of caring" (Kessler & McLeod, 1984). Studies within the strain tradition, on the other hand, focus largely on boys (Agnew, 1992; Cloward & Ohlin, 1960; Cohen, 1955; Merton, 1938/1996) and assume that delinquent behavior results from exposure to anger-inducing stimuli, including frustration over not attaining goals at school or at home (Agnew, 1985; Cloward & Ohlin, 1960; Cohen, 1955; Merton, 1938/1996). Thus, a main problem in comparing results for boys and girls is that studies of girls have tended to focus on depressed mood and studies of boys have tended to focus on anger and frustration.

Recently, scholars within both the mental health and the criminology traditions have pointed out that single-outcome empirical studies may produce biased estimates of the effects of stress, particularly estimates they are used to explain gender differences in stress reactivity (De Coster, 2005; Piquero & Sealock, 2004). De Coster (2005) pointed out that the tendency within the mental health literature to focus solely on depression when examining the deleterious effects of stress has led to misconceptions surrounding the relationship between stress and gender. Stress, hence, may not be more important among girls. Instead, females and males simply may respond to stress in different ways. Similarly, within the criminology tradition, scholars have begun to include different measures of emotional reactions in order to better understand the link between strain and delinquency for both girls and boys. For example, Piquero and Sealock (2004) showed that among youth at facilities for juvenile delinquents, strain was positively associated with anger for both males and females; however, strain was positively associated with depression among males but not among females.

Indeed some NLEs may be more important for producing depressed mood in girls, and others may be more important for producing anger in boys. Thus, different emotional reactions may occur for boys and girls in response to stress without either group's being less reactive than the other to stress in general (Agnew & Broidy, 1997; De Coster, 2005; Mirowsky & Ross, 1995). This is especially important when we consider the role that

comorbidity may play in stress reactivity among boys and girls. For example, Agnew (2001) argued that although both boys and girls experience anger in response to stress, the anger of girls may be more likely to co-occur with feelings of guilt, depression, and anxiety. These comorbid emotions may mitigate the link between anger and delinquency among girls. Similarly, sex role socialization theory (Rosenfield, 1980) suggests that because females are taught to repress angry emotions in response to stress (because such emotions contradict the nurturing and supportive roles of females in society), women and girls are more likely to direct their anger inward, leading to higher levels of depressed mood in response to stress.

This Study

A number of questions remain unanswered regarding the roles of stress and emotional reactivity in the lives of adolescent boys and girls. Studies suggesting that girls are more likely than boys to respond to stress with depressed mood but that boys are more likely to respond with anger have been based largely on analyses of single outcomes (e.g., anger or depressed mood) and with rare exception have examined stress as a cumulative scale. Thus we still lack knowledge about the degree to which boys and girls experience different types and amounts of stress and whether they respond differently to stress when it occurs. Furthermore, it is important to study whether adolescent girls are more likely than adolescent boys to exhibit comorbid responses to stress in the form of anger *and* depressed mood because it has been suggested that depressed mood felt along with anger may suppress delinquent behavior among girls. This study is designed to answer these questions. The study is the first one to measure negative life events among adolescents in an entire country. Specifically, we used data from the population-based National Survey of Icelandic Adolescents (Thorlindsson et al., 1998) to address the following questions:

Do adolescent boys and girls experience different amounts of stress?
Do adolescent boys and girls experience different types of stress?
Are adolescent boys more likely than adolescent girls to respond to stress with anger?
Are adolescent girls more likely than adolescent boys to respond to stress with depressed mood?
Which types of NLEs are most likely to lead to anger among adolescent boys and girls?
Which types of NLEs are most likely to lead to depressed mood among adolescent boys and girls?
Are adolescent girls more likely than adolescent boys to exhibit comorbid responses to stress in the form of anger *and* depressed mood?

Method

Data

This study used data from the National Survey of Icelandic Adolescents, *Youth in Iceland* (Thorlindsson et al., 1998). The sample consisted of all students attending the 9th and 10th grade in all Icelandic secondary schools. Anonymous questionnaires were administered to all students that were present in class on March 17, 1997. Teachers and research assistants distributed the questionnaires, and students sealed them in blank envelopes on completion. Valid questionnaires were obtained from 7,758 individuals, approximately 89% of all students enrolled in school in these age groups.

In Iceland, schooling is mandatory for these grades, and all schools are funded by municipalities that are supervised by the Ministry of Education. The Icelandic educational system is divided into nine geographical districts. In terms of student population, the largest districts include Reykjavik (33.1%), the surrounding capital area (21.9%), and the Northeast district, where the large town of Akureyri is located (10.1%). The other six districts account for the remaining 34.9% of the student population in these age groups. However, the more rural districts are characterized by numerous smaller schools. As a result, the number of schools is roughly equal in all districts (8%-13% of total), with the exception of fewer schools in the Reykjanes district.

Measures

Depressed mood. To measure depressed mood, respondents were asked how often during the past week the following 10 statements applied to them: "I was sad or had little interest in doing things," "I had little appetite," "I felt lonely," "I had sleeping problems," "I cried easily or wanted to cry," "I felt sad or blue," "I was not excited about doing things," "I was slow or had little energy," "The future seemed hopeless," and "I thought about suicide." Answers could be 0 (*never*), 1 (*seldom*), 2 (*sometimes*), or 3 (*often*). These items were combined into a scale with a range from 0 to 30 ($\alpha = .86$).

Anger. To measure anger, respondents were asked how often during the past week each of the following four statements applied to them: "I was easily annoyed and irritated," "I experienced outbursts of anger that I could not control," "I wanted to break or damage things," and "I yelled at somebody or threw things." Answers could be 0 (*never*), 1 (*seldom*), 2

(*sometimes*), or 3 (*often*). These items were also combined into a scale with a range from 0 to 12 ($\alpha = .79$).

NLEs. Adolescents were asked whether, in the past year, they had experienced a range of NLEs, including severe arguments at home, physical violence at home,[1] separation or divorce of parents, separation from a friend, a severe accident, serious illness, severe accident or illness in the family, death of a friend, or death of a parent or a sibling. These items were coded as dichotomous variables (0 = *no* and 1 = *yes* in the past year). Focusing on NLEs that occurred during the past year provides reasonable certainty that these events predate the occurrence of anger and depressed mood in the sample (in which anger and depressed mood during the past week were measured).

Female gender. Female gender was measured by a variable coded 0 for boys and 1 for girls. The sample contained 3,750 girls and 4,008 boys.

Control variables. Two variables were used as control variables in this study: family structure and family socioeconomic status. Family structure measures whether adolescents live with both biological parents (74%) or in other family arrangements (26%). Within the group of adolescents living in other arrangements, 10.4% lived with a single mother and 11.4% with a mother and stepfather. The remaining students lived with a single father (1.3%), their father and stepmother (1.3%), or in other settings (1.6%), such as with grandparents, siblings, relatives, or on their own.

To measure socioeconomic status, respondents were asked about the educational attainment of each of their parents (1 = *finished elementary school or less*, 2 = *started a school on the secondary level*, 3 = *finished secondary level*, 4 = *started university level*, 5 = *has a university degree*). The scores were summed to form two scales, one for each parent, ranging from 1 (*parent finished elementary education or less*), to 5 (*parent has a university degree*). These items were summed to form a scale ranging from 2 through 10 and indicating family socioeconomic status.

In Iceland around 94% of the population is of Norse and Celtic descent (Hagstofa Íslands, 2006), and 88% of the population belongs to the Lutheran Church (Hagstofa Íslands, 2006). Because of this homogeneity, other exogenous factors, such as race, ethnicity, and religion, often used in research in the United States, are not included in the study.

Table 1 presents the means, standard deviations, ranges, and differences between boys and girls for all of the variables in the analysis.

Table 1
Descriptive Statistics

	N (Boys)	*N* (Girls)	Range	Min	Max	*M* (Boys)	*M* (Girls)	*SD* (Boys)	*SD* (Girls)	Xb – Xg
Depressed mood scale (past week)	3,810	3,595	30	0	30	5.40	8.250	5.002	6.627	–2.85**
Little interest in doing things	3,928	3,701	3	0	3	1.145	1.277	0.937	0.973	–0.13**
Little appetite	3,972	3,727	3	0	3	0.678	1.089	0.866	1.046	–0.41**
Felt lonely	3,952	3,709	3	0	3	0.513	0.844	0.811	1.014	–0.33**
Sleeping problems	3,970	3,728	3	0	3	0.625	0.759	0.915	1.011	–0.13**
Cried/wanted to cry	3,969	3,727	3	0	3	0.182	0.914	0.541	1.094	–0.73**
Felt sad or blue	3,963	3,726	3	0	3	0.499	1.018	0.769	1.002	–0.52**
Not excited in doing things	3,972	3,721	3	0	3	0.714	0.787	0.844	0.904	–0.07**
Slow or had little energy	3,958	3,720	3	0	3	0.470	0.641	0.769	0.896	–0.17**
Future seemed hopeless	3,957	3,717	3	0	3	0.400	0.603	0.805	0.962	–0.20**
How often thought about suicide	3,966	3,718	3	0	3	0.240	0.360	0.685	0.815	–0.12**
Anger scale (past week)	3,943	3,702	12	0	12	2.692	3.027	2.738	2.888	–0.34**
Easily annoyed and irritated	3,975	3,732	3	0	3	1.214	1.498	0.950	0.975	–0.28**
Experienced outbursts of anger that could not control	3,968	3,724	3	0	3	0.449	0.614	0.805	0.921	–0.17**
Wanted to break or damage things	3,967	3,731	3	0	3	0.723	0.591	1.031	0.970	0.13**
Yelled at somebody or threw things	3,970	3,729	3	0	3	0.308	0.324	0.697	0.742	–0.02
Negative life events scale (past year)	3,790	3,544	1	0	1	0.543	0.655	0.498	0.475	–0.11**
Severe accident	3,967	3,728	1	0	1	0.088	0.048	0.283	0.214	0.04**
Serious illness	3,967	3,704	1	0	1	0.107	0.113	0.309	0.316	–0.01
Separation from a friend	3,946	3,690	1	0	1	0.229	0.378	0.420	0.485	–0.15**
Divorce or separation of parents	3,951	3,713	1	0	1	0.044	0.061	0.205	0.240	–0.02**
Severe arguments at home	3,958	3,713	1	0	1	0.190	0.249	0.392	0.433	–0.06**

(continued)

Table 1 (continued)

	N (Boys)	*N* (Girls)	Range	Min	Max	*M* (Boys)	*M* (Girls)	*SD* (Boys)	*SD* (Girls)	Xb – Xg
Physical violence at home	3,965	3,717	1	0	1	0.058	0.068	0.234	0.251	–0.01
Death of a parent or sibling	3,953	3,727	1	0	1	0.019	0.010	0.138	0.099	0.01**
Severe accident or illness in the family	3,942	3,702	1	0	1	0.182	0.258	0.386	0.437	–0.08**
Death of a friend	3,925	3,690	1	0	1	0.055	0.074	0.228	0.262	–0.02**
Control variables										
Lives with both parents	3,994	3,735	1	0	1	0.73	0.74	0.442	0.438	–0.01
Father's education	3,236	3,173	4	1	5	3.098	2.970	1.304	1.304	0.13**
Mother's education	3,049	3,213	4	1	5	2.694	2.522	1.401	1.371	0.17**
Parents' education	2,836	2,968	8	2	10	5.831	5.532	2.342	2.295	0.30**

Note: Xb – Xg = difference between the means for boys and girls.
**$p < .01$.

Statistical Techniques

We used a series of means tests to examine differences between boys and girls in their past year's experiences of NLEs. These analyses enabled us to answer our first two research questions:

Do adolescent boys and girls experience different amounts of stress?
Do adolescent boys and girls experience different types of stress?

We used ordinary least squares (OLS) regression with interaction terms to examine whether there are differences between boys and girls in the associations between NLEs and anger and depressed mood, respectively. These analyses enabled us to answer our next two research questions:

Are adolescent boys more likely than adolescent girls to respond to stress with anger?
Are adolescent girls more likely than adolescent boys to respond to stress with depressed mood?

These analyses also enabled us to answer two more of our research questions:

Which types of NLEs are most likely to lead to anger among adolescent boys and girls?
Which types of NLEs are most likely to lead to depressed mood among adolescent boys and girls?

To examine whether girls are more likely to experience comorbid emotions (e.g., both anger and depressed mood) in response to stress, we used multinomial logit regression (MLR; Tabachnick & Fidell, 2001). MLR enabled us to examine the effects of NLEs on each of the following dependent outcomes: anger only, depressed mood only, and both anger and depressed mood. Specifically, MLR produces three separate logit regressions, one predicting anger, one predicting depressed mood, and one predicting the combination of the two. Interaction terms with gender in the MLR model enabled us to answer the following research question:

Are adolescent girls more likely than adolescent boys to exhibit comorbid responses to stress in the form of anger *and* depressed mood?

Results

Table 1 provides means comparisons by gender for each of the variables included in this study. The last column of the table indicates the difference

between the means for boys and girls and whether this difference is statistically significant (based on an independent samples *t* test). As shown, girls reported higher levels of depressed mood in the past week than boys. This result held for the cumulative scale and for each of the items in that scale. Girls also reported higher levels of anger in the past week than boys, based on the cumulative scale. In terms of items, girls reported higher levels of being easily annoyed and irritated and experiencing angry outbursts, whereas boys reported a greater inclination to want to break or damage things. Overall, these results indicate a higher degree of emotionality among girls than among boys.

Table 1 also shows that girls in this study experienced a greater number of negative life events in the past year than did boys. In addition, the results indicate that girls and boys experienced different types of NLEs. Girls were more likely to report experiencing separation from a friend, divorce or separation of parents, severe arguments at home, a severe accident or illness in the family, or the death of a friend. On the other hand, boys were more likely than girls to report having a severe accident or experiencing the death of a parent or sibling. There were no differences between boys and girls in their experience of serious illness or of physical violence at home.

Next we examined whether boys were more likely than girls to respond to NLEs with anger. Table 2 presents the results of separate OLS regression equations for boys and girls with anger as the dependent variable and the NLE measures as independent variables. Columns 2 and 4 present unstandardized OLS regression coefficients for boys and girls, respectively. Model 1 shows results for the cumulative NLE scale. Here we see that the cumulative NLE scale was significantly and positively related to anger for both girls and boys and that the magnitude of these effects was approximately equal (girls, $B = 1.32$; boys, $B = 1.16$). Both boys and girls exhibited a similar tendency to respond with anger to the cumulative NLE measure.

Model 2 shows results for the separate NLE items. As shown, anger was significantly and positively related to the following NLE items among both boys and girls: severe accidents, separation from a friend, severe arguments at home, physical violence at home, and death of a friend. Serious illness was significantly and positively related to anger for girls only, and death of a parent or sibling was positively related to anger only among boys. The experience of severe arguments at home had the strongest predictive effect on anger, controlling for other negative life events (girls, $B = 1.46$; boys, $B = 1.24$), followed by the experience of physical violence at home (girls, $B = 1.32$; boys, $B = 1.75$). Separation from a friend also was highly predictive of anger among both girls and boys (girls, $B = 0.77$; boys, $B = 0.63$).

Table 2
Unstandardized and Standardized Coefficients From Ordinary Least Squares Regressions Predicting Anger Among Boys and Girls

	Boys (n = 2,665)		Girls (n = 2,789)	
Model	Unstandardized	Standardized	Unstandardized	Standardized
Model 1: Negative Life Events (NLE) Scale				
NLE Scale	1.163**	0.216	1.321**	0.229
Parents' education	–0.058**	–0.051	–0.096**	–0.081
Lives with both parents	–0.149	–0.024	–0.537**	–0.082
Constant	2.431**		2.916**	
R^2	0.052	0.071		
Model 2: NLE Items				
Severe accident	0.517**	0.053	0.530*	0.041
Serious illness	0.320	0.036	0.353*	0.039
Separation from a friend	0.630**	0.100	0.772**	0.136
Parents divorced/separated	0.170	0.013	0.004	0.000
Severe arguments at home	1.237**	0.182	1.455**	0.224
Physical violence at home	1.746**	0.153	1.323**	0.116
Death of a parent or sibling	1.051*	0.047	1.118	0.034
Severe accident/illness in family	0.160	0.023	0.160	0.025
Death of a friend	0.658**	0.054	0.570**	0.053
Parents' education	–0.062**	–0.055	–0.088**	–0.073
Lives with both parents	0.042	0.007	–0.334**	–0.051
Constant	2.307**		2.716**	
R^2	0.122	0.151		

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

The effects of other NLE items on anger were considerably lower. In general, boys and girls exhibited similar tendencies to respond with anger to the occurrence of specific NLE items.

Next we examined whether girls were more likely than boys to respond to NLEs with depressed mood. Table 3 presents the results of separate OLS regression equations for boys and girls with depressed mood as the dependent variable and the NLE measures as independent variables. Model 1 shows results for the cumulative NLE scale. Here we see that the cumulative NLEs scale was significantly and positively related to depressed mood for both girls and boys and that the magnitude of the effect was somewhat greater for girls ($B = 3.83$) than for boys ($B = 2.07$). Thus, boys and girls both exhibited a tendency to respond to the cumulative NLE measure with depressed mood.

Table 3
Unstandardized and Standardized Coefficients From Ordinary Least Squares Regressions Predicting Depressed Mood Among Boys and Girls

	Boys (n = 2,581)		Girls (n = 2,733)	
Model	Unstandardized	Standardized	Unstandardized	Standardized
Model 1: Negative Life Events (NLE) Scale				
NLE Scale	2.070**	0.207	3.830**	0.282
Parents' education	0.014	0.006	–0.219**	–0.078
Lives with both parents	–0.479*	–0.041	–1.354**	–0.087
Constant	4.462**		7.677**	
R^2	0.048	0.101		
Model 2: NLE Items				
Severe accident	0.592	0.032	1.012	0.033
Serious illness	1.687**	0.101	1.666**	0.079
Separation from a friend	1.315**	0.113	2.443**	0.183
Parents divorced/separated	0.616	0.025	1.096*	0.039
Severe arguments at home	1.824**	0.144	2.901**	0.189
Physical violence at home	2.541**	0.118	2.044**	0.075
Death of a parent or sibling	1.949*	0.045	3.403*	0.043
Severe accident/illness in family	0.190	0.015	0.906**	0.061
Death of a friend	1.156**	0.051	1.891**	0.074
Parents' education	0.005	0.002	–0.201**	–0.072
Lives with both parents	–0.152	–0.013	–0.869**	–0.056
Constant	4.245**		7.333**	
R^2	0.102	0.165		

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

Model 2 shows results for the separate NLE items. As shown, depressed mood was positively related to the following NLE items among both boys and girls: serious illness, separation from a friend, severe arguments at home, physical violence at home, death of a parent or a sibling, and death of a friend. Parental divorce or separation and severe accidents or illness in the family were significantly and positively related to depressed mood for girls only. As with anger, the experience of severe arguments at home had the strongest predictive effect on depressed mood for girls, while controlling for other negative life events ($B = 2.90$), followed by the experience of separation from a friend ($B = 2.44$). For boys, severe arguments at home ($B = 1.82$), physical violence at home ($B = 2.54$) and separation from a

Table 4
Odds Ratios From Multinomial Logit Regression Model Predicting the Effects of Negative Life Experiences (NLEs) on Anger and Depressed Mood

Model 1: NLE Scale	Anger Only	Depressed Mood Only	Anger and Depressed Mood
Female gender	0.925	1.070	1.283
NLE scale	1.492	1.059	2.080**
NLE Scale × Female Gender	–0.650	1.062	1.109
Parents' education	0.970	0.994	0.952*
Lives with both parents	1.188	1.112	0.858
Constant	–0.447	0.305	2.067**

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

friend ($B = 1.32$) had the strongest effects on depressed mood. In general these results indicate that both boys and girls respond to NLEs with depressed mood; however, girls tend to respond to NLEs with depressed mood more frequently than do boys.

Next we examined whether girls exhibited a greater tendency than boys to respond to NLEs with both anger and depressed mood. Table 4 displays the MLR model addressing this question. The MLR model yielded three separate logistic regressions, one for each of the nominal categories on the dependent variables (e.g., anger only, depressed mood, and both anger depressed mood). The findings did not indicate any statistically significant difference between girls and boys in responding to NLEs with both anger and depressed mood. Although the NLE scale was significantly related to comorbid experiences of anger and depressed mood for the entire sample (odds ratio = 2.08), the lack of significance found for the Gender × NLE interaction term indicates that girls did not show a greater tendency than did boys to respond to NLEs with comorbid experiences of anger and depressed mood.

Discussion

The purpose of this study was to examine the link between NLEs and two emotional reactions, anger and depressed mood, among adolescent boys and girls. Specifically, we examined whether adolescent boys and girls experienced different amounts and types of stress, whether adolescent boys were more likely than girls to respond to stress with anger, and whether

adolescent girls were more likely than boys to respond to stress with depressed mood. We also examined which types of NLEs were most likely to lead to anger and depressed mood among adolescent boys and girls and whether adolescent girls were more likely than adolescent boys to exhibit comorbid responses to stress in the form of both anger and depressed mood.

A number of important observations emerged from this study. First, our results indicate that girls in general experience more stress in their lives than do boys. A cumulative scale measuring negative life events in the past year showed that girls reported having experienced significantly more negative life events than had boys in the period under study.

Second, the findings of the current study add to our understanding of the types of strain experienced across gender. They indicate that the relationship between stress and emotional reactions is in important ways gender specific, as girls and boys report experiencing different types of stress. Boys were more likely to report having been involved in severe accidents. However, girls reported more exposure than did boys to problems within their social network. Girls were more likely than boys to report separation from a friend, severe arguments at home, and having experienced severe accidents or illnesses in their family. They were also a bit more likely than boys to report separation or divorce of parents. These findings are in line with studies showing that females are more likely to report stresses that involve other people or pose threats to the development and maintenance of social relations (e.g., "communal stress") whereas boys are more likely to report self-events (De Coster, 2005; Turner, Wheaton, & Lloyd, 1995). The explanations for this difference may be twofold. First, boys and girls may in fact be exposed to different types of stress. In support of this explanation are public accident records showing that boys are more likely than girls to experience car accidents (Road Accident Analysis Group, 2003). Similarly, girls' higher exposure to stress within their social network may be due to their having larger networks than boys have and hence more network-related problems. Second, girls and boys may perceive different types of stress as more or less stressful. If true, our study suggests that girls' proneness to communal stresses may already be present in girls by age 14.

Third, we found that NLEs were not a stronger predictor of anger among boys than among girls. However, girls were more likely than boys to report responding to stress with depressed mood. Prior research has consistently found that females are more likely than males to respond to stress with internalizing emotions (Broidy, 2001; Cyranowski, Frank, Young, & Shear, 2000; Piquero & Sealock, 2004). Studies have furthermore shown that males are not necessarily more likely than females to respond to stress with

anger (Mirowsky & Ross, 1995; Piquero & Sealock, 2004). These results, along with our own, have important implications for Agnew's (1992) GST in explaining higher rates of delinquent behavior typically observed among adolescent boys. GST posits that anger is a central link between NLEs and delinquent behavior. The theory, therefore, leads one to expect higher rates of anger and a stronger connection between NLEs and anger among boys than among girls. As reported above, neither of these predictions was supported by the data. The question therefore remains: Why is the anger of boys more likely to result in delinquent behavior than is the anger of girls (Sigfusdottir, Farkas, & Silver, 2004)? One direction for future research may be to examine whether girls' anger leads to different kinds of delinquent behavior than hitherto studied by scholars. Hence, girls may be more likely than boys to find a relief for their emotions in inwardly directed forms of delinquency or self-destructive behavior, including suicidal attempts or eating disorders. Another important matter for future research is to study whether more delinquency among boys may stem from differences in coping resources and support mechanisms across gender. GST suggests that coping skills may alleviate the pressures of strain through legitimate means. Recent research, however, suggests that the availability of social coping resources may exacerbate rather than deter delinquent activity because males appear to turn to a social network that either encourages delinquency or provides opportunity for crime (Piquero, Glover, Macdonald, & Piquero, 2005; Piquero & Sealock, 2004). There is a strong need to gain further understanding of the internal and external coping resources available to boys and girls and whether and how such resources may buffer the effect of stress on emotional reactions and behavior.

It has been suggested that higher rates of depressed mood observed among girls may operate as a countervailing force that diminishes the role that anger plays in linking NLEs to delinquency among boys (Agnew, 2001, 2005). For this to be true, higher rates of both anger and depressed mood in response to NLEs among girls would need to exist. We found, however, that girls and boys were similar in their tendencies to respond to NLEs with both anger and depressed mood. Thus, the hypothesis that girls' greater emotional reactivity in response to NLEs accounts for their lower rates of delinquent behavior was not supported by these data. Clearly, sorting out the role that comorbid emotions play in predicting delinquent behavior among adolescent boys and girls remains an important task for future research.

Family conflict, measured as severe arguments and physical violence in the home, and separation from a friend were found to be the strongest predictors of anger and depressed mood among adolescent boys and girls. It is

quite possible that experiencing a separation from a friend may indicate the presence of interpersonal conflict with peers. Thus, interpersonal conflict, at home and among friends, seems to be a special kind of negative experience in the lives of adolescent boys and girls, one that predicts anger and depression more strongly than do other types of NLEs. These results are consistent with prior studies showing that ongoing conflict in the family is a profoundly disturbing experience for most adolescents (Amato, 1993; Mechanic & Hansell, 1989). For example, Avison and Turner (1988) found that chronic conflict in and out of the home (including ongoing disputes with and among significant others) predicted depressed mood among adolescents more strongly than did other acute negative events. In addition, Mechanic and Hansell (1989) found that family conflict had a stronger effect on changes over time in depressed mood and anxiety than did other measures of NLEs related to one's family, such as parental divorce, current separation from parents, or parental death. Consistent with these prior studies, the results of the current study indicate that conflict with and among family members and friends strongly affects anger and depressed mood among adolescent boys and girls. This finding has important implications for the use of cumulative NLE scales for understanding emotional reactions to NLEs among adolescents. Specifically, by using cumulative NLE scales that combine the effects of different NLEs, researchers may run the risk of overlooking the associations between specific NLEs and particular emotional reactions.

Some limitations of our study are worth noting. First, we used cross-sectional data for our analyses, which does not provide definitive causal evidence. Second, all of our measures were self-report, and some of the students may not have accurately reported their feelings. Furthermore, it can be argued that our measure for anger is gendered, and that girls would be more likely to express their anger in the form of relational aggression. We do not have in our data a measure for relational aggression. Using our measure for anger may hence lead to an underestimation of anger among girls.

There are, however, two reasons we are reasonably confident about the reliability of our data. First, our aim was not to establish rates or prevalence of negative life events, depressed mood, and anger; instead we used the self-reported measures of negative life events as ordinal correlates of depressed mood and anger. Second, our sample size was very large—almost 8,000 adolescents—which gives us confidence that the responses are much more reliable than if we had studied a smaller sample. In conclusion, our findings highlight the complex nature of the effects of negative life events on emotions and show that particular types of stress are conducive to

certain types of emotions. Together with prior research, they add to our understanding of gender-specific effects of negative life events on emotional reactions and at the same time highlight the need for a greater understanding of potential coping resources or support mechanisms that may mitigate the effects of stress on emotional reactions and behavior for adolescent boys and girls.

Note

1. Arguments and physical violence at home may have been entirely between the parents or may have included the adolescent.

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