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The Effect of Harsh Parenting on Anxiety Levels in Adolescents as Moderated by RSA and
Family Stability

An honors thesis presented to the
Department of Psychology,
University at Albany, State University Of New York
in partial fulfillment of the requirements
for graduation with Honors in Psychology
and graduation from The Honors College.

Laura B. Welburn

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Research Advisor: Elana B. Gordis, Ph.D.

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Abstract

The present study examines the relation between harsh parenting experienced during adolescence on anxiety symptoms during adulthood as moderated by the parasympathetic nervous system (PNS) activity and family stability. Participants completed questionnaires assessing parenting styles, the regularity of family activities, and current anxiety symptoms (61 adults; mean age = 19.39 years; 50.8% European American; 47.5% male). PNS activity was measured by resting respiratory sinus arrhythmia (RSA). The results suggest that among males, relatively high RSA buffers the effects of harsh parenting on anxiety symptoms. Also, for males, the stability of home life at relatively high levels can be a protective factor for increased levels of reported anxiety symptoms in a non-abusive environment. There were no significant findings for female participants. The results indicate that high RSA and high levels of family stability are both protective against the negative effects of harsh parenting.

Keywords: harsh parenting, parenting styles, family stability, parasympathetic nervous system, respiratory sinus arrhythmia, psychophysiology, anxiety

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The Effect of Harsh Parenting on Anxiety Levels in Adolescents as Moderated by RSA and Family Stability

Family life, including routines at home and parenting styles, can create either positive or negative outcomes based on parenting tactics and the level of consistency children experience at home. The present study examines the moderating effects of family stability, defined as the consistency in which routines and activities occur in a family, and measures of the parasympathetic nervous system (PNS) on the relation between harsh parenting and reported anxiety symptoms in young adults. The current study examines reported current anxiety symptoms in adolescents and retrospective reports of home life and parenting styles.

Harsh Parenting and Anxiety Symptoms

Current research on anxiety focuses on the development of disorders and the effect of parenting style (McLeod, Wood, & Weisz, 2007). Parenting styles can have significant influence on the level of anxiety parents report and children self-report (Hill & Bush, 2001). Harsh parenting has been shown to contribute to the acquisition or continuation of anxiety traits (Gallagher & Cartwright-Hatton, 2008). Briere and Runtz (1988) found that physical harsh parenting, perpetrated by the father, is associated with later anxiety, which could be explained by an increased level of anxiety related arousal. Interventions focusing on improving parental discipline techniques helps to alleviate anxiety symptoms in young children (Cartwright-Hatton, Phil, McNally, White, & Verduyn, 2005).

Past research has shown that an early experience with harsh, punitive and inconsistent parenting style is related to anxiety in adolescence (Cartwright-Hatton et al., 2005). Cartwright-Hatton (2008) also reported that an overinvolved or controlling parenting style can be a risk

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factor for increased levels of anxiety in young adults. The use of psychological control in one's parenting style is associated with adolescent anxiety (Pettit, Laird, Dodge, Bates, & Criss, 2001).

Parenting style and child anxiety are closely related and warrant further study. However, parenting style alone is not the only factor that influences anxiety symptoms.

Family Stability and Anxiety Symptoms

Past literature shows that family environments have a relation with internalizing problems (Liber, List, Van Loey, & Kef, 2006). Childhood psychopathology that has developed from family difficulties may be buffered by the consistency of family activities (Ivanova & Israel, 2006). Family stability acts as a protective factor against depression, which has a high comorbidity with anxiety disorders and warrants further research into the relation between stability of home activities and anxiety (Ivanova & Israel, 2005). Liber et al. (2006) found a negative correlation between parental control (i.e., parents are uninvolved caregivers) and their children's internalizing problems. Family functioning and anxiety may also be mediated by control, with a lack of control in a family environment causing increased anxiety (Ballash, Pemble, Usui, Buckley & Woodruff-Borden, 2006). Lack of control implies less time spent together on family activities, which suggests family routines are beneficial to child adjustment. This could indicate that unstable home life styles lead to increased anxiety problems. However, not all children who grow up in chaotic households develop increases anxiety.

Autonomic Nervous System and Anxiety Symptoms

The autonomic nervous system (ANS) is comprised of two branches, the sympathetic nervous system (SNS) and PNS. Both systems innervate most organs and glands, but produce reciprocal outcomes when activated (Quigley, 2010). The sympathetic nervous system is a fast reaction to a perceived threat characterized by increased heart rate and breathing. Conversely, the

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PNS activates gradually to relax the body, decreasing heart rate and increasing digestion (Quigley, 2010). We will focus on the parasympathetic branch as measured by resting respiratory sinus arrhythmia (RSA) activity. RSA is the variation in heart rate across respiration activity (i.e. shortening of heart periods in relation to inspiration and lengthening of heart periods in relation to expiration; Berntson, Cacioppo, & Quigley, 1993). Suppression of RSA is associated with negative emotion regulation and is observed among adolescents with anxiety disorders (Shannon, Beauchaine, Brenner, Neuhaus, & Gatzke-Kopp, 2007; Lyonfields, Borkovec, & Thayer, 1995). El-Sheikh (2005) provided supporting evidence that lower levels of vagal tone (as indexed by RSA) indicate an increased susceptibility to externalizing and internalizing problems for children with parents that have drinking problems.

There has been other research that suggests high RSA could be both a buffer and a risk factor. One theory that focuses on physiological effects on psychopathology is the biological sensitivity to context (BSC). According to this theory, highly reactive phenotypes reflect elevated BSC (Boyce & Ellis, 2005). This can be interpreted as children with high reactivity being more susceptible to the environment in which they are raised (i.e. highly reactive children in adverse environments are more prone to illness than are their less reactive counterparts; Boyce & Ellis, 2005). This suggests a physiological component may influence the development of anxiety disorders.

PNS as a Moderator of the Effects of Harsh Parenting on Anxiety Symptoms

RSA is studied as a protective factor against the negative effects of conflict in the home. High resting RSA is a measure of emotion regulation and can act as a defense against the effects of maternal depressive symptoms as shown by a decrease in negativity through early childhood (Blandon, Calkins, Keane, & O'Brien, 2008). High baseline RSA has been shown to also buffer

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boys against the effects of maltreatment on aggression (i.e. the relation between maltreatment and aggression is not significant at high RSA; (Gordis, Feres, Olezeski, Rabkin, & Trickett, 2010). Studies suggest that RSA may moderate the relation between salivary alpha-amylase (sAA), an indicator of the sympathetic nervous system, and externalizing factors (i.e. aggression, delinquency and hyperactivity; Keller, & El-Sheikh, 2008). RSA is involved with emotion regulation for externalizing factors, so it is reasonable to hypothesize that it also plays a moderating role in internalizing factors, such as anxiety.

The Present Study: Harsh Parenting, Family Stability, PNS Measures and Anxiety Symptoms

The current study examines RSA and family stability as moderators of the relation between harsh parenting and anxiety symptoms. To my knowledge, there have not been any previous studies on this combination of variables. Harsh parenting influences the development of anxiety symptoms, but it can be buffered or exacerbated by the level of family stability as well as resting physiological activity. This study is designed to determine the extent to which these variables interact so that interventions may be created to protect vulnerable population and to aid in our understanding of resilient individuals. We expect high RSA to act as a protective factor against the negative effects of harsh parenting. Individuals with high RSA should report lower anxiety symptoms given a similar family environment compared to those with low RSA. We also predict that family stability will be protective against the negative outcomes of harsh parenting. More stability should give children a sense of security and thus develop less anxiety symptoms even in the presence of abuse.

Methods

Participants

As part of a larger study examining physiological reactions to stress, 85 participants were recruited from the subject pool of undergraduate introductory psychology classes. A total of 61 participants were included in this study. The remaining participants were excluded due to missing data because of either equipment malfunction or incomplete questionnaires. The excluded participants did not differ significantly from the included participants in score variation, gender or age. The sample consisted of 29 males (47.5%). The average age of included participants was 19.39 years (range 18 years to 52 years, $SD=4.387$). Ethnic and racial composition was 50.8% European American (Caucasian/white), 29.5% Black or African American, 11.5% Hispanic, or 8.2% Asian. The sample consisted of 29 (47.5%) males. The majority of participants (52.5%) were in their first year of college.

Procedures

The University at Albany institutional review board approved all of the procedures. After a researcher completed consent procedures with the participant they took him/her to a private room where the physiological equipment was set up. The participant self-applied two disposable electrocardiography (ECG) electrodes, one on each side of his/her torso 6 inches below the armpit, to measure heart rate. The researcher applied a third electrode behind the participant's non-dominant ear as a ground. The researcher also attached a respiration bellows around the participant's torso to measure respiration. After verifying that the readings were recording properly, the researcher instructed the participant to relax while a 3-minute baseline was recorded. Once physiological data collection was complete, the participants were taken to another room to complete questionnaires. For more information see Barry et al. (under review).

Measures

Family stability. Family stability was measured using the Stability of Activities in the Family Environment (SAFE; Israel et al., 2002). The SAFE is a retrospective self-report questionnaire consisting of 23 questions used to assess the level of consistency of family activities during childhood. These activities include daily family routines such as getting ready for school or work, participating in after school programs, doing chores and other activities that involve participation from family members. Participants answered each question on a 7 point scale (0-6) where 0 meant the activity was not regular at all and 6 meant the activity was extremely regular. Scores were summed to create a final stability score with higher scores representing higher levels of stability and lower scores representing lower levels of stability. Previous studies indicate acceptable internal consistency (Cronbach's $\alpha = .84$) and test-retest reliability ($r = .86$; Israel et al., 2002). In the present sample α was $.87$. SAFE is shown to be valid by its correlation with other family measures such as the Jensen et al. (1983)'s Family Routines Inventory (FRI) and the Moos's Family Environment Scale (FES; Israel et al., 2002).

Researchers totaled the responses from questions 1-21, excluding question 22 due to difficulties coding it. The sum was analyzed and square transformed as raw scores were substantially, positively skewed. Transformed scores were centered on a mean to facilitate interpretation.

Harsh parenting. Harsh parenting was measured using a version of the Conflict Tactic Scale-Parent to Child (CTS-PC). The CTS-PC measures parenting practices using a 22-item self-report questionnaire and yields three factors of parenting style: positive parenting (i.e. non-violent discipline), psychological aggression (i.e. verbal threats) and physical assault (i.e. severe physical maltreatment). We modified the original CTS-PC to account for a variety of domestic

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living situations and instructed participants to report tactics used by their mother, father, stepmother, stepfather, mother's other partner, father's other partner, and/or foster parent. Our modified version offered the following responses *never, once, a few times, pretty often, very often*, and *not applicable*, in order to account for the level of specificity with which people are able to recall retrospectively. Participants were instructed to complete the CTS-PC retrospectively based on the parenting practices experienced during their adolescence (aged 13-18 years) using an anchor point memory at age 13 to improve accuracy. The scores were totaled to indicate both prevalence and chronicity. In this sample, the scores ranged between 1 and 31 with any scores above 0 indicating at least one experience of harsh parenting. Higher scores indicated increased exposure and/or chronicity. For example, a high score could indicate that the participant experienced several different varieties of harsh parenting behaviors or one behavior numerous times. The un-modified CTS-PC psychological aggression had an alpha of .60 (Straus et al., 1998). In the present study, the modified CTS-PC had an overall alpha of .89.

Our data showed that 29 (100%) males and 29 (90.6%) females reported some experience with psychological harsh parenting during their adolescence.

The scores were summed and then analyzed. The raw scores were positively skewed so we square root transformed them and then centered them on a mean to facilitate interpretation.

PNS activity. PNS activity was measured using RSA data. Resting PNS activity levels were based on the 3-minute collection of RSA data. Electrocardiography data were sampled and digitized at 1 kHz and R-wave times were extracted from the ECG channel and then manually edited using ECGRWAVE software (James Long Company, Caroga Lake, NY). A computerized RSA program (James Long Company, Caroga Lake, NY) calculated RSA as the difference between the minimum interbeat interval (IBI) during inspiration and the maximum IBI during

expiration (in seconds) twice for each respiration cycle. Researchers assigned midpoint times for inspiration and expiration and for calculating the arrhythmia. The peak-to-valley method used for the present study is comparable to spectral analysis (i.e., Grossman, van Beek, & Wientjes, 1990).

The RSA values were analyzed and then transformed by the natural log to lessen the positive skewness of the raw scores. The values were then centered on a mean to facilitate interpretation.

Anxiety symptoms. Anxiety symptoms were measured using Beck's Anxiety Inventory (BAI; Beck et al., 1988). The BAI is a 21-item self-report with each question rated on a 4-point scale. The participants were instructed to rate how much each symptom had bothered them in the past week. The lowest rating was 'not at all' and the highest rating was 'severely'. The items included physical symptoms (i.e. heart racing, feeling hot, trembling) and emotional symptoms (i.e. nervousness, fearfulness). The responses were recoded into numeric values and then added together to create an anxiety score with higher numbers indicating higher anxiety levels. The BAI had high internal consistency ($\alpha=.92$; Steer et al., 1992). In the present study alpha was .928.

Due to a substantial positive skew, we transformed the BAI data by using a natural log transformation and then centered the result on a mean of 0.

Results

Descriptive Information

All statistical analyses were conducted using the SPSS 20.0 software (SPSS, Inc., Chicago, IL).

Correlations among RSA, harsh parenting and anxiety symptoms

Bivariate correlations examine relations among resting RSA, harsh parenting, and family stability (Table 2). Analysis showed that among adolescent male participants, harsh parenting was significantly correlated with RSA and anxiety symptoms. There were no significant correlations for females. As shown in Table 1, this male vs. female difference cannot be attributed to differential restrictions of range in the measures for males and females.

Regression analysis predicting Anxiety Symptoms in Adolescent Males

Regression analysis examining main effects and interactions of family stability, adolescent psychological harsh parenting and RSA accounts for 51.1% of the variance in anxiety symptoms among males (Table 3). There were significant interactions between family stability and harsh parenting as well as RSA and harsh parenting. We ran two follow-up regressions with RSA at conditional values of 1 SD above and 1 SD below the mean. At RSA values 1 SD below the mean, the relation between harsh parenting and anxiety symptoms was significant and positive ($\beta=1.523$, $t=4.177$, $p<.001$) At RSA values 1 SD above the mean the relation was null ($\beta=.365$, $t=1.739$, $p=.095$; Figure 1). We also probed the relation between SAFE and harsh parenting among adolescent males. At SAFE values 1 SD above the mean, the relation was significant and positive ($\beta=1.162$, $t=2.275$, $p<.05$). At SAFE values 1 SD below the mean, the relation was not significant ($\beta=.170$, $t=.548$, $p=.589$; Figure 2).

Models Examining Females. Regression analyses examining main effects and interactions of family stability, harsh parenting and RSA were not significant for models predicting anxiety symptoms among females. Within the model, no significant main effects or interactions were found.

Discussion

The present study examined the effects of psychological harsh parenting experienced in adolescence on anxiety symptoms as moderated by PNS activity and family stability. The results indicate a gender-specific effect of RSA on the relation between harsh parenting and anxiety. In adolescent males, high baseline RSA acts as a buffer on harsh parenting and the subsequent anxiety symptoms. In other words, the relation between harsh parenting and anxiety symptoms is insignificant at relatively high levels of baseline RSA. This is consistent with previous research regarding baseline RSA as a moderator among males (Gordis et al., 2010). At relatively low levels of baseline RSA, the relation between harsh parenting and anxiety symptoms is positive and significant. That result indicates that low RSA is a risk factor for developing anxiety symptoms among male adolescents exposed to harsh parenting. However, among females, we did not find any significant effect of baseline RSA, which is inconsistent with previous studies that suggest higher measures of the PNS is protective for both males and females (El-Sheikh, Harger, & Whitson, 2001).

In regards to the stability of home environments, the present study revealed a significant interaction among males between harsh parenting and SAFE predicting anxiety symptoms. At relatively high levels of SAFE, there was a positive relation between harsh parenting and anxiety symptoms. This contradicted our hypothesis of family stability being protective against the effects of harsh parenting. Adolescents in more stable environments, exposed to harsh parenting showed higher levels of anxiety symptoms as compared to adolescents who did not experience harsh parenting. These data suggest that high stability when parenting is particularly harsh may put males at risk for later anxiety. Further, this result may be better understood by taking over-controlling parents into consideration. Having a home life that is extremely routine may lead

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children to be more reactive and less equipped to respond to changes in their environments. This finding is consistent with Liber et al.'s (2006) finding that suggested greater parental control is related to their children's internalizing problems, such as anxiety. LeMoyn and Buchanan (2011) found that children of helicopter parents (i.e. parents who are overinvolved in their children's lives) were more likely to have prescriptions for anxiety medications. In a related study, it was found that children diagnosed with anxiety disorders had parents who observers rated as more controlling (i.e. allowed less psychological autonomy; Siqueland, Kendall, & Steinberg, 1996). It seems that autonomy is an important factor in predicting anxiety outcomes. Siqueland et al.'s (1996) study also found that the children diagnosed with anxiety disorders rated their parents as less accepting which offers a possible cause for increased anxiety. If children view their parents as less accepting, the youths may be more unwilling to share their worries with their parents or feel that they are unable to express themselves.

There are several limitations to this study. Most importantly, the information we have on parenting and family stability is retrospective. Thus, responses may be biased and confounded with current anxiety and general mental health and functioning. In addition, the sample is relatively small and lacks diversity, given that all of these participants were college students. We had a small sample size gathered from a specific subset of the general population so our results may not generalize well.

Even with these limitations, the present study adds valuable information about RSA as a moderator of early life experiences and later internalizing symptoms. The results of this study can help guide intervention to improve parenting styles in the hopes of reducing anxiety symptoms. Parents should be instructed in more constructive discipline styles. Parents should also be told of the benefits of consistent routines while keeping in mind the importance of their

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children's autonomy to avoid becoming helicopter parents. Being aware of what parenting styles protect against and contribute to the development of anxiety symptoms will hopefully allow parents to raise their children with better outcomes. This study can also help in identifying which individuals are most at risk for developing anxiety disorders and therefore prepare interventions to lessen the negative outcomes. Children with low resting RSA are more vulnerable to the negative effects of harsh parenting and would require the most intensive interventions.

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Table 1
Means and Standard Deviations

	Non-Transformed		Transformed		
	Females (n=32)	Males (n=29)	Females (n=32)	Males (n=29)	F (gender)
Adolescent Psychological Harsh Parenting	9.4 (6.74)	11.6 (7.37)	3.0 (1.11)	3.4 (0.97)	2.153
Stability of Activities in a Family Environment	86.9 (20.33)	77.8 (15.60)	9.3 (1.11)	8.8 (.88)	3.405
Resting RSA	0.1 (.06)	0.1 (.05)	-2.6 (.55)	-2.6 (.59)	0.225
Beck Anxiety Inventory	11.1 (9.77)	8.5 (5.74)	1.0 (.33)	0.9 (.30)	0.713

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Table 2
Correlations of Studied Variables

	1	2	3	4
1. HP	-	-.086	.380*	.429*
2. SAFE	-.048	-	-.007	-.244
3. RSA	.031	-.148	-	-.027
4. BAI	.153	-.059	.044	-

Note: Correlations for males appear above the diagonal. Correlations for females appear below the diagonal. HP= Psychological Harsh Parenting Experienced in Adolescence; SAFE=Stability of Activities in the Family Environment; RSA=Respiratory Sinus Arrhythmia; BAI=Beck Anxiety Inventory

*significant at the 0.05 level (2-tailed)

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Table 3
Regression analysis of anxiety symptoms (BAI)

		β	t	F	R ²
Males	HP	.949	4.567	4.801**	.551
	SAFE	-.132	-0.884		
	RSA	-.428	-2.445*		
	SAFE x HP	.362	2.146*		
	RSA x HP	-.481	-2.710*		
Females	HP	.230	1.220	.787	.362
	SAFE	-.137	-0.653		
	RSA	-.055	-0.267		
	SAFE x HP	-.273	-1.281		
	RSA x HP	-.263	-1.261		

Notes. HP= Psychological Harsh Parenting Experienced in Adolescence; SAFE=Stability of Activities in the Family Environment; RSA=Respiratory Sinus Arrhythmia; BAI=Beck Anxiety Inventory

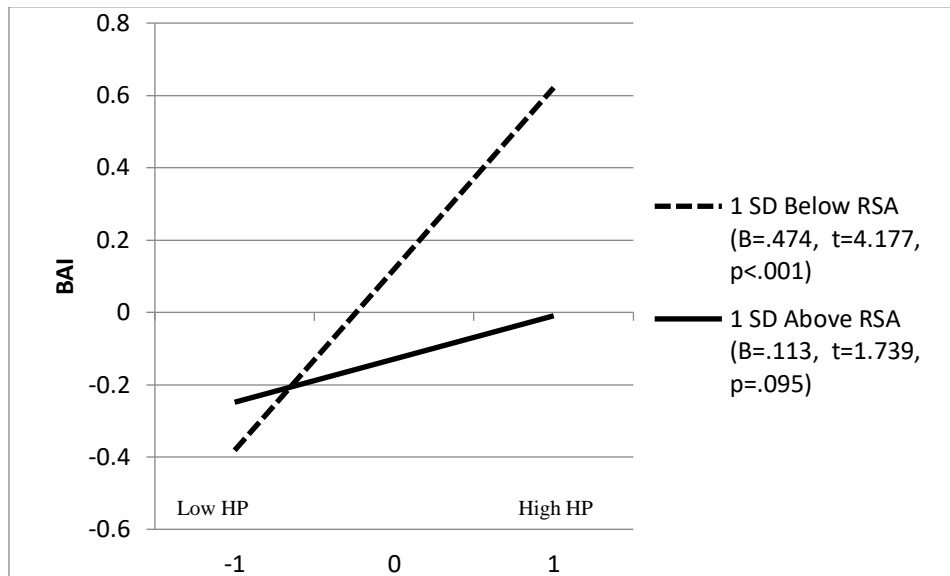
*p< .05

**p<.01

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Figure 1

Probing the relationship between harsh parenting and anxiety levels as moderated by RSA at one standard deviation above and below the mean in adolescent males

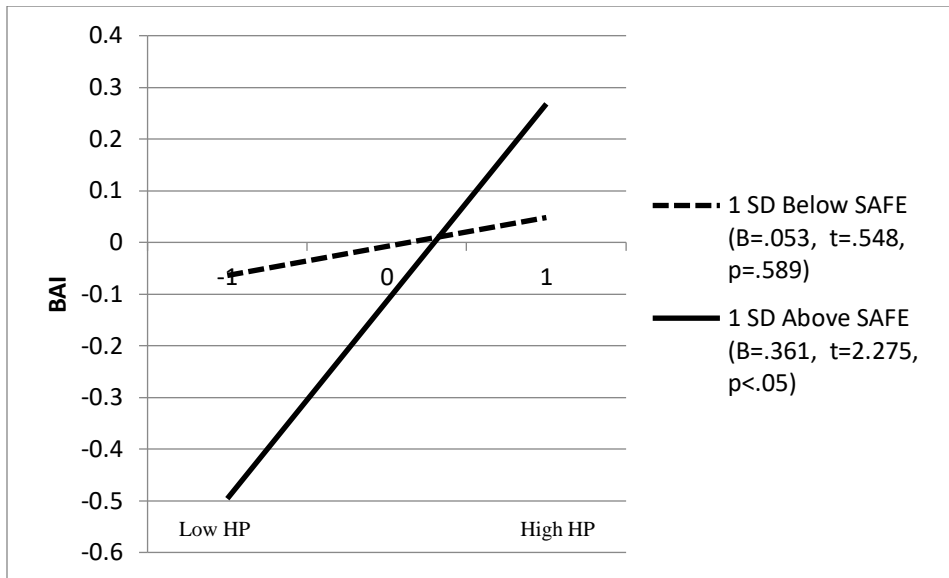


Notes. RSA= Respiratory Sinus Arrhythmia; BAI=Beck Anxiety Inventory; HP=Psychological Harsh Parenting Experienced during Adolescence

HOME ENVIRONMENT, ANXIETY, AND RSA

Figure 2

Probing the relationship between harsh parenting and anxiety levels as moderated by SAFE at one standard deviation above and below the mean in adolescent males



Notes. RSA= Respiratory Sinus Arrhythmia; BAI=Beck Anxiety Inventory; HP=Psychological Harsh Parenting Experienced during Adolescence