Published in final edited form as:
Dev Psychol. 2011 May ; 47(3): 693–706. doi:10.1037/a0021909.

Skin Conductance Level Reactivity Moderates the Association Between Harsh Parenting and Growth in Child Externalizing Behavior

Stephen A. Erath,
Department of Human Development & Family Studies, Auburn University

Mona El-Sheikh,
Department of Human Development & Family Studies, Auburn University

J. Benjamin Hinnant, and
Department of Human Development & Family Studies, Auburn University

E. Mark Cummings
Department of Psychology, University of Notre Dame

Abstract

Skin conductance level reactivity (SCLR) was examined as a moderator of the association between harsh parenting at age 8 years and growth in child externalizing behavior from age 8 to age 10 (N = 251). Mothers and fathers provided reports of harsh parenting and their children's externalizing behavior; children also provided reports of harsh parenting. SCLR was assessed in response to a socioemotional stress task and a problem-solving challenge task. Latent growth modeling revealed that boys with higher harsh parenting in conjunction with *lower* SCLR exhibited relatively high and stable levels of externalizing behavior during late childhood. Boys with higher harsh parenting and *higher* SCLR exhibited relatively low to moderate levels of externalizing behavior at age 8, but some results suggested that their externalizing behavior increased over time, approaching the same levels as boys with higher harsh parenting and lower SCLR by age 10. For the most part, girls and boys with lower harsh parenting were given relatively low and stable ratings of externalizing behavior throughout late childhood. Results are discussed from a developmental psychopathology perspective with reference to models of antisocial behavior in childhood.

Keywords

harsh parenting; children; externalizing behavior; skin conductance; electrodermal responses

Experimental, longitudinal, and genetically informative research designs have demonstrated that harsh parenting and child externalizing behavior can elicit one another concurrently and prospectively (e.g., Burt, McGue, Krueger, & Iacono, 2005; Gershoff, 2002; Larsson, Viding, Rijsdijk, & Plomin, 2008; Patterson, Reid, & Dishion, 1992; Pettit & Arsiwalla, 2008). In addition, moderation models have shown that the strength of association between parenting and child behavior varies on the basis of child temperamental characteristics (Bates, Pettit, Dodge, & Ridge, 1998; Kochanska, 1997; Wootton, Frick, Shelton, &

Correspondence concerning this article should be addressed to Stephen A. Erath, Department of Human Development & Family Studies, 203 Spidle Hall, Auburn University, Auburn, AL 36849. serath@auburn.edu.

Silverthorn, 1997), and evidence of moderation exists in studies concerned specifically with harsh parenting and child externalizing behavior (Colder, Lochman, & Wells, 1997; Erath, El-Sheikh, & Cummings, 2009; Morris et al., 2002; Paterson & Sanson, 1999; Prinzie et al., 2003). The present study follows up on cross-sectional evidence (Erath et al., 2009) to investigate whether skin conductance level reactivity (SCLR) and sex moderate the association between harsh parenting and growth in externalizing behavior during late childhood. The longitudinal design yields a more rigorous test of differential prediction from harsh parenting to child externalizing behavior depending on SCLR and sex.

Harsh parenting refers to coercive behaviors and negative emotional expressions that parents direct toward children, including verbal and physical aggression. *Child externalizing behavior* includes disruptive, oppositional, and aggressive behaviors. Harsh parenting and child externalizing behavior may be linked via several experiential mechanisms, including social learning and negative reinforcement of aggression (Patterson et al., 1992), parents' failure to instill prosocial values when children misbehave (Hoffman, 1983; Kochanska, 1993), children's acquisition of hostile attributional biases (Dodge, Bates, & Pettit, 1990), and children's emotionally insecure experiences of parent–child relationships (Cummings & Davies, 1996). In addition, children's externalizing behavior may incite harsh parental responses, and parents and their children may share genetic dispositions toward aggression (Jaffee et al., 2004).

Like harsh parenting in the environmental domain, reduced SCLR in the physiological domain has been linked with child externalizing behavior (e.g., Beauchaine, 2001; Beauchaine, Katkin, Strassberg, & Snarr, 2001; Gao, Raine, Venables, Dawson, & Mednick, 2010; Lorber, 2004; Raine, 2002). SCLR refers to electrodermal reactivity caused by the sweat glands, which are innervated by the sympathetic (SNS) component of the autonomic nervous system (ANS; Fowles, Kochanska, & Murray, 2000). The SNS is activated in response to perceived threat and enables "fight-or-flight" responses by increasing sweat gland secretion as well as heart rate and oxygen flow throughout the body (Boucsein, 1992). SCLR is also a marker of the behavioral inhibition system (BIS), a neurophysiological motivational system that promotes inhibition in aversive situations (Beauchaine, 2001; Fowles, 1980; Gray, 1987). *Low* SCLR has been conceptualized as an indicator of fearlessness or reduced behavioral inhibition in negative, threatening, or punishing circumstances (Beauchaine, 2001; Fowles et al., 2000; Gao et al., 2010; Matthys, van Goozen, Snoek, & van Engeland, 2004; Raine, 2002). In the present study, SCLR was measured in the context of a simulated interpersonal argument (i.e., stress task) and a frustrating laboratory challenge (i.e., challenge task) that are designed to induce stress and known to activate the SNS (El-Sheikh, 2007).

Beyond the main effects of harsh parenting and low SCLR on child externalizing behavior, and consistent with growing evidence for Person × Environment interactions, harsh parenting and SCLR may exacerbate or attenuate the effects of one another. One published study reported cross-sectional evidence that SCLR moderates the association between harsh parenting and child externalizing behavior (Erath et al., 2009). Associations between parent- and child-reported harsh parenting and child externalizing behavior were stronger among school-aged children (especially boys) who exhibited lower SCLR, compared with children who exhibited higher SCLR. One implication of our earlier findings (Erath et al., 2009) is that parents' attempts to socialize low-SCLR children through harsh punishment may be especially ineffective or counterproductive because of these children's potential underarousal in the face of stressful or aversive circumstances. Furthermore, underaroused (i.e., less anxious or less fearful) children may be more likely to respond to harsh discipline with defiance or aggression and thereby trigger coercive parent–child interactions associated with antisocial behavior (Dadds & Salmon, 2003; Patterson et al., 1992).

It is notable that heightened externalizing behavior among boys with relatively harsh parents and reduced SCLR was evident across informants and laboratory tasks in our earlier study (Erath et al., 2009), and these findings are compatible with influential conceptualizations of harsh parenting and child externalizing behavior (e.g., Beauchaine, 2001; Patterson et al., 1992; Raine, 2002). The potential vulnerability function of lower SCLR among boys has also been documented in the context of marital conflict (El-Sheikh, Keller, & Erath, 2007).

However, higher SCLR is not an unequivocal protective factor in the context of family stress. Although potentially more effective as an immediate behavioral suppressant among children who exhibit higher SCLR, harsh parenting may have unintended negative implications for these children as well, such as generating feelings of rejection and failing to direct attention to the consequences of children's actions on others (Hoffman, 1983; Kochanska, 1993, 1997). Some studies using community samples have linked higher SCLR with externalizing behavior, such as reactive aggression (e.g., Hubbard et al., 2002) and externalizing problems among girls (El-Sheikh, 2005). In addition, Cummings, El-Sheikh, Kouros, and Keller (2007) found that higher SCLR operated as a vulnerability factor for externalizing problems in the context of parental depressive symptoms. El-Sheikh also found stronger cross-sectional and longitudinal associations between marital conflict and externalizing behavior among girls with higher SCLR, compared with girls with lower SCLR (El-Sheikh, 2005; El-Sheikh et al., 2007). More generally, there is some evidence that children who are more reactive to environmental challenge, consistent with higher SCLR, are also more sensitive to negative (and positive) environmental influences (Boyce & Ellis, 2005; Belsky & Pluess, 2009; Wootton et al., 1997).

Given these unresolved issues, longitudinal research is necessary to further elucidate the risks associated with varying levels of harsh parenting and SCLR among boys and girls. In the present study, we investigated whether SCLR to stressful or challenging laboratory tasks moderated the predictive association between harsh parenting at age 8 and linear growth in child externalizing behavior from age 8 to 10 years. Harsh parenting (Straus & Stewart, 1999) and child externalizing behavior (Bonger, Koot, van der Ende, & Verhulst, 2003; Stanger, Achenbach, & Verhulst, 1997) both normatively decline during the period under investigation, yet substantial variability exists (Keiley, Bates, Dodge, & Pettit, 2000). Furthermore, late childhood immediately precedes early adolescence, when levels of delinquent behavior begin to increase and peer influences gain strength (Stanger, Achenbach, & Verhulst, 1997). As youths transition to new schools and peer groups in late childhood and early adolescence, their externalizing behavior may influence which peers they find attractive, as well as which peers find them attractive (Hartup, 2005). Socialization processes may exacerbate externalizing behavior among youths who choose antisocial peer groups, and peer socialization appears to grow stronger in adolescence compared with childhood (Caspi & Moffitt, 1995; Dishion, Patterson, Stoolmiller, & Skinner, 1991). Thus, understanding family and physiological risk and protective factors that shape the externalizing behaviors that children carry into their early adolescent social networks may be particularly critical (Brown, Mounts, Lamborn, & Steinberg, 1993; Dodge & Pettit, 2003).

We hypothesized that harsh parenting would predict increasing child externalizing behavior over time among children who exhibited either higher or lower SCLR to stressful and challenging laboratory tasks; that is, we expected this predictive association to hold for all children to some extent. However, we anticipated that the association between harsh parenting and increasing child externalizing behavior would be stronger among children who exhibited lower SCLR, compared with children who exhibited higher SCLR. Given evidence that lower SCLR may be a more robust vulnerability factor for externalizing behavior among boys in the context of family stress (El-Sheikh, 2005; El-Sheikh et al.,

2007; Erath et al., 2009), as well as higher rates of underaroused externalizing behavior among boys (Marsee, Silverthorn, & Frick, 2005), we hypothesized that harsh parenting would especially predict increasing externalizing behavior among boys with lower SCLR, compared with girls with lower SCLR.

The design of the present study paralleled our earlier, cross-sectional study (Erath et al., 2009), except that measures of child externalizing behavior from three waves of data collection were included in the present study. Hypotheses were tested using a relatively large and diverse community-based sample. The use of both child and parent reports of harsh parenting allowed us to eliminate common informant bias in some analyses and to consider whether the moderating function of SCLR would hold across independent perspectives on harsh parenting. Parents are in a unique position to assess their own behaviors, although children's subjective experiences of harsh parenting may have greater implications for their physiological responses and behavioral adjustment. SCLR was measured in response to a moderate socioemotional stress task (i.e., hearing an interadult argument) and a frustrating, problem-solving challenge task (i.e., star-tracing). Although we expected that hypotheses would be supported in similar ways across these tasks, we examined SCLR to each task separately, to evaluate whether the moderating role of SCLR generalizes across these stressful situations.

Given ethnic differences in electrodermal activity (Boucsein, 1992), rates of externalizing behavior (e.g., Aber, Brown, & Jones, 2003), and responses to parental discipline (e.g., Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004), we controlled for ethnicity (as well as socioeconomic status [SES]). In addition, because of the common comorbidity of externalizing and internalizing problems (Hinden, Compas, Howell, & Achenbach, 1997), and a rationale for our hypotheses that is most relevant to "pure" externalizing problems (Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003), we controlled for child-reported internalizing symptoms in analyses. We included child-reported internalizing symptoms and parent-reported externalizing behaviors because parents and children are considered valid informants of these respective problems (Loeber, Green, & Lahey, 1990). Finally, we controlled for marital conflict to assess links between harsh parenting and child externalizing behavior independent of a related family stressor (Davies, Sturge-Apple, Woitach, & Cummings, 2009).

Method

Participants

Two hundred fifty-one families participated, including 128 girls and 123 boys with a mean age of 8.23 years (*SD* = 0.73; range = 80–120 months) at Time 1 (T1). Time 2 (T2) and Time 3 (T3) data collection occurred in approximately 1-year intervals. Children were recruited from three school districts surrounding a small town in the southeastern United States. Families were eligible to participate if children were in second or third grade, two parents were present in the home, and families had been living together for at least 2 years. Exclusion criteria included diagnoses of physical illness, attention-deficit/hyperactivity disorder (ADHD), learning disability, or intellectual disability. Participating couples were married or had been living together for a substantial time period (*M* = 10 years; *SD* = 5.67). Most children (73%) lived with both biological parents; 24% lived with their biological mother and a stepfather or mother's live-in boyfriend, and the remaining 3% lived mostly with their biological father and a stepmother. Two hundred forty-two (242) mothers and 206 fathers participated. The sample was representative of the communities from which it was drawn, including 64% European Americans and 36% African Americans (United States Census Bureau, 2005). The Hollingshead Index (Hollingshead, 1975) was used to determine SES and indicated that participating families represented the entire range of SES levels (1–

5). Specifically, 25% were in Levels 1 or 2 (e.g., semiskilled workers), 34% were in Level 3 (e.g., skilled workers), and 41% were in Levels 4 or 5 (e.g., professionals). Sampling procedures allowed recruitment of both European American and African American families across a wide range of SES. Families were compensated monetarily for their participation.

Procedure

At T1, families visited our university laboratory for one session during which both parents and children completed questionnaires and children participated in a physiological assessment session. Electrodes were attached to the child during a 10-min warm-up period in which research assistants conversed with the parent and child to help the child relax. Next, the child was told that the parent would leave but would be next door for the remainder of the assessment session. Children were then allowed to acclimate to the laboratory for 2 min without their parent present. Skin conductance level (SCL) was then measured for a 3-min baseline period. Next, SCL was recorded while children listened to a 3-min audiotaped argument between a man and woman (i.e., socioemotional stress task). To increase generalizability of the argument stimulus, children were randomly assigned to hear either an angry disagreement about in-laws or leisure activities; SCLR did not differ based on argument theme. A similar number of boys and girls across each of the two ethnic groups were exposed to each theme. The validity of this task for assessing children's physiological reactivity to socio-emotional stress has been demonstrated in numerous studies (El-Sheikh, 2001, 2005, 2007; El-Sheikh, Harger, & Whitson, 2001). In addition, many studies have demonstrated that children respond with negative affect to enacted simulations of similar argument episodes, further supporting the designation of this task as a stress task (e.g., Cummings, Ballard, El-Sheikh, & Lake, 1991; Goeke-Morey, Cummings, Harold, & Shelton, 2003). This socioemotional stress task is referred to as the "stress task" throughout the remainder of the article.

Following a 6-min recovery period after the stress task, SCL was also measured during a star-tracing task, in which children were asked to trace a star using only a mirror image as a visual guide (Mirror Tracer, Lafayette Instrument Company). This task is considered a frustrating, problem-solving challenge and has been used to elicit SCLR or other forms of physiological reactivity in many studies (e.g., Allen & Matthews, 1997; El-Sheikh, 2007). This problem-solving challenge task is referred to as the "challenge task" throughout the remainder of the article. A fixed order of laboratory tasks was used, because the focus of the study was on individual differences in physiological responding rather than task-specific responses per se. At the end of the session, children listened to a resolution of the argument for ethical purposes. Similar procedures were used at T2 and T3, but at T2 and T3, only the measure of parent-reported externalizing behavior was used in the present study.

Measures

SCLR—Children's skin conductance level (SCL; expressed in microSiemens) was measured continuously throughout the laboratory session at T1. Two Ag-AgCl electrodes filled with isotonic NaCl electrode gel were placed on the volar surfaces of the distal phalanges of the first and second fingers of the nondominant hand using small Velcro bands. The area of gel contact was carefully controlled through the use of double-sided adhesive collars with a 1-cm hole in the center. A constant sinusoidal (AC) voltage (0.5 V rms) was used to avoid biasing the electrodes. A 16-channel A/D converter was used to digitize and amplify the signals. Software from the James Long Company was used to collect data at 1,000 readings per second. Averages for each of the three periods (baseline, stress task, challenge task) were calculated. As is typical in psychophysiological research, 8%–9% of participants did not have SCL data because of equipment failure or measurement artifacts. An SCL change score in response to each task was calculated by subtracting the initial SCL

baseline score from SCL during the respective task. It is notable that children's SCL increased significantly from baseline (M = 5.79, SD = 4.48) in response to both the stress task, M = 6.78, SD = 5.09, $t(234) = -10.02$, $p < .01$, and challenge task, M = 8.75, SD = 5.77, $t(231) = -16.86$, $p < .01$. Higher SCL during the challenge task relative to the stress task may reflect cumulative exposure to novel circumstances (the challenge task followed the stress task) or greater SNS activation to a task that required an active response (i.e., problem-solving, star-tracing) compared with one that involved passive exposure (i.e., listening to an argument). In accord with the law of initial values, to eliminate the influence of baseline SCL on skin conductance level reactivity, SCLR was computed as a residualized change score. The residualized change score is the residual variance when the respective SCL change score is regressed on baseline SCL. SCLR to the stress and challenge tasks were moderately correlated (see Table 1).

Marital conflict—At T1, mothers and fathers reported their own and their spouses' verbal and physical aggression in the past year on the Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), which has well-established reliability and validity. Parents rated their use of 18 behaviors during conflict on a 7-point scale, ranging from 0 (*never*) to 6 (*more than 20 times*). Mothers' and fathers' reports were averaged to create a marital conflict score; internal consistency was high (cross-subscale, cross-informant, cross referent α = .85). Marital conflict was a control variable in analyses.

Harsh parenting—At T1, mothers, fathers, and children completed the Parent–Child Conflict Tactics Scale (CTSPC; Straus, 1999), which is widely used to assess harsh parenting (Yodanis, Hill, & Straus, 2001). The CTSPC has well-established psychometric properties (Straus, 1999). Subscales used in the present study assessed the frequency of verbal aggression (e.g., shouted, yelled, or screamed; said he/she would send you away; five items rated on a 7-point scale) and physical aggression (e.g., spanked you on the bottom with bare hand; slapped you on the face or head or ears; nine items rated on a 7-point scale) that parents directed toward the child in the past year (ranging from *never* to *more than 20 times*). Mothers' and fathers' reports of their own and their spouses' verbal (M = 6.43, SD = 4.04) and physical (M = 5.29, SD = 4.46) aggression toward the child were averaged to create a parent-reported harsh parenting score (cross-subscale, cross-reporter, cross-referent α = .82). Child reports of both parents' verbal (M = 4.94, SD = 4.91) and physical (M = 5.99, SD = 6.16) aggression were also averaged to create a composite child-reported harsh parenting score with high internal consistency (cross-subscale, cross referent α = .88). Correlations between verbal and physical harsh parenting within and across parents and informants (mother, father, child) ranged from .34 to .82 (all ps < .001). Any instances of verbal aggression toward children were reported by 96% of parents and 86% of children, and any instances of physical aggression toward children were reported by 95% of parents and 89% of children (for high rates of "corporal punishment" throughout the United States, see Straus & Stewart, 1999); of course, any (e.g., single) instance of harsh parenting is not necessarily sufficient to characterize parenting as harsh.

Child internalizing behavior—At T1, children completed the Children's Depression Inventory (CDI; Kovacs, 1985) via interview. The CDI is well-established and known to have good reliability and validity (Kovacs, 1985). Internal consistency was α = .95 in the present sample. In addition, children completed the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1979) via interview. This measure also has well-established reliability and validity (Reynolds & Richmond, 1979) and high internal consistency in the present study (α = .91). Children's reports on the CDI and RCMAS were correlated (r = .46, $p < .001$); these scores were standardized and averaged to yield a

composite score for child internalizing symptoms, which was used as a control variable in analyses.

Child externalizing behavior—Both parents completed the Personality Inventory for Children–2 (PIC–2, Lachar & Gruber, 2001) at T1, T2, and T3. The externalizing behavior composite is composed of delinquency and impulsivity/distractibility subscales, which include items assessing aggression, impulsivity, disruptive behavior, delinquency, and noncompliance. The PIC–2 has demonstrated test–retest reliability, interrater reliability, as well as discriminant and construct validity (Lachar & Gruber, 2001; Wirt, Lachar, Klinedinst, & Seat, 1990). For example, the externalizing scale of the PIC–2 was correlated (r = .55) with teacher-reported behavior problems on the Student Behavior Survey (SBS; Lachar, Wingenfeld, Kline, & Gruber, 2000). Likewise, El-Sheikh (2001) found that mother-reported externalizing behavior on the PIC–2 was correlated with teacher-reported externalizing behavior (r = .48, p < .001) on the Child Behavior Checklist-Teacher Report Form (Achenbach, 1991).

In the present study, mothers' and fathers' reports were correlated, r = .39, p < .001 at T1, r = .55, p < .001 at T2, and r = .54, p < .001 at T3, and were averaged to derive child externalizing behavior at T1, T2, and T3. The internal consistency (α) of the child externalizing composite was .85 at T1, .92 at T2, and .98 at T3. Forty-five (18%), 31 (14%), and 25 (13%) children were within the borderline or clinical range ($T \geq 60$) of externalizing behavior based on at least one parent's report at T1, T2, and T3, respectively.

Results

Plan of Analysis

Latent growth modeling (LGM) was used in the present study to investigate inter- and intraindividual change in parent-reported externalizing behavior over time. Time was centered at the first wave of data collection, setting our metric of change to zero at Time 1 (age 8), one at Time 2 (age 9), and two at Time 3 (age 10; Biesanz, Deeb-Sossa, Papadakis, Bollen, & Curran, 2004). Three time points permitted us to estimate linear change in externalizing behavior beginning at T1 (Curran & Willoughby, 2003). An unconditional growth model was first estimated to define an average initial level (intercept) of externalizing behavior and an average rate of change (slope) of externalizing behavior for all children. Variability in the intercept and the slope was also assessed in the unconditional model. Next, a conditional growth curve model addressed our main study hypotheses: Interactions among T1 harsh parenting, SCLR, and sex would predict trajectories of externalizing behavior from age 8 to age 10. In the present study, we focused on prediction of change (i.e., slope) in externalizing behavior, following up on cross-sectional associations using the same sample (Erath et al., 2009).

We used methods recommended by Curran, Bauer, and Willoughby (2004) to test interactions among harsh parenting, SCLR, and sex as predictors of growth in parent-reported externalizing behavior. Harsh parenting, SCLR, and sex may be viewed as moderators of time in models that predict the slope of externalizing behavior (Curran et al., 2004). All continuous predictor variables were mean-centered for analyses, and all categorical variables (i.e., ethnicity and sex) were coded as 0 or 1. Significant interactions were plotted at ±1 standard deviations on the continuous predictor variables, and simple slopes and their significance values were estimated (Curran et al., 2004).

All analyses were conducted using SPSS Version 16 and AMOS Version 16. To describe model fit, we report chi-square, degrees of freedom, chi-square divided by degrees of freedom, and the p value (chi-square/df values of 2 or less indicate good fit; nonsignificant p

values indicate good fit); root-mean-square error of approximation (RMSEA; lower values indicate better fit, with .05 or lower indicating excellent fit); comparative fit index (CFI; higher values indicate better fit, with .95 or higher indicating excellent fit); and, in the case of nested models, we also report change in chi-square, change in degrees of freedom, and the Browne-Cudeck criterion (BCC; Schreiber, Stage, King, Nora, & Barlow, 2006). We also report ΔR^2. Missing data (because of attrition, primarily) were handled with full information maximum likelihood (FIML) estimation (Schafer & Graham, 2002). FIML uses all available data to estimate model parameters and does not discard cases that are missing some information. FIML estimation is advantageous if data are missing completely at random or missing at random (Acock, 2005; Raykov, 2005).

Preliminary Analyses

Means, standard deviations, and correlations among all study variables are presented in Table 1. Evaluation of the descriptive data, including skew and kurtosis and visual inspection of the data via histograms, suggested that the variables were generally univariate normal; we also note that LGM and structural equation models using FIML are generally robust with small to moderate departures from normality (Boomsma, 1987). Thus, data were not transformed. Data were available for the following percentages of participants on study variables: sex (100%), race (100%), age (99%), SES (99%), marital conflict (99%), child internalizing behavior (99%), child-reported harsh parenting (99%), parent-reported harsh parenting (99%), SCLR-stress (92%), SCLR-challenge (91%), parent-reported externalizing behavior at T1 (100%), parent-reported externalizing behavior at T2 (87%), and parent-reported externalizing behavior at T3 (80%). Little's MCAR chi-square test indicated that missing data were not MCAR, $\chi^2(292) = 352.38$, $p = .01$. Missing value analyses indicated that children with missing data at T3 were more likely to be from families with lower SES. It is notable that missingness in T3 externalizing behavior, the variable with the most missing data, was not associated with any other study variable. Bivariate correlations indicated that externalizing behaviors were strongly associated with each other at each time point. Other correlational findings of note include the positive associations between harsh parenting and child externalizing behavior (see Table 1).

Unconditional Growth

We first estimated an unconditional growth model (i.e., a growth model with no predictors) for the full sample. Constraining the error variances to be equal for the repeated measure of externalizing behavior resulted in a slight improvement in fit; this more parsimonious model was retained (Duncan & Duncan, 2004). Parameters for the unconditional model with and without constrained error variances are presented in Table 2. The unconditional model provided an excellent fit to the data and revealed that both the average intercept and slope of externalizing behavior were significantly different from zero. The intercept and slope were not significantly correlated with one another ($r = -.16$, $p = .39$). The slope parameter indicated a significant decline in externalizing behavior from age 8 to age 10. In addition, significant variability was observed in both the intercept and the slope, suggesting that it was possible to predict variability in the intercept and slope.

Conditional Growth

Four conditional models were fit to predict initial levels and changes in parent-reported externalizing behavior.[1,2] Models that included the following variables are presented in the following order: (a) *child*-reported harsh parenting, SCLR to the *stress* task, sex, and two- and three-way interactions among these variables; (b) *child*-reported harsh parenting, SCLR to the *challenge* task, sex, and two- and three-way interactions among these variables; (c) *parent*-reported harsh parenting, SCLR to the *stress* task, sex, and two- and three-way interactions among these variables; and (d) *parent*-reported harsh parenting, SCLR to the

challenge task, and two- and three-way interactions among these variables. In all four conditional models, we controlled for family SES, child age, child ethnicity, child-reported internalizing behavior at T1, and parent-reported marital conflict at T1. As in the unconditional model, error variances of the repeated measure of externalizing behavior were constrained to be equal (Duncan & Duncan, 2004). Covariances among interaction terms and their constituent variables were freely estimated, as were covariances among variables that were associated in the correlation table. Our conceptual conditional growth model is presented in Figure 1.

Child-Reported Harsh Parenting × SCLR-Stress × Sex—This conditional model fit the data well, $\chi^2(59) = 82.60$, $p = .02$, $\chi^2/df = 1.40$, RMSEA = .04, CFI = .97. Results of this model are presented on the left side of Table 3. Predictor variables accounted for 18% of the variance in the intercept and 18% of the variance in the slope of externalizing behavior. Child-reported harsh parenting ($\Delta R^2 = .05$), marital conflict ($\Delta R^2 = .03$), and internalizing behavior ($\Delta R^2 = .03$) were positively associated with initial levels of externalizing behavior. No significant interactions predicted the intercept of externalizing behavior. SCLR was positively associated with the slope of externalizing behavior, indicating that children with higher SCLR increased in externalizing behavior over time ($\Delta R^2 = .07$). No significant interactions predicted the slope of externalizing behavior; thus, this model is not depicted in a figure.

Child-Reported Harsh Parenting × SCLR-Challenge × Sex—This conditional model also fit the data well, $\chi^2(59) = 96.49$, $p = .001$, $\chi^2/df = 1.64$, RMSEA = .05, CFI = .96. Results of this model are presented on the right side of Table 3. Predictor variables accounted for 19% of the variance in the intercept and 28% of the variance in the slope of externalizing behavior. The increased variance explained in the slope is primarily attributable to several significant interactions that predicted the slope. Child-reported harsh parenting, marital conflict, and internalizing behavior were positively associated with initial externalizing behavior. Interactions between harsh parenting and SCLR on the intercept are not presented in detail in this article because they parallel findings reported in the article with cross-sectional effects (Erath et al., 2009) and because they are also represented as part of the overall growth model.

---

[1]We also conducted growth models using teachers' reports of children's externalizing behavior on the Student Behavior Survey (Lachar et al., 2000). In the present study, relatively few teachers completed questionnaires ($n = 131$ at T1, $n = 81$ at T2, and $n = 100$ at T3); thus, we present these findings in a footnote. The unconditional model revealed significant variability in the intercept of teacher-reported externalizing behavior but no significant variability in the slope. Thus, only the intercept could be predicted in the conditional model. The three-way interaction among parent-reported harsh parenting, SCLR-stress, and sex predicted initial teacher-reported externalizing behavior ($p = .03$), as did the three-way interaction among parent-reported harsh parenting, SCLR-challenge, and sex ($p = .006$). The association between harsh parenting and teacher-reported externalizing behavior was significant only among boys with higher SCLR-stress ($p = .03$), but the estimated level of externalizing behavior (20.00) among boys with harsh parents (+1SD) and low SCLR-stress (−1SD) was as high as the estimated level of externalizing behavior (20.04) among boys with harsh parents (+1SD) and high SCLR-stress (+1SD). Parent-reported harsh parenting was negatively related to externalizing behavior among girls with higher SCLR-challenge ($p = .02$). Three-way interactions were not significant in models that included child-reported harsh parenting.

[2]We also considered an alternate measurement of harsh parenting. Principle component analysis was used to derive a factor score for harsh parenting from the shared variance among mother, father, and child reports (Kraemer et al., 2003). As expected, the first of the three components had positive loadings and accounted for 50% of the total variance (the shared mother–father–child perspective). This harsh parenting factor score was used in subsequent conditional models. Results indicated that both three-way interactions (Harsh Parenting Factor Score × SCLR-Stress × Sex and Harsh Parenting Factor Score × SCLR-Challenge × Sex) were significant predictors of parent-reported externalizing behavior over time ($p = .05$ and $p = .04$, respectively). Boys with higher harsh parenting and lower SCLR-stress were given high initial ratings of externalizing behavior, which decreased over time but remained relatively high ($p = .02$). Girls with higher harsh parenting and higher SCLR-stress were given high initial ratings of externalizing behavior (relative to other girls), which also decreased over time ($p = .05$). Similar results emerged in analyses with SCLR-challenge as a moderator. Boys with higher harsh parenting and lower SCLR-challenge were given high initial ratings of externalizing behavior, which decreased over time but remained relatively high ($p = .008$). Girls with higher harsh parenting and higher SCLR-challenge were given high initial ratings of externalizing behavior (relative to other girls), which decreased over time ($p = .04$).

Regarding slope effects, analyses revealed that a two-way interaction between child-reported harsh parenting and SCLR-challenge and a three-way interaction among child-reported harsh parenting, SCLR-challenge, and sex predicted the slope of externalizing behavior ($\Delta R^2 = .09$). The three-way interaction is depicted in Figures 2A (boys) and 2B (girls). Boys with higher child-reported harsh parenting and lower SCLR-challenge had elevated levels of externalizing behavior at age 8 and showed nonsignificant decline in externalizing behavior over time (intercept = 7.42, slope = −0.62, slope $p = .08$). Boys with higher child-reported harsh parenting and higher SCLR-challenge had relatively low levels of externalizing behavior at age 8, but their externalizing behavior increased significantly over time (intercept = 4.53, slope = 1.14, slope $p < .01$). Boys who reported lower harsh parenting, regardless of their SCLR-challenge, had initially low levels of externalizing behavior that did not change significantly over time (for boys with lower SCLR, intercept = 4.02, slope = 0.12, slope $p = .78$; for boys with higher SCLR, intercept = 4.31, slope = 0.13, slope $p = .74$). Girls showed similarly low initial levels of externalizing behavior and relatively little variability in their slopes irrespective of levels of child-reported harsh parenting or SCLR-challenge (all intercepts < 5.12, all slopes between −0.39 and 0.15, all ps > .20).

Parent-Reported Harsh Parenting × SCLR-Stress × Sex—This conditional model fit the data adequately, $\chi^2(55) = 102.36$, $p < .001$, $\chi^2/df = 1.86$, RMSEA = .06, CFI = .95. Results of this model are presented on the left side of Table 4. Predictor variables accounted for 30% of the variance in the intercept and 33% of the variance in the slope of externalizing behavior. The increased variance explained in comparison to the models with child-reported harsh parenting is due to several interactions on the intercept and slope, as well as shared method variance between parent-reported harsh parenting and externalizing behavior. Child-reported internalizing symptoms were positively associated with initial levels of externalizing behavior, whereas SES was negatively associated with initial externalizing behavior. Two-way interactions between harsh parenting and SCLR-stress and between harsh parenting and sex predicted the intercept of externalizing behavior; these interactions can be interpreted in the context of the overall growth model.

Regarding slope effects, a significant three-way interaction among parent-reported harsh parenting, SCLR-stress, and sex qualified the main effects ($\Delta R^2 = .13$). As shown in Figure 3A, boys with higher parent-reported harsh parenting and lower SCLR-stress exhibited high initial levels of externalizing behavior at age 8, and their externalizing behavior remained relatively high, despite a significant decline over time (intercept = 8.27, slope = −0.81, slope $p < .05$). Boys with higher parent-reported harsh parenting and higher SCLR-stress exhibited moderate initial levels of externalizing behavior at age 8, and their externalizing behavior remained relatively stable over time, such that their externalizing behavior was similar to boys with higher parent-reported harsh parenting and lower SCLR-stress by age 10 (intercept = 5.97, slope = 0.26, slope $p = .42$). Boys with lower parent-reported harsh parenting and higher SCLR-stress had low initial levels of externalizing behavior that increased significantly over time, but remained relatively low to moderate (intercept = 3.04, slope = 1.0, slope $p < .05$). Finally, boys with lower parent-reported harsh parenting and lower SCLR-stress had low initial levels of externalizing behavior that remained relatively stable in late childhood (intercept = 2.75, slope = 0.63, slope $p = .12$).

Similar to boys, high initial levels of externalizing behavior were evident among girls whose parents reported higher levels of harsh parenting (see Figure 3B). Among girls with relatively high parent-reported harsh parenting, girls with lower SCLR-stress exhibited high and stable levels of externalizing behavior over time (intercept = 5.97, slope = −0.07, slope $p = .84$). Girls with higher SCLR-stress exhibited significant declines in externalizing behavior over time (intercept 5.69, slope = −0.79, slope $p = .05$). Girls with lower parent-reported harsh parenting exhibited relatively low and stable levels of externalizing behavior

(for girls with lower SCLR-stress, intercept = 4.19, slope = −0.53, slope p = .07; for girls with higher SCLR-stress, intercept = 3.82, slope = 0.42, slope p = .14).

Parent-Reported Harsh Parenting × SCLR-Challenge × Sex—This conditional model also fit the data well, $\chi^2(55) = 90.56$, p = .002, $\chi^2/df = 1.65$, RMSEA = .05, CFI = .96. Results of this model are presented on the right side of Table 4. Predictor variables accounted for 33% of the variance in the intercept and 29% of the variance in the slope of externalizing behavior. Parent-reported harsh parenting and child-reported internalizing behavior were positively associated with initial externalizing behavior at age 8, whereas SES and SCLR-challenge were negatively related to initial externalizing symptoms. Like the prior model, two-way interactions between harsh parenting and SCLR-challenge and between harsh parenting and sex predicted the intercept of externalizing behavior (ΔR^2 = .08). SCLR-challenge was positively associated with the slope of externalizing behavior, whereas harsh parenting was negatively related to the slope. In this model, no significant interactions qualified these main effects on the slope; thus, this model is not depicted in a figure.

Discussion

We investigated whether SCLR moderated the association between harsh parenting at age 8 and growth in child externalizing behavior from age 8 to age 10. Interaction findings suggested that associations linking harsh parenting with initial levels and changes in externalizing behavior during late childhood may be conditional upon children's SCLR and sex. In particular, results suggested that elevated externalizing behavior may emerge and persist earlier in childhood among boys with relatively harsh parents and *lower* SCLR, compared with boys with relatively harsh parents and *higher* SCLR, whose externalizing behavior may increase during late childhood. The higher level of externalizing behavior associated with harsh parenting, especially among boys, is noteworthy given the prevalence of at least some harsh parenting reported by children and parents in the present study. Girls and boys with less harsh parents appear to exhibit relatively lower externalizing behavior during late childhood.

Three out of four analytic models revealed an interaction between harsh parenting and SCLR that predicted initial levels of child externalizing behavior at age 8. Results replicated an earlier cross-sectional investigation with the same sample in which the highest levels of externalizing behavior at age 8 were evident among children (especially boys) with lower SCLR in the context of harsh parenting (Erath et al., 2009). In addition, three-way interactions on the slope of externalizing behavior revealed no significant decline in externalizing behavior from age 8 to age 10 among boys with higher child-reported harsh parenting and lower SCLR-challenge. A significant decline in externalizing behavior was observed among boys with higher parent-reported harsh parenting and lower SCLR-stress. In both cases of three-way interaction among harsh parenting, SCLR, and sex on the slope of externalizing behavior, however, levels of externalizing behavior among boys with higher harsh parenting and lower SCLR remained relatively high throughout late childhood. Furthermore, the two-way interaction between parent-reported harsh parenting and SCLR-challenge on the intercept of externalizing behavior, together with the lack of a slope effect in this model, also suggests that children with higher harsh parenting and lower SCLR continued to exhibit high levels of externalizing behavior throughout late childhood. Among girls with higher harsh parenting and lower SCLR, externalizing behavior was slightly elevated at each time point but did not change significantly over time. In summary, results consistently suggested that boys with relatively harsh parents and lower SCLR exhibit elevated externalizing behavior throughout late childhood (although some evidence for a slight decline in externalizing behavior over time emerged).

Three-way interaction effects on the slope also revealed a significant increase in externalizing behavior from age 8 to age 10 among boys with higher child-reported harsh parenting and higher SCLR-challenge, such that these boys were given ratings of externalizing behavior at age 10 that were as high as boys with higher child-reported harsh parenting and lower SCLR-challenge. Likewise, in the context of higher parent-reported harsh parenting, boys with higher SCLR-stress were given ratings of externalizing behavior at age 10 that were as high as boys with lower SCLR-stress. In contrast, a significant decline in externalizing behavior from age 8 to age 10 was evident among girls with higher parent-reported harsh parenting and higher SCLR-stress, and no significant change in externalizing behavior was evident among girls with higher child-reported harsh parenting and higher SCLR-challenge. It is possible that girls' higher SCLR operates as a protective factor against externalizing behavior in the context of harsh parenting, but this finding should be interpreted with caution, because it appeared in only one model and is not consistent with other findings on the function of higher SCLR in the context of family stress among girls (El-Sheikh, 2005; El-Sheikh et al., 2007). In the two models without significant interactions on the slope factor (i.e., child report of harsh parenting/SCLR-stress; parent report of harsh parenting/SCLR-challenge), higher SCLR was associated with lower externalizing behavior at age 8, but with increasing externalizing behavior from age 8 through age 10, suggesting a possible ceiling effect of lower SCLR by age 8 or a developmental change in the association between SCLR and externalizing behavior in late childhood. In summary, results suggested that boys with relatively harsh parents in conjunction with higher SCLR may approach elevated levels of externalizing behavior by age 10 that are similar to boys with relatively harsh parents and lower SCLR.

Thus, in the context of harsh parenting, two out of four analytic models demonstrated that boys exhibited similar levels of externalizing behavior at age 10, but their developmental progression toward elevated externalizing behavior at age 10 differed depending on their SCLR. Boys with lower SCLR appeared to exhibit heightened externalizing behavior in the context of relatively harsh parenting earlier than did boys with higher SCLR. From a developmental psychopathology perspective, this finding may illustrate equifinality, which suggests that individuals may arrive at similar functional levels via different developmental pathways or via different combinations of risk and protective factors at different times (Cicchetti & Cohen, 1995). Despite the apparently similar externalizing outcome at age 10, however, the different timing of elevated externalizing behavior among boys with relatively harsh parents and higher or lower SCLR may presage long-term differences in trajectories of externalizing behavior, potentially reflecting different forms of behavior problems. Indeed, a finding that spans several different forms of psychopathology is that earlier-developing problems forecast worse outcomes than later-developing problems, and this phenomenon is particularly well documented in the case of externalizing behavior problems.

In the present study, SCLR was measured in response to a simulated interpersonal argument (stress task) and a frustrating laboratory challenge (challenge task). The similarity of results across socially stressful and frustrating/challenging lab situations increases our confidence that the SCLR effects are at least somewhat generalizable across negative circumstances and applicable in the context of harsh parenting. However, SCLR was not measured directly in the context of harsh parenting. Examining SCLR under more relevant and naturalistic conditions, such as during interactions with parents or under conditions of punishment, would be informative and would lend further credibility to the mechanisms we discuss below.

To shed light on the potential meaning of results, we consider the possibility that reduced SCLR to the tasks in the present study reflects a physiological predisposition toward low anxiety, fearlessness, or behavioral disinhibition in the context of stressful or threatening

circumstances (Beauchaine, 2001), consistent with the callous-unemotional traits in a subset of children (particularly boys) with conduct problems (e.g., Frick et al., 2003; Marsee et al., 2005). These temperamental characteristics may underlie externalizing behavior, elicit coercive parent–child exchanges, or increase the likelihood that children will learn aggression from harsh parenting rather than feel punished by it (Dadds & Salmon, 2003). That is, boys who exhibit lower SCLR may associate harsh parental responses to their misbehavior with less negative physiological arousal or corresponding psychological distress compared with children who exhibit higher SCLR; thus, harsh parenting strategies may not serve as effective punishment among boys who exhibit lower SCLR.

In the present study, three out of four analytic models suggested that levels of externalizing behavior among boys with relatively harsh parents and lower SCLR remained elevated from age 8 through age 10. Thus, to the extent that the combination of harsh parenting and lower SCLR exacerbated externalizing behavior at some point in childhood, the process may have been most dynamic in early or middle childhood, when rates of parent–child interaction, corporal punishment, and childhood behavior problems are highest (Stanger et al., 1997; Straus & Stewart, 1999). The design of the present study, however, does not allow us to draw conclusions about whether the relatively high and stable externalizing behavior among boys with relatively harsh parents and lower SCLR is the result of parent-, child-, or genetically driven effects or some combination of these factors.

It is possible that harsh parenting predicted increases in externalizing behavior only among boys with higher SCLR because their behavior is less mediated by child effects and more responsive to environmental contingencies, potentially reflecting susceptibility to environmental influences (Belsky & Pluess, 2009) or biological sensitivity to context (Boyce & Ellis, 2005). Indeed, Wootton et al. (1997) reported that children with callous-unemotional (CU) traits, consistent with reduced SCLR, showed elevated conduct problems, regardless of the quality of parenting they experienced. By comparison, children without CU traits, consistent with normal or high SCLR, exhibited elevated conduct problems only in the context of ineffective parenting (see also, Shannon, Beauchaine, Brenner, Neuhaus, & Gatzke-Kopp, 2007). Boys who exhibit higher SCLR, who may be more sensitive to aversive circumstances, may be especially likely to react negatively to harsh parenting later in childhood, during a developmental period characterized by increasing needs for autonomy from parents and greater opportunities to exercise independence with peers. Indeed, it is interesting that increases in externalizing behavior were evident among boys with higher SCLR in the model in which children (rather than parents) reported higher harsh parenting. Thus, behavioral inhibition or sensitivity to punishment, potentially reflected by higher SCLR, may dampen externalizing behavior in the context of harsh parenting during early and middle childhood but fuel frustrated reactions to coercive parenting in late childhood and adolescence, when opportunities for behavioral infractions increase outside of the parent–child context.

Harsh parenting was linked with higher initial levels of child externalizing behavior in all analytic models but with declining externalizing behavior over time in models that included parent-reported harsh parenting. Despite the decline in externalizing behavior during late childhood, children with higher child- or parent-reported harsh parenting were given higher ratings of externalizing behavior at age 10, compared with children who had lower harsh parenting. It was somewhat surprising that there was a significant decline in externalizing behavior during late childhood among boys with higher parent-reported harsh parenting and lower SCLR. This finding may be comparable to evidence that the association between temperamental resistance to control in early childhood and later externalizing behavior is attenuated by parental restrictive control (Bates et al., 1998). However, the relatively high mean levels of externalizing behavior among children with relatively harsh parents and

lower SCLR at age 8 and age 10 suggests that harsh parenting (e.g., verbal or physical aggression) is not effective punishment for children with higher or lower SCLR. It would be intriguing to conclude that harsh parenting is especially predictive or symptomatic of child externalizing behavior among children with lower SCLR during earlier childhood and especially predictive of child externalizing behavior among children with higher SCLR during later childhood, but a longitudinal design that spans a wider range of childhood is necessary to establish conclusions about sensitive developmental periods.

Findings of the present study and their interpretation must be considered in the context of several limitations. First, findings were only partially consistent across analytic models, and their level of consistency must be interpreted with some caution because predictor variables used in separate analyses were correlated, increasing the likelihood of replication. We did not create cross-informant or cross-task composite scores for predictor variables because we wished to eliminate common informant bias in some analyses, account for both child and parent perspectives on harsh parenting, and represent physiological responses to stress as comprehensively as possible. In addition, we did not include child- and parent-reported harsh parenting variables in the same analysis because our aim was to determine whether the moderating role of SCLR was robust across informants of harsh parenting, without obscuring the meaningful shared variance between child and parent reports.

The pattern of findings was somewhat consistent across the stress and challenge tasks in the present study. Examining similarities and differences in stress responses across multiple tasks may provide information about the generalizability or specificity of effects. In the present study, SCLR-stress and SCLR-challenge were moderately correlated, and results across these tasks were moderately consistent, making it difficult to draw strong conclusions about task specificity. Future research is needed to examine stress responses to multiple tasks that are further isolated than the tasks in the present study, to clarify the qualities of tasks that elicit certain responses as well as the meaning of those responses. In addition, given the apparent malleability of children's psychophysiological functioning (e.g., Boyce & Ellis, 2005), it will be important to test SCLR as a mediator of the association between harsh parenting and child externalizing behavior. For example, it is possible that lower SCLR reflects habituation to a history of harsh parental treatment or other adverse circumstances, whereas higher SCLR could reflect sensitization to repeated stress experiences or biological sensitivity to a generally positive environmental context; future research with a larger sample and multiyear longitudinal design beginning in earlier childhood could test these possibilities.

It will be informative for future research to distinguish proactive and reactive forms of aggression, as well as nonaggressive conduct problems, given possible differences in their physiological correlates (Frick et al., 2003). Our measure of externalizing behavior may not have been sensitive to externalizing behaviors that are more dynamic and responsive to harsh parenting among girls. It also will be important for future research to establish whether findings generalize to externalizing behavior in the school setting and to consider outcomes such as internalizing symptoms and peer relationships. Finally, although the full range of externalizing problems was represented in our study, most children were within the normal range. Findings should generalize to many children but do not necessarily generalize to children with clinical levels of externalizing problems. In addition, findings may not generalize to children living in family arrangements other than the two-parent type of family included in the present study (e.g., single-parent families). Future research with an even larger and more diverse sample would increase confidence in the findings.

Despite these limitations, the present study sheds new light on the interactive effects of harsh parenting and electrodermal responses on children's externalizing behavior during late

childhood. Predictors accounted for between 18% and 33% of the variance in the slope of child externalizing behavior during late childhood, with harsh parenting and SCLR and interactions among these variables accounting for most variance. Most notably, boys with relatively harsh parents and lower SCLR appear to exhibit elevated externalizing behavior throughout late childhood but may not show an escalating pattern of externalizing behavior during late childhood, whereas boys with relatively harsh parents and higher SCLR may approach elevated levels of externalizing behavior by age 10 that are similar to boys with relatively harsh parents and lower SCLR. Girls and boys with less harsh parents appear to exhibit lower externalizing behavior during late childhood.

Acknowledgments

This research was supported by National Institutes of Health Grant RO1-HD046795 to Mona El-Sheikh and E. Mark Cummings. We wish to thank participating families and the staff of the Child Development Lab.

References

Aber JL, Brown JL, Jones SL. Developmental trajectories toward violence in middle childhood: Course, demographic differences, and response to school-based intervention. Developmental Psychology. 2003; 39:324–348.10.1037/0012-1649.39.2.324 [PubMed: 12661889]

Achenbach, TM. Integrative guide for the 1991 CBCL/4–18, YSR, and CBCL-TRF profiles. Burlington, VT: University of Vermont Department of Psychiatry; 1991.

Acock AC. Working with missing values. Journal of Marriage and Family. 2005; 67:1012–1028.10.1111/j.1741-3737.2005.00191.x

Allen MT, Matthews KA. Hemodynamic responses to laboratory stressors in children and adolescents: The influences of age, race, and gender. Psychophysiology. 1997; 34:329–339.10.1111/j.1469-8986.1997.tb02403.x [PubMed: 9175447]

Bates JE, Pettit GS, Dodge KA, Ridge B. Interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. Developmental Psychology. 1998; 34:982–995.10.1037/0012-1649.34.5.982 [PubMed: 9779744]

Beauchaine TP. Vagal tone, development, and Gray's motivational theory: Toward an integrated model of autonomic nervous system functioning in psychopathology. Development and Psychopathology. 2001; 13:183–214.10.1017/S0954579401002012 [PubMed: 11393643]

Beauchaine TP, Katkin ES, Strassberg Z, Snarr J. Disinhibitory psychopathology in male adolescents: Discriminating conduct disorder from attention deficit/hyperactivity disorder through concurrent assessment of multiple autonomic states. Journal of Abnormal Psychology. 2001; 110:610–624.10.1037/0021-843X.110.4.610 [PubMed: 11727950]

Belsky J, Pluess M. Beyond diathesis stress: Differential susceptibility to environmental influences. Psychological Bulletin. 2009; 135:885–908.10.1037/a0017376 [PubMed: 19883141]

Biesanz JC, Deeb-Sossa N, Papadakis AA, Bollen KA, Curran PJ. The role of coding time in estimating and interpreting growth curve models. Psychological Methods. 2004; 9:30–52. [PubMed: 15053718]

Bongers IL, Koot HM, van der Ende J, Verhulst FC. The normative development of child and adolescent problem behavior. Journal of Abnormal Psychology. 2003; 112:179–192.10.1037/0021-843X.112.2.179 [PubMed: 12784827]

Boomsma, A. The robustness of maximum likelihood estimation in structural equation models. In: Cuttance, P.; Ecob, R., editors. Structural modeling by example: Applications in educational, sociological, and behavioral research. New York, NY: Cambridge University Press; 1987. p. 160-188.

Boucsein, W. Electrodermal activity. New York, NY: Plenum Press; 1992.

Boyce WT, Ellis B. Biological sensitivity to context: An evolutionary-developmental theory of the origins and functions of stress reactivity. Developmental Psychopathology. 2005; 7:271–301.

Brown BB, Mounts N, Lamborn SD, Steinberg L. Parenting practices and peer group affiliation in adolescence. Child Development. 1993; 64:467–482.10.2307/1131263 [PubMed: 8477629]

Burt SA, McGue M, Krueger RF, Iacono WG. How are parent–child conflict and childhood externalizing symptoms related over time? Results from a genetically informative cross-lagged study. Development and Psychopathology. 2005; 17:145–165.10.1017/S095457940505008X [PubMed: 15971764]

Caspi, A.; Moffitt, TE. The continuity of maladaptive behavior: From description to understanding in the study of antisocial behavior. In: Cicchetti, D.; Cohen, DJ., editors. Developmental psychopathology. Volume 2: Risk, disorder, and adaptation. New York, NY: Wiley; 1995. p. 472-511.

Cicchetti, D.; Cohen, DJ. Perspectives on developmental psychopathology. In: Cicchetti, D.; Cohen, DJ., editors. Developmental psychopathology. Volume 1: Theory and methods. New York, NY: Wiley; 1995. p. 3-22.

Colder CR, Lochman JE, Wells KC. The moderating effects of children's fear and activity level on relations between parenting practices and childhood symptomatology. Journal of Abnormal Child Psychology. 1997; 25:251–263.10.1023/A:1025704217619 [PubMed: 9212377]

Cummings EM, Ballard M, El-Sheikh M, Lake M. Resolution and children's responses to interadult anger. Developmental Psychology. 1991; 27:462–470.10.1037/0012-1649.27.3.462

Cummings EM, Davies PT. Emotional security as a regulatory process in normal development and the development of psychopathology. Development and Psychopathology. 1996; 8:123–139.10.1017/S0954579400007008

Cummings EM, El-Sheikh M, Kouros CD, Keller PS. Children's skin conductance reactivity as a mechanism of risk in the context of parental depressive symptoms. Journal of Child Psychology and Psychiatry. 2007; 48:436–445.10.1111/j.1469-7610.2006.01713.x [PubMed: 17501724]

Curran PJ, Bauer DJ, Willoughby MT. Testing main effects and interactions in latent curve analysis. Psychological Methods. 2004; 9:220–237.10.1037/1082-989X.9.2.220 [PubMed: 15137890]

Curran PJ, Willoughby MT. Implications of latent trajectory models for the study of developmental psychopathology. Development and Psychopathology. 2003; 15:581–612.10.1017/S0954579403000300 [PubMed: 14582933]

Dadds MR, Salmon K. Punishment insensitivity and parenting: Temperament and learning as interacting risks for antisocial behavior. Clinical Child and Family Psychology Review. 2003; 6:69–86.10.1023/A:1023762009877 [PubMed: 12836578]

Davies PT, Sturge-Apple ML, Woitach MJ, Cummings EM. A process analysis of the transmission of distress from interparental conflict to parenting: Adult relationship security as an explanatory mechanism. Developmental Psychology. 2009; 45:1761–1773.10.1037/a0016426 [PubMed: 19899930]

Dishion TJ, Patterson GR, Stoolmiller M, Skinner MS. Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. Developmental Psychology. 1991; 27:172–180.10.1037/0012-1649.27.1.172

Dodge KA, Bates JE, Pettit GS. Mechanisms in the cycle of violence. Science. 1990; 250:1678–1683.10.1126/science.2270481 [PubMed: 2270481]

Dodge KA, Pettit GS. A biopsychosocial model of the development of chronic conduct problems in adolescence. Developmental Psychology. 2003; 39:349–371.10.1037/0012-1649.39.2.349 [PubMed: 12661890]

Duncan TE, Duncan SC. An introduction to latent growth curve modeling. Behavior Therapy. 2004; 35:333–363.10.1016/S0005-7894(04)80042-X

El-Sheikh M. Parental drinking problems and children's adjustment: Vagal regulation and emotional reactivity as pathways and moderators of risk. Journal of Abnormal Psychology. 2001; 110:499–515.10.1037/0021-843X.110.4.499 [PubMed: 11727940]

El-Sheikh M. The role of emotional responses and physiological reactivity in the marital conflict-child functioning link. Journal of Child Psychology and Psychiatry. 2005; 46:1191–1199.10.1111/j.1469-7610.2005.00418.x [PubMed: 16238666]

El-Sheikh M. Children's skin conductance level and reactivity: Are these measures stable over time? Developmental Psychobiology. 2007; 49:180–186.10.1002/dev.20171 [PubMed: 17299790]

El-Sheikh M, Harger J, Whitson SM. Exposure to interparental conflict and children's adjustment and physical health: The moderating role of vagal tone. Child Development. 2001; 72:1617–1636.10.1111/1467-8624.00369 [PubMed: 11768136]

El-Sheikh M, Keller PS, Erath SA. Marital conflict and risk for child maladjustment over time: Skin conductance level reactivity as a vulnerability factor. Journal of Abnormal Child Psychology. 2007; 35:715–727.10.1007/s10802-007-9127-2 [PubMed: 17503176]

Erath SA, El-Sheikh M, Cummings EM. Harsh parenting and child externalizing behavior: Skin conductance level reactivity as a moderator. Child Development. 2009; 80:578–592.10.1111/j.1467-8624.2009.01280.x [PubMed: 19467012]

Fowles DC. The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. Psychophysiology. 1980; 17:87–104.10.1111/j.1469-8986.1980.tb00117.x [PubMed: 6103567]

Fowles DC, Kochanska G, Murray K. Electrodermal activity and temperament in preschool children. Psychophysiology. 2000; 37:777–787.10.1017/S0048577200981836 [PubMed: 11117458]

Frick PJ, Cornell AH, Bodin SD, Dane HA, Barry CT, Loney BR. Callous-unemotional traits and developmental pathways to severe conduct problems. Developmental Psychology. 2003; 39:246–260.10.1037/0012-1649.39.2.246 [PubMed: 12661884]

Gao Y, Raine A, Venables PH, Dawson ME, Mednick SA. Reduced electrodermal fear conditioning from ages 3 to 8 years is associated with aggressive behavior at age 8 years. Journal of Child Psychology and Psychiatry. 2010; 51:550–558.10.1111/j.1469-7610.2009.02176.x [PubMed: 19788551]

Gershoff ET. Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. Psychological Bulletin. 2002; 128:539–579.10.1037/0033-2909.128.4.539 [PubMed: 12081081]

Goeke-Morey MC, Cummings EM, Harold GT, Shelton KH. Categories and continua of destructive and constructive marital conflict tactics from the perspective of U.S. and Welsh children. Journal of Family Psychology. 2003; 17:327–338.10.1037/0893-3200.17.3.327 [PubMed: 14562457]

Gray, JA. The psychology of fear and stress. Cambridge, England: Cambridge University Press; 1987.

Hartup WW. Peer interaction: What causes what? Journal of Abnormal Child Psychology. 2005; 33:387–394.10.1007/s10802-005-3578-0 [PubMed: 15957565]

Hinden BR, Compas BE, Howell DC, Achenbach TM. Covariation of the anxious-depressed syndrome during adolescence: Separating fact from artifact. Journal of Consulting and Clinical Psychology. 1997; 65:6–14.10.1037/0022-006X.65.1.6 [PubMed: 9103729]

Hoffman, ML. Affective and cognitive processes in moral internalization. In: Higgins, ET.; Ruble, DN.; Hartup, WW., editors. Social cognition and social development: A sociocultural perspective. New York, NY: Cambridge University Press; 1983. p. 236-274.

Hollingshead, AB. Unpublished manuscript. 1975. Four factor index of social status.

Hubbard JA, Smithmyer CM, Ramsden SR, Parker EH, Flanagan KD, Dearing KF, Simons RF. Observational, physiological, and self-reported measures of children's anger: Relations to reactive versus proactive aggression. Child Development. 2002; 73:1101–1118.10.1111/1467-8624.00460 [PubMed: 12146736]

Jaffee SR, Caspi A, Moffitt TE, Polo-Thomas M, Price T, Taylor A. The limits of child effects: Evidence for genetically mediated child effects on corporal punishment, but not on maltreatment. Developmental Psychology. 2004; 40:1047–1058.10.1037/0012-1649.40.6.1047 [PubMed: 15535755]

Keiley MK, Bates JE, Dodge KA, Pettit GS. A cross-domain growth analysis: Externalizing and internalizing behaviors during 8 years of childhood. Journal of Abnormal Child Psychology. 2000; 28:161–179.10.1023/A:1005122814723 [PubMed: 10834768]

Keiley MK, Lofthouse M, Bates JE, Dodge KA, Pettit GS. Differential risks of covarying and pure components in mother and teacher reports of externalizing and internalizing behavior across ages 5 to 14. Journal of Abnormal Child Psychology. 2003; 31:267–283.10.1023/A:1023277413027 [PubMed: 12774860]

Kochanska G. Toward a synthesis of parental socialization and child development in early development of conscience. Child Development. 1993; 64:325–347.10.2307/1131254

Kochanska G. Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. Developmental Psychology. 1997; 33:228–240.10.1037/0012-1649.33.2.228 [PubMed: 9147832]

Kovacs M. The Children's Depression Inventory (CDI). Psychological Bulletin. 1985; 21:995–998.

Kraemer HC, Measelle JR, Ablow JC, Essex MJ, Boyce WT, Kupfer DJ. A new approach to integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. American Journal of Psychiatry. 2003; 160:1566–1577.10.1176/appi.ajp.160.9.1566 [PubMed: 12944328]

Lachar, D.; Gruber, CP. Personality Inventory for Children. 2. Los Angeles, CA: Western Psychological Services; 2001. (PIC–2)

Lachar, D.; Wingenfeld, SA.; Kline, RB.; Gruber, CP. Student behavior survey manual. Los Angeles, CA: Western Psychological Services; 2000.

Lansford JE, Deater-Deckard K, Dodge KA, Bates JE, Pettit GS. Ethnic differences in the link between physical discipline and later adolescent externalizing behaviors. Journal of Child Psychology and Psychiatry. 2004; 45:801–812.10.1111/j.1469-7610.2004 .00273.x [PubMed: 15056311]

Larsson H, Viding E, Rijsdijk FV, Plomin R. Relationships between parental negativity and childhood antisocial behavior over time: A bidirectional effects model in a longitudinal genetically informative design. Journal of Abnormal Child Psychology. 2008; 36:633–645.10.1007/s10802-007-9151-2 [PubMed: 17602294]

Loeber R, Green SM, Lahey BB. Mental health professionals' perception of the utility of children, mothers, and teachers as informants on childhood psychopathology. Journal of Clinical Child Psychology. 1990; 19:136–143.10.1207/s15374424jccp1902_5

Lorber MF. Psychophysiology of aggression, psychopathy, and conduct problems: A meta-analysis. Psychological Bulletin. 2004; 130:531–552.10.1037/0033-2909.130.4.531 [PubMed: 15250812]

Marsee MA, Silverthorn P, Frick PJ. The association of psychopathic traits with aggression and delinquency in non-referred boys and girls. Behavioral Sciences and the Law. 2005; 23:803–817.10.1002/bsl.662 [PubMed: 16333813]

Matthys W, van Goozen SHM, Snoek H, van Engeland H. Response preservation and sensitivity to reward and punishment in boys with oppositional defiant disorder. European Child and Adolescent Psychiatry. 2004; 13:362–364.10.1007/s00787-004-0395-x [PubMed: 15619048]

Morris AS, Silk JS, Steinberg L, Sessa FM, Avenevoli S, Essex MJ. Temperamental vulnerability and negative parenting as interacting predictors of child adjustment. Journal of Marriage and the Family. 2002; 64:461–471.10.1111/j.1741-3737.2002.00461.x

Paterson G, Sanson A. The association of behavioural adjustment to temperament, parenting and family characteristics among 5-year-old children. Social Development. 1999; 8:293–309.10.1111/1467-9507.00097

Patterson, GR.; Reid, JB.; Dishion, TJ. Antisocial boys. Eugene, OR: Castalia; 1992.

Pettit GS, Arsiwalla DD. Commentary on special section on "bidirectional parent–child relationships": The continuing evolution of dynamic, transactional models of parenting and youth behavior problems. Journal of Abnormal Child Psychology. 2008; 36:711–718.10.1007/s10802-008-9242-8 [PubMed: 18473161]

Prinzie P, Onghena P, Hellinckx W, Grietens H, Ghesquiere P, Coplin H. The additive and interactive effects of parenting and children's personality on externalizing behaviour. European Journal of Personality. 2003; 17:95–117.10.1002/per.467

Raine A. Biosocial studies of antisocial and violent behavior in children and adults: A review. Journal of Abnormal Child Psychology. 2002; 30:311–326.10.1023/A:1015754122318 [PubMed: 12108763]

Raykov T. Analysis of longitudinal studies with missing data using covariance structure modeling with full-information maximum likelihood. Structural Equation Modeling. 2005; 12:493–505.10.1207/s15328007sem1203_8

Reynolds CR, Richmond BO. Factor structure and content validity of "What I Think and Feel": The Revised Children's Manifest Anxiety Scale. Journal of Personality Assessment. 1979; 43:281–283.10.1207/s15327752jpa4303_9 [PubMed: 469706]

Schafer JL, Graham JW. Missing data: Our view of the state of the art. Psychological Methods. 2002; 7:147–177.10.1037/1082-989X.7.2.147 [PubMed: 12090408]

Schreiber JB, Stage FK, King J, Nora A, Barlow EA. Reporting structural equation modeling and confirmatory factor analysis results: A review. Journal of Educational Research. 2006; 99:323–338.10.3200/JOER.99.6.323-338

Shannon KE, Beauchaine TP, Brenner SL, Neuhaus E, Gatzke-Kopp L. Familial and temperamental predictors of resilience in children at risk for conduct disorder and depression. Development and Psychopathology. 2007; 19:701–727.10.1017/S0954579407000351 [PubMed: 17705899]

Stanger C, Achenbach TM, Verhulst FC. Accelerated longitudinal comparisons of aggressive versus delinquent syndromes. Development and Psychopathology. 1997; 9:43–58.10.1017/S0954579497001053 [PubMed: 9089123]

Straus, MA. Child-report, adult-recall, and sibling versions of the Revised Conflict Tactics Scale. Durham, NC: Family Research Laboratory; 1999.

Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The revised Conflict Tactics Scales (CTS-2): Development and preliminary psychometric data. Journal of Family Issues. 1996; 17:283–316.10.1177/019251396017003001

Straus MA, Stewart JH. Corporal punishment by American parents: National data on prevalence, chronicity, severity, and duration, in relation to child and family characteristics. Clinical Child and Family Psychology Review. 1999; 2:55–70.10.1023/A:1021891529770 [PubMed: 11225932]

United States Census Bureau. United States Census 2005. 2005. Retrieved from: http://www.census.gov/

Wirt, RD.; Lachar, D.; Klinedinst, JK.; Seat, PD. Multidimensional description of child personality: A manual for the Personality Inventory of Children. 1990. Los Angeles, CA: Western Psychological Services; 1990.

Wootton JM, Frick PJ, Shelton KK, Silverthorn P. Ineffective parenting and childhood conduct problems: The moderating role of callous-unemotional traits. Journal of Consulting and Clinical Psychology. 1997; 65:301–308.10.1037/0022-006X.65.2.292.b [PubMed: 9086694]

Yodanis, CL.; Hill, KA.; Straus, MA. Tabular summaries of methodological characteristics of research using the Conflict Tactics Scale. Durham, NC: Family Research Laboratory; 2001.

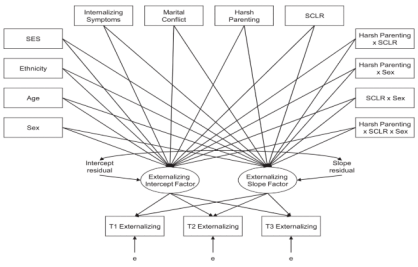

Figure 1.
Conceptual conditional latent growth model for externalizing behavior. SCLR = skin conductance level reactivity; SES = socioeconomic status.

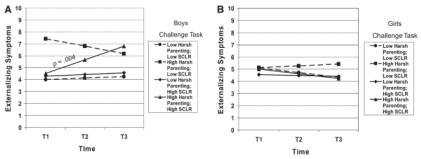

Figure 2.

Trajectories of externalizing behavior among boys (A) and girls (B) at ±1 standard deviation on child-reported harsh parenting and SCLR-challenge. SCLR = skin conductance level reactivity.

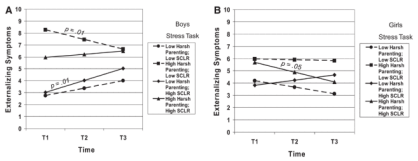

Figure 3.
Trajectories of externalizing behavior among boys (A) and girls (B) at ±1 standard deviation on parent-reported harsh parenting and SCLR-stress. SCLR = skin conductance level reactivity.

Table 1

Descriptive Statistics and Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	*M*	*SD*
1. Sex[a]	—												—	—
2. Age (months) at T1	−.16*	—											98.71	8.71
3. Ethnicity[b]	.04	−.08	—										—	—
4. SES	−.03	.07	−.22**	—									37.38	9.92
5. Internalizing (child report)[c]	.11	−.13*	.12	−.03	—								0.00	.85
6. Marital conflict	−.01	.04	.16*	−.09	−.01	—							4.21	4.69
7. Harsh parenting (child report)	−.22**	−.06	.09	.04	.31**	−.06	—						5.47	4.90
8. Harsh parenting (parent report)	−.05	.04	.01	.02	.06	.39**	.15*	—					5.86	3.71
9. SCLR-stress[d]	.01	.01	−.11	.10	.05	.12	−.02	.05	—				−0.10	1.29
10. SCLR-challenge[d]	.05	.05	−.19**	.11	−.04	.06	−.16*	−.01	.51**	—			−0.09	2.38
11. T1 Externalizing	−.05	.03	.01	−.12	.14*	.15*	.19**	.43**	−.13	−.13*	—		4.92	3.74
12. T2 Externalizing	−.17*	.09	−.05	−.11	.17*	.10	.21**	.24**	.05	−.05	.71**	—	4.73	3.82
13. T3 Externalizing	−.07	−.01	−.11	−.07	.16*	.05	.22**	.25**	.07	.03	.63**	.74**	4.36	3.97

Note. SCLR = skin conductance level reactivity.

[a] Sex was coded 0 for boys and 1 for girls.

[b] Ethnicity was coded 0 for European American and 1 for African American.

[c] Standardized score.

[d] SCLR-stress and SCLR-challenge are residualized scores that represent change from baseline to lab tasks, such that a positive score indicates higher levels of SCL during the task than during baseline.

* $p < .05$.

** $p < .01$.

Table 2

Parameter Estimates and Standard Errors for Unconditional Growth Models of Externalizing Behavior With Unconstrained and Constrained Error Variances

	Intercept factor		Slope factor									
Model	**Estimate**	***SE***	**Estimate**	***SE***	**RMSEA**	**CFI**	χ^2	***df***	***p***	$\Delta\chi^2$	Δdf	**BCC**
Unconstrained error variances					.00	1.0	.157	1	.69	—	—	16.41
Constrained error variances	4.92** (10.43**)	.23 (1.37)	−.24* (0.94**)	.11 (0.36)	.00	1.0	.890	3	.83	.73	2	13.07

Note. RMSEA = root-mean-square error of approximation; CFI = comparative fit index; BCC = Browne-Cudeck criterion. Estimates and standard errors are shown for the growth model used in analyses (the model with constrained error variances). Average intercept and slope values and their standard errors are listed without parentheses. Variability estimates of the intercept and slope and their standard errors are shown in parentheses.

* $p < .05$.

** $p < .01$.

Table 3

Parameter Estimates and Standard Errors for Conditional Growth Models of Externalizing Behavior Predicted by Child-Reported Harsh Parenting, SCLR, Sex, and Their Interactions

	Model 1: SCLR-stress						Model 2: SCLR-challenge					
	Externalizing Intercept factor			Externalizing Slope factor			Externalizing Intercept factor			Externalizing Slope factor		
Predictor	***B***	***SE***	**β**	***B***	***SE***	**β**	***B***	***SE***	**β**	***B***	***SE***	**β**
Sex	−.28	.45	−.04	−.13	.23	−.06	−.18	.45	−.03	−.25	.23	−.13
Age at T1	.02	.03	.05	−.01	.01	−.04	.02	.03	.06	−.01	.01	−.04
Ethnicity	−.57	.47	−.08	−.32	.24	−.15	−.56	.47	−.08	−.35	.24	−.17
SES	−.04	.02	−.13	.01	.01	.04	−.04	.02	−.12	.01	.01	.02
Internalizing (child report)	.57	.27	.15*	.01	.14	.01	.58	.27	.15*	.01	.14	.01
Marital conflict	.14	.05	.20**	−.03	.02	−.14	.13	.05	.19**	−.02	.02	−.11
Harsh parenting (child report)	.19	.06	.28**	.01	.03	.02	.16	.06	.24**	.02	.03	.09
SCLR	−.50	.27	−.19	.31	.14	.39*	−.26	.13	−.19*	.18	.07	.42**
Harsh parenting × SCLR	−.04	.05	−.08	.01	.03	.06	−.06	.03	−.19*	.03	.01	.33*
Harsh Parenting × Sex	−.16	.10	−.14	.01	.05	.04	−.14	.10	−.12	−.02	.05	−.07
SCLR × Sex	.31	.40	.08	−.14	.21	−.13	.19	.21	.09	−.20	.11	−.32
Harsh Parenting × SCLR × Sex	.04	.10	.03	−.02	.05	−.05	.08	.05	.15	−.06	.02	−.38*

Note. SES = socioeconomic status; SCLR = skin conductance level reactivity.

* $p < .05$.

** $p < .01$.

Table 4

Parameter Estimates and Standard Errors for Conditional Growth Models of Externalizing Behavior Predicted by Parent Reported Harsh Parenting, SCLR, Sex, and Their Interactions

	Model 3: SCLR-stress						Model 4: SCLR-challenge					
	Externalizing Intercept factor			Externalizing Slope factor			Externalizing Intercept factor			Externalizing Slope factor		
Predictor	***B***	***SE***	**β**	***B***	***SE***	**β**	***B***	***SE***	**β**	***B***	***SE***	**β**
Sex	−.42	.41	−.06	−.23	.22	−.11	−.49	.41	−.08	−.28	.22	−.13
Age at T1	.01	.02	.03	−.01	.01	−.01	.02	.02	.05	−.01	.01	−.05
Ethnicity	−.16	.44	−.02	−.40	.24	−.17	−.22	.43	−.03	−.35	.24	−.16
SES	−.04	.02	−.13*	.01	.01	.03	−.04	.02	−.13	.01	.01	.04
Internalizing (child report)	.60	.24	.16*	.05	.13	.04	.68	.24	.18**	.08	.13	.06
Marital conflict	−.01	.05	−.01	−.01	.02	−.02	.01	.05	.01	−.01	.02	−.01
Harsh parenting (parent report)	.54	.08	.58**	−.14	.04	−.45**	.52	.08	.57**	−.13	.04	−.46**
SCLR	−.42	.24	−.16	.31	.13	.36*	−.32	.12	−.23**	.21	.07	.46**
Harsh Parenting × SCLR	−.11	.05	−.19*	.03	.03	.14	−.07	.03	−.19*	.01	.02	.05
Harsh Parenting × sex	−.25	.11	−.20*	.07	.06	.17	−.28	.11	−.23**	.10	.06	.25
SCLR × Sex	.33	.34	.09	−.22	.19	−.17	.26	.18	.13	−.18	.10	−.28
Harsh Parenting × SCLR × Sex	.16	.09	.13	−.13	.05	−.34**	−.012	.05	−.02	−.04	.03	−.18

Note. SES = socioeconomic status; SCLR = skin conductance level reactivity.

* $p < .05$.

** $p < .01$.