Differential effects of harsh parenting on the autonomic nervous system

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Introduction
Research has linked childhood maltreatment to aggression (Colvin et al., 2000) and harsh parenting (HP), as a robust measure of maltreatment, has been associated with aggressive behavior (e.g. Erath, El-Shiekh, & Cummings, 2009). Research also suggests that autonomic nervous system (ANS) activity is also related to aggressive behavior; in particular skin conductance level (SCL), a measure of sympathetic nervous system (SNS) activity (Raes, 2005) and respiratory sinus arrhythmia (RSA), a marker of parasympathetic nervous system (PNS) activity (Baune, Hong, & Marsh, 2006, Eisenberg, et al., 1995).

Regarding harsh parenting and marital conflict, researchers have found that high levels of baseline RSA can act as a buffer for negative effects (El-Shiekh, Hager, & Whilton, 2001) while low SCL combined with abusive parenting can increase aggression (Raes, 2005) especially among boys (El-Shiekh, et al., 2009). Because the PNS and SNS generally act oppositely and reciprocally on organ systems (e.g. Berntson, Cacioppo, & Quigley, 1991), the pattern of activity across these systems is important in assessing the developmental effects on emotional and behavior problems (Baumeister, Quan, & Duyer, 2002).

Consistent with our previous work (i.e. Gordis, Ferro, Olezeski, Rabkin, & Trickett, in press), we hypothesized that measures of ANS activity would indicate significant differences between males and females in terms of PNS and SNS activity and their interaction.

Methods and materials
As part of a larger examination of relations of marital conflict, family violence, and measures of SNS and PNS activity, 159 college students were recruited from a psychology research pool. Students filled out a number of self-report measures, including the Buss-Perry aggression questionnaire (BP-VA), the Parent-Child Conflict Tactics Scale (CTCS), the Center for Epidemiological Depression Scale (CES-D) and participated in a stressor task while measures of SNS and PNS activity were collected.

The CES-D is a self-report measure designed to measure depression in the general population (Radloff, 1977). The BP-VA is a self-report measure designed to measure aggression (Buss & Perry, 1992). The CTCS is a self-report measure designed to measure child maltreatment and harsh parenting in terms of 5 scale items (physical, sexual, emotional, and neglect). The CES-D was collected using a 100 mV, 30 Hz sinusoidal excitation waveform yielding a SCL output of 10 µS/V that was digitized at 1kHz. RSA was then calculated as the difference between the minimum and maximum values of the digitized data lines times square root of two times the period divided by two times the period in the range of interest (Berntson, 1991). The CES-D scores were therefore calculated using a 100 mV, 30 Hz sinusoidal excitation waveform yielding a SCL output of 10 µS/V that was digitized at 1kHz using a 100 mV, 30 Hz sinusoidal excitation waveform yielding a SCL output of 10 µS/V that was digitized at 1kHz. Mean RSA was then calculated as the difference between the minimum and maximum values of the digitized data lines times square root of two times the period divided by two times the period in the range of interest (Berntson, 1991).

Regression analyses were conducted using SPSS 17.0. Variables entered included the subscales from the BP-VA: physical aggression, verbal aggression, anger, and hostility; CES-D total score; childhood total parenting; teenage harsh parenting; SCL; RSA; and their interactions as noted. Consistency was then conducted to interpret 2-way and 3-way interactions.

Results

Table 1. Regression analysis of BP: Aggression

Table 2. Regression analysis of BP: Verbal Aggression

Table 3. Regression analysis of BP: Anger

Table 4. Regression analysis of BP: Hostility

Table 5. Standardized F(7,78)=1.002,

Table 6. Standardized F(7,69)=1.625,

Table 7. Standardized F(3,12)=.441*.

Table 8. Standardized F(7,26)=.727**.

Table 9. Standardized F(7,68)=.107.

Table 10. Standardized F(7,78)=.446*.  

Table 11. Standardized F(7,68)=.031*.

Table 12. Standardized F(7,78)=.894.

The data from females suggests that high corresponding activation in SNS and PNS may increase the effects of harsh parenting, whereas complementary patterns of activation (high SNS/low PNS and low SNS/high PNS) may be protective. Among males, high SNS seemed to increase risk for later verbal aggression in the face of harsh parenting.

Conclusions

Results indicated significant 2-way interactions for SCL and childhood harsh parenting scales for the BP verbal aggression subscale, suggesting that among males the complementary interactions of harsh parenting and high SCL increased risk for verbal aggression.

References


