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Developmental Timing of Trauma Exposure Relative to Puberty and the Nature of Psychopathology Among Adolescent Girls

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Abstract

Objective—Because increased neuroplasticity and neural development during puberty provide a context for which stress and trauma can have dramatic and long-lasting effects on psychological systems, this study was designed to test if exposure to potentially traumatic events during puberty uniquely predicts adolescent girls' psychopathology. Because neural substrates associated with different forms of psychopathology seemingly develop at different rates, the possibility that the developmental timing of trauma relative to puberty predicts the nature of psychopathology (posttraumatic stress disorder [PTSD], depressive, and anxiety disorders) was examined.

Method—A subset of 2,899 adolescent girls from the National Comorbidity Survey Replication-Adolescent Supplement who completed the study 2+ years post-menarche was selected. Past-year psychiatric disorders and reports of age of trauma exposure were assessed using the Composite International Diagnostic Interview. Developmental stages were defined as the two years after the year of menarche ("post-puberty"), three years prior to, and year of, menarche ("puberty"), 2–6 years prior to the puberty period ("grade school"), and 4–5 years after birth ("infancy–preschool").

Results—Compared to other developmental periods, trauma during puberty conferred significantly more risk (50.47% of model R^2) for girls' past-year anxiety disorder diagnoses (primarily social phobia), while trauma during the grade school period conferred significantly more risk (47.24% of model R^2) for past-year depressive disorder diagnoses. Recency of trauma best predicted past-year PTSD diagnoses.

Conclusion—Supporting rodent models, puberty may be a sensitive period for the impact of trauma on girls' development of an anxiety disorder. Trauma pre-puberty or post-puberty distinctly predicts depression or PTSD, suggesting differential etiological processes.

Keywords

sensitive period; anxiety; depression; posttraumatic stress disorder; abuse

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INTRODUCTION

Stress is central to the development of most forms of psychopathology.¹ Although moderate levels of stress can be beneficial,² extreme stress, such as exposure to potentially traumatic events, is consistently associated with elevated risk for development of psychiatric disorders, including depressive disorders, posttraumatic stress disorder (PTSD), and a variety of anxiety disorders.³

Due to substantial neuroplasticity, early childhood is often thought to be a sensitive period for the impact of trauma on development of psychopathology.⁴ More recently, puberty has been hypothesized to be another sensitive period due to continued neural development and sex steroid changes that seemingly impact neuroplasticity.^{5–10} Pubertal status predicts girls' development of depression and anxiety beyond the effect of age,¹¹ and, among rodents, stress during puberty confers elevated risk for psychopathological processes, particularly anxious behaviors.⁵ However, despite a recent surge of interest in the question, no existing studies among humans test whether risk for psychopathology is greater following stress or trauma during puberty compared to other developmental stages.

Because the types of psychopathology that most frequently result from trauma exhibit associations with distinct brain circuits,¹² which each may have unique periods of maximum vulnerability to stress, the developmental timing of trauma may dictate the nature of trauma-based psychopathology.^{7,13,14} Among rodents, stress during adolescence confers substantial risk for development of anxious behaviors and less risk for depression-like behaviors.^{5,10,15} Among women, early trauma (defined as occurring prior to age 13 in one study and during ages 3–5 in the other study) confers more risk for depression than PTSD, whereas conflicting results emerged regarding trauma-based risk for PTSD across development.^{14,16} The impact of trauma during puberty, a clearly defined developmental stage, has not been examined, and development of anxiety disorders has not been predicted among humans.

The current study references puberty, rather than age, to define biologically meaningful developmental periods for which to test whether the developmental timing of trauma differentially predicts the nature of resultant psychopathology, and whether puberty serves as a sensitive period for the effects of trauma on psychopathology. Hypotheses are tested exclusively among girls because this study is designed to extend earlier studies focused on women,^{14,16} adolescent girls show higher rates of anxious and depressive disorders than boys despite comparable rates in childhood,¹⁷ and women and girls are especially sensitive to the psychological effects of trauma. For example, despite lower rates of trauma exposure, women are 2–3 times more likely to develop PTSD than men, and early trauma sensitizes girls, but not boys, to the effects of subsequent trauma.^{3,18,19} Focus is placed on disorders of anxiety, depression, and PTSD to facilitate rodent–human translation,¹³ given their temporal associations with menarche,¹¹ developmental links to trauma and adversity,³ and particular relevance to girls in terms of the impact of trauma and subsequent stress.²⁰ Questions are addressed using data from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A),²¹ the first nationally representative survey of US adolescents that used a structured diagnostic interview to assess *DSM-IV* psychiatric disorders. The NCS-A

also uniquely assessed age of menarche and age of exposure to a wide range of potentially traumatic events.

METHOD

Sample and Procedures

Participants include 2,899 girls selected from the 5,046 girls age 13–18 who participated in the NCS-A. Those who had not yet reached menarche ($n=160$) or completed the study less than two years after menarche ($n=1,844$) were excluded given a necessary two-year post-puberty period on which to report trauma exposure. Further, because pubertal tempo varies with atypical pubertal timing,²² participants who reached menarche before age 9 ($n = 19$) or after age 14 ($n = 124$) were excluded.

Selected participants were, on average, age 15.96 ($SD=1.23$) and reached menarche at age 11.71 ($SD=1.18$). Most (55.05%) participants identified as White, while 19.73% identified as Hispanic, 19.39% as Black, and 5.83% as Other. Participants primarily resided in metropolitan (46.05%) or other urban (32.25%) areas, while 21.70% resided in rural areas. As expected given exclusionary criteria, selected participants were significantly older than unselected girls ($t[5044]=53.72, p<.001, r=.60$) and reached menarche at a younger age ($t[5044]=15.47, p<.001, r=.21$). Negligible ($r=.05$) differences in socio-demographic factors were observed between selected and unselected participants.

Comprehensive reports exist regarding the NCS-A design, procedures, and measures.^{23–26} In brief, the NCS-A surveyed 10,148 adolescents using dual-frame sampling of household and school subsamples. Recruitment, consent, and data collection procedures were approved by the human subjects committees of Harvard Medical School and the University of Michigan. Parents/guardians provided informed consent, and adolescents provided informed assent. The overall response rate was 82.9%. Only minor differences were observed compared to US Census data, which were corrected using poststratification weighting.^{23,25}

Measures

To obtain past-year *DSM-IV* diagnoses, a modified version of the Composite International Diagnostic Interview (CIDI)²⁷ was administered to adolescents. Modifications were made to ease use with adolescents by, for example, changing wording to enhance comprehension and changing content to make it more relevant to adolescents' experiences. Meaning and logic comparability to the adult version was maintained.²⁶ The current report focuses on diagnoses of depressive disorders (major depressive disorder [MDD] and dysthymic disorder), anxiety disorders (specific phobia, social phobia, panic disorder, agoraphobia with or without panic disorder, and generalized anxiety disorder [GAD]), and PTSD. Resembling *DSM-5* classification, PTSD was examined separately from the anxiety disorders. A parent questionnaire developed for NCS-A use was additionally used to assess depressive disorders. To optimize concordance with blinded clinical diagnoses, parent and adolescent reports were combined at the symptom level using an "or" rule.²⁴

Trauma exposure was measured during the PTSD section of the CIDI. Participants reported if they ever experienced each event, then their age the first time each event occurred.

Twenty-three potentially traumatic events (e.g., major disaster, refugee experience, kidnapping, perpetration of serious injury or death, stalking, witnessing family violence, physical assault, sexual assault) were assessed, but responses to the following five items were excluded to ensure that experiences included witnessing or experiencing serious injury or life threat (rather than potentially being “serious,” “stressful,” or “upsetting” without presence of injury or life threat): having a very serious or life-threatening illness; having a close other experience a very stressful or life-threatening experience; being in a place of ongoing terror; any other very upsetting or life-threatening event; and any very upsetting or life-threatening event they did not want to describe.

Age (in years) of menarche was self-reported in response to the interviewer-administered question, “How old were you when you had your first menstrual period?” A similar measure exhibits convergent validity with more complex measures of pubertal timing.²⁸

Statistical Analysis

Data on participants’ earliest experiences of trauma were structured such that participants received four dichotomous scores representing the presence or absence of trauma during the 1) two years after the year of menarche (“post-puberty”), 2) three years prior to, and year of, menarche (“puberty”), 3) 2–6 years prior to the puberty period (“grade school”), and 4) 4–5 years after birth (“infancy–preschool”). The number of years included in the infancy–preschool and grade school periods varied due to variability in number of years from birth to menarche. Although most girls complete puberty in less than four years, the time span for puberty was used to conservatively ensure coverage of adrenarche (particularly for those with earlier pubertal timing but slower tempo²²); given that ages of trauma and menarche were estimated by year such participants could conceivably have little more than two years from time of trauma to time of menarche. Importantly, this classification scheme provided the best possible means of maintaining similarity, on average, in the number of years and rates of trauma in each developmental period (i.e., 7.3%, 19.1%, 22.9%, and 21.8% respectively in the infancy–preschool, grade school, puberty, and post-puberty periods), thus minimizing variability in predictive power due to differing base rates of trauma exposure (Table 1). Dichotomous scores representing the presence or absence of trauma exposure during each developmental period were used to minimize excessive statistical skew when measuring the number of traumas experienced.

Following computation of descriptive statistics and simple group comparisons, traditional logistic regression analyses were combined with relative weight analyses to estimate individual contributions of correlated predictors in explaining variance in outcomes.²⁹ Bias-corrected and accelerated CIs for individual relative weights and corresponding significance tests were based on bootstrapping with 5,000 replications.³⁰ Indicators of trauma exposure during each of the four developmental periods were used to predict past-year diagnoses of 1) a depressive disorder, 2) PTSD, and 3) an anxiety disorder. Models were adjusted for number of years from menarche to study completion to minimize bias due to a possible relationship between recency of trauma and psychopathology. Models were also adjusted for participants’ age of menarche to minimize bias due to: 1) differing number of years included in the infancy–preschool and grade school periods, 2) possible relationships between trauma

exposure or other forms of adversity and pubertal timing, and 3) possible increased sensitivity to the effects of trauma among early maturers.

RESULTS

Rates of Trauma Exposure Across Development

Rates of trauma exposure increased across development, with a particularly noticeable increase after menarche: 10.73% ($n=311$) and 13.52% ($n=392$) of participants reported trauma exposure during the first and second years after the year of menarche, respectively (Figure 1). In contrast, less than 5% of participants reported trauma exposure during years 7 to 14 before menarche. Similar to the full NCS-A sample,¹⁸ 62.50% of participants reported trauma exposure during their lifetimes. The number of types of trauma experienced during each developmental period differed minimally ($r=.03$ – $r=.10$; Table 1).

Participants most frequently reported exposure to disaster ($n=44$, $n=108$), death of a loved one ($n=45$, $n=136$), and witnessing violence at home ($n=45$, $n=132$) during the infancy/preschool and grade school periods, respectively. Participants most frequently endorsed witnessing death or serious injury ($n=93$), disaster ($n=103$), and death of a loved one ($n=290$) during puberty, and witnessing death or serious injury ($n=101$), rape or other sexual assault ($n=103$), and death of a loved one ($n=257$) during the post-puberty period.

Rates of Psychiatric Diagnoses

Rates of past-year psychiatric diagnoses were generally similar to prior reports for the full NCS-A sample of girls,^{31–34} with specific phobia, social phobia, and MDD being especially common (Table 2). Rates of each disorder were consistently higher among those who experienced trauma than those who did not, though not significantly so for GAD.

Relations Between Age of Menarche and the Experience of Trauma and Psychopathology

Age of menarche did not differ between participants who did and did not experience trauma during the infancy–preschool ($t[2897]=-0.93$, $r=.03$), grade school ($t[2897]=1.59$, $r=.03$), puberty ($t[2897]=0.26$, $r=.00$), or post-puberty ($t[2897]=2.10$, $r=.04$) periods. Age of menarche was earlier among participants who held past-year diagnoses of a depressive disorder ($t[451.53]=2.57$, $p<.05$, $r=.12$), PTSD ($t[2897]=3.94$, $p<.001$, $r=.07$), and an anxiety disorder ($t[1699.67]=3.37$, $p<.001$, $r=.08$), compared to participants who did not hold the indicated diagnoses.

Relative Predictive Value of Trauma Across Development

As indicated in Table 3, trauma during each developmental period except infancy–preschool significantly increased risk for a past-year depressive disorder diagnosis at study completion. The majority of predicted variance is attributed to trauma during grade school (50.47% of model R^2), which is a significantly greater proportion of variance than trauma during any other developmental period. Trauma during the infancy–preschool period conferred less than 1% of the model R^2 and significantly less than any other developmental period. The pattern of results remained when exclusively predicting MDD diagnoses (see Table S1, available online).

Trauma during each developmental period significantly increased risk for a past-year PTSD diagnosis at study completion. The relative weight analysis suggests that risk for PTSD increases linearly according to recency of trauma exposure. Trauma post-puberty conferred significantly more risk for the development of PTSD (27.42% of model R^2) than trauma during infancy–preschool, but not grade school or puberty.

Trauma during each developmental period also significantly increased risk for a past-year anxiety disorder diagnosis at study completion. The majority of predicted variance is attributed to trauma during puberty (47.24% of model R^2), which is a significantly greater proportion of variance than trauma during any other developmental period. Decomposition of this effect (see Table S1, available online) indicated that, compared to other anxiety disorder diagnoses, trauma during puberty exhibited the strongest specific effect in the prediction of a social phobia diagnosis at study completion (57.43% of model R^2).

DISCUSSION

The current analysis supports the notion that, among girls, puberty is a sensitive period for the effect of exposure to potentially traumatic events on some forms of psychopathology. Further, the developmental timing of trauma may contribute to the nature of resultant psychopathology. That is, compared to trauma during other developmental periods, trauma during puberty conferred the greatest degree of risk for presence of an anxiety disorder at study completion (on average, 4.25 years post-menarche). In contrast, trauma during the grade school period conferred the greatest degree of risk for presence of a depressive disorder, whereas the recency of trauma (particularly post-puberty) predicted presence of a PTSD diagnosis.

These results may reflect differential patterns of plasticity and associated vulnerability to stress across brain systems that develop at different rates. The strong predictive value of trauma during puberty on anxiety may reflect activational and organizational effects of sex steroids during a period of increased neuroplasticity and neural development, thus providing the context for which environmental events can have considerable effects.^{5–10,35,36} The hypothalamic–pituitary–adrenal axis undergoes substantial maturation during puberty, and stress during puberty can alter future stress reactivity as well as the brain's response to gonadal hormones that partly regulate anxious and depressive behavior.^{5,37} This may be partly due to the influence of sex steroids on expression of genes that confer risk for psychiatric disorders.³⁸ The current results suggest that processes that result in behavioral and emotional manifestations of anxiety may be most vulnerable among girls. Indeed, while threat processing changes during adolescence,³⁹ fear extinction is impaired, and long-term maintenance is exacerbated by stress.^{40,41} Furthermore, because of all anxiety disorders, social phobia was most strongly impacted by the unique effect of trauma during puberty, processes impacting social sensitivity may be similarly vulnerable. Supportive research indicates that social cognition develops throughout adolescence,⁴² puberty amplifies social sensitivity,^{42,43} and stress during adolescence decreases rodents' social interaction, while increasing their anxiety and defensive behaviors in social contexts.^{44–46}

Results indicating that girls' depression was most strongly predicted by early (grade school) trauma, whereas risk for PTSD increased as time since trauma exposure decreased (i.e., trauma post-puberty conferred significantly more risk for PTSD than trauma during infancy–preschool, but not significantly more than trauma during grade school or puberty), are generally consistent with prior research.^{14,16} PTSD is often thought to represent an extended, or delayed, process of natural recovery, and onset of PTSD early in development has been associated with the greatest odds of recovery in adolescence.¹⁸ However, Andersen et al¹⁴ found that PTSD was most strongly predicted by trauma at ages 9–10, and Maercker et al¹⁶ found no difference in PTSD risk based on if the trauma occurred before or after age 13. This divergence of findings may be due to the failure of age groups to represent meaningful developmental periods or an exclusive focus on sexual abuse experiences, which can attenuate predictive value given considerable overlap across traumatic events.⁴⁷ Additionally, this prior work was conducted with young adult women and varied in terms of either measuring lifetime diagnoses or current symptoms. Because depression can occur episodically and PTSD often remits over time, the occurrence of psychiatric symptoms throughout development should ideally be measured. Nonetheless, it is important to recognize that depression and PTSD, two highly comorbid conditions, may exhibit distinct patterns of vulnerability across development, thus suggesting differential etiological processes.

Girls' trauma during the infancy–preschool period conferred virtually no risk for a depressive disorder diagnosis at study completion and relatively little risk for PTSD or an anxiety disorder diagnosis. This is possibly due to a relatively low rate of trauma exposure during this time, difficulties recalling trauma at such early ages, and inadequate measurement of the types and chronicity of trauma that infants, toddlers, and preschool children most often endure. It may also be due to the co-occurrence of trauma during the infancy–preschool period with trauma during later developmental periods such that infancy–preschool trauma may confer substantial risk for psychopathology when experienced in combination with trauma during one or more additional developmental periods. These results are in contrast to much of the existing research among humans and non-human animals demonstrating effects of trauma and adversity during this developmental period.^{7,48,49} However, these results should also be considered in light of the notion of a human postnatal stress hyporesponsive period resembling that found in rodents.⁵⁰ This idea emerged from observations among humans of cortisol hyporesponsivity beginning during the first year of life and extending at least through the preschool years,⁵¹ as well as increased risk for PTSD that occurs after ages 3–5.^{14,52} Because the possibility of a human postnatal stress hyporesponsive period impacts definitions of an “early” sensitive period, more research in this area is needed. Currently, it is not known when the early sensitive period begins, nor is it clear when, or if, that window closes. Instead, sensitivity to the effects of stress may exist throughout childhood and adolescence, with the timing of stress or trauma dictating the nature of the outcome.

Additional secondary findings warrant consideration. First, girls' rate of trauma exposure increased across development, potentially reflecting decreased adult supervision, increased sensation seeking,⁵³ and alterations in social information processing⁵⁴ that can increase risk for trauma exposure. Alternatively, it may reflect difficulties in recalling earlier experiences

of trauma. Second, rates of psychopathology were higher among girls with a trauma history than those without, and this increased risk occurred similarly across depressive and anxiety disorders, possibly due to transdiagnostic processes. Third, age of menarche was earlier among participants with past-year psychiatric diagnoses compared to those without, which is consistent with existing literature.⁵⁵ Finally, trauma exposure was not associated with earlier menarche, which may be due to different types of trauma differentially influencing early versus late menarche.⁵⁶

Consideration of this study's limitations can help contextualize conclusions and guide future research. First and foremost, measurement of pubertal status at the time of trauma and extent of trauma exposure (particularly in terms of chronicity) was imprecise. Consequently, the results do not speak to which specific aspects of puberty (e.g., elevated hormones at adrenarche, social perceptions of maturity, age) are key to elevated risk, and effect size estimates (which were small) may be attenuated. The small effect size estimates suggest that other factors, including those that may be consequences of sensitizing effects of trauma, are also important to the development of psychiatric disorders. Second, the accuracy of retrospective reports of trauma exposure may be especially diminished among those experiencing psychopathology. However, assuming that specific forms of psychopathology do not systematically bias reports of trauma during specific developmental stages, comparisons across developmental stages would be minimally impacted. One exception to this proposition is that retrospective reports may be especially impacted by lack of knowledge of trauma exposure during the infancy–preschool period, thus calling for future use of parental reports. Fourth, although psychopathology was measured, on average, more than four years post-menarche, the permanence of observed effects is unknown. Relatedly, the nature of trauma-related psychopathology may change over time. For example, although conflicting results exist,^{58,59} depression has been found to occur secondary to some anxiety disorders.⁶⁰ Thus, the experience of trauma during the grade school period may result in anxiety disorders like that observed for trauma during puberty, but, for some participants, such anxiety may have transformed into a depressive disorder by the time of study completion. Because such a process occurs relatively rarely,^{59–61} does not appear to occur among adolescents (particularly early adolescents or younger populations) and, when it occurs, takes an average of 12.3 years,⁶¹ this alternate explanation is unlikely, but should be addressed in a sample with a greater time since puberty using longitudinal measures of psychopathology throughout development. Finally, generalizability of study results is limited such that 1) although the *DSM-IV* and *DSM-5* capture the vast majority of the same cases,⁵⁷ use of *DSM-IV* criteria may not fully generalize to *DSM-5* diagnoses, 2) the selected sample was slightly biased towards girls who experienced menarche earlier than average, 3) the impact of developmental timing of trauma exposure on other forms of psychopathology is unknown, and 4) generalizability to boys is unknown, an issue that deserves serious consideration. Potentially due to sex-specific pruning of particular brain regions,⁶² sex differences in neural and behavioral reactivity to stressors during adolescence exist^{5,10,15} that may be responsible for dramatic sex differences in the prevalence of many psychiatric disorders.⁶³

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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CLINICAL GUIDANCE

- If the current findings are due to increased neuroplasticity during puberty, such neuroplasticity may not only increase vulnerability, but also resilience when provided appropriate services during puberty, thus preventing chronicity of psychiatric disorders into adulthood.^{8,9} Clinicians should consider implementing additional efforts to overcome the challenges of treatment initiation and adherence among puberty-aged girls, particularly in regard to treatments targeting anxiety disorders.
- With continued research, it is foreseeable that consideration of the developmental timing of trauma will inform the nature of trauma-responsive interventions to target the most likely forms of psychopathology. Currently, clinicians can use knowledge of the developmental timing of trauma exposure to inform personalized treatment planning.
- Despite challenges involving mandated reporting of child abuse, the developmental timing of trauma exposure should be systematically assessed by all healthcare providers in order to inform treatment needs and/or referrals.

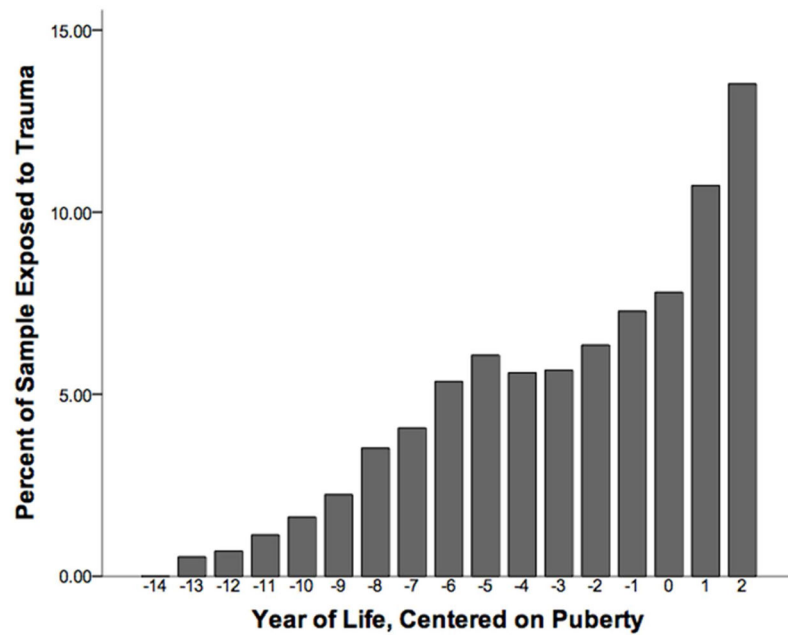


Figure 1.

Percentage of participants who were exposed to at least one traumatic event during each year of life pre- and postmenarche. Note: Year of life 0 = year of menarche, whereas years prior to menarche are negative and years after menarche are positive. Given differing ages of menarche, $n = 2,899$ for years -9 to $+2$, but lower for earlier years ($n = 2,769, 2,469, 1,735, 753$, and 144 for years $-10, -11, -12, -13$, and -14 , respectively).

Table 1

Ages Included in Each Developmental Period Based on Age of Menarche

	Age of Menarche						Years <i>M</i>	Rate of trauma % (<i>n</i>)	Number trauma types <i>M</i> (<i>SD</i>)
	9 (<i>n</i> =130)	10 (<i>n</i> =300)	11 (<i>n</i> =734)	12 (<i>n</i> =982)	13 (<i>n</i> =609)	14 (<i>n</i> =144)			
Infancy–preschool	0–3	0–3	0–3	0–4	0–4	0–4	4.5	7.3% (212)	1.21 (.55)
Grade school	4–5	4–6	4–7	5–8	5–9	5–10	4	19.1% (553)	1.26 (.59)
Puberty	6–9	7–10	8–11	9–12	10–13	11–14	4	22.9% (663)	1.31 (.66)
Post puberty	10–11	11–12	12–13	13–14	14–15	15–16	2	21.8% (632)	1.35 (.76)

Note: The number of trauma types was computed only among those who reported at least one trauma during the indicated developmental period.

Table 2

Rates of Past-Year Psychiatric Diagnoses in the Full Sample and According to Trauma Exposure (*n* and Percentage)^a

Disorder	Full Sample (<i>N</i> = 2,899)	No Trauma (<i>n</i> = 1,087)	Trauma (<i>n</i> = 1,812)	OR (95% CI) ^b
Any depressive disorder	364 (12.6%)	77 (7.1%)	287 (15.8%)	2.47 (1.90–3.21)
MDD	362 (12.5%)	77 (7.1%)	285 (15.7%)	2.45 (1.88–3.19)
Dysthymic disorder	55 (1.9%)	6 (0.6%)	49 (2.7%)	— ^c
PTSD	167 (5.8%)	3 (0.3%)	164 (9.1%)	— ^c
Any anxiety disorder	938 (32.4%)	227 (20.9%)	711 (39.2%)	2.45 (2.06–2.91)
Specific phobia	617 (21.3%)	137 (12.6%)	480 (26.5%)	2.50 (2.03–3.07)
Social phobia	463 (16.0%)	119 (10.9%)	344 (19.0%)	1.91 (1.52–2.38)
Panic disorder	93 (3.2%)	13 (1.2%)	80 (4.4%)	3.82 (2.11–6.89)
Agoraphobia	93 (3.2%)	16 (1.5%)	77 (4.2%)	2.97 (1.73–5.12)
GAD	52 (1.8%)	13 (1.2%)	39 (2.2%)	1.82 (0.97–3.42)

Note: GAD = generalized anxiety disorder; MDD = major depressive disorder; PTSD = posttraumatic stress disorder.

^aRates of subgroup diagnoses do not sum to main category diagnoses due to cases of comorbidity.

^bOdds ratio and 95% CI for trauma exposure compared to no trauma exposure.

^cStatistical comparison not made due to small cell size.

Table 3

Prediction of Psychopathology by Trauma Exposure During Each Developmental Period

Predictor	b^a	OR	OR 95% CI	RW ^b	RW 95% CI	RS-RW ^c (%)
Criterion = Depressive disorder diagnosis ($R^2 = .03$; $\chi^2 [4,6] = 85.02, p < .001$)						
Age of menarche	-.07	.94	.84–1.05	.0019	-.0001–.0071	5.67
Years post-menarche	.13**	1.14	1.03–1.26	.0040	.0008–.0101	12.06
Infancy–preschool trauma	.07	1.08	.72–1.62	.0002 _a	-.0007–.0030	0.69
Grade school trauma	.84***	2.31	1.80–2.95	.0169 _c	.0097–.0283	50.47
Puberty trauma	.41**	1.50	1.18–1.93	.0058 _b	.0017–.0127	17.19
Post-puberty trauma	.40**	1.50	1.16–1.93	.0047 _b	.0012–.0111	13.92
Criterion = PTSD diagnosis ($R^2 = .07$; $\chi^2 [4,6] = 158.86, p < .001$)						
Age of menarche	-.20*	.82	.70–.96	.0062	.0011–.0137	9.16
Years post-menarche	.19**	1.21	1.05–1.39	.0060	.0014–.0139	8.81
Infancy–preschool trauma	1.07***	2.91	1.88–4.51	.0081 _a	.0029–.0167	11.94
Grade school trauma	.91***	2.50	1.77–3.52	.0134 _{a,b}	.0062–.0243	19.78
Puberty trauma	.91***	2.49	1.78–3.47	.0155 _{a,b}	.0074–.0275	22.88
Post-puberty trauma	1.07***	2.92	2.09–4.08	.0186 _b	.0093–.0314	27.42
Criterion = Anxiety disorder diagnosis ($R^2 = .05$; $\chi^2 [4,6] = 147.61, p < .001$)						
Age of menarche	-.11**	.90	.83–.97	.0038	.0007–.0090	7.96
Years post-menarche	.05	1.05	.97–1.12	.0015	-.0002–.0055	3.23
Infancy–preschool trauma	.42**	1.53	1.14–2.04	.0036 _a	.0006–.0089	7.56
Grade school trauma	.44***	1.55	1.27–1.88	.0086 _a	.0037–.0156	17.98
Puberty trauma	.71***	2.03	1.69–2.44	.0226 _b	.0143–.0330	47.24
Post-puberty trauma	.40***	1.49	1.23–1.80	.0077 _a	.0031–.0146	16.02

Note: PTSD = posttraumatic stress disorder; RS = rescaled; RW = relative weight.

^aUnstandardized regression weight;* $p < .05$,

^c Relative weight rescaled as a percentage of predicted variance attributed to each predictor.
^d Raw relative weight; subscripts indicate significant differences in predictive strength ($\alpha = .05$).

 $p < .001$.
**
 $p < .01$.