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Talking about emotions: Effects of emotion-focused interviewing on children's physiological regulation of stress and discussion of the subjective elements of a stressful experience

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Abstract

This is the first study to examine the effect of questioning children about emotions and cognitions versus facts on children's stress reactivity and regulation, as well as children's abilities to discuss their subjective experiences, in the context of adult–child discussions about a stressful event. A total of 80 8- to 12-year-old children participated in a stressful laboratory task (i.e., Trier Social Stress Test). Following the task, half of the children were engaged in an emotion-focused conversation with an adult interviewer about the event, and half were engaged in a fact-focused conversation. Electrodermal and cardiac preejection activity and respiratory sinus arrhythmia were derived at baseline, during the laboratory stressor, and during the conversation to index stress reactivity and regulation. Children's narratives were coded for indicators of emotion processing (i.e., positive and negative emotion words, cognitive words [e.g., think, know]). Children's English language abilities, self-reported stress, and several parent-report measures (demographics, child life stress, and children's emotion regulation strategies) were also obtained. Results indicate that the emotion-focused interview facilitated children's discussions of their subjective experiences without increasing their stress reactivity and that children showed enhanced physiological stress regulation during the emotion-focused interview. This research will be of interest to those in the fields of child narratives, stress, and social context as well as to parents and practitioners interested in improving children's understanding, reporting, and recovery after stressful experiences.

Keywords

Children's stress response; Stress regulation; Emotion narrative; Emotion processing

Introduction

Reminiscing about life events creates a context for adults to guide children about what is important to recall and how best to interpret and react to experiences (Nelson & Fivush, 2004). This is often most critical, and most challenging, when children experience stressful events. Children rely on adult guidance to help them understand, interpret, and regulate negative emotions (Garnefski, Legerstee, Kraaij, Van Den Kommer, & Teerds, 2002; McRae

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et al., 2012). Theoretical and correlational work suggests the importance of adult–child conversations for the development of emotion-related skills and memory abilities following stressful experiences (e.g., Van Bergen & Salmon, 2010). However, there is a paucity of empirical quantitative examinations of the effects of emotion-focused conversations on children's abilities to experience, process, and regulate emotions and stress as well as on children's abilities to discuss their experiences.

The current design manipulated the type of interview children received regarding a stressful experience. This work pulled from literature on parent–child conversations about emotional experiences, narrative processing of subjective experiences, interviewing child witnesses to crimes, and psychobiology of stress in children to test differential effects of emotion-focused and fact-focused interviewing on children's stress reactivity and regulation as well as the likelihood of discussing the subjective elements of their experience. A long-term goal of this line of work is to provide a tool for adults (parents, clinicians, and forensic interviewers) who wish to elicit information about children's subjective experience of stressful experiences while supporting children's recovery from such experiences.

Emotion conversations and regulation

The content of adult–child conversations about emotional and stressful personally experienced events has typically been investigated via qualitative observations of conversations between parents and their preschoolers (e.g., Van Bergen & Salmon, 2010). This work suggests that parents often use emotion conversations to help their children regulate emotions in the context of negative events (Wang & Fivush, 2005). Conversations that help children to identify potential explanations and causes for negative emotion have been linked to emotion-related skill development and psychological well-being in typically developing children (Garnefski et al., 2002). In fact, suboptimal emotion conversations, in terms of quantity and also quality, have been identified as a mediator explaining the association between substantiated maternal maltreatment and a host of negative emotional and physiological outcomes for maltreated children. Outcomes include poor emotion knowledge and emotion regulation and blunted cortisol slopes (Speidel, Valentino, McDonnell, Cummings, & Fondren, 2019; Valentino et al., 2015). These findings suggest that the ways in which adults discuss emotional events with children affect children's ability to process and cope with emotion and stress over the long term. Less is known, however, about how emotion conversations affect children's immediate need to recover from a stressful experience, including when discussing the experience with an unfamiliar adult. Thus, the current research is the first to experimentally test how the content of a single conversation about a stressful past experience may affect children's reactions to, and discussion of, a stressful experience.

The ability to identify explanations and causes for negative emotions becomes internalized with age, allowing children to independently regulate their emotions while also helping children with immediate needs to process and regulate emotions prior to the internalization of these skills (Kopp, 1989; Styers & Baker-Ward, 2013). A shift occurs as children approach adolescence such that they begin to internalize these skills and use secondary regulation strategies such as "thinking through emotions" (Band & Weisz, 1988). Similarly, across development, youths have increasing physiological reactions to social stressors (Somerville & Casey, 2014). The current study sought to examine the developmental period leading up to these shifts to test interviewing effects on emotion processing and expression and regulation while children's skills are within this zone of proximal development and period of increasing stress sensitivity.

Discussion alone does not necessarily confer benefits for children's coping and well-being, and neither does children's spontaneous use of terms indicating emotional or cognitive processing of past events (Gottman, Katz, & Hooven, 1996). However, children may be more likely to demonstrate enhanced well-being when adult conversational partners include specific assistance with understanding emotions and cognitions (Wang & Fivush, 2005). Although previous work has examined parents' spontaneous guidance regarding causes of emotions and cognitions, experimental work is needed to test whether this guidance specifically causes differences in children's recovery from stress. The current research tested the effects of receiving an emotion-focused interview, compared with a fact-focused interview, conducted by a trained interviewer on children's emotion and physiological regulation to address important theoretical questions about adult contributions to children's regulatory abilities.

Previous research examining adult–child conversations about stressful experiences has nearly exclusively relied on retrospective reports of naturally occurring stressful events, introducing between-child variability. The use of a standardized stressful experience in the current research adds experimental control to the study of stressful event narratives. Furthermore, the proposed research builds on existing narrative literature by using autonomic measures of emotion and stress reactivity, namely sympathetic-linked cardiac preejection period (PEP), an index of approach, and sympathetic-linked electrodermal activity (EDA), an index of avoidance (Berntson, Lozano, Chen, & Cacioppo, 2004; Quas, Yim, Rush, & Sumaroka, 2012), and regulation, namely parasympathetic-linked respiratory sinus arrhythmia (RSA; Stifter, Dollar, & Cipriano, 2011), in addition to self-report, to assess mechanisms underlying behavioral reactions to stressful events and postevent conversations.

In terms of sympathetic functioning, stressful stimuli that evoke approach-based responses (e.g., goals, rewards) are associated with reactivity indexed via cardiac PEP or the interval between contraction of the left ventricle and the onset of ejection of blood into the aorta. PEP is believed to function as an index of beta-adrenergic control of the heart via projections from dopamine-rich regions such as the ventral striatum/nucleus accumbens (Berntson et al., 1997). Impedance cardiography can be used to derive cardiac PEP (Sherwood, Turner, Light, & Blumenthal, 1990–1991). Among typically developing youths, shortening of PEP in response to stressful stimuli indexes greater sympathetic influence over heart rate associated with approach behavior (Brenner & Beauchaine, 2011).

A second index of sympathetic functioning, EDA, is believed to be linked with avoidance-based stress responses via influence of the amygdala (Inman et al., 2018; Lanteaume et al., 2006). Increased activity in cholinergic fibers, which directly affect the activity of the eccrine sweat glands, is associated with greater sympathetic activity (Cacioppo, Tassinary, &

Bernston, 2007). Among typically developing youths, previous literature has indicated that increased EDA is highly correlated with sympathetic activity (Wallin, 1981) as well as avoidance behavior (Salminen, Ravaja, Kallinen, & Saari, 2013).

With respect to the role of parasympathetic functioning in the stress response, much work has demonstrated that respiratory sinus arrhythmia (RSA) serves as an index of vagal control (influenced by prefrontal regions) of the heart under conditions of regulation response to stressful stimuli (Lane, Reiman, Ahern, & Thayer, 2001). RSA can be derived from electrocardiogram data and is a reliable and valid index of parasympathetic nervous system activity. RSA is specifically related to parasympathetic control of heart rate through efferent vagus nerve activity, as empirically demonstrated by pharmacological blockade studies (Berntson, Cacioppo, & Quigley, 1993; Hayano et al., 1991). It is well established that among typically developing youths, greater RSA at rest is associated with improved coping in the context of stressful stimuli, whereas lower RSA at rest is associated with less optimal stress-linked coping. Furthermore, prior work demonstrates that among typically developing youths, in specific contexts RSA reactivity (i.e., withdrawal from resting levels) is associated with active coping to stressful stimuli as well as the maintenance of homeostasis (Berntson et al., 1997; Porges, Doussard-Roosevelt, Portales, & Greenspan, 1996).

Emotion conversations and narrative content

Narratives are sources of information about how the speaker thinks about, feels about, and remembers past experiences (Pennebaker, 2011). Examination of narrative content can provide insight into how individuals internally process past experiences. Specifically, use of emotion terms (e.g., upset, scared) and cognitive terms (e.g., think, know) in narratives about stressful experiences indicates active processing of emotional content (Pennebaker, 2011). Children tend to use more emotion and cognitive terms when discussing stressful events, likely because of greater need for processing and understanding these experiences (Pennebaker, 2011). Importantly, narrative content is also heavily dependent on the listener. Prior work demonstrates that even subtle differences in behaviors demonstrated by adult interviewers (e.g., supportive vs. neutral posture and facial expression) can affect emotion and cognitive term use in children's stressful event narratives (Klemfuss, Milojevich, Yim, Rush, & Quas, 2013). However, in interviewing contexts, children provide only minimal information about their emotional reactions to stressful experiences without direct prompting from adults (Lyon, Scurich, Choi, Handmaker, & Blank, 2012). Given that even subtle interviewer behaviors affect children's narrative processing, and that children rarely spontaneously report emotional reactions to stressful experiences, we anticipated that variation in an interviewer's questioning focus (emotional vs. factual) would have a dramatic effect on children's responding. This finding would allow replication of the core finding from previous interviewing work that children can discuss subjective reactions to stressful experiences in an interview context but do so rarely, and it would help to address our core research question about whether emotion-focused interviewing can help children to regulate stress responses while still reporting emotions and cognitions arising from the stressor.

The current study

The current study tested the effects of emotion-focused versus fact-focused interviewing when discussing a stressful experience on children's stress reactivity and regulation, emotion processing, and reporting of subjective experience. A total of 80 8- to 12-year-old children participated in a well-validated, experimentally controlled laboratory stressor known to reliably induce physiological and self-reported stress in children within this age range, namely the Trier Social Stress Test modified for use with children (TSST-M; Yim, Quas, Cahill, & Hayakawa, 2010). Child participants were then interviewed about their experience with either an emotion-focused protocol or a fact-focused protocol. Children self-reported their level of stress both after the TSST-M and after the interview, and their physiological reactivity (PEP and EDA) and regulation (RSA) were monitored throughout. Children completed a measure of English language proficiency, and caregivers completed a battery of questionnaires about family demographic information and children's emotion regulation skills.

This research was driven by two primary aims. The first, was to examine the effects of emotion-focused versus fact-focused interviewing on children's reactions to a stressful experience. We hypothesized that children in the emotion-focused interview condition would show decreased physiological stress reactivity and increased down-regulation of stress during the conversation about the stressful laboratory event as well as decreased self-reported stress at the conclusion of the event interview relative to children in the fact-focused condition. The second aim was to test the effects of interviewing condition on children's abilities to report the subjective elements of their stressful experience. We hypothesized that children in the emotion-focused condition would include a higher percentage of emotion and cognitive terms in the event interview relative to those in the fact-focused condition and, importantly, that this would not hinder their ability to down-regulate stress.

Method

Participants

A total of 80 youths ages 8–12 years (M_{age} = 10.13 years, SD = 1.26), participated in this study. The full sample was ethnically and racially diverse (see Table 1). The sample was 44% male and 56% female. The age range of youths (i.e., 8–12 years) was specifically selected because children in this age range have been developing emotion regulation skills via practice with caregivers but yet have not fully mastered independent regulation skills (Band & Weisz, 1988), making this a critical developmental period. Children in this age group have reliable stress reactions to the selected laboratory stressor (Yim et al., 2010) and are capable of reporting extensive emotional content, allowing for wide variation in narrative indicators of emotion processing (Lyon et al., 2012). Youths were recruited through advertisements (e.g., newspapers, E-mail, flyers) and community events (e.g., family-oriented expositions, local school events). Exclusion criteria included the use of any psychoactive medication (including stimulants) and the presence of any cardiovascular, developmental, neurological, or psychiatric disorders, per parental report.

Parent-report measures

Emotion regulation checklist—The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) assesses lability/negativity and emotion regulation in 6-to 12-year-old children using 24 4-point Likert scale items. Subscale internal consistency (.83–.96) and full scale internal consistency (.89) are high (Shields & Cicchetti, 1995). Validity has been established via correlation with conceptually related measures (Block & Block, 1980).

Child and adolescent survey of experiences—The Child and Adolescent Survey of Experiences (CASE; Allen, Rapee, & Sandberg, 2012) assesses exposure to stressful life experiences in children and adolescents. Caregivers are provided with a list of 38 potentially stressful events that may be experienced by children or adolescents and are asked to indicate which of the events their children experienced during the previous 12 months and, if experienced, how good or bad the experience was for their children on a 6-point Likert scale from *very good* to *very bad.*

Language measure

Because language has been linked to children's abilities to discuss past events (Klemfuss, 2015) children completed a measure of English productive language via the Expressive Vocabulary Test–Second Edition (EVT-2; Williams, 2007). This allowed for verification of parent reports of children's English fluency.

Task and psychophysiology recording procedures

Baseline task conditions—Psychophysiology data were recorded during a 2-min resting baseline period prior to the task as well as while the participants engaged in a talking/reading task to approximate the physiological response during speech. The talking baseline was completed to rule out effects of speech on psychophysiological variables.

Stress induction task—Participants completed the TSST-M (Yim, Granger, & Quas, 2010; Yim, Quas, et al., 2010). The TSST-M has been shown to reliably elicit physiological and self-reported stress in children in the proposed age range (Yim, Quas, et al., 2010). It is a complex and engaging event that facilitates child narratives rich with language indicative of emotion processing and regulation (Klemfuss et al., 2013). According to standard procedure, the TSST-M was completed in a laboratory room in which two unfamiliar research assistants, one male and one female, were seated at a table. Children were instructed to prepare a 5-min speech to perform in front of the observers, which they were told would be videotaped for later analysis. After 3 min of preparation, participants were instructed to begin the speech, and if needed the male observer prompted them twice to continue until the 5 min had elapsed. Next, the female observer administered an oral math test. The oral math test was restarted any time the participants included an error in their math. During the TSST-M procedure both observers remained neutral in their demeanor. At the conclusion, the primary experimenter entered the room to escort the child participants to an adjacent testing room.

Self-reported stress

Children were asked a series of questions indicating their level of experienced stress at two time points: (a) immediately following the TSST-M procedure and (b) immediately following the event conversation (below). The questions assessed perceived task difficulty, amount of effort required by children, self-perceived performance, and degree of experienced stress. For example, children reported the degree to which they felt stressed during the speech and math test, respectively, and while talking about the speech and math test, respectively, on a 7-point scale from *not at all stressed* to *extremely stressed*. These questions were based on those used in previous research examining children's reactions to the TSST-M (Klemfuss et al., 2013).

Event interview

After completion of the first self-reported stress questionnaire, the primary interviewer interviewed child participants about the TSST-M experience. The interview was the primary manipulation. The event interview structure and direct questions were developed based on well-established, research-based best practice interviewing techniques that have been shown to elicit accurate and complete reports from children and adolescents in laboratory and forensic contexts (Hershkowitz, Fisher, Lamb, & Horowitz, 2007). First, all children received a free recall prompt: "I'd like you to tell me everything that happened just now when you were in the other room. Please tell me everything that happened from when I left the room to when I came back to get you. Try not to leave anything out." Interviewers followed up with neutral facilitators such as "uh huh," "okay," and "what else?" until children indicated that they could provide no further information. Interviewers noted whether children spontaneously mentioned each of the four primary components of the TSST-M (preparing a speech, delivering a speech, answering questions about themselves, and answering math questions) using children's exact wording. These notes formed the basis for 16 direct questions in each condition—4 about each event component. Children were randomly assigned to participate in either the emotion-focused or fact-focused interview, which began immediately on completion of their free recall.

Emotion-focused interview—The emotion-focused interview incorporated techniques from research on eliciting emotion content and emotion processing from children (Ackil, 2011; Sales & Fivush, 2005). In particular, the emotion-focused interview prompted children's descriptions of *causes* of their emotional reactions because this has been demonstrated to be effective in enhancing children's psychological well-being and has been proposed to do so by aiding in emotion understanding and regulation (Wang & Fivush, 2005). Interviewers directly questioned children about each of the primary TSST-M components (preparing a speech, delivering a speech, answering questions about themselves, and completing the oral math test) that children mentioned in free recall using the children's own language. For each of the four TSST-M components, children received four direct questions of the following form: (1) How were you feeling during [children's wording for the TSST-M component]? (2) What made you feel [taken from children's response to Direct Question 1]? (3) What were you thinking during [children's wording for the TSST-M component]? (4) What made you think [taken from children's response to Direct Question 3]? If children failed to mention one of the four primary TSST-M components (preparing a speech, delivering a speech, answering questions about themselves, and answering math questions), the interviewer questioned children about the remaining component(s) by saying "I heard you had to [e.g., prepare a speech]" and asking the four standard direct questions. The emotion-focused interview served as the experimental group.

Fact-focused interview—The participants randomized to the fact-focused interview served as the control group. The fact-focused interview paralleled the emotion-focused interview, but each of the 16 direct questions focused on factual content (e.g. "You said you had to do some math. Tell me more about that."). As with the emotion-focused interview condition, after interviewers asked direct questions about all the TSST-M activities spontaneously mentioned by children, they asked direct questions about any of the main event components not spontaneously described by children (e.g., "I heard you had to [e.g., prepare a speech]. What happened when you had to [e.g., prepare a speech]?").

Emotion and cognition terms—Transcripts of children's narratives from the emotion-focused and fact-focused interview conditions were coded for language indicative of emotion processing via the Language Inquiry and Word Count software (LIWC; Pennebaker, Booth, & Francis, 2007). LIWC compares words in written transcripts against extensive dictionaries of conceptually related terms, including positive and negative emotion terms and cognitive terms (i.e. those indicating active processing of event content such as "think" and "know"). References to emotions and cognitions have been used as indicators of active emotion processing in numerous past studies (Pennebaker, 2011; Pennebaker, Mayne, & Francis, 1997). LIWC has been used to successfully identify differences in emotion and cognitive terms in previous work examining children's narratives about the TSST-M (Klemfuss et al., 2013). The key variables are automatically computed as percentages of terms from a given category out of the total word count in the entered text. The variables of interest in the current study were total word count, percentage of positive and negative emotion terms, percentage of total emotion terms, and percentage of cognitive terms. These variables were calculated for free recall and for children's responses to direct questions.

Psychophysiology recording overview

To obtain psychophysiological indexes continuously across task conditions, including resting baseline, talking baseline, TSST-M, and interview, disposable silver/silver chloride electrodes were placed in an electrocardiogram and impedance cardiography configuration (for added details, see Musser et al., 2011). In addition, EDA electrodes with 0% chloride were placed on the palm of the nondominant hand at roughly thenar and hypothenar muscles.

Respiratory sinus arrhythmia—RSA was derived in 60-s epochs using the detrended R-R time series, derived from electrocardiogram, and submitted to a Fourier transformation. The high-frequency respiratory band (ms^2) was set over the respiratory frequency band of 0.24–1.040 Hz and estimated via impedance cardiography. Respiratory rates were derived from the impedance cardiography signal (Z0) to verify that the signals remained within the analytic bandwidth. R-R waves were inspected for artifacts by visual inspection and MindWare Heart Rate Variability Version 3.1 software (MindWare Technologies, 2008a), and interrater reliability (*k* > .90) was established by two raters randomly examining 20% of the data obtained from each task condition.

Cardiac preejection period—PEP was derived at 60-s epochs from electrocardiogram and impedance cardiography with MindWare Impedance Cardiography Version 3.1 software (MindWare Technologies, 2008b). PEP was indexed as milliseconds from the onset of the Q-wave to the B-point of the dZ/dt wave. Artifacts were examined and removed through the MindWare software and through visual inspection, and interrater reliability (*k* > .85) was established by two raters randomly examining 20% of the data obtained from each task condition.

Electrodermal activity—EDA was recorded at a rate of 1000 samples per second and derived at 60-s epochs. Artifacts were examined and removed by MindWare EDA Version 3.1.1 (MindWare Technologies, 2008c) and through visual inspection. Interrater reliability (*k* > .90) was established by two raters randomly examining 20% of the data obtained from each task condition. Criteria for a skin conductance response (SCR) included at least 0.05 microsiemens (μS) of a difference from peak and to trough and an SCR duration of no more than 10 s with at least 0.25 s between each SCR. The value used during analysis was mean skin conductance (mean SC).

Analytic plan

For preliminary analyses to examine group (i.e., fact-focused interview vs. emotion-focused interview) differences in demographic and behavioral data, chi-square analyses were used for categorical data (e.g., biological sex, ethnicity, race), whereas analysis of variance (ANOVA) was used for continuous variables (e.g., age, EVT-2 scores, rating scale scores). For a second round of preliminary analyses, a series of repeated-measures ANOVAs (RM-ANOVAs) were conducted to examine whether there were group differences in baseline psychophysiological functioning or group differences in response to the TSST-M in order to rule out alternate explanations. Finally, for primary analyses, a series of RM-ANOVAs were conducted to examine whether groups differed in psychophysiological response, as well as emotion and cognitive terms, to the interview condition manipulation. Each of these models was first examined without covariates and then with covariates, including child age, biological sex, ethnicity/race, and parent-rated child emotion regulation, because these factors have been shown to affect psychophysiological responding in prior work (i.e., child age, biological sex, ethnicity/race) or differed between groups in the current study (i.e., parent-rated child emotion regulation). The pattern of results was consistent with and without covariates in the model. Thus, models are presented herein without covariates included. Results of analytical models with covariates are available on request from the corresponding author.

Power analysis

G*Power was used. With a sample size of 80 participants, a post hoc power analysis for RM-ANOVA with five levels would have adequate power ($b = .85$, $p < .05$) to detect small effects (Cohen’s $d > .20$). With the addition of covariates, power was not expected to be reduced significantly.

Results

Descriptive and diagnostic statistics

As presented in Table 1, age, ethnicity, race, sex, and EVT-2 scores did not vary according to group. Although these variables have been shown to affect psychophysiological responding in prior work, the inclusion of these variables did not affect overarching results in the preliminary or primary models; thus, these variables were excluded from further analyses. Analyses including these variables as covariates are available on request from the corresponding author.

Behavioral/rating scale endorsed characteristics are also included in Table 1. Scores on the ERC differed significantly between groups, $F(1,79) = 8.51$, $p = .01$, partial eta squared $\left(\eta_p^2\right) = .09$. However, no other differences were observed in child emotional functioning or child life events as reported on the ERC or CASE (see Table 1 for details). Results of the preliminary and primary analyses were consistent with children's scores on the ERC. The analyses are reported without covariates included; however, the results with covariates included are available from the second author. Child self-reported stress during the TSST-M and Interview is also reported in Table 1. No group differences were observed for the emotion-focused versus fact-focused groups.

Preliminary examination of RSA, PEP, and EDA during baselines and TSST-M

Baseline effects—Raw scores are included in Table 2 for all psychophysiological variables of interest according to task epoch for resting baseline, talking baseline, TSST-M, and interview conditions. Based on RM-ANOVA, the emotion-focused and fact-focused groups did not differ significantly in their resting RSA, $F(1, 79) = 0.110$, $p = .741$, $\eta_p^2 = .001$, resting PEP, $F(1, 79) = 1.672$, $p = .200$, $\eta_p^2 = .023$, or resting EDA, $F(1, 79) = 1.668$, $p = .200$, $\eta_p^2 = .021$ (means and standard deviations in Table 2). Similar results were observed for the talking baseline, where again, based on RM-ANOVA, the emotion-focused and fact-focused groups did not differ significantly in their talking RSA, $F(1, 79) = 0.346$, $p = .558$, $\eta_p^2 = .004$, talking PEP, $F(1, 79) = 0.212$, $p = .647$, $\eta_p^2 = .003$, or talking EDA, $F(1, 79) = 0.672$, $p = .415$, $\eta_p^2 = .009$ (means and standard deviations in Table 2) (see Figs. 1–3).

TSST-M effects on RSA—RSA raw scores for each TSST-M task epoch are listed according to group in Table 2. A 10 × 2 RM-ANOVA (Epoch [1–10 min] × Group [fact or emotion]) examined the effects of the TSST-M task on RSA according to group assignment. As expected, there was a significant effect of time/epoch on RSA, $F(1, 79) = 26.61$, $p < .001$, $\eta_p^2 = .245$ (means and standard deviations in Table 2). Furthermore, as expected, neither the main effect of group on RSA, $F(1, 79) = 0.031$, $p = .861$, $\eta_p^2 = .001$, nor the interaction effect of group by epoch on RSA, $F(1, 79) = 0.380$, $p = .539$, $\eta_p^2 = .005$, was significant (means and standard deviations in Table 2) (see Fig. 1). Thus, as expected, the TSST-M appears to have been successful in inducing stress; however, as designed, there were no group differences in the parasympathetic response to the TSST-M.

TSST-M effects on PEP—As with RSA, PEP raw scores for each TSST-M task epoch are listed according to group in Table 2. A 10 × 2 RM-ANOVA (Epoch [1–10 min] × Group [fact or emotion]) examined the effects of the TSST-M task on PEP according to group assignment. As expected, there was a significant effect of time/epoch on PEP, $F(1, 79) = 5.24$, $p < .001$, $\eta_p^2 = .077$ (means and standard deviations in Table 2). Furthermore, as expected, neither the main effect of group on PEP, $F(1, 79) = 1.60$, $p = .211$, $\eta_p^2 = .025$, nor the interaction effect of group by epoch on PEP, $F(1, 79) = 1.12$, $p = .348$, $\eta_p^2 = .017$, was significant (means and standard deviations in Table 2) (see Fig. 2). Thus, as expected, PEP analyses suggest that the TSST-M was successful in inducing stress; however, as designed, there were no group differences in the approach-based sympathetic response to the TSST.

TSST-M effects on EDA—EDA raw scores for each TSST-M task epoch are also listed according to group in Table 2. Again, a 10 × 2 RM-ANOVA (Epoch [1–10 min] × Group [fact or emotion]) examined the effects of the TSST-M task on EDA according to group assignment. As expected, there was a significant effect of time/epoch on EDA, $F(1, 79) = 8.057$, $p < .001$, $\eta_p^2 = .095$ (means and standard deviations in Table 2). Furthermore, as expected, neither the main effect of group on EDA, $F(1, 79) = 0.953$, $p = .332$, $\eta_p^2 = .012$, nor the interaction effect of group by epoch on EDA, $F(1, 79) = 0.670$, $p = .737$, $\eta_p^2 = .009$, was significant (means and standard deviations in Table 2) (see Fig. 3). Thus, the EDA analyses suggest that the TSST-M was successful in inducing stress; however, as designed, there were no group differences in the avoidance-linked sympathetic response to the TSST.

Primary analyses

As described in the Method section, children's RSA, PEP, and EDA were assessed in 1-min epochs throughout the course of the interviews. In both conditions, interviews nearly exclusively lasted for 5-min-long epochs. There were two exceptions in which interviews lasted longer than 5-min-long epochs. One of these was an emotion-focused interview, and the other a fact-focused interview. Thus, for all participants, we included only the first 5-min-long epochs in the following analyses.

Interview effects on RSA—RSA raw scores for each interview task epoch are listed according to group in Table 2. A 5 × 2 RM-ANOVA (Epoch [1–5 min] × Group [fact or emotion]) examined the effects of the emotion-focused or fact-focused interview condition group assignment on RSA during the interview. Here, there was no significant effect of time/epoch on RSA, $F(1, 79) = 1.37$, $p = .255$, $\eta_p^2 = .081$ (means and standard deviations in Table 2) (see Fig. 1). Furthermore, there was no significant main effect of group on RSA, $F(1, 79) = 0.651$, $p = .423$, $\eta_p^2 = .010$. However, there was a significant interaction effect of group by epoch on RSA, $F(1, 79) = 3.133$, $p = .015$, $\eta_p^2 = .046$ (means and standard deviations in Table 2). Thus, the interview appears to have affected stress differentially over time depending on interview group assignment. Specifically, both the linear effect, $F(1, 79) = 4.34$, $p = .041$, $\eta_p^2 = .063$, and the quadratic effect were significant, $F(1, 79) = 5.194$, $p = .026$, $\eta_p^2 = .074$.

Interview effects on PEP—PEP raw scores for each interview task epoch are listed according to group in Table 2. A 5 × 2 RM-ANOVA (Epoch [1–5 min] × Group [fact or emotion]) examined the effects of the emotion-focused or fact-focused interview condition group assignment on PEP during the interview. Here, there was no significant effect of time/epoch on PEP, $F(1, 79) = 1.019$, $p = .398$, $\eta_p^2 = .019$ (means and standard deviations in Table 2) (see Fig. 2). Furthermore, there was no significant main effect of group on PEP, $F(1, 79) = 1.631$, $p = .207$, $\eta_p^2 = .030$, and no interaction effect of group by epoch on PEP, $F(1, 79) = 1.457$, $p = .216$, $\eta_p^2 = .026$ (means and standard deviations in Table 2). Thus, the interview appears to have had little effect on PEP across time for either group.

Interview effects on EDA—EDA raw scores for each interview task epoch are listed according to group in Table 2. A 5 × 2 RM-ANOVA (Epoch [1–5 min] × Group [fact or emotion]) examined the effects of the emotion-focused or fact-focused interview condition group assignment on EDA during the interview. Here, there was a significant effect of time/epoch on EDA, $F(1, 79) = 1.125$, $p = .003$, $\eta_p^2 = .051$ (means and standard deviations in Table 2) (see Fig. 3). However, there was no significant main effect of group on EDA, $F(1, 79) = 1.380$, $p = .244$, $\eta_p^2 = .018$, and no interaction effect of group by epoch on EDA, $F(1, 79) = 1.435$, $p = .241$, $\eta_p^2 = .018$ (means and standard deviations in Table 2). Thus, the interview appears to have had little differential effect on EDA according to group.

Interview effects on subjective reporting—The average word counts for both free recall and direct questions, as well as the average percentage of children's total emotion words, positive emotion words, negative emotion words, and cognitive words, are included in Table 1. As expected, there were no differences in overall word count, $F(1, 79) = 1.67$, $p = .21$, $\eta_p^2 = .03$, or the percentages of emotion or cognitive terms across conditions, Fs$(1, 79) = 0.26$ to 0.91, ps $> .05$, in free recall given that free recall was conducted before the experimental manipulation. Nor was there a significant difference in overall word count in direct questions by condition, $F(1, 79) = 3.49$, $p = .07$, $\eta_p^2 = .04$. However, as hypothesized, in responses to direct questions, children in the emotion condition (compared with the fact condition) used higher percentages of overall emotion words $F(1, 79) = 14.15$, $p < .01$, $\eta_p^2 = .20$, positive emotion words, $F(1, 79) = 3.96$, $p = .01$, $\eta_p^2 = .09$, and negative emotion words, $F(1, 79) = 12.51$, $p < .01$, $\eta_p^2 = .12$. Similarly, in response to direct questions, children in the emotion condition (compared with the fact condition) used a significantly greater percentage of cognitive words, $F(1, 79) = 16.21$, $p < .01$, $\eta_p^2 = .27$. Thus, overall, children in the emotion-focused interviewing condition used higher percentages of emotion and cognitive words relative to children in the fact-focused interviewing condition (Table 1).

Discussion

Experiencing stressful events can help children to learn about and practice regulating their emotions. These skills are critical to healthy normative development (Eisenberg, Sadovsky, & Spinrad, 2005). However, successfully processing and regulating emotions is challenging for children and may require assistance from adults (Garnefski et al., 2002; McRae et al., 2012). Previous descriptive work from the field of parent–child reminiscing supports this claim and suggests that specific types of adult assistance are most beneficial for children's emotional processing and regulatory skill development (e.g., focusing on identifying and explaining emotional reactions; Oppenheim, Nir, Warren, & Emde, 1997; Sales & Fivush, 2005).

The current research was the first to experimentally manipulate the type of interview children received when discussing a stressful experience to examine the effects on children's regulatory abilities and stress responding and discussion of their subjective experience of the stressor. This work built on correlational findings from the parent–child reminiscing literature using a controlled experimental design and on those from the interviewing literature by testing psychophysiological and behavioral stress reactions to emotion prompts in addition to children's reporting of their emotional and cognitive reactions. The results provide a critical step toward understanding and improving children's reporting, processing of, and recovery from stressful experiences across contexts such as parent–child reminiscing, clinical settings, and forensic interviews. We expected that children in this age range would benefit from direct questioning about emotions and cognitions in terms of recovery from stress and verbally processing their stressful experience. We found partial support for our primary hypotheses. Specifically, we observed that children demonstrated more physiological stress regulation over time in the emotion-focused interviewing condition relative to the fact-focused interviewing condition.

It is worth mentioning that there was convergent evidence to support the effectiveness of the stressful event for engaging children's physiological stress responses. Children showed markers of increased sympathetic reactivity (PEP and EDA) and parasympathetic withdrawal (RSA) in response to the TSST-M relative to both resting and talking baseline. As such, the TSST-M was effective in inducing stress and facilitated our examination of the effects of the emotion-focused interview on children's stress reactions and processing of emotional content. Although, contrary to our hypotheses, there was no evidence to suggest that the emotion-focused interview helped to dampen children's stress reactivity or self-reported stress during the interview, there was evidence for differing patterns of parasympathetic withdrawal, as evidenced by increased RSA scores during the emotion-focused interview relative to the fact-focused interview.

Whereas we expected that the emotion-focused interview would decrease children's stress reactivity, it is promising that we saw no evidence that it induced additional stress in children relative to the fact-focused condition. Some prior research suggests that children who focus more on the subjective components of their stressful experiences without direct adult prompting to do so tend to have worse psychological outcomes in terms of internalizing and externalizing problems (McLean, Breen, & Fournier, 2010). Researchers have hypothesized that this is because these children are bringing to mind their negative emotions and thoughts about the stressful experience without the ability to successfully regulate those negative emotions and thoughts. The pattern of results in the current study suggests that when children are focused on feelings and thoughts aroused by a stressful experience in response to direct questioning from adults, they do not experience additional stress relative to children who discuss their experience in a fact-focused context. In fact, it appears that they more successfully engage in regulation of emotion and stress via parasympathetic activation. So, it appears that the act of talking about emotions and cognitions elicited during a stressful past experience is not sufficient to induce additional stress in children, but instead it may be the case that when children spontaneously do so, particularly after a delay, it indicates that children are ruminating about their subjective reactions to the experience rather than discussing their experiences constructively under adult guidance. However, these findings speak only to the effects of emotion focus in an immediate interview about a moderate stressor. It will be important for future research to examine children’s long-term reactions to more severe personally experienced stress in order to assess the generalizability of the current findings.

In terms of children’s parasympathetic withdrawal (RSA), which is considered an indicator of physiological regulation of stress, children demonstrated decreased withdrawal, as evidenced by increased levels of RSA, in the interview relative to the TSST-M. However, here there were also group differences between children in the emotion-focused and fact-focused conditions. The level of withdrawal during the interview was initially lower for children in the emotion-focused condition. This gap between conditions closed by the end of the interview. As such, children in the emotion-focused condition were indicating more stress regulation than those in the fact-focused condition. It may have been the case that the fact-focused interview caused delays in children’s ability to down-regulate stress elicited by the TSST-M. Or, this finding may suggest that children in the emotion-focused condition were experiencing additional stress when directly questioned about subjective reactions to the stressful event but that this was evident in only one stress measurement. It could also be the case that although children in the emotion-focused condition did experience additional stress, they were able to successfully down-regulate this stress, at least in the context of an interview that prompted this discussion. Finally, the different patterns of parasympathetic withdrawal may indicate that the emotion-focused interview facilitated children’s active processing of their stressful experiences, as evidenced both in parasympathetic withdrawal and in increased use of terms indicating processing of their emotional experience.

Children in the emotion-focused condition used higher percentages of emotion words, both positive (e.g., calm, confident) and negative (e.g., nervous, stressed), and more cognitive words (e.g., think, know) when discussing the stressful laboratory event. This pattern of results indicates that the emotion-focused interview successfully focused children on the subjective elements of their experience. Furthermore, it suggests that these children may have more actively processed the emotional aspects of the experience. Percentages of emotion and cognitive words reported in a conversation, as coded using the current automated coding software (LIWC), have been used as indicators of active emotion processing (see Pennebaker, 2011). And, at least in adults, use of these categories of words in narratives about stressful past experiences, particularly adaptive shifts in these words over time, have been linked to a host of positive behavioral and psychological outcomes (Frattaroli, 2006).

Finally, increasing children’s talk about feelings and thoughts elicited by stressful events can benefit children indirectly because it allows children to communicate these reactions to adults invested in helping and protecting children across a variety of contexts. Insofar as emotion-focused questioning increases the likelihood that children will report their emotions, it may help clinicians to better address children's adverse emotional reactions and help caregivers to better understand how and when to provide their children with emotional support.

Emotion-focused questioning also holds relevance in legal settings, where jurors expect child witnesses to express emotions elicited by crimes when testifying (Golding, Fryman, Marsil, & Yozwiak, 2003) and verbal emotion expression is considered a central part of a testimonial narrative (Snow, Powell, & Murfett, 2009). Children rarely express such emotions spontaneously (Lyon et al., 2012), likely reducing their credibility. Forensic interviewers who facilitate children's discussion of subjective reactions to their experiences can testify about this in court. They can also explain that, unless directly asked, it is normative for children to fail to describe their emotional and cognitive reactions to stressful experiences. Of course, in legal contexts, interviewing children about factual content is of paramount importance. Future work is needed to test whether forensic interviews can successfully integrate emotion-focused interviewing prompts into a fact-focused interviewing protocol to help children with physiological stress regulation and reporting of emotional and cognitive content without sacrificing the fact-finding goal of a forensic interview. Of note, the current gold standard forensic interviewing protocol currently includes emotion-related prompting (e.g., "You mentioned [activity, object, *feeling, thought*]. Tell me more about that."; Revised NICHD Protocol; Hershkowitz, Lamb, & Katz, 2014).

There are limitations in the current study that should be addressed with future work to confirm these preliminary findings and to facilitate application in the field. Although the stressor used in the current study has been shown to be moderately stressful for children in the current age range, future work should examine the efficacy of an emotion-focused interview for children who have experienced more severe and personally relevant stressors. It is also unclear whether the effects of emotion-focused interviewing may vary across different populations of children. For example, encouraging attention to emotional reactions during a stressful experience may be problematic for children with a tendency to ruminate (e.g., Hilt & Pollack, 2012). Future work will also need to consider the potential effects of delay, and the effects of repeated interviews, on the current findings. Although the current results address interviewing effects on children's immediate stress processing, it is unclear how the same interview might affect children's responding over time. It may be the case that emotion-focused interviews are less effective after children have had time to independently process and gain closure about a stressor. Or, emotion-focused interviewing may be even more effective after a delay because children may be better able to adaptively discuss their emotional and cognitive reactions over time and, potentially, across repeated interviews (see Frattaroli, 2006). Finally, we opted to use an automated text analysis program (LIWC, 2015; Pennebaker, Boyd, Jordan, & Blackburn, 2015) to capture children's emotion and cognitive term use. Because LIWC does not capture the context of the terms it classifies, it is possible that the program may make classification errors. For example, in the sentence "I was not feeling sad," "sad" would be classified as a negative emotion term despite the speaker's intention of conveying neutral or positive emotion. However, LIWC output has been shown to be internally reliable and externally valid (Pennebaker et al., 2015) and has been refined across four versions of the program since 1997. Specific information about category internal consistency can be found in Pennebaker et al. (2015).

In addition to answering important theoretical questions about children's reactions to stress, this work has substantial implications within clinical and legal settings. In each of these real-world contexts, children are often asked to discuss emotionally negative, stressful, personally experienced events. In clinical settings, emotion-focused questioning could be an important intervention tool to assist children with adaptive coping; in fact, many clinicians already focus children on thoughts and feelings elicited from negative events, but without evidence that this is effective for improving children's well-being. In legal settings, it is important for child witnesses to be able to discuss their emotional reactions to stressful experiences in order to appear credible to jurors (Snow et al., 2009). Therefore, emotion-focused questioning may be a useful tool in forensic interviews to help children discuss their emotional reactions to stress without overwhelming them.

Conclusions

The current study is the first to test whether emotion-focused and fact-focused interviewing would lead to different trajectories of physiological reactions in children following a stressful event. When children were directly prompted to describe their emotions and cognitions stemming from the TSST-M, and the underlying causes of those emotions and cognitions, they were significantly more likely to do so. More important, despite the fact that the emotion-focused interview drew more attention to the emotional elements of the event, children showed similar physiological reactivity in both interviews and greater physiological regulation in the emotion-focused interview. Importantly, the primary results of this study were not observed to be due to child age, biological sex, or ethnicity/race. Similarly, parent ratings of child emotion regulation did not appear to directly affect the primary study results. As such, these affects appear to be relatively robust. Thus, emotion-focused interviewing has potential for eliciting children's subjective reactions to a stressful event without accompanying aversive physiological stress responses.

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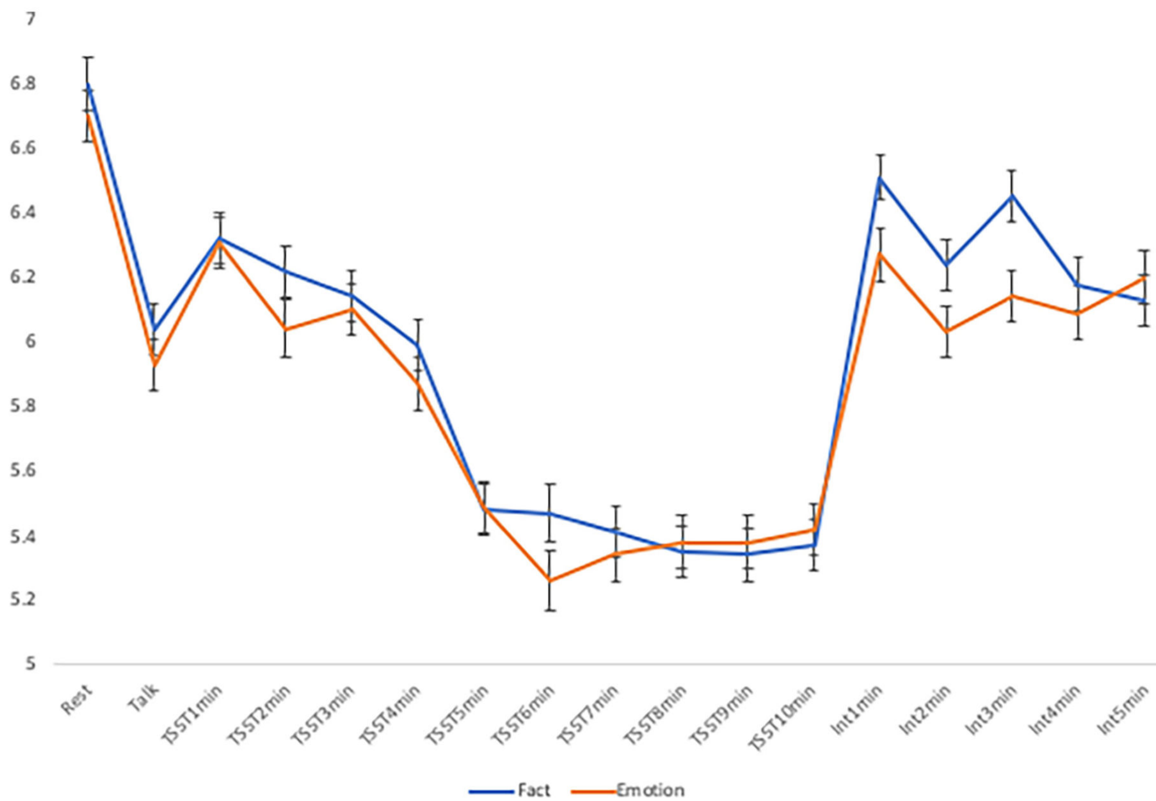

Fig. 1.

Respiratory sinus arrhythmia (RSA) by task epoch (i.e., baseline, Trier Social Stress Test modified for use with children [TSST], and interview [Int]) according to group assignment to emotion-focused or fact-focused questioning.

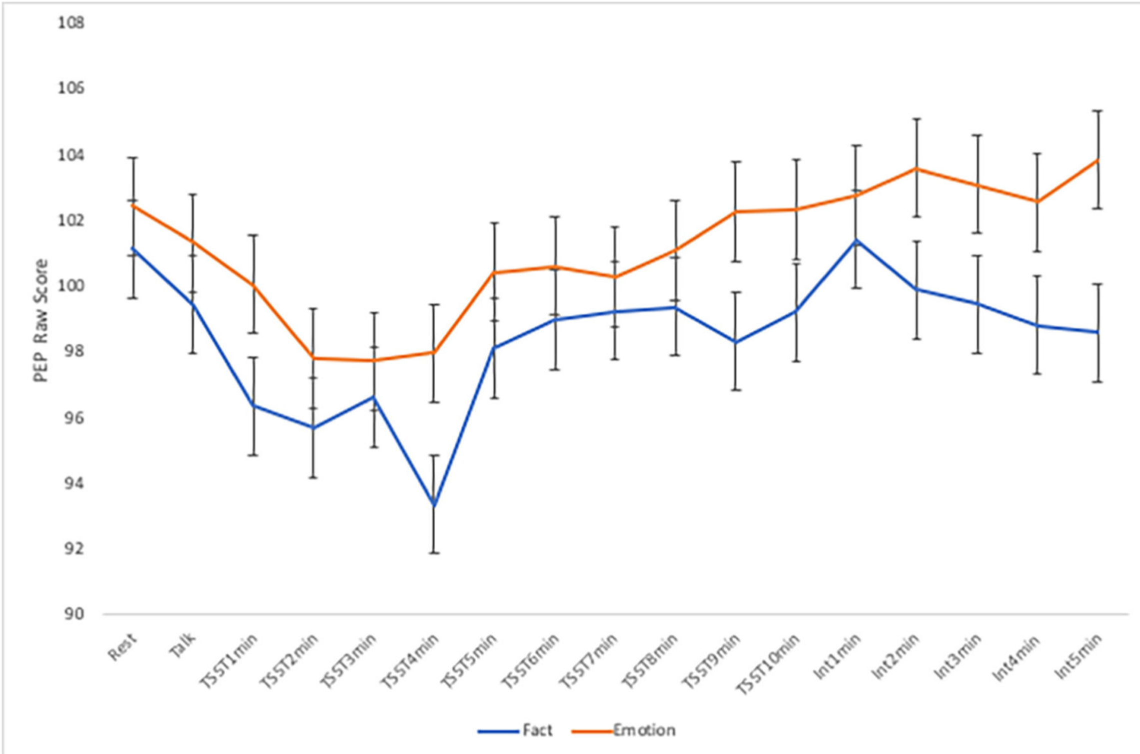

Fig. 2.
Cardiac preejection period (PEP) by task epoch (i.e., baseline, Trier Social Stress Test modified for use with children [TSST], and interview [Int]) according to group assignment to emotion-focused or fact-focused questioning.

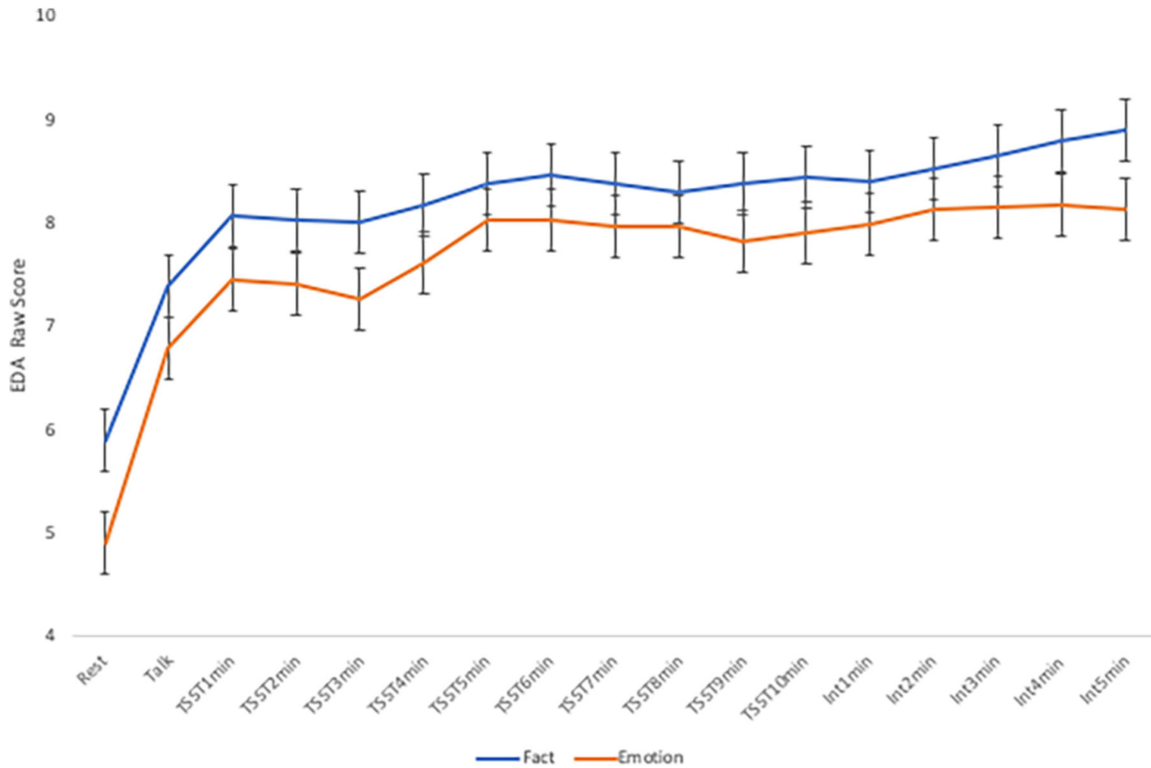

Fig. 3.

Electrodermal activity (EDA) by task epoch (i.e., baseline, Trier Social Stress Test modified for use with children [TSST], and interview [Int]) according to group assignment to emotion-focused or fact-focused questioning.

Table 1

Descriptive demographic and behavioral data and statistics for fact and emotion groups.

Variable	Fact (n = 45)	Emotion (n = 35)	F or χ^2
Demographic data			
Age (months) [*M* (*SD*)]	122.96 (15.74)	120.31 (14.40)	0.60
Biological (% male)	43.2	47.2	0.13
Ethnicity (% Hispanic/Latino)	68.9	55.6	1.53
Race (% non-White)	28.9	33.3	0.19
Black/African American (%)	22.0	20.0	–
Multiple races (%)	8.9	13.3	–
White/Caucasian (%)	71.1	66.7	–
EVT-2 score [*M* (*SD*)]	98.64 (8.69)	97.28 (14.76)	0.27
Behavioral data: Rating scales			
Emotion Regulation Checklist			
Emotion regulation [*M* (*SD*)]	3.20 (0.38)	3.46 (0.36)	8.51*
Negativity/lability [*M* (*SD*)]	1.93 (0.43)	1.76 (.048)	2.28
Life events			
Positive life events [*M* (*SD*)]	4.43 (2.05)	4.52 (2.08)	0.03
Negative life events [*M* (*SD*)]	2.83 (2.87)	2.50 (2.12)	0.25
Impact of positive events [*M* (*SD*)]	10.98 (5.13)	10.77 (6.30)	0.02
Impact of negative events [*M* (*SD*)]	4.88 (4.98)	4.78 (5.84)	0.01
Self-reported stress			
TSST self-report [*M* (*SD*)]	4.39 (0.93)	4.37 (1.08)	0.01
Interview self-report [*M* (*SD*)]	3.30 (1.20)	3.51 (1.13)	0.56
TSST interview S-R [*M* (*SD*)]	1.09 (1.26)	0.86 (0.95)	.68
Word usage direct question			
Overall word count [*M* (*SD*)]	561.48 (382.09)	380.22 (307.77)	3.49
% Total affect words [*M* (*SD*)]	4.62 (1.89)	7.08 (2.90)	14.15***
% Positive affect words [*M* (*SD*)]	3.06 (1.36)	3.94 (1.91)	3.96*
% Negative affect words [*M* (*SD*)]	1.54 (1.28)	3.13 (2.03)	12.51***
% Cognitive words [*M* (*SD*)]	18.20 (3.07)	22.02 (3.89)	16.21***
Word usage free recall			
Overall word count [*M* (*SD*)]	130.58 (89.14)	163.09 (94.25)	1.67
% Total affect words [*M* (*SD*)]	4.50 (3.23)	4.08 (2.71)	0.26
% Positive affect words [*M* (*SD*)]	2.89 (2.20)	2.82 (2.62)	0.91
% Negative affect words [*M* (*SD*)]	1.61 (2.14)	1.26 (1.28)	0.48
% Cognitive words [*M* (*SD*)]	17.28 (5.74)	16.95 (6.22)	0.40

Note. EVT-2, Expressive Vocabulary Test–Second Edition; TSST self-report, Trier Social Stress Task self-reported stress rating; Interview self-report, interview self-reported stress rating; TSST interview S-R, Trier Social Stress Task interview self-reported stress rating. Missing data handled via listwise deletion.

* $p < .05$.

***$p < .001$.

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Table 2

Raw respiratory sinus arrhythmia (ms^2), preejection period (ms), and electrodermal activity (μS) across task epochs for fact and emotion groups.

Variable	Fact (*n* = 45)	Emotion (*n* = 35)
Baseline physiology data		
Rest baseline 1 min		
RSA	6.80 (1.19)	6.76 (1.40)
PEP	101.69 (10.22)	102.42 (8.26)
EDA	6.11 (3.45)	5.12 (3.38)
Rest baseline 2 min		
RSA	6.79 (1.32)	6.65 (1.20)
PEP	99.97 (10.38)	101.53 (10.99)
EDA	5.69 (3.43)	4.69 (3.40)
Average rest baseline		
RSA	6.80 (1.20)	6.70 (1.19)
PEP	101.13 (9.16)	102.00 (9.37)
EDA	5.89 (3.44)	4.90 (3.39)
Rest 1 min correlated rest 2 min	RSA $r = .802^{***}$	
	PEP $r = .748^{***}$	
	EDA $r = .974^{***}$	
Talk baseline 1 min		
RSA	6.01 (1.35)	5.78 (1.10)
PEP	99.05 (11.21)	101.33 (9.03)
EDA	7.37 (3.13)	6.71 (3.46)
Talk baseline 2 min		
RSA	6.07 (0.99)	6.09 (1.02)
PEP	100.03 (11.06)	101.07 (9.62)
EDA	7.41 (3.19)	6.85 (3.36)
Average talk baseline		
RSA	6.04 (1.07)	5.93 (0.98)
PEP	99.43 (10.98)	101.31 (9.41)
EDA	7.39 (3.16)	6.78 (3.41)
Talk 1 min correlated talk 2 min	RSA $r = .662^{***}$	
	PEP $r = .860^{***}$	
	EDA $r = .985^{***}$	
Rest average correlated talk average	RSA $r = .652^{***}$	
	PEP $r = .819^{***}$	
	EDA $r = .850^{***}$	
TSST task physiological data		

Variable	Fact (*n* = 45)	Emotion (*n* = 35)
TSST 1 min		
RSA	6.32 (1.18)	6.31 (1.09)
PEP	96.35 (11.46)	100.06 (11.18)
EDA	8.06 (2.46)	7.44 (2.92)
TSST 2 min		
RSA	6.22 (1.17)	6.04 (1.23)
PEP	95.69 (11.49)	97.79 (12.47)
EDA	8.03 (2.54)	7.40 (2.97)
TSST 3 min		
RSA	6.14 (1.298)	6.10 (1.26)
PEP	96.62 (12.06)	97.71 (11.44)
EDA	8.00 (2.57)	7.26 (3.06)
TSST 4 min		
RSA	5.99 (1.82)	5.87 (1.10)
PEP	93.36 (12.15)	97.97 (8.57)
EDA	8.17 (2.29)	7.62 (2.78)
TSST 5 min		
RSA	5.48 (1.13)	5.49 (1.15)
PEP	98.10 (11.42)	100.42 (10.92)
EDA	8.38 (1.97)	8.03 (2.54)
TSST 6 min		
RSA	5.47 (1.15)	5.26 (1.02)
PEP	98.97 (11.52)	100.61 (9.08)
EDA	8.46 (1.98)	8.02 (2.47)
TSST 7 min		
RSA	5.41 (0.99)	5.34 (1.22)
PEP	99.25 (12.45)	100.28 (10.06)
EDA	8.38 (2.12)	7.96 (2.51)
TSST 8 min		
RSA	5.35 (1.09)	5.38 (1.17)
PEP	99.37 (11.77)	101.09 (10.68)
EDA	8.30 (2.15)	7.96 (2.50)
TSST 9 min		
RSA	5.34 (1.10)	5.38 (1.01)
PEP	98.32 (10.80)	102.26 (9.49)
EDA	8.37 (2.06)	7.81 (2.69)
TSST 10 min		
RSA	5.37 (1.11)	5.42 (1.25)
PEP	99.20 (11.03)	102.32 (9.11)
EDA	8.44 (1.86)	7.90 (2.46)
TSST 1 min through 10 min	RSA $r > .500^{***}$	

Variable	**Fact (*n* = 45)**	**Emotion (*n* = 35)**
	PEP $r > .300^{**}$	
	EDA $r > .850^{***}$	
Interview 1 min		
RSA	6.51 (1.07)	6.27 (1.11)
PEP	101.42 (11.92)	102.76 (10.50)
EDA	8.39 (2.10)	7.98 (2.52)
Interview 2 min		
RSA	6.24 (1.03)	6.03 (1.11)
PEP	99.89 (9.42)	103.59 (10.49)
EDA	8.52 (1.96)	8.12 (2.48)
Interview 3 min		
RSA	6.45 (1.13)	6.14 (1.14)
PEP	99.46 (11.26)	103.09 (10.16)
EDA	8.65 (1.76)	8.15 (2.44)
Interview 4 min		
RSA	6.18 (1.02)	6.09 (1.04)
PEP	98.81 (11.55)	102.56 (10.24)
EDA	8.80 (1.52)	8.17 (2.39)
Interview 5 min		
RSA	6.13 (1.02)	6.20 (1.05)
PEP	98.59 (9.98)	103.83 (10.13)
EDA	8.89 (1.37)	8.13 (2.38)
Interview 1 min through 5 min	RSA $r > .700^{***}$	
	PEP $r > .600^{***}$	
	EDA $r < .890^{***}$	

Note. Values are means and standard deviations [*M* (*SD*)] except *r* values. RSA, respiratory sinus arrhythmia; PEP, preejection period; EDA, electrodermal activity. This table is presented for full transparency/meta-analytic work; primary repeated-measures analysis is presented in the text.

** $p<.01$

*** $p < .001$.