

**Skin conductance reactivity moderates the association between parental behavioral control
and adolescent externalizing behavior**

by

Courtney Fixelle

A thesis submitted to the Graduate Faculty of
Auburn University in partial fulfillment of the
requirements for the Degree of
Master of Science

Auburn, Alabama
August 4, 2018

Keywords: externalizing behaviors, permissive parenting, parental behavioral control, skin
conductance level reactivity, early adolescence

Copyright 2018 by Courtney Fixelle

Approved by

Stephen A. Erath, Chair, Professor, Human Development and Family Studies
Thomas A. Smith, Associate Professor, Human Development and Family Studies
Mallory Lucier-Greer, Associate Professor, Human Development and Family Studies

Abstract

The present study examined whether skin conductance level reactivity (SCLR) moderated the concurrent and longitudinal association between parental behavioral control and early adolescents' externalizing behaviors. Data were collected from 80 early adolescents and their parents when they were initially in the fifth or sixth grade (T1) and then again a year later (T2). Parents reported on parental behavioral control at T1 and adolescent externalizing behaviors at T1 and T2, and adolescents self-reported on aggression at T1 and T2. At T1, adolescents' SCLR was measured during a peer-evaluative stress task (SCLR-peer) and parent-adolescent interaction about possible peer rejection (SCLR-parent). Consistent with the literature, regression analyses revealed a cross-sectional association between higher parental behavioral control (i.e., lower permissive parenting) and lower T1 parent-reported externalizing behaviors. Also, higher SCLR-parent and SCLR-peer were associated with lower T1 adolescent-reported aggression. SCLR-parent moderated the association between parental behavioral control and parent-reported adolescent externalizing behaviors in both cross-sectional and longitudinal analyses. In cross-sectional analyses, parental behavioral control was associated with lower T1 parent-reported externalizing behaviors at lower and higher levels of SCLR, although the association was stronger at higher levels of SCLR. In longitudinal analyses, parental behavioral control did not predict T2 parent-reported externalizing behaviors at higher levels of SCLR, but predicted higher T2 parent-reported externalizing behaviors at lower levels of SCLR. Results suggest that interventions for adolescents with behavior problems may be improved by matching parenting strategies with adolescents' attributes.

Acknowledgements

The author would like to thank Dr. Stephen Erath for his support and encouragement throughout this Master's thesis, as well as her committee members, Dr. Thomas Smith and Dr. Mallory Lucier-Greer. The author would also like to express her gratitude to her family, cohort, and other faculty members over the past two years.

This research was supported by a grant from the National Science Foundation (BCS0921271) awarded to Stephen Erath and a grant from the Alabama Agricultural Experiment Station (ALA010-047) awarded to Gregory Pettit and Stephen Erath. The content is solely the responsibility of the author and does not necessarily represent the official views of the National Science Foundation or Alabama Agricultural Experiment Station. We wish to thank the research team and the children and parents who participated.

Table of Contents

Introduction.....	1
Literature Review.....	2
Parental Behavioral Control and Adolescent Externalizing Behaviors.....	2
Interaction between Parenting and Temperament.....	4
Skin Conductance Level Reactivity as a Potential Moderator.....	6
Interaction between Parental Behavioral Control and SCLR.....	7
The Present Study.....	12
Methods.....	13
Participants.....	13
Procedures.....	14
Measures.....	15
Plan of Analysis.....	17
Results.....	18
Preliminary Analyses.....	18
Predicting Parent-reported Adolescent Externalizing Behaviors.....	19
Predicting Adolescent-Reported Aggression.....	20
Discussion.....	22
Parental Behavioral Control and Adolescent’s Externalizing Behaviors.....	23
SCLR and Adolescent’s Externalizing Behaviors.....	25

SCLR Moderates Parental Behavioral Control and Adolescent's Externalizing Behaviors.....	26
Limitations/Future Directions.....	30
Intervention Implications.....	31
References.....	33

List of Tables

Table 1: Descriptive Statistics.....	41
Table 2: Correlations Between Demographics, Predictors, and Outcomes.....	42
Table 3: Predicting Parent-reported Externalizing Behaviors with Permissive Parenting and SCLR-Parent	43
Table 4: Predicting Parent-reported Externalizing Behaviors with Permissive Parenting and SCLR-Peer.....	44
Table 5: Predicting Adolescent-reported Aggression with Permissive Parenting and SCLR-Parent.....	45
Table 6: Predicting Adolescent-reported Aggression with Permissive Parenting and SCLR-Peer.....	46

List of Figures

Figure 1: Associations between Permissive Parenting and Externalizing Behaviors at Higher and Lower Levels of SCLR-Parent	47
Figure 2: Longitudinal Associations between Permissive Parenting and Externalizing Behaviors at Higher and Lower Levels of SCLR-Parent	48

Skin conductance reactivity moderates the association between parental behavioral control and adolescent externalizing behaviors

Externalizing behaviors refers to impulsivity, defiance, aggression, and covert antisocial behaviors (Hinshaw, 2002). Externalizing behavior is a common and relatively stable form of childhood maladjustment with possible long-term negative psychosocial outcomes (Pinquart, 2017), including disorders such as oppositional defiant disorder and conduct disorder, as well as learning and relationship problems, anxiety disorders, mood disorders, and substance use disorders (Hinshaw, 2002; McKee, Colletti, Rakow, Jones, & Forehand, 2008). While some children experience a decrease in symptoms over time, others continue to exhibit externalizing behaviors, creating significant social problems in their adolescent and adult lives (Campbell, Shaw, & Gilliom, 2000).

Numerous studies have examined risk and protective factors for child externalizing behaviors (Barber, Olsen, & Shagle, 1994; Grusec & Davidov, 2010; Pinquart, 2017). As reviewed below, poor parental behavioral control and autonomic nervous system (ANS) under-arousal are well-documented predictors of externalizing behaviors. Furthermore, many studies have demonstrated that externalizing behavior is the result of interactions between environmental factors, such as parental behavioral control, and individual factors, such as ANS under-arousal. In particular, recent studies have suggested that low skin conductance level reactivity (SCLR), a measure of ANS under-arousal and physiological marker low inhibitory self-control, increases vulnerability to externalizing behaviors in the context of harsh or aggressive social environments, such as harsh parenting. An innovative and important question addressed by the present study is whether SCLR also moderates the association between parental behavioral control (i.e., setting and consistently enforcing limits) and adolescent externalizing behaviors.

Parental Behavioral Control and Adolescent Externalizing Behaviors

Parental behavioral control is one of several major domains of socialization (Grusec & Davidov, 2010). In the control domain, parents utilize their resources, specifically, social and material rewards, withdrawal of rewards and privileges, and superior knowledge, to discourage children's inappropriate behavior and encourage appropriate behavior. Behavioral control strategies also include maturity demands, limit-setting, behavioral monitoring, and consequences (Aunola and Nurmi, 2005). The present study examines aspects of parental behavioral control commonly identified as permissive parenting, which involve the extent to which parents establish and enforce clear rules and limits.

The association between parental behavioral control and lower adolescent externalizing behavior is well-established. Locke and Prinz (2002) synthesized the literature on parental discipline and nurturance over the past 20 years, including longitudinal and cross-sectional studies. Using both reports and interviews, the review concluded that higher parental behavioral control is associated with lower externalizing behaviors. Furthermore, a meta-analysis of the concurrent and prospective associations between parental behavioral control strategies and child externalizing problems was conducted, integrating research from 1,435 studies (454 longitudinal) with children and adolescents (M age = 10.70) (Pinquart, 2017). Poorer parental behavioral control, including permissive parenting, was linked with higher levels of externalizing problems in both cross-sectional (behavioral control $r = -.19$) and longitudinal studies (behavioral control $r = -.07$).

Several studies demonstrate the association between parental behavioral control and externalizing behaviors in late childhood and early adolescence. For example, Barber, Olsen, and Shagle (1994) examined 473 fifth, eighth, and tenth grade students in a cross-sectional study

examining child reports of parent behaviors (e.g., authoritarian/intrusive, unrestricted autonomy granting, monitoring, laissez-faire) and externalizing behaviors. Analyses revealed that higher externalizing behaviors was linked to lower parental behavioral control (Barber, Olsen, & Shagle, 1994). As another example, Stice and Barrera (1995) used a longitudinal study containing data from 441 adolescents, ranging from 10.5 to 15.5 years, and their parents to examine the relationship between parenting and adolescents' externalizing behaviors. The study used both parent and adolescent reports to examine parental behavioral control, parental support, externalizing symptoms, and adolescent substance use. There was an association between adolescent externalizing symptoms and deficits in parental support and control (e.g., consistency and monitoring) (Stice & Barrera, 1995). More recently, Gryczkowski, Jordan, and Mercer (2010) conducted a study on 135 cohabitating couples with a child ages 6-12 to examine the relationship between parenting and externalizing behaviors. Lower parental behavioral control, including poor supervision/monitoring and inconsistent discipline, related to higher levels of externalizing behaviors (Gryczkowski et al., 2010).

In addition to evidence from correlational studies, intervention studies also provide evidence for an association for parental behavioral control and reduced externalizing behaviors in children. Behavioral parent training programs are widely used to address child behavioral problems (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005), and these programs primarily target parental behavioral control such as consistency and rule setting. A meta-analysis showed that children whose parents participated in behavioral parent training programs had fewer externalizing behavior problems than 80% of children whose parents did not participate (Serketich & Dumas, 1996). The consistent positive effects of behavioral parent training programs in randomized controlled trials provides additional compelling evidence that effective

parental behavioral control can reduce children's externalizing behavior problems (Maughan et al., 2005; Serketich & Dumas, 1996).

Interaction between Parenting and Temperament

Despite the relatively robust association between parental behavioral control and externalizing behaviors, a growing body of research shows that child characteristics account for variability in the strength of associations linking family and parenting processes with child outcomes (Bates & Pettit, 2007). Consistent with person x environment and developmental psychopathology conceptual frameworks, child adjustment outcomes depend on the fit between attributes of the child (e.g., temperament) and aspects of the environment (Cicchetti, 2006; Thomas & Chess, 1977). That is, developmental outcomes are not strongly predicted based on either individual or environmental factors alone; generally, the combination of information about the individual and the environment better predicts outcomes than either alone.

Several studies have examined whether child temperament dimensions related to inhibitory self-control moderate the association between parental behavioral control and child externalizing behaviors. For example, one cross-sectional study examined the interaction between parenting and temperament (Karreman, De Haas, Van Tuijl, Van Aken, & Dekovic, 2010). Participants included 89 two-parent families raising their firstborn preschool-age child in the Netherlands and 81 daycare and preschool playgroup teachers. Externalizing behaviors and temperament were measured using questionnaires completed by mothers, fathers, and teachers. Observation of two sessions of unstructured and two sessions of structured play with each parent provided the parenting data. Analyses revealed that child impulsivity and anger were positively associated with externalizing problems. However, positive control (limit setting, provision of

structure) of the father attenuated the association between impulsivity and externalizing problems.

Similarly, Stice and Gonzales examined interactions between parenting and adolescent temperament as predictors of antisocial behavior and substance use in a sample of 631 adolescents. The cross-sectional study included adolescent reports of parental behavioral control, adolescent behavioral under-control, antisocial behavior, and substance use. In terms of temperament, behavioral under-control emerged as a risk factor for antisocial behavior and substance use. However, parental behavioral control protected adolescents with low control from risky problem behaviors. That is, the association between low self-control and risky problem behavior was weaker when parental behavioral control was stronger (Stice & Gonzales, 1998).

Using a longitudinal design, Kuhn and Laird (2013) examined the interaction between parental restrictions (opportunity restrictions to possible exposure to antisocial behaviors) and child self-control in early adolescence. Data from this study were collected from a sample of 180 early adolescents over a two-year period. The study examined adolescent reports of low self-control, antisocial peer involvement, unsupervised time, parent solicitation, family rules, and antisocial behavior. Consistent with previous research, lower self-control was associated with antisocial behavior, involvement with antisocial peers, more unsupervised time, less parental solicitation, and fewer family rules. Parental restrictions predicted less antisocial behavior for children with low self-control, suggesting that parental restrictions protect adolescents with low self-control from engaging in antisocial behaviors (Kuhn & Laird, 2013).

Thus, several studies have shown that children's temperamental inhibitory self-control, as measured by parent or self-reports, moderated the association between parental behavioral control and child or adolescent externalizing behaviors. These studies suggest that externalizing

problems are elevated among adolescents with low inhibitory self-control in the context of less parental behavioral control. The study focuses on the interaction between parental behavioral control and SCLR. SCLR is a physiological measure that is conceptually related to temperamental inhibitory self-control, but measured objectively in the context of social stress.

Skin Conductance Level Reactivity as a Potential Moderator

The ANS is a key component of the human stress response system, and ANS activity is a well-documented moderator of family influences (El-Sheikh & Erath, 2011). In general, ANS arousal reflects sensitivity to environmental circumstances. ANS arousal also serves as a signal to increase awareness and provides physiological resources for cognitive or behavioral action (Porges, 2007). Children who experience low levels of ANS arousal in challenging social situations may be insensitive to social cues or negative social consequences (Raine, 2002). This insensitivity may increase their risk for social and behavioral problems, particularly in the context of other social risk factors (e.g., harsh parenting, Erath, El-Sheikh, & Cummings, 2009; peer victimization, Gregson, Tu, & Erath, 2014; affiliation with deviant peers (Sijtsema, Rambaran, & Ojanen, 2013). At the other extreme, children who experience heightened ANS arousal in challenging social situations may experience increased emotional distress and tend to retaliate with aggressive behaviors (Hubbard et al., 2002; Rudolph, Troop-Gordon, & Granger, 2010). Whether low or high ANS reactivity is maladaptive may depend on the nature of the social challenge as well as the particular ANS measure (El-Sheikh & Erath, 2011; Lafko, Murray-Close, & Shoulberg, 2015; Obradovic, Bush, & Boyce, 2011).

SCLR refers to electrodermal reactivity caused by the activity of sweat glands, stimulated solely by the sympathetic (SNS) component of the autonomic nervous system (ANS). SCLR is also a marker of the Behavioral Inhibition System (BIS), a neurophysiological motivational

system that promotes inhibition, or caution, in situations that involve threat or potential negative consequences (Beauchaine, 2001). Consistent with fearlessness and stimulation-seeking theories (Raine, 2002), low SCLR is conceptualized as a marker of punishment insensitivity and poor inhibitory self-control (Beauchaine, 2001). For example, in support of this proposition, Matthys, van Goozen, Snoek, and van Engeland (2004) reported a correlation between response preservation following experimental punishment (i.e., “door-opening task”) and lower SCLR during the experimental procedure, suggesting that children with lower SCLR during the task were relatively insensitive to punishment. Furthermore, low SCLR is associated with impulsive and delinquent behaviors during childhood and adolescence (Beauchaine, Katkin, Strassberg, & Snarr, J 2001; Murray-Close, 2013; Raine, 2002). In contrast, higher SCLR is induced when individuals inhibit dominant responses, such as through cognitive reappraisal (Sheppes, Catran, & Meiran, 2009) or expressive suppression (Gross, 1998) in negative emotional circumstances. Thus, lower SCLR in social stress situations may reflect fearlessness or disinhibition, whereas higher SCLR may reflect inhibitory self-control efforts.

Interaction between Parental Behavioral Control and SCLR

The primary aim of the present study was to examine whether and how SCLR moderates the prospective association between parental behavioral control and early adolescents’ externalizing behaviors. Several studies have examined whether SCLR moderates the effects of other parenting practices on externalizing behavior. For example, one study examined SCLR as a moderator of concurrent associations between parent- and child-reported harsh parenting and children’s parent-reported externalizing behaviors (Erath, El-Sheikh, & Cummings, 2009). Participants included 251 children ($M_{age} = 8.23$ years) whose SCLR was measured in response to interpersonal (i.e., hearing an inter-adult argument) and cognitive (i.e., tracing a star with only

a mirror image as a guide) challenges. Analyses revealed consistent positive associations between harsh parenting and child externalizing behaviors at lower levels of SCLR, but not at higher levels of SCLR. Consistent with the conceptualization of SCLR as a marker of sensitivity to punishment and inhibitory self-control, children with low SCLR may not experience physiological cues that promote cautious behavioral responses to threat, and therefore may display increased anger and aggression in the context of harsh parental behaviors such as verbal aggression or physical discipline (Erath et al., 2009). This study was extended longitudinally, and additional analyses revealed that boys (but not girls) with harsher parents and lower SCLR exhibited high and stable parent-reported externalizing behaviors between ages 8 through 10 (Erath, El-Sheikh, Hinnant & Cummings, 2011).

Similarly, Kochanska, Brock, Chen, Aksan, and Anderson (2015) examined interactions between power-assertive discipline and skin conductance level (SCL; level of skin conductance during stress or challenge, rather than change from baseline to stress or challenge as in SCLR) as predictors of externalizing behaviors. The study utilized a sample of 102 children followed from infancy through late childhood, as well as a follow up longitudinal study (Kochanska et al., 2015; Kochanska, Brock, & Boldt, 2017). Kochanska et al. (2015) examined children's externalizing behaviors, measured at age eight and age ten using questionnaires completed by each parent. Mothers' and fathers' power-assertive control was measured at five time points during a laboratory observation in which parents directed requests (toy cleanup, do not touch the very attractive, off-limits objects displayed on the low shelf in the laboratory, etc.) to their children ages 15-80 months old. SCL was measured during five tasks: resting, deep breathing, startling (eight acoustic startle sounds), resting, and gift anticipation (wait for a gift while the timer on the computer screen showed the countdown). Children with lower SCL and a history of maternal

power assertive discipline had the highest levels of externalizing behaviors. In contrast, children with lower SCL and lower levels of maternal power assertive discipline had levels of externalizing behaviors that were similar to their counterparts with higher SCL. Thus, this study also suggested that lower SCL increases susceptibility to externalizing behaviors in the context of harsh parenting (Kochanska et al., 2015).

In a similar follow-up study, children were followed from 4.5 – 12 years old, with the same measures of SCL and antisocial behavior, but measures of mothers' and fathers' power assertive discipline at ages five and six (Kochanska, Brock, & Boldt, 2017). Observation of parents and children occurred during several naturalistic contexts involving simple requests (toy cleanup, do not touch the very attractive, off-limits objects displayed on the low shelf in the laboratory, etc.). The study revealed that early disregard for the rules predicts future antisocial behavior in children with low SCL whose parents use power-assertive discipline, but there was no direct effect among children with high SCL (Kochanska et al., 2017).

The studies cited above have shown that lower SCLR confers vulnerability to externalizing behavior problems in the context of direct parental aggression (i.e., harsh parenting or power assertive discipline). Notably, additional research has shown that low SCLR operates similarly to increase vulnerability to externalizing behaviors in the context of direct peer aggression. Gregson, Tu, and Erath (2014) examined 123 fifth and sixth grade students (and one parent per child) whose SCLR was measured during lab-based peer-evaluative stress tasks. Analyses revealed a link between peer victimization and externalizing behaviors, moderated by SCLR. The association between peer victimization and externalizing behaviors was stronger at lower levels of SCLR compared to higher levels of SCLR.

Erath, Su, and Tu (2016) extended the Gregson et al. (2014) study longitudinally, across the transition to middle school, and additional analyses revealed stable-high parent-reported externalizing behaviors and increasing adolescent-reported depressive symptoms at higher levels of adolescent- and teacher-reported peer victimization and lower levels of SCLR (Erath et al., 2016). The authors suggested that lower SCLR in the context of negative peer experiences may reflect lack of fear or caution, and prompt retaliatory responses, which are known to increase both peer problems and depressive symptoms (Dirks Suor, Rusch, & Frazier, 2014; Kochenderfer-Ladd, 2004).

As reviewed above, several studies provide evidence that harsh treatment by parents or peers predicts elevated or increasing externalizing behaviors, particularly among children with relatively low SCLR. Harsh treatment is believed to fuel oppositional and aggressive responses, particularly when directed at children who are relatively insensitive to negative consequences and struggle to inhibit impulsive responses (Erath, et al., 2009; Gregson et al., 2014). An important question for future research is whether children with low SCLR particularly *benefit* from a different kind of parenting behavior – parental behavioral control, rather than negativity and power assertion that appears to escalate parent-child conflict and corresponding externalizing behaviors.

Two recent studies have examined interactions between non-negative parental control in the peer domain (i.e., parental directing of friendships) and SCLR as predictors of peer outcomes. In these studies, parental directing, conceptualized as a form of parental behavioral control, referred to parental efforts to direct early adolescents toward prosocial friends and away from antisocial friends. Using the same sample and stress task described above (Gregson et al., 2014), parental directing of friendships predicted more prosocial peer affiliations and higher

friendship quality at lower levels of SCLR, but not at higher levels of SCLR (Tu, Erath, Pettit, & El-Sheikh, 2014). Similarly, Tu, Erath, and El-Sheikh (2017) also examined interactions between parental directing of friendships and SCLR. Data collection for this study occurred across multiple waves with a sample of 246 adolescents. The study examined SCLR using a baseline measure and a stress task that included participants tracing the outline of a star using only the reflection of the star through a mirror as a guide (i.e., star-tracing task). Consistent with previous research, SCLR moderated the association between parental directing and peer adjustment. Parental directing of friendships was associated with a decrease in friends' deviant behavior and adolescents' peer rejection at lower levels of SCLR. When parents do not direct disinhibited adolescents toward positive peer interactions, these adolescents may be more likely to affiliate with deviant friends and engage in risky activities (Tu et al., 2017).

The results of these studies suggest that whereas children with lower SCLR may carry heightened risk for externalizing behaviors in the context of parental aggression, they may particularly benefit from non-negative parental control (i.e., parental directing of friendships). One study has examined this possibility with measures of general parenting, rather than parenting in the peer domain specifically. Hinnant, Erath, Tu, and El-Sheikh (2016) examined 252 adolescents in a cross-sectional study. The study used adolescent reports of permissive parenting (Schaefer, 1965), SCLR to a star-tracing task, and adolescent reports of deviant peer affiliations. The star-tracing task is a standardized and widely-used measure of SCLR; however, it does not capture responses to social stress. High levels of permissive parenting were associated with deviant peer affiliation for adolescents with low SCLR. Thus, adolescents with lower SCLR and permissive parents affiliated with more deviant peers; however, when parents imposed more behavioral control (i.e., less permissive parenting), adolescents with lower SCLR affiliated with

less deviant peers. Building upon Hinnant et al. (2016), the current study advances the literature by incorporating a longitudinal design and measures of SCLR to social stress, as well as parent and adolescent reports of externalizing behaviors as outcome variables.

The Present Study

Research has shown that direct aggression against children (e.g., harsh parenting, peer victimization) is more strongly associated with externalizing behaviors among children with lower SCLR compared to higher SCLR. Potentially, this association occurs because children with low levels of inhibitory self-control are more inclined to retaliate or behave defiantly despite negative social consequences (Erath et al., 2009; Erath et al., 2011; Gregson et al., 2014; Kochanska et al., (2015; 2017). Studies have also suggested that children with relatively low temperamental inhibitory self-control (Karreman et al., 2010; Kuhn & Laird, 2013; Stice & Gonzales, 1998) or relatively low SCLR (Hinnant et al., 2016; Tu et al., 2014; 2017) may benefit more from non-negative forms of parental behavioral control compared to their counterparts with more inhibitory self-control or higher SCLR. However, these studies have been limited to subjective reports of temperament, measures of parental behavioral control that narrowly focus within the peer domain, or cross-sectional designs. No prior studies have examined whether SCLR moderates the cross-sectional and prospective association between general parental behavioral control and subsequent externalizing behaviors in early adolescence, despite the potential of such research to advance understanding of variability in the effects of parenting and to inform tailored prevention and intervention approaches.

The first aim of the present study was to examine if there is an association between parental behavioral control and early adolescents' externalizing behaviors using both parent and adolescent reports of externalizing (or aggressive) behaviors. We hypothesized that low parental

behavioral control (i.e., higher permissive parenting) would predict higher externalizing behaviors. The second aim was to examine if there is an association between SCLR and early adolescents' externalizing behaviors. We hypothesized that lower SCLR would predict higher externalizing behaviors.

The third and primary aim was to understand if SCLR (SCLR-peer and SCLR-parent) moderates the cross-sectional and longitudinal association between parental behavioral control and early adolescents' externalizing behaviors. We anticipated that early adolescents with lower SCLR would require more parental behavioral control compared to early adolescents with higher SCLR, who may impose their own behavioral limits. We hypothesized that an association between higher parental behavioral control (i.e., lower permissive parenting) and lower externalizing behaviors would exist among early adolescents who exhibited higher or lower SCLR. However, we hypothesized that the association between higher parental behavioral control and lower externalizing behaviors would be stronger among adolescents who exhibited lower SCLR compared to children who exhibited higher SCLR. These hypotheses were tested using a community-based sample of 80 early adolescents followed over the course of one year. Parents reported on parental behavioral control, SCLR was measured in response to social stress, and parents and early adolescents reported on externalizing behaviors. Age, gender, race, and family income were considered as possible control variables due to associations between these demographic variables and parental behavioral control, SCLR, or externalizing behaviors (Hinnant et al., 2016; Tu et al., 2014; 2017).

Methods

Participants and Procedures

Participants

Eighty early adolescents (T1, M age = 11.92 years, SD = 1.27) and their parents (79% biological mothers) participated in this study. The sample of early adolescents included 55% male and 55% African American, 43% European American, and 2% of other races/ethnicities, consistent with demographics of the surrounding communities. The mean family income was between \$20,001 and \$35,000; 24% reported an income of less than \$20,000, and 22% reported an income of more than \$75,000. Sixty-four early adolescents participated at Time 2 (T2) approximately one year later. There were no differences on T1 variables between those with and without T2 data.

Procedures

Participants were recruited through flyers posted in community locations and sent home in fifth and sixth grade classrooms at elementary schools in the southeastern United States. The researchers provided a detailed description of the study (including lab protocol, described below) to each parent who responded to the flyers. Telephone scheduling of subsequent lab visits occurred. Obtainment of parental consent and early adolescent assent occurred at the beginning of the lab visit. The visit lasted approximately two hours, and both parents and early adolescents received monetary compensation. Both adolescents and parents completed questionnaires (T1 and T2). In addition, adolescents also participated in lab activities, during which their physiological activity was recorded (T1). The University Institutional Review Board approved all study procedures.

The laboratory protocol included peer evaluation (modeled after a protocol used in prior research; Erath & Tu, 2014) and parent-adolescent discussion periods. A research assistant (RA; same sex) asked the adolescent to lead a 3-minute conversation with the RA as if they were meeting for the first time (peer evaluation period). The adolescents were informed that the

conversation would be viewed via one-way Skype by three same-sex peer judges, who were actually fictitious. Participants were told that the peer judges would decide how well they performed in the conversation activity compared to two other participants. After the conversation, adolescents were told that if they were not chosen by the peer judges as one of the best performers, they would be given the opportunity to speak directly to the peer judges (via Skype) in order to try to change their minds. Then early adolescents were asked to have a 3-minute conversation with their parent about what they should do if they were not selected by the peer judges as one of the top performers (parent-adolescent discussion period). Prior to the parent-adolescent discussion, parents were instructed to prepare their child in case he or she was not chosen as one of the best performers. Parents were told that they could approach the conversation with their child in any way they wished, and sample conversation topics were given, including reasons why the child was not chosen (if not chosen), whether he/she should speak directly to the peer judges to change their minds, and if so, what he/she should talk about. During the laboratory activities, all participants behaved in a manner consistent with motivation to perform well and belief in the peer judges (e.g., leading the conversation as requested, asking questions about peer judges). Following the parent-adolescent discussion, the task was ended, and early adolescents were carefully debriefed and led to their own conclusions that the peer judges were fictitious.

Measures

Parental behavioral control. Parents completed the reliable and valid Parent Behavior Inventory (Schaefer, 1965). Two eight-item scales that are reliably and commonly conceptualized as dimensions of (low) parental behavioral control were examined: lax discipline (e.g., “I let my child off easy when s/he does something wrong”, “Can’t say no to anything s/he

wants”) and nonenforcement (e.g., “I do not pay much attention to my child’s misbehavior”, “Don’t check up to see whether my child has done what I told her/him”) during the past year. Items were rated on a 3-point scale (1 = not like to 3 = like, referring to similarity of behavior described to parents’ behavior). Lax discipline and nonenforcement items were averaged to create an internally consistent ($\alpha = .76$) permissive parenting variable (lower scores reflect higher behavioral control and higher scores reflect lower behavioral control).

SCLR. Data acquisition followed standard guidelines using a MindWare data acquisition system and MindWare EDA analysis software (MindWare Technologies, Gahanna, OH). Skin conductance (units = microsiemens) was measured with two disposable Ag-AgCl electrodes (1 ½” x 1” foam, 0% chloride gel) placed on the palm of the non-dominant hand. Participants were seated throughout the psychological assessment and a taped loop in electrode lead cables was used to further limit movement artifacts. Skin conductance was measured during acclimation (5 minutes), resting baseline (3 minutes), speaking baseline (reading aloud with a research assistant; 3 minutes), peer evaluation (3 minutes), waiting (2 minutes), parent-adolescent problem-solving discussion (3 minutes), and recovery periods (2 minutes). Skin conductance levels during the pretask period (resting baseline), peer evaluation period, and parent-adolescent problem-solving discussion period were used in the present study. SCLR was computed as the residualized change score between the pre-task period and the (a) peer evaluation period (SCLR-evaluation) and (b) parent-adolescent problem-solving period (SCLR-parent-adolescent interaction). Skin conductance data were not valid for 8 participants due to measurement artifacts.

Externalizing behaviors. Two reports of externalizing behaviors were collected, one as parent-report and one as adolescent-report. Parents completed the thirty-five-item externalizing subscale of the Child Behavior Checklist (CBCL; Achenbach, 1991; e.g., “argues a lot” and

“swearing or obscene language”). Ratings were made on a 3-point scale (0 = *not true* to 2 = *very true*). Internal consistency was high at both T1 ($\alpha = .89$) and T2 ($\alpha = .90$). In addition, early adolescent participants completed twenty-four items (e.g., “if others have angered me, I often hit, kick, or punch them,” “if others have threatened me, I often say mean things about them”) that tap multiple forms and functions of aggressive behavior (Little, Jones, Henrich, & Hawley, 2003). Ratings were made on a 4-point scale (“not at all” to “completely true.”). Internal consistency was high at both T1 ($\alpha = .88$) and T2 ($\alpha = .93$).

Demographic variables. Parents reports about child sex (coded 0 = *male*, 1 = *female*), age (in years), and race or ethnicity (coded 1 = *African American or other minority*, 0 = *Caucasian*). Parents reported annual household income on a 6-point scale from 1 (*less than \$10,000*) to 6 (*more than \$75,000*).

Plan of Analysis

Preliminary analyses checked for normal distributions and outliers and examined descriptive statistics and correlations. Regression analyses were used to test the main hypotheses and were conducted in AMOS, which uses full information maximum likelihood estimation. All continuous predictor variables were mean-centered prior to regression analyses to reduce multicollinearity and assist with interpretation. Of the demographic variables, only ethnicity was correlated with permissive parenting and adolescent externalizing behaviors, and was thus entered as a control variable. In a series of nested regression models, earlier levels of externalizing behaviors were entered in the first model (in longitudinal analyses but not cross-sectional analyses), demographic controls were entered in the second model, parental behavioral control was entered in the third model, SCLR was entered in the fourth model, and the interaction between parental behavioral control and SCLR were entered the fifth model. For

significant interaction effects, simple intercepts and simple slopes were computed and plotted according to standard procedures (Aiken & West, 1991). To test for corroborating evidence or method-specific effects, separate analyses were conducted with (a) parent- or adolescent-reported externalizing (or aggressive) behaviors as the outcome variable and (b) SCLR-peer or SCLR-parent as the moderator. All analyses were conducted both cross-sectionally (only T1 data) and longitudinally (predicting T2 externalizing behaviors while controlling for T1 externalizing behaviors).

Results

Preliminary Analyses

Descriptive analyses were conducted to calculate the ranges, means, standard deviations, and skewness statistics for each of the study variables (Table 1). Skewness statistics for all study variables were within the acceptable range except for T1 parent-reported externalizing behaviors, T2 parent-reported externalizing behaviors, and T1 adolescent-reported aggression. One value of each of these three variables was greater than four standard deviations from the mean and disconnected from other data values, and thus these values were Winsorized.

Correlations were conducted for all study variables (Table 2). Adolescent-reported aggression and ethnic minority were moderately correlated, such that ethnic minority adolescents self-reported higher levels of aggressive behavior. Income was correlated with lower T1 externalizing behaviors and adolescent-reported aggression. SCLR-parent was strongly correlated with SCLR-peer. Furthermore, T1 externalizing behaviors were significantly correlated to T2 externalizing behaviors, demonstrating strong stability over time. Adolescent-reported aggression at T1 was significantly correlated to lower SCLR-peer and SCLR-parent and

higher T2 externalizing behaviors. Similar to externalizing behaviors, T1 aggression was correlated with T2 aggression, demonstrating the stability across time.

Predicting Parent-Reported Adolescent Externalizing Behaviors

Cross-sectional analyses with SCLR-parent: Analyses with parent-reported permissive parenting as a predictor of parent-reported externalizing behaviors yielded some support for the hypotheses. Permissive parenting moderately predicted higher parent-reported externalizing behaviors ($B = .223, SE = .071, p = .002$); however, SCLR-parent did not predict parent-reported externalizing behaviors ($B = .006, SE = .009, p = .498$). An interaction effect also emerged. SCLR-parent moderated the association between permissive parenting and parent-reported externalizing behaviors ($B = .085, SE = .037, p = .021$). The association between permissive parenting and parent-reported externalizing behaviors was stronger at higher levels of SCLR ($B = .367, SE = .063, p < .001$) compared to lower levels of SCLR ($B = .249, SE = .071, p < .001$) (Figure 1). The full set of predictors explained 20% of the variance in T1 parent-reported externalizing behaviors (Table 3).

Longitudinal analyses with SCLR-parent: Analyses with parent-reported permissive parenting as a predictor of parent-reported externalizing behaviors also yielded some support for hypotheses. Parent-reported externalizing behaviors at T1 strongly predicted parent-reported externalizing behaviors at T2, indicating stability in parent-reported externalizing behaviors over time ($B = .92, SE = .096, p > .001$). Neither permissive parenting nor SCLR-parent predicted parent-reported externalizing behaviors over time ($B = -.086, SE = .066, p = .19$; $B = .003, SE = .008, p = .739$). However, an interaction effect emerged. SCLR-parent moderated the association between permissive parenting and parent-reported adolescent externalizing behaviors ($B = .067, SE = .033, p = .042$). Permissive parenting did not predict changes in parent-reported

externalizing behaviors at higher levels of SCLR ($B = .008, SE = .076, p = .911$); however, higher levels of permissive parenting predicted lower parent-reported externalizing behaviors at lower levels of SCLR ($B = -.155, SE = .065, p < .05$). The full set of predictors explained 63% of the variance in adolescent T2 parent-reported externalizing behaviors (Table 3).

Cross-sectional analysis with SCLR-peer: Analyses with parent-reported permissive parenting as a predictor of parent-reported externalizing behaviors yielded little support for hypotheses. Permissive parenting was statistically significant and predicted higher parent-reported externalizing behaviors. However, neither SCLR-peer nor the interaction between permissive parenting and SCLR-peer predicted parent-reported externalizing behaviors ($B = -.014, SE = .009, p = .108; B = .006, SE = .041, p = .888$). The full set of predictors explained 15% of the variance in T1 parent-reported externalizing behaviors (Table 4).

Longitudinal analysis with SCLR-peer: Analyses with parent-reported permissive parenting as a predictor of parent-reported externalizing behaviors did not yield support for hypotheses. Parent-reported externalizing behaviors at T1 strongly predicted parent-reported externalizing behaviors at T2, indicating stability in parent-reported externalizing behaviors over time. However, permissive parenting did not predict parent-reported externalizing behaviors over time ($B = -.086, SE = .066, p = .19$). Furthermore, SCLR-peer was not significantly related to parent-reported externalizing behaviors ($B = .005, SE = .008, p = .545$). Also, the interaction between permissive parenting and SCLR-peer did not predict parent-reported externalizing behaviors ($B = .060, SE = .045, p = .184$). The full set of predictors explained 62% of the variance in T2 parent-reported externalizing behaviors (Table 4).

Predicting Adolescent-Reported Aggression

Cross-sectional analysis with SCLR-parent: Analyses with parent-reported permissive parenting as a predictor of adolescent-reported aggression provided support for some hypotheses. Ethnic minority predicted aggression ($B = .292, SE = .103, p = .005$), such that ethnic minority adolescents reported higher adolescent-reported aggression. However, permissive parenting did not predict adolescent-reported aggression ($B = -.038, SE = .224, p = .867$). SCLR-parent significantly predicted lower adolescent-reported aggression ($B = -.061, SE = .024, p = .013$). The interaction between permissive parenting and SCLR-parent did not predict adolescent-reported aggression ($B = .114, SE = .114, p = .319$). The full set of predictors explained 18% of the variance in T1 adolescent-reported aggression (Table 5).

Longitudinal analysis with SCLR-parent: Analyses with parent-reported permissive parenting as a predictor of adolescent-reported aggression were not consistent with hypotheses. Adolescent-reported aggression at T1 predicted adolescent-reported aggression at T2, indicating stability in adolescent-reported aggression over time ($B = .335, SE = .108, p = .002$). In addition, ethnic minority was associated with adolescent-reported aggression ($B = .307, SE = .1, p = .002$), such that ethnic minority adolescents reported higher adolescent-reported aggression. However, permissive parenting did not predict adolescent-reported aggression ($B = -.04, SE = .207, p = .848$), SCLR parent did not predict adolescent-reported aggression ($B = .004, SE = .025, p = .867$), and the interaction between permissive parenting and SCLR-parent did not predict adolescent-reported aggression ($B = .081, SE = .109, p = .459$). The full set of predictors explained 25% of the variance in T2 adolescent-reported aggression (Table 5).

Cross-sectional analysis with SCLR-peer: Analyses with parent-reported permissive parenting as a predictor of adolescent-reported aggression provided support for some hypotheses. Ethnic minority predicted adolescent-reported aggression ($B = .292, SE = .103, p = .005$). Unlike

parent-reported externalizing behaviors, permissive parenting did not predict higher levels of adolescent-reported aggression ($B = -.038, SE = .224, p = .867$). SCLR-peer predicted lower adolescent-reported aggression ($B = -.072, SE = .025, p = .003$). The interaction between permissive parenting and SCLR-peer did not predict adolescent-reported aggression ($B = .079, SE = .117, p = .498$). The full set of predictors explained 21% of the variance in T1 adolescent-reported aggression (Table 6).

Longitudinal analysis with SCLR-peer: Analyses with parent-reported permissive parenting as a predictor of adolescent-reported aggression provided no support for the hypotheses. Adolescent-reported aggression at T1 predicted adolescent-reported aggression at T2, indicating stability in adolescent-reported aggression over time ($B = .335, SE = .108, p = .002$). In addition, ethnic minority moderately predicted adolescent-reported aggression at T2 ($B = .307, SE = .1, p = .002$). Unlike parent-reported externalizing behaviors, permissive parenting did not predict higher levels of adolescent-reported aggression ($B = -.04, SE = .207, p = .848$). Furthermore, SCLR-peer did not predict adolescent-reported aggression over time ($B = .017, SE = .026, p = .524$). The interaction between permissive parenting and SCLR-peer also failed to predict T2 adolescent-reported aggression ($B = .070, SE = .112, p = .535$). The full set of predictors explained 26% of the variance in T2 adolescent-reported aggression (Table 6).

Discussion

The present study examined direct and interactive associations linking parental behavioral control and SCLR with early adolescents' externalizing behaviors concurrently and prospectively. Parents reported on parental behavioral control, SCLR was measured in the context of peer stress and parent-adolescent interaction, and parents and adolescents reported on externalizing behaviors. In support of the first hypothesis, lower levels of parental behavioral

control (i.e., higher levels of permissive parenting) predicted higher parent-reported externalizing behaviors in cross-sectional (but not longitudinal) analyses, but this effect was not corroborated in analyses with adolescent-reported aggression. In support of the second hypothesis, lower levels of SCLR in the context of peer stress and parent-adolescent interaction were concurrently (but not prospectively) associated with higher adolescent-reported aggression, but not parent-reported externalizing behaviors. The primary aim was to examine whether SCLR moderated the association between parental behavioral control and early adolescents' externalizing behaviors. Using both cross-sectional and longitudinal data, there was a significant interaction between permissive parenting and SCLR-parent (but not SCLR-peer) in the prediction of parent-reported externalizing behaviors (but not adolescent-reported aggression). In contrast to the third hypothesis, parental behavioral control predicted lower T1 externalizing behaviors at lower levels of SCLR and higher levels of SCLR, but this association was stronger at higher levels of SCLR. That is, adolescents with lower SCLR appeared to benefit relatively less from parental behavioral control than adolescents with higher SCLR. In longitudinal analyses, parental behavioral control did not predict changes in externalizing behaviors at higher levels of SCLR; however, in contrast to the hypothesis, higher levels of parental behavioral control predicted higher externalizing behaviors at lower levels of SCLR.

Parental Behavioral Control and Adolescents' Externalizing Behaviors

Parental behavioral control is the extent to which parents establish and enforce clear rules and limits for their children (Aunola and Nurmi, 2005). Social learning theory contends that children's behavior can be shaped through consistent rewards for positive behaviors and consistent consequences for negative behaviors (Grusec & Davidov, 2010). Consistent with social learning theory, a recent meta-analysis showed that low parental behavioral control

predicted higher levels of externalizing behaviors (Pinquart, 2017). Similarly, in the present study, lower parental behavioral control (i.e., higher permissive parenting) was concurrently associated with higher levels of parent-reported externalizing behaviors.

However, in contrast to the meta-analysis (Pinquart, 2017), parental behavioral control did not predict lower externalizing behaviors at T2, when T1 levels of externalizing behaviors were controlled. Externalizing behaviors are highly stable (Husemann, Eron, Lefkowitz, & Walder, 1984; Olweus, 1978), and the stability of externalizing behaviors from T1 to T2 is one explanation for the lack of association between parental behavioral control and changes in externalizing behaviors in the present study. Given the lack of longitudinal effect, the cross-sectional association between higher parental behavioral control and lower parent-reported externalizing behaviors could be interpreted as a possible adolescent effect. Stice and Barrera (1995) found that child externalizing behaviors predicted parental behavioral control, but did not find that parental behavioral control predicted externalizing behaviors in their longitudinal model, although a large body of research suggests bidirectional associations between parental behavioral control and child externalizing behaviors (Lengua & Kovacs, 2005; Pardini, 2008). A larger sample with greater power to detect small effects and measures of both parental behavioral control and parent-reported adolescent externalizing behaviors at T1 and T2 would help clarify the direction(s) of effect.

Surprisingly, parental behavioral control did not predict adolescent-reported aggression at T1 or T2. Parents and adolescents have different perspectives on behaviors and may report either higher or lower externalizing behaviors. Aggressive children tend to have inaccurate perceptions of their behaviors, limiting the validity of their reports (Achenbach, McConaughy, & Howell, 1987). However, it is also possible that parental biases contributed to the association between

parent-reported behavioral control and parent-reported externalizing behaviors. As one example of parental biases, parents may report poorer parenting and more externalizing behaviors for their child if they experience depression (Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009).

SCLR and Adolescents' Externalizing Behaviors

Lower levels of SCLR-parent and SCLR-peer were associated with higher adolescent-reported aggression but not parent-reported externalizing behaviors. Other studies have found that ANS under-arousal increases adolescents' risk for aggression and other conduct problems, and these associations have been explained in terms of stimulation-seeking and fearlessness theories (Raine, 2002). Stimulation-seeking theory contends that abnormally low physiological arousal is uncomfortable, and thus under-aroused individuals seek stimulation through risky behaviors to increase their arousal to a normal level. Fearlessness theory argues that abnormally low physiological arousal is a marker of fearlessness, and thus under-aroused individuals fail to associate risky or antisocial behaviors with negative consequences (Raine, 2002).

An association may not have been found between SCLR and parent-reported externalizing behaviors because of parents' inability to fully report on both overt and covert externalizing behaviors. Parent-reported externalizing behaviors may reflect primarily overt externalizing behaviors such as physical altercations, whereas adolescent-reported aggression may capture both overt aggression as well as more covert aggressive behaviors (Olson et al., 2013). According to the fearlessness theory, under-aroused early adolescents may display more risk taking, such as stealing or hitting someone, and parents may not be aware of each negative action and be limited in the scope of their reporting compared to the adolescent who completed a self-report of their aggression.

Contrary to the second hypothesis, SCLR-parent and SCLR-peer did not predict parent-reported externalizing behaviors over time. There was no significant longitudinal association between SCLR-parent or SCLR-peer and either parent-reported externalizing behaviors or adolescent-reported aggression. The lack of evidence for the longitudinal association may be due to the high stability of externalizing behaviors from T1 to T2, leaving little variance to predict in T2 parent-reported externalizing behaviors. Physiological under-arousal may underlie some aggressive and externalizing behaviors even if under-arousal does not continue to predict changes in aggressive and externalizing behaviors across developmental periods.

SCLR Moderates the Association Between Parental Behavioral Control and Adolescents' Externalizing Behaviors

SCLR was also examined as a moderator of the association between parental behavioral control and adolescents' externalizing behaviors. SCLR-parent moderated the association between parent-reported parental behavioral control and parent-reported externalizing behaviors in cross-sectional and longitudinal analyses. In cross-sectional analyses, parental behavioral control was associated with lower parent-reported externalizing behaviors at lower and higher levels of SCLR, but the association was significantly stronger at higher levels of SCLR. In the longitudinal analyses, parental behavioral control did not predict changes in parent-reported externalizing behaviors at higher levels of SCLR, but higher levels of parental behavioral control surprisingly predicted higher parent-reported externalizing behaviors at lower levels of SCLR. Thus, in contrast to hypotheses, both analyses suggest that adolescents with lower SCLR to parent-adolescent interaction benefit relatively less from parental behavioral control than adolescents with higher SCLR.

One prior study examined SCLR as a moderator of the concurrent association between parental behavioral control and deviant peers. In contrast to results of the present study, Hinnant et al. (2016) found that adolescents with lower SCLR and more permissive parents were affiliated with more deviant peers, and that less permissive parenting (i.e., more parental behavioral control) was associated with less deviant peer affiliations among adolescents with lower SCLR. The Hinnant et al. (2016) study contained key distinctions from the present study, specifically a larger sample, adolescent-reported measures of both predictor and outcome variables, a star-tracing task to assess SCLR, and deviant peers as an outcome variable. Although it is unclear why different results were found across studies, a variety of methodological differences may explain the different results. For example, the specific SCLR star-tracing task used in the Hinnant et al. (2016) study may reflect under-arousal that requires more parental behavioral control. In contrast, adolescents' low SCLR during the parent-adolescent discussion in the present study may reflect less anxiety or more comfort with their parents, and perhaps a better relationship, and thus less need for parental behavioral control (Grusec & Davidov, 2010).

Results of the present study are also inconsistent with prior studies in which parental behavioral control predicted lower antisocial behaviors particularly among children or adolescents with lower temperamental inhibitory self-control (Kuhn & Laird, 2013). A potential explanation for the inconsistency is that SCLR as measured in the present study may not reflect temperamental disinhibition as measured through parent reports.

Results of the present study are also somewhat inconsistent with recent research on parental directing of adolescent friendships, a form of parental behavioral control in the peer domain. Specifically, Tu et al. (2017) found that parental directing predicted better friendship quality at lower levels of SCLR. The authors suggested that children with lower SCLR need

more parental behavioral control to compensate for the low levels of inhibitory self-control that may be reflected in their low SCLR (Tu et al., 2017). In contrast, the authors suggested that youth with higher SCLR may not need as much parental directing away from antisocial peers because of the stronger sensitivity to risk or negative consequences potentially reflected in higher SCLR. One possible explanation for different results across studies could be that the Tu et al. (2017) study concerned parental behavioral control in the peer domain and peer outcomes specifically, whereas the present study examined parental behavioral control and externalizing behaviors generally. Parental behavioral control of adolescents with lower SCLR may be more effective in the narrower context of peer relationships compared to the broader context measured in the present study.

Some studies have found results that are more consistent with the present study. For example, Kochanska (1995) examined relationships of temperamental fearfulness, attachment security, and maternal discipline with emerging internalization in toddlers. Temperamental fearlessness was measured through behavioral observations of fearlessness involving unfamiliar stimuli and events to the child. Questionnaires and observed interactions were used to examine maternal gentle discipline, which is similar to parental behavioral control. Internalization was measured through behavioral observations of cleanups and committed compliance when the mother directed the child to do certain activities, such as to clean up and avoid using certain objects. Maternal gentle discipline was associated with greater internalization for children who were more fearful, but not for children who were relatively fearless. However, attachment security was associated with greater internalization for children with high levels of fearlessness.

Similarly, in a follow-up longitudinal study, Kochanska (1997) examined child temperamental fearfulness as a moderator of the impact of socialization on development at ages

four and five. The study used the same laboratory observations to examine children's temperamental fearfulness, attachment security, mothers' gentle discipline, and multiple measures of children's conscience during structured cheating games with the research assistant. The study found that gentle maternal discipline did not predict conscience for fearless children; however, maternal gentle discipline was associated with higher conscience for fearful children. Attachment security predicted conscience development for fearless children, but not fearful children. The study concluded that fearless children were insufficiently aroused by gentle discipline techniques and required alternative socialization mechanisms such as positive mother-child interactions, secure attachment, and maternal responsiveness, whereas children with fear were attuned to the possible negative consequences of antisocial behaviors and internalized rules faster (Kochanska, 1997). Drawing a similar conclusion, Dadds and Salmon (2003) conceptualized that fearless children who are insensitive to punishment need an alternative parenting approach than rule setting and consequences (Dadds & Salmon, 2003). Thus, like the "fearless" children (Dadds & Salmon, 2003; Kochanska 1995, 1997), adolescents with lower SCLR in the present study may be relatively less responsive to the behavioral limits and consequences that comprise parental behavioral control, compared to children with higher SCLR.

Other research has shown that children with lower SCLR are particularly susceptible to externalizing behaviors in the context of harsh parenting. For example, harsh parenting was more strongly associated with higher externalizing behaviors for children with lower SCLR compared to children with higher SCLR, potentially because children with lower inhibitory control are more likely to retaliate in response to harsh parental behavior (Erath et al., 2009; 2011). Interestingly, results of the present study suggest that the same children who are sensitive to harsh punishment (i.e., those with lower SCLR) may also be relatively insensitive to the normal

(i.e., non-harsh) limits and consequences that constitute parental behavioral control. Thus, consistent with Kochanska's (1995; 1997) assertion, children and adolescents with lower SCLR may be insufficiently aroused by gentle behavioral control strategies and thus more likely to learn appropriate behaviors through positive, cooperative parent-child interactions.

There was no significant interaction between parental behavioral control and parent-reported externalizing behaviors in analyses with SCLR-peer or adolescent-reported aggression. The lack of significant interactions suggest that the impact of parental behavioral control was the same regardless of the adolescents' SCLR. SCLR-parent may be a more reliable predictor than SCLR-peer because SCLR-parent is more relevant to behavioral control. That is, SCLR-parent was measured in the context of a parent-adolescent interaction, the same context in which parents exercise behavioral control.

Limitations/Future Directions

Limitations of the present study and directions for future research are important to address. The community sample of relatively well-adjusted early adolescents may limit the generalizability of the findings to early adolescents who are at higher risk for externalizing behaviors. A second limitation was the small sample, which reduced the power of the study design. Additionally, the small sample reduced the ability to examine other moderators such as age and sex in the study. Future studies should examine sex, age, and ethnic differences among early adolescents in a larger sample. The present study examined SCLR as a moderator of parental behavioral control and adolescent externalizing behaviors. Future studies should consider using teacher reports of the adolescent's externalizing behaviors because they may provide an important perspective and help tap into externalizing behaviors in the peer domain that the parent may not be privy towards. Different informants of parenting behaviors may also

predict youth adjustment outcomes (Mounts, 2007). Understanding the early adolescent's perspective may help resolve the discrepancy between previous research where adolescent reports were used as opposed to parent reports of parenting or externalizing behaviors. Furthermore, examining SCLR when the parent is attempting to implement rules and limit setting as opposed to a conversation where the parent's goal was to support the adolescent may provide a better test of whether SCLR moderates the association between parental behavioral control and adolescent externalizing behaviors.

Despite these limitations, the present study extends the literature on the moderating effect of SCLR on the association between parental behavioral control and adolescent externalizing behaviors. Specifically, we tested the interaction between SCLR and general parental behavioral control using an adolescent sample, longitudinal design with multiple informants, and measure of SCLR in the context of parent-adolescent interaction.

Intervention Implications

Findings from this study provide additional support that parental behavioral control predicts adolescent externalizing behaviors, but it is notable that these findings were not consistent across informants, indicating that multiple informants provide unique perspectives of adolescent externalizing symptoms. Interestingly, SCLR-parent was a significant moderator between parental behavioral control and adolescent externalizing behaviors. These findings contribute to our knowledge of potential risk and protective factors for adolescent adjustment and further explain differences in the association between parental behavioral control and adolescent externalizing behaviors.

These findings may have implications for prevention and intervention with parents and adolescents with externalizing behaviors. Understanding that an adolescent with either low or

high SCLR may react differently to parental behavioral control and may inform approaches to parenting. Specifically, an effective parenting approach for adolescents with physiological under-arousal may include more parental warmth and affection compared to rules and limit setting (Dadds & Salmon, 2003; Kochanska, Aksan, & Koenig, 1995; Kochanska, Murray, & Coy, 1997). Current interventions demonstrate that behavioral parent training programs used to treat disruptive/externalizing behaviors are somewhat effective, but do not tailor the treatment to the specific attributes of adolescents (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005). Awareness of physiological arousal may help inform treatment of adolescents with low or high SCLR to achieve a more effective outcome (Hinnant et al., 2016).

References

- Achenbach, T. M. (1991). *Integrative guide for the 1991 CBCL/4-18, YSR, and CBCL-TRF profiles*. Burlington: University of Vermont Department of Psychiatry.
- Achenbach, T. M., McConaughy, S. H., & Howell, C. T., (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*, 213-232.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Aunola, K., & Nurmi, J. E. (2005). The role of parenting styles in children's problem behavior. *Child Development, 76*, 1144-1159.
- Barber, B. K., Olsen, J. E., & Shagle, S. C. (1994). Associations between parental psychological and behavioral control and youth internalized and externalized behaviors. *Child Development, 65*, 1120-1136.
- Bates, J. E., & Pettit, G. S. (2007). Temperament, parenting, and socialization. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization* (pp. 153-177). New York: Guilford.
- Bates, J. E., Pettit, G. S., Dodge, K. A., & Ridge, B. (1998). Interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. *Developmental Psychology, 34*, 982-995.
- Beauchaine, T. P. (2001). Vagal tone, development, and Gray's motivational theory: Toward an integrated model of autonomic nervous system functioning in psychopathology. *Development and Psychopathology, 13*, 183-214.

- Beauchaine, T. P., Katkin, E. S., Strassberg, Z., & Snarr, J. (2001). Disinhibitory psychopathology in male adolescents: Discriminating conduct disorder from attention-deficit/hyperactivity disorder through concurrent assessments of multiple autonomic states. *Journal of Abnormal Psychology, 110*, 610-624.
- Blatt-Eisengart, I., Drabick, D. A. G., Monahan, K. C., & Steinberg, L. (2009). Sex differences in the longitudinal relations among family risk factors and childhood externalizing symptoms. *Developmental Psychology, 45*, 491-502.
- Campbell, S. B., Shaw, D. S., & Gilliom, M. (2000). Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467-488.
- Cicchetti, D. (2006). Development and psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (Vol. 1, 2nd ed., pp 1-23). New York: Wiley.
- Dadds, M. R., & Salmon, K. (2003). Punishment insensitivity and parenting: Temperament and learning as interacting risks for antisocial behavior. *Clinical Child and Family Psychology Review, 6*, 69-86.
- Dirks, M. A., Suor, J. H., Rusch, D., & Frazier, S. L. (2014). Children's responses to hypothetical provocation by peers: Coordination of assertive and aggressive strategies. *Journal of Abnormal Child Psychology, 42*, 1077-1087.
- Dishion, T. J., Andrews, D. W., & Crosby, L. (1995). Antisocial boys and their friends in early adolescence: Relationship characteristics, quality, and interactional process. *Child Development, 66*, 139-151.

- El-Sheikh, M., & Erath, S. A. (2011). Family conflict, autonomic nervous system functioning, and child adaptation: State of the science and future directions. *Development and Psychopathology, 23*, 703-721. <http://dx.doi.org/10.1017/S0954579411000034>
- El-Sheikh, M., & Whitson, S. A. (2006). Longitudinal relations between marital conflict and children's adjustment: Vagal regulation as a protective factor. *Journal of Family Psychology, 20*, 30-39.
- Erath, S. A., El-Sheikh, M., & Cummings, E. M. (2009). Harsh parenting and child externalizing behavior: Skin conductance level reactivity as a moderator. *Child Development, 80*, 578-592.
- Erath, S. A., El-Sheikh, M., Hinnant, J. B., & Cummings, E. M. (2011). Skin conductance level reactivity moderates the association between harsh parenting and growth in child externalizing behavior. *Developmental Psychology, 47*, 693-706.
- Erath, S. A., Su, S., & Tu, K. M. (2016). Electrodermal reactivity moderates the prospective association between peer victimization and depressive symptoms in early adolescence. *Journal of Clinical Child and Adolescent Psychology*.
- Gregson, K., Tu, K. M., & Erath, S. A. (2014). Sweating under pressure: Skin conductance level reactivity moderates the association between peer victimization and externalizing behavior. *Journal of Child Psychology and Psychiatry, 55*, 22-30.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 224-237. doi:10.1037/0022-3514.74.1.224
- Grusec, J. E., & Davidov, M. (2010). Integrating different perspectives on socialization theory and research: A domain-specific approach. *Child Development, 81*, 687-709.

- Gryczkowski, M. R., Jordan, S. S., & Mercer, S. H. (2010). Differential relations between mothers' and fathers' parenting practices and child externalizing behavior. *Journal of Child and Family Studies, 19*, 539-546.
- Hinnant, B. J., Erath, S. A., Tu, K. M., & El-Sheikh, M. (2016). Permissive parenting, deviant peer affiliations, and delinquent behavior in adolescence: the moderating role of sympathetic nervous system reactivity. *Journal of Abnormal Child Psychology, 44*, 1071-1081.
- Hinshaw, S. (2002). Process, mechanism, and explanation related to externalizing behavior in developmental psychopathology. *Journal of Abnormal Child Psychology, 30*, 431-446. doi:10.1023/A:1019808712868.
- Hubbard, J. A., Smithmyer, C. M., Ramsden, S. R., Parker, E. H., Flanagan, K. D., Dearing, K. F., ... Simons, R. F. (2002). Observational, physiological, and self-reported measures of children's anger: Relations to reactive versus proactive aggression. *Child Development, 73*, 1101-1118. doi:10.1111/1467-8624.00460
- Huesmann, L. R., Eron, L. D., Lefkowitz, M. M., & Walder, L. O. (1984). Stability of aggression over time and generations. *Developmental Psychology, 20*, 1120-1134.
- Karreman, A., De Haas, S., Van Tuijl, C., Van Aken, M. A. G., & Dekovic, M. (2010). Relations among temperament, parenting and problem behavior in young children. *Infant Behavior and Development, 33*, 39-49.
- Kochanska, G. (1995). Children's temperament, mother's discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development, 66*, 597-615.
- Kochanska, G., Brock, R. L., Chen, K., Aksan, N., & Anderson, S. W. (2015). Paths from mother-child and father-child relationships to externalizing behavior problems in children

- differing in electrodermal reactivity: A longitudinal study from infancy to age 10. *Journal of Abnormal Child Psychology*, 43(4), 721-734.
- Kochanska, G., Brock, R. L., & Boldt, L. J. (2017). A cascade from disregard for rules of conduct at preschool age to parental power assertion at early school age to antisocial behavior in early preadolescence: Interplay with the child's skin conductance level. *Development and Psychopathology*, 29, 875-885.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology*, 33, 228-240.
- Kochenderfer-Ladd, B. (2004). Peer victimization: The role of emotions in adaptive and maladaptive coping. *Social Development*, 13, 329-349.
- Kuhn, E. S., & Laird, R. D. (2013). Parent and peer restrictions of opportunities attenuate the link between low self-control and antisocial behavior. *Social Development*, 22, 813-830.
- Lafko, N., Murraray-Close, D., & Shoulberg, E. K. (2015). Negative peer status and relational victimization in children and adolescents: The role of stress physiology. *Journal of Clinical Child & Adolescent Psychology*, 44, 405-416.
doi:10.1080/15374416.2013.850701
- Little, T. D., Jones, S. M., Henrich, C. C., & Hawley, P. H. (2003). Disentangling the “whys” from the “whats” of aggressive behaviour. *International Journal of Behavioral Development*, 27, 122-133.
- Locke, L. M., & Prinz, R. J. (2002). Measurement of parental discipline and nurturance. *Clinical Psychology Review*, 22, 895-929.

- Matthys, W., Van Goozen, S. H. M., Snoek, H., & Engeland, H. V. (2004). Response preservation and sensitivity to reward and punishment in boys with oppositional defiant disorder. *European Child Adolescent Psychiatry, 13*, 362-364.
- Maughan, D. R., Christiansen, E., Jenson, W. R., Olympia, D., & Clark, E. (2005). Behavioral parent training as a treatment for externalizing behaviors and disruptive behavior disorders: A meta-analysis. *School Psychology Review, 34*, 267-286.
- McKee, L., Colletti, C., Rakow, A., Jones, D. J., & Forehand, R. (2008). Parenting and child externalizing behaviors: Are the associations specific or diffuse? *Aggression Violence Behavior, 13*, 201-215.
- Mounts, N. S. (2007). Adolescents' and their mothers' perceptions of parental management of peer relationships. *Journal of Research on Adolescence, 17*, 169-178.
- Murray-Close, D. (2013). Psychophysiology of adolescent peer relations I: Theory and research findings. *Journal of Research on Adolescence, 23*, 236-259. doi:10.1111/j.1532-7795.2012.00828.x
- Obradovic, J., Bush, N. R., & Boyce, W. T. (2011). The interactive effect of marital conflict and stress reactivity on externalizing and internalizing symptoms: The role of laboratory stressors. *Development and Psychopathology, 23*, 101-114.
doi:10.1017/S0954579410000672
- Olson, S. L., Sameroff, A. J., Lansford, J. E., Sexton, H., Davis-Kean, P, Bates, J. E., ...Dodge, K. A. (2013). Deconstructing the externalizing spectrum: Growth patterns of overt aggression, covert aggression, oppositional behavior, impulsivity/inattention, and emotion dysregulation between school entry and early adolescence. *Development and Psychopathology, 25*, 817-842.

- Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys*. Eugene, OR: Castalia.
- Pinquart, M. (2017). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology, 53*, 873-932.
- Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology, 74*, 116-143.
- Raine, A. (2002). Biosocial studies of antisocial and violent behavior in children and adults: A review. *Journal of Abnormal Child Psychology, 30*, 311-326.
- Reitz, E., Dekovic, M., & Meijer, A. M. (2005). The structure and stability of externalizing and internalizing problem behavior during early adolescence. *Journal of Youth and Adolescence, 34*, 577-588.
- Rudolph, K. D., Troop-Gordon, W., & Granger, D. A. (2010). Peer victimization and aggression: moderation by individual differences in salivary cortisol and alpha-amylase. *Journal of Abnormal Child Psychology, 38*, 843-856. doi:10.1007/s10802-010-9412-3
- Schaefer, E. S. (1965). Children's reports of parental behavior: An inventory. *Child Development, 36*, 413-424.
- Serketich, W. J., & Dumas, J. E. (1996). The effectiveness of behavioral parent training to modify antisocial behavior in children: A meta-analysis. *Behavior Therapy, 27*, 171-186.
- Sheppes, G., Catran, E., & Meiran, N. (2009). Reappraisal (but not distraction) is going to make you sweat: Physiological evidence for self-control effort. *International Journal of Psychophysiology, 71*, 91-96. doi:10.1016/j.ijpsycho.2008.06.006

- Sijtsema, J. J., Rambaran, A. J., & Ojanen, T. J. (2013). Overt and relational victimization and adolescent friendships: Section, de-selection, and social influence. *Social Influence, 8*, 177-195. doi:10.1080/15534510.2012.739097
- Stice, E., & Barrera, M. (1995). A longitudinal examination of the reciprocal relations between perceived parenting and adolescents' substance use and externalizing behaviors. *Developmental Psychology, 31*, 322-334.
- Stice, E., & Gonzales, N. (1998). Adolescent temperament moderates the relation of parenting to antisocial behavior and substance use. *Journal of Adolescent Research, 13*, 5-31.
- Thomas, A., & Chess, S. (1977). *Temperament and Development*. New York: Brunner/Mazel.
- Tu, K. M., Erath, S. A., Pettit, G. S., & El-Sheikh, M. (2014). Physiological reactivity moderates the association between parental directing and young adolescent friendship adjustment. *Developmental Psychology, 50*, 2644-2653.
- Tu, K. M., Erath, S. A., & El-Sheikh, M. (2017). Parental management of peers and autonomic nervous system reactivity in predicting adolescent peer relationships. *Developmental Psychology, 53*, 540-551.

Tables

Table 1

Descriptive Statistics

	<i>N</i>	Min	Max	<i>M</i>	<i>SD</i>	<i>Sk</i>
Child's Age	63	9	14	11.83	1.29	-.316
Annual Income	78	1	6	3.83	1.69	-.27
Permissive Parenting PR	80	1	2.05	1.31	.24	1.02
Skin Conductance Baseline	58	1.04	14.41	4.64	3.14	1.06
Skin Conductance Peer	74	1.58	19.47	7.58	3.82	.77
Skin Conductance Parent	72	.93	18.59	7.58	3.96	.85
T1 PR Externalizing Behavior	75	.00	.60	.20	.15	1
T2 PR Externalizing Behavior	65	.00	.68	.18	.18	1.32
T1 AR Aggression	79	1.00	1.17	1.56	.47	1.09
T2 AR Aggression	62	1.00	2.71	1.52	.43	.94

PR = Parent Report

AR = Adolescent Report

Table 2

Correlations Between Demographics, Predictors, and Outcomes

	1	2	3	4	5	6	7	8	9	10	11	12
1. Child Sex	1											
2. Ethnic Minority	-.036 .754	1 80										
3. Income	-.237* .037	-.551** .000	1 78									
4. Age	-.078 .500	.041 .726	.089 .450	1 76								
5. Permissive by Parents	.040 .725	-.230* .404	.137 .231	.082 .484	1 80							
6. SCLR Peer	-.165 .215	-.021 .873	.096 .479	.097 .477	.090 .503	1 58						
7. SCLR Parent	-.054 .690	-.101 .456	.130 .343	.047 .734	-.002 .991	.754** .000	1 57					
8. T1 External Behavior	-.053 .654	-.404 .733	-.232* .048	-.028 .814	.388** .001	-.165 .238	.071 .617	1 75				
9. T2 External Behavior	-.077 .541	.157 .213	-.122 .341	-.049 .706	.103 .416	-.110 .462	.044 .772	.700** .000	1 65			
10. T1 Aggression	.001 .991	.307** .006	-.294** .009	-.002 .985	-.086 .450	-.348** .008	-.319* .017	.220 .060	.350** .005	1 79		
11. T2 Aggression	-.051 .694	.401** .001	-.377** .003	.113 .395	-.060 .641	-.032 .830	-.109 .470	.066 .624	.054 .676	.411** .001	1 62	
12. Permissive by Child	-.079 .487	-.290** .009	.176 .123	.206 .075	.003 .982	-.047 .726	.007 .959	-.107 .360	-.197 .115	-.118 .301	-.302* .017	1 62
	80	80	78	76	80	58	57	75	65	79	62	80

Table 3

<i>Predicting Parent-reported Externalizing Behaviors with Permissive Parenting and SCLR-Parent</i>								
	T1: Externalizing Behavior				T2: Externalizing Behavior			
	Step of entry		Final model		Step of entry		Final model	
	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β
Step 1: T1 Externalizing Behavior					.92 (.096)	.772***	.887 (.103)	.747***
R ²					0.595			
Step 2: Permissive	.223 (.071)	.342**	.21 (.069)	.324**	-.086 (.066)	-.112	-.063 (.064)	-.082
R ²	.117				0.604			
Step 3: SCLR Parent	.006 (.009)	.088	.007 (.008)	.103	.003 (.008)	.032	.005 (.007)	.058
R ²	.125				.604			
Step 4: Permissive X SCLR Parent			.085 (.037)	.283*			.067 (.033)	.189*
R ²			.195				.634	

Note. T1 = Time 1, T2 = Time 2, SCLR = Skin Conductance Level Reactivity

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

<i>Predicting Parent-reported Externalizing Behaviors with Permissive Parenting and SCLR-Peer</i>									
	T1: Externalizing Behavior				T2: Externalizing Behavior				
	Step of entry		Final model		Step of entry		Final model		
	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	
Step 1: T1 Externalizing Behavior					.92 (.096)	.772***	1.027 (.106)	.824***	
R ²						.595			
Step 2: Permissive	.223 (.071)	.342**	.219 (.070)	.336**	-.086 (.066)	-.112	-.141 (.085)	-.140	
R ²		.117				.604			
Step 3: SCLR Peer	-.014 (.009)	-.202	-.014 (.009)	-.199	.005 (.008)	.057	.001 (.010)	.011	
R ²		.155				.613			
Step 4: Permissive X SCLR Peer			.006 (.041)	0.018			.060 (.045)	.121	
R ²				.153				.624	

Note. T1 = Time 1, T2 = Time 2, SCLR = Skin Conductance Level Reactivity

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Predicting Adolescent-reported Aggression with Permissive Parenting and SCLR-Parent

	T1: Adolescent Aggression				T2: Adolescent Aggression			
	Step of entry		Final model		Step of entry		Final model	
	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β
Step 1: T1 Adolescent Aggression					.335 (.108)	.372**	.239 (.102)	.265*
R ²					0.138			
Step 2: Ethnic Minority	.292 (.103)	.306**	.253 (.101)	.267**	.307 (.100)	.355**	.300 (.102)	.349**
R ²	.094				.256			
Step 3: Permissive	-.038 (.224)	-.019	-.085 (.215)	-.043	-.040 (.207)	-.022	-.025 (.206)	-.014
R ²	.094				.253			
Step 4: SCLR Parent	-.061 (.024)	-.296**	-.061 (.024)	-.296**	.004 (.025)	.023	.005 (.025)	.029
R ²	.172				.251			
Step 5: Permissive X SCLR			.114 (.114)	.121			.081 (.109)	.095
R ²			.181				.25	

Note. T1 = Time 1, T2 = Time 2, SCLR = Skin Conductance Level Reactivity

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

<i>Predicting Adolescent-reported Aggression with Permissive Parenting and SCLR-Peer</i>								
	T1: Adolescent Aggression				T2: Adolescent Aggression			
	Step of entry		Final model		Step of entry		Final model	
	$\beta(SE)$	β	$\beta(SE)$	β	$\beta(SE)$	β	$\beta(SE)$	β
Step 1: T1 Adolescent Aggression					.335 (.108)	.372**	.271 (.114)	.300*
R ²						.138		
Step 2: Ethnic Minority	.292 (.103)	.306**	.275 (.100)	.289**	.307 (.100)	.355**	.288 (.102)	.333**
R ²		.094				.256		
Step 3: Permissive	-.038 (.224)	-.019	-.044 (.212)	-.022	-.040 (.207)	-.022	-.084 (.205)	-.046
R ²		0.094				.253		
Step 4: SCLR Peer	-.072 (.025)	-.338**	-.073 (.024)	-.342**	.017 (.026)	.086	.016 (.026)	.081
R ²		.204				.262		
Step 5: Permissive X SCLR Peer			.079 (.117)	.08			.070 (.112)	.078
R ²				.21				.263

Note. T1 = Time 1, T2 = Time 2, SCLR = Skin Conductance Level Reactivity

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1

Associations between Permissive Parenting and Externalizing Behaviors at Higher and Lower Levels of SCLR-Parent

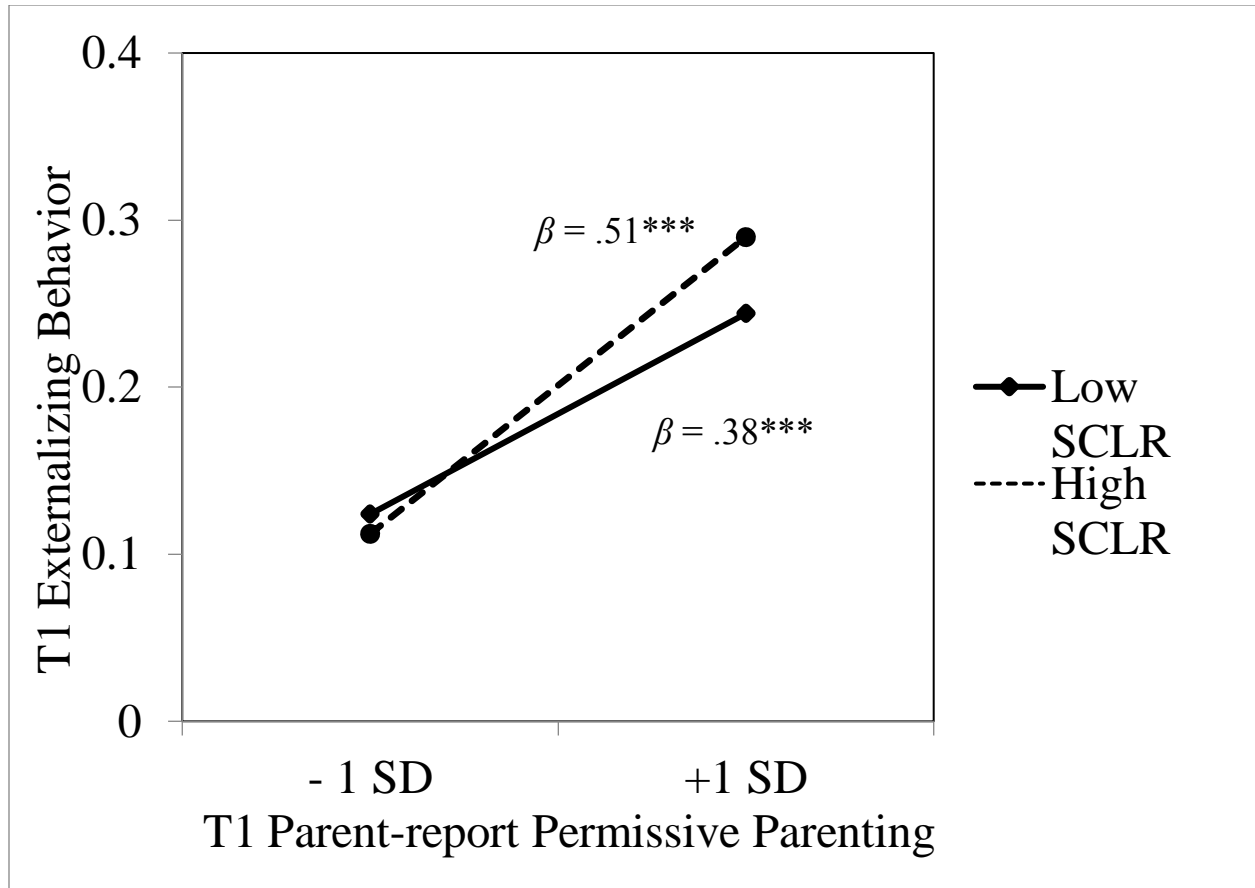


Figure 2

Longitudinal Associations between Permissive Parenting and Externalizing Behaviors at Higher and Lower Levels of SCLR-Parent

