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Stress at encoding, context at retrieval, and children's narrative content

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ABSTRACT

Research concerning the relations between stress and children's memory has been primarily correlational and focused on memory volume and accuracy. In the current study, we experimentally manipulated 7- and 8-year-olds' and 12- to 14-year-olds' experienced stress during a to-be-remembered event to examine the effects of stress on the *content* of their memory. We further manipulated the degree of interviewer support at retrieval to determine whether it moderated the effects of stress at encoding on memory. Children's age, gender, stress at encoding, and interviewer support all influenced the type of information included in their narrative reports. Most notably, across ages, children who experienced a more stressful event but were questioned in a supportive manner provided the largest ratio of terms representing internal states such as those about cognitions and emotions. Results suggest that how children process past events may be influenced by both the nature of the event itself and the context within which it is recalled.

Introduction

Communicating about past events is an integral part of our culture (Nelson & Fivush, 2004). The act of reminiscing merges important events into our life histories, helps to direct our future behavior, and enhances social bonds (Bluck, Alea, Habermas, & Rubin, 2005; Nelson, 1993; Pillemer, 1992). The

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content of our narratives about the past also influences how we organize memory and how we come to understand, respond to, and cope with our experiences (see Nelson & Fivush, 2004). Indeed, variations in narrative content have been linked to psychological and physical well-being, especially when recounting negative, stressful prior experiences (Bird & Reese, 2006; Marin, Bohanek, & Fivush, 2008; Pennebaker, Mayne, & Francis, 1997; Reese, Bird, & Tripp, 2007; Rubin, 2011; Rude, Gortner, & Pennebaker, 2004).

Despite these links, and despite the importance of narrative content for a range of outcomes, we know relatively little about what factors influence that content, especially during childhood, a time when narrative skills undergo rapid developmental change.

The overarching purpose of the current investigation was to examine how stress during a to-be-remembered event influences the content of children's and adolescents' event narratives. We were further interested in whether the context at retrieval, namely the provision of support, would increase narrative markers of active emotional processing, particularly when the to-be-remembered event was more rather than less stressful. We manipulated stress at encoding to draw causal inferences about the effects of stress per se and manipulated the provision of support by an interviewer at retrieval to determine whether comfort while describing a past event, directly and in conjunction with encoding stress, affected narrative content. Finally, we included children and adolescents to identify developmental changes in children's narrative content about a stressful experience.

Internal state language and stress at encoding

In research focused on narrative content, a distinction is often made between language that refers to factual details (i.e., objectively verifiable features of a past event) and language that refers to internal states (i.e., subjective interpretation of the event such as thoughts and feelings elicited) (see Fivush & Baker-Ward, 2005). Factual details have been studied extensively in domains such as education and eyewitness testimony, and results have led to improved theoretical understanding of memory development and to policy advancements in applied settings. Internal state details, although less well studied, are also of significant theoretical and practical interest. Theoretically, internal state language has implications for understanding emotion knowledge and evaluating different models of coping; practically, the use of internal state terms has been linked to active processing of emotional content and health functioning across the lifespan (Dunn, Brown, & Beardsall, 1991; Fivush & Baker-Ward, 2005; Fivush, Sales, & Bohanek, 2008; Nelson, 1993; Taumoepeau & Ruffman, 2008).

Internal state language first appears, albeit in a rudimentary form, in children's event narratives early in development (Bartsch & Wellman, 1995; Bretherton & Beeghly, 1982), with the sophistication and frequency of internal state language continuing to increase across childhood and into adolescence. Pasupathi and Wainryb (2010), for instance, interviewed 8- and 9-year-olds, 12- and 13-year-olds, and 16- and 17-year-olds about positive and negative experiences. As might be expected, the amount of information included in their narratives increased with age. Of note, however, this increase was due largely to more frequent "interpretive content" elaborations, that is, internal state words reflecting children's interpretations and understanding of their experiences.

Some research has focused not on age differences in internal state language use but instead on how the nature of a to-be-remembered event shapes internal state language use. Findings consistently suggest that narratives about negative events contain a greater amount of internal state language than those about positive events (Baker-Ward, Eaton, & Banks, 2005; Bohanek, Fivush, & Walker, 2005; Fivush et al., 2008). However, findings are less clear as to how the intensity of emotions experienced during a negative event influences internal state language. Some studies find that children use more internal state language when discussing more stressful or arousing events relative to less arousing negative events (e.g., Fivush, Hazzard, Sales, Sarfati, & Brown, 2003; Fivush et al., 2008). Fivush and colleagues (2003), for example, asked children to narrate about a past event. Afterward, the authors categorized the event children described as either a high-stress experience (e.g., witnessing a gunfight) or a low-stress experience (e.g., nonserious illness). Children who described the high-stress experience used more internal state language than children who described the low-stress experience. Yet, other studies have reported the opposite, namely, lower internal state language use when recounting more rather than less stressful experiences (Peterson & Biggs, 1998; Sales, Fivush, Parker,

& Bahrick, 2005). Peterson and Biggs (1998) reported that children who were more distressed during a parent-nominated event (according to parental report) provided fewer internal state terms in their narratives about that event than children who were less distressed.

The variability in findings may be attributable to several differences across and even within studies. One concerns the to-be-remembered events themselves. Not only did the events vary, at times within a single study (e.g., parents identified past events for their children to describe), but so did the events' meaningfulness and the level of personal threat, duration, and delay between the events and when children narrated about them, all of which can affect what children include in their narratives irrespective of how much arousal the events induced. Second, in many studies, stress was determined via parental report. Parents' own arousal, distortions in parents' memory, and/or parents' perceptions of how their children ought to have felt could influence their ratings (Kassam-Adams, Garcia-Espana, Miller, & Winston, 2006; Quas, Goodman, Bidrose, Pipe, & Craw, 1999).

Third, studies often collapsed potentially meaningful subtypes of internal state language, most noteworthy cognitive and emotion terms. Cognitive terms include words that demonstrate a narrator is mentally processing elements of the event. Examples include *cause*, *know*, and *ought*, all of which suggest that the narrator is reflecting or extrapolating on observable features of the event. Emotion terms are composed of direct labels of emotional states, such as *nervous*, *scared*, and *happy*, as well as indirect references to emotional states or emotional evaluations, such as *loves* and *mean*. Although the two types of terms are often combined in investigations of internal state language, some research suggests that the two forms may vary in unique ways depending on the amount of stress endured during a to-be-remembered event.

Specifically, Sales and colleagues (2005) asked children to narrate about what happened when their family endured Hurricane Andrew, a disaster that hit the coast of Florida in August 1992. When interviewed shortly after the hurricane, children who were "more negatively affected" (e.g., experienced more damage to their homes) included fewer cognitive terms and fewer positive emotion terms in their narratives than children who were "less affected." However, when they were reinterviewed 6 years later, the more negatively affected children included a greater number of cognitive and negative emotion terms (no differences in positive emotion term use emerged). Thus, cognitive, positive emotion, and negative emotion term use seemed to follow different temporal pathways depending on the likely level of arousal that the hurricane induced, perhaps because the terms tapped into slightly different processes such as thoughtful deliberation (cognitive terms) versus emotional evaluation (emotion terms).

Fourth, and finally, none of the studies experimentally manipulated stress during the to-be-remembered event. Such a manipulation, however, is necessary to ascertain whether internal state language, including both cognitive and emotion term use, is actually *affected* by the level of arousal experienced. The to-be-remembered events, moreover, need to be objectively similar salient experiences (with only the stressfulness varying) that occurred after a comparable delay in order to control for other potential influences on children's narrative content.

Context at retrieval and internal state language

In a separate body of work, considerable scientific attention has focused on the effects of different interview contexts on children's memory and reporting of prior experiences (Almerigogna, Ost, Bull, & Akehurst, 2007; Carter, Bottoms, & Levine, 1996; Davis & Bottoms, 2002; Quas, Bauer, & Boyce, 2004; Quas & Lench, 2007). Context is most often manipulated by varying how an interviewer behaves; supportive interviewers build rapport, smile, maintain an open body posture and eye contact, and provide positive feedback, whereas nonsupportive interviewers are minimally interactive, are emotionally unavailable, and do not provide any feedback (Carter et al., 1996; Davis & Bottoms, 2002; Goodman, Bottoms, Rudy, & Schwartz-Kenney, 1991).

Studies of context effects have focused nearly exclusively on how variations in interviewer behavior influence children's provision of factual details. Findings consistently reveal positive effects of a supportive interviewer on children's reports, particularly in terms of enhancing accuracy and reducing suggestibility. Theoretically, a supportive interviewer increases children's comfort, which then affects their ability to focus on the memory task or willingness to contradict suggestive questions

(Almerigogna et al., 2007; Quas & Lench, 2007). This comfort may be especially important when children are interviewed about stressful events insofar as merely recounting such events can lead to some increases in arousal (Brenner, 2000; Levine, Burgess, & Laney, 2008) and a supportive interviewer may help to reduce that arousal (Bottoms, Quas, & Davis, 2007). Analyses of lineup identification data collected as a part of the current study are consistent with this general notion. In our study, children and adolescents completed a high- or low-stress laboratory task (one of two versions of the modified Trier Social Stress Test [TSST-M] described below) and were later asked to identify the individual who administered the task. Among participants in the high-stress condition, those queried by a supportive interviewer made fewer identification errors than those queried by a nonsupportive interviewer. Among participants in the low-stress condition, no differences in errors were observed (Rush, Quas, Yim, Clark, & Larson, 2013).

Importantly, studies have yet to examine how interviewer support affects the content of children's reports directly and in conjunction with the stressfulness of the to-be-remembered event. By helping children to focus on the memory task and feel comfortable with the interviewer, a supportive interviewer may encourage children to engage in greater processing of a negative event, which could increase children's internal state term use. Evidence hinting at this possibility emerged in college students; Pasupathi and Hoyt (2010) found that, when discussing an experience playing a new video game, participants used more language indicative of internal states when their partner was attentive rather than distracted. Whether similar patterns would emerge in children when a partner's behavior is more dramatically different is not known but is an important extension of existing research.

The current study

In the current study, we examined the influence of stress at encoding and interviewer supportiveness at retrieval on the content of children's and adolescents' event narratives. At encoding, we relied on a new methodology, the TSST-M (Yim, Quas, Cahill, & Hayakawa, 2010), to induce arousal. The TSST-M is a laboratory-based stress-inducing procedure that can be used with children as young as 7 or 8 years to reliably induce self-reported as well as physiological arousal (see Buske-Kirschbaum et al., 1997; Kirschbaum, Pirke, & Hellhammer, 1993; Quas, Yim, Edelstein, Cahill, & Rush, 2011; Yim et al., 2010). We varied components of the TSST-M, which led to two versions: the standard version (heretofore referred to as the high-stress version) and a low-stress version (see Quas, Rush, Yim, & Sumaroka, in press). We then manipulated interviewer support at retrieval using procedures common to studies of children's memory and suggestibility (see Bottoms et al., 2007, for a review). We included boys and girls in two age groups, 7- and 8-year-olds and 12- to 14-year-olds, selected because these ages have been examined in prior work on stress, memory accuracy, and narrative content and may both be affected, in potentially developmentally varying ways, by the nature of their encoding and retrieval experiences.

Our main prediction was that encoding stress would interact with interviewer support at retrieval to affect the content of children's reports. That is, despite some mixed findings in the literature, we expected the higher stress situation to produce more negative emotion in need of resolution and, therefore, to influence the inclusions of internal state language. Specifically, we hypothesized that children in the high-stress TSST-M condition would include a higher ratio of cognitive terms and a lower ratio of positive emotion terms than children in the low-stress TSST-M condition and possibly would include a higher ratio of negative emotion terms, but only when the children were interviewed in a supportive manner. We did not anticipate that interviewer support would affect the reports of children who experienced the low-stress version of the TSST-M. Finally, we expected that adolescents would provide higher volume narratives overall and a higher ratio of cognitive and emotion terms, especially when they were exposed to the high-stress TSST-M (e.g., McEwan, 1996; McLean & Thorne, 2003; Pasupathi & Wainryb, 2010).

Beyond these predictions, we were secondarily interested in children's use of (a) relativity terms, because these terms suggest that children are noting and drawing connections between multiple aspects of the event, and (b) social terms, because use of these terms suggest that participants are attending to other people and relationships during the event. We expected that children who were more focused on meaning making in their narratives, as evidenced by higher rates of cognitive and

emotion terms, would be consequently less focused on event integration (relativity terms) and social interaction (social terms).

Method

Participants

Participants were 169 children and adolescents: 84 7- and 8- year-olds (M = 7.44 years, SD = 0.50) and 85 12- to 14-year-olds (M = 12.94 years, SD = 0.88). Families were recruited via telephone by a market research firm (Fieldwork, Los Angeles, CA, USA) to complete a study located on a university campus concerning emotion and communication. When first contacted, parents were questioned to ensure that participants were fluent in English, were free from serious medical or mental health problems, and did not have any known anxieties about public speaking or math. Among the children, 53% were Caucasian, 9% were Hispanic/Latino, 5% were African American, 2% were Asian, 30% were multiethnic, and 3% were "other." Among the parents, 47% of mothers and 56% of fathers had a bachelor's degree or higher. With regard to family income, 79% of parents reported an annual household income of $60,000 or more. Of the 169 participants, 7 (4%) were excluded because they did not answer the free recall question or their responses were not recorded due to equipment failure.

Measures and procedures

Overview

The current study involved analyses of data collected as part of a large investigation concerning physiological arousal, memory, and suggestibility across development (Quas, Yim, Rush, & Sumaroka, 2012). Briefly, participants visited the laboratory twice in the afternoon for 2-h sessions. During the first visit, following parental consent and child assent, children completed either the standard high-stress TSST-M or a low-stress version of the TSST-M. After a 2-week delay, children returned for a surprise memory test conducted by either a supportive or nonsupportive interviewer. The memory test included not only recall prompts but also recognition and suggestive questions and a lineup presentation at the end. During both sessions, physiological measures of arousal (autonomic nervous system activation and hypothalamic pituitary adrenal axis activation) were collected. None of these measures is relevant to the current report, and they are not discussed here (see Quas et al., in press, for a detailed description of results concerning physiological responses, memory, and suggestibility; see Rush et al., 2013, for results concerning children's lineup identification performance). Participants within age and gender were randomly assigned to TSST-M conditions, and participants within each age, gender, and TSST-M condition were randomly assigned to interview conditions.

Session 1

After an approximately 30-min familiarization and rest period, participants were escorted to a room where two unfamiliar observers, one male and one female, were waiting (see Yim et al., 2010). A researcher explained to children that they would be asked to complete a speech and math task in front of the observers and that they would be videotaped. Specifically, children were told to pretend that they were new students in a class and to tell the class about themselves, including at least one positive detail and one negative detail. Children were given 3 min to prepare. Then the male observer asked children to stand and begin the speech. The speech lasted 5 min. If children stopped talking before 5 min ended, the male observer twice prompted them to continue and then asked open-ended questions in 30-s intervals (see Yim et al., 2010, for details regarding the TSST-M's development and validity). After the 5 min ended, the female observer administered the math task, which required participants to subtract one number (e.g., 5) from a larger number for 5 min. When participants erred, they were instructed to start again (the precise numbers being subtracted varied depending on children's age and year in school).

In the high-stress condition, as is standard for the TSST-M, the observers remained neutral throughout the procedure. They were silent during the preparation and did not smile or introduce themselves. Children were told that their videotape would be later shown and analyzed by experts.

In the low-stress condition, the researcher introduced the observers, who talked among themselves during the preparation period. The researcher also said that the male observer was new, was in training, and may make mistakes. During the speech and math tasks, both observers behaved in a way that conveyed warmth and interpersonal support. They smiled, sat in an open relaxed manner, maintained eye contact, and talked with vocal intonation. In addition, if participants stopped talking before 5 min had ended, the male observer still prompted them to tell more and then asked scripted questions, but he fumbled through writing down information to avoid periods of silence. Participants were informed that the reason for the videotaping was as a backup in case the observers could not write down everything participants were saying.

After the TSST-M ended, the observers left and the researcher entered. She asked children to complete a brief questionnaire about their perceptions of the TSST-M (e.g., to rate several statements on 7-point scales: "This session was ..." [1 = *not at all hard*, 7 = *extremely hard*]; "When I did the speech, I thought I did ..." [1 = *very poorly*, 7 = *very well*]; "When I did the speech, I felt ..." [1 = *not at all stressed*, 7 = *very stressed*]). Participants then completed unrelated tasks for the remainder of the session (e.g., answered questionnaires about relationships, listened to words on a recorder). At the end of the session, parents were asked not to discuss the TSST-M with their children during the interim. Neither parents nor children were told of our interest in memory.

Session 2

Session 2 took place after a 2-week delay (M = 14 days, SD = 1.68) in a separate building to reduce reminder cues (neither of the TSST-M observers was present). After a 30-min familiarization period, participants were escorted to an interview room where an unfamiliar female interviewer (blind to participants' specific TSST-M experience) was waiting. The researcher told children that they would be asked to answer questions about what happened the last time they were at the laboratory and that they had 3 min to think about it and try to remember. The interviewer began the interview after the 3 min ended. She asked three general open-ended prompts requesting narrative details about what happened during the previous session (e.g., "Tell me everything that happened when you went to the other building across the street and you completed the first part of the study"). She followed with a series of closed-ended recognition and suggestive questions to clarify what happened and with a lineup photo array of the observers. Because these questions did not require narrative answers, only participants' recall responses are analyzed here (see Quas et al., in press; Rush et al., 2013).

All interviewers conducted approximately the same number of both types of interviews within ages and TSST-M conditions. In the supportive interview condition, interviewers followed protocols used in prior studies of interviewer support and children's eyewitness abilities (e.g., Carter et al., 1996; Davis & Bottoms, 2002; Quas & Lench, 2007). Interviewers dressed casually and introduced themselves, maintained eye contact, smiled frequently, and provided positive verbal feedback at designated times. In the nonsupportive interview condition, interviewers dressed in black business attire and did not introduce themselves. They maintained a cold demeanor and did not smile or provide positive feedback during the interview. In addition, to enhance the test-like evaluative setting in the nonsupportive condition, interviewers informed children that an observer was behind a mirror evaluating them and at specified times asked children to speak up.

Immediately after the interview, children rated their experience during the interview using the same 7-point Likert scales and questions as after the first session. They then relaxed for the remainder of the session, and at the end they were debriefed, thanked, and given an honorarium for their assistance.

Narrative coding

Children's narrative responses to the free recall prompts were entered into the Linguistic Inquiry and Word Count (LIWC) software program (Pennebaker, Booth, & Francis, 2007). LIWC analyzes written text on a word-by-word basis. Every word of a text file is compared with a dictionary containing 82 dimensions. LIWC provides information on volume (i.e., number of words) and content. The content dimensions of interest in the current study included cognitive terms and affective/emotion terms. Cognitive terms included words referring to insight (e.g., *knew, thought*), causation (e.g., *because*),

discrepancy (e.g., *would*, *could*), tentativeness (e.g., *maybe*, *guess*), certainty (e.g., *never*), inhibition (e.g., *stopped*), inclusion (e.g., *and*), and exclusion (e.g., *but*). Affective/Emotion terms included both positive valence (e.g., *loves*, *nice*) and negative valence (e.g., *nervous*). For example, the following narrative includes multiple cognitive terms (e.g., *but*, *and*, *remember*, *try*, *could*, *memorize*, *difficult*, and *think*) and emotion terms (e.g., *nervous*, *calmed*):

> Well, at the first session I was like *nervous* at first, *but* then well like I *calmed* down for a while, then it all went away *and* I'm doing okay over there, so I think I'll be doing okay for this second one, this session. . . . I *remember* that I was doing math problems, *and* I had to say my name *and* tell what I'm going do when I'm going to my first rent . . . so yeah. . . . I *remember* that I had to watch this on the computer *and* had to *try* to *remember* every word *and* see if I *could memorize*. It was *difficult*. But I *think* that I got some *but* not all. It was really hard.

Of secondary interest were social terms that included any references to family, friends, or other humans (e.g., *girl*) and words that indicate relativity between concepts through reference to the passage of time (e.g., *after*), motion (e.g., *moving*), and location (e.g., *on*). Additional examples from the study transcripts representing each subcategory of content terms are presented in the Appendix.

Word categories within the LIWC program are not mutually exclusive; such that one word can be placed into multiple relevant categories (see Appendix). For each narrative, LIWC tabulates the percentage of words that fall into the content dimensions of interest out of the total number of words in the narrative. Internal reliability and external validity have been established for the LIWC content dimensions (e.g., Pennebaker & Francis, 1996) and are discussed in a recent review by Tausczik and Pennebaker (2010).

Results

Preliminary analyses

Preliminary analyses tested for potential confounds and then examined whether our experimental manipulations (i.e., of the TSST-M and interview) differed reliably. The delay between sessions and participant ethnicity did not vary by condition. These variables were also unrelated to any of the narrative content variables and are not considered further. Child gender did not vary across conditions and was significantly associated with cognitive term use, $t(159) = 2.09$, $p = .038$, $d = 0.33$, such that girls used a higher percentage of cognitive terms in their narratives ($M = 21.63$, $SD = 5.12$) than boys ($M = 19.55$, $SD = 7.35$). Thus, gender was included in analyses examining cognitive term use.

Next, we examined whether the TSST-M manipulation was effective in leading to differences in children's stress responses. We averaged children's ratings to four questions asking about the difficulty of the TSST-M, how stressed they felt during the speech/math components, and how much they wanted to stop doing the TSST-M ($rs = .29–.55$) and then entered this score into a 2 (Age: 7- and 8-year-olds or 12- to 14-year-olds) × 2 (TSST-M Condition: high stress or low stress) analysis of variance (ANOVA). The main effect of TSST-M condition was significant, $F(1, 168) = 11.95$, $p = .001$, $\eta_p^2 = .068$. Participants who completed the high-stress TSST-M reported being more stressed than participants who completed the low-stress version ($Ms = 4.00$ and 3.30, $SDs = 1.36$ and 1.22, respectively). No other significant effects emerged.

We then conducted a similar analysis to test for differences in children's responses to the interviewer support manipulation. Children's averaged responses to questions concerning interview difficulty, children's self-perceived stress, and desire to stop the interview ($rs = .41–.55$) were entered into a 2 (Age) × 2 (Interview Condition) ANOVA. The main effect of interview condition was significant, $F(1, 166) = 5.82$, $p = .017$, $\eta_p^2 = .035$. Participants in the nonsupportive interview condition reported being more stressed than participants in the supportive condition ($Ms = 3.02$ and 2.51, $SDs = 1.46$ and 1.23, respectively).

Finally, we evaluated whether the volume (total number of words) of children's narratives varied as a function of their age or condition assignment via a 2 (Age) × 2 (TSST Condition) × 2 (Interview Condition) ANOVA. Age was significantly associated with narrative volume, $F(1, 169) = 13.34$, $p < .001$,

η_p^2 = .077. As expected, older children said more than younger children (*M*s = 105.56 and 73.81, *SD*s = 56.52 and 54.24, respectively). No other significant effects or interactions emerged.

Together, these analyses revealed that we successfully manipulated subjective stress experiences at both encoding and retrieval, thereby allowing us to test our main hypotheses. We also found that volume did not vary depending on the encoding or retrieval manipulations, suggesting that any observed differences in narrative content across the manipulations were not simply due to differences in the amount of information provided.

Stress and narrative content

The main purpose of the study was to examine the effects of stress at encoding and interviewer support at retrieval on children's narrative content, especially cognitive and emotion terms but other terms as well. The LIWC program calculates content scores as a function of the total volume of the narrative. Thus, the content scores represent the percentage of words from a given category out of the total number of words contained in the narrative (because the content categories are not mutually exclusive; however, percentages do not necessarily sum to 100%). We entered participants' cognitive, relativity, and social term use LIWC scores into a multivariate analysis of variance (MANOVA), which allowed us to test for general trends across the main study variables. Positive and negative emotion terms were used quite infrequently across the sample. Thus, we converted these scores to dichotomous variables and analyzed emotion term use separately via logistic regressions. All significant effects are reported.

As a reminder, we expected stress at encoding to positively affect cognitive term use and, consequently, to negatively affect the relative frequency of terms from the relativity and social categories. We further hypothesized that interviewer support at retrieval would moderate this effect, such that children who experienced the standard high-stress TSST-M and were interviewed supportively would provide an even greater number of cognitive terms relative to children who experienced the high-stress TSST-M and were interviewed nonsupportively. We entered children's use of cognitive, relativity, and social terms into a 2 (Age) × 2 (Gender) × 2 (TSST-M Condition) × 2 (Interview Condition) MANOVA. Significant main effects of age and TSST-M condition emerged, as did two interactions: TSST-M Condition × Interview Condition, $F(3, 143) = 6.78$, $p < .001$, $\eta_p^2 = .125$, and Age × Gender × TSST-M Condition, $F(3, 143) = 2.80$, $p = .042$, $\eta_p^2 = .055$.

Examination of the univariate effects showed that the MANOVA results were driven by cognitive and relativity term use. Cognitive words contributed to the significant main effect of TSST-M condition and to both significant interactions: TSST-M Condition × Interview Condition, $F(1, 145) = 18.63$, $p < .001$, $\eta_p^2 = .114$, and Age × Gender × TSST-M Condition, $F(1, 145) = 7.10$, $p = .009$, $\eta_p^2 = .047$. Among participants who experienced the high-stress TSST-M, those then questioned by the supportive interviewer included a higher percentage of cognitive words ($M = 23.78$, $SD = 5.81$) than those then questioned by the nonsupportive interviewer ($M = 18.98$, $SD = 5.90$). Among participants who experienced the low-stress TSST-M, however, there was a reverse trend. Those questioned by the nonsupportive interviewer provided a higher percentage of cognitive terms ($M = 21.04$, $SD = 4.92$) than those questioned by the supportive interviewer ($M = 18.59$, $SD = 7.49$), Furthermore, within the supportive interviewer condition, children used more cognitive terms if they experienced the high-stress TSST-M ($M = 23.78$, $SD = 5.81$) than if they experienced the low-stress TSST-M ($M = 18.59$, $SD = 7.49$) (see Fig. 1). There was no difference in the nonsupportive interviewer condition.

With regard to the Gender × Age × TSST-M Condition interaction, younger boys who experienced the low-stress TSST-M included fewer cognitive terms in their event reports ($M = 14.72$, $SD = 6.72$) than all other groups of children (i.e., younger boys in the high-stress TSST-M condition and older boys and younger and older girls regardless of TSST-M experience, with means for the latter groups ranging from 20.09 to 22.49 and standard deviations ranging from 5.89 to 8.80). Thus, although young boys who experienced lower stress at encoding provided the same overall number of words in their narratives, a lower percentage of those words referenced cognitive processes.

Relativity words also contributed to the significant MANOVA effects of age and TSST-M condition. Adolescents included a higher percentage of relativity words (i.e., words reflecting motion [relativity of a location to a previous or future one], space [relativity of one place to another], and time [relativity

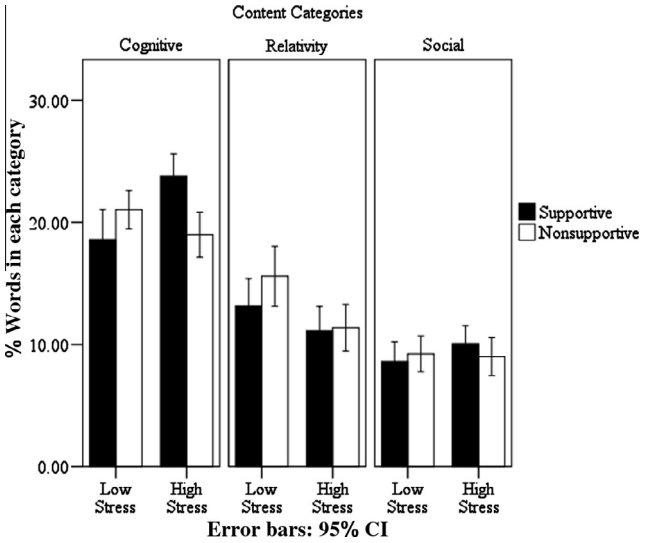

Fig. 1. Content words by stress and interview condition.

of one time to a previous or future one]; $M = 12.78$, $SD = 6.57$) than children ($M = 11.33$, $SD = 6.74$), $F(1, 145) = 7.34$, $p = .008$, $\eta_p^2 = .048$. We suspected that this effect was due to general developmental differences in children's ability to communicate about temporal relations. A second MANOVA examining the effects of age on the motion, space, and time subcategories confirmed this possibility, $F(3, 157) = 3.29$, $p = .022$, $\eta_p^2 = .059$. Age-related differences emerged only in the percentage of time words included in the narrative, $F(1, 159) = 8.82$, $p = .003$, $\eta_p^2 = .053$. With regard to TSST-M condition effects, children in the high-stress condition ($M = 11.25$, $SD = 6.14$) included fewer relativity words relative to other content than children in the low-stress condition ($M = 14.40$, $SD = 7.32$), $F(1, 145) = 7.84$, $p = .006$, $\eta_p^2 = .051$. No significant effects emerged concerning use of social terms.

Next, we analyzed positive and negative emotion term use. We expected that participants in the standard high-stress condition would include fewer positive emotion terms and perhaps more negative emotion terms than participants in the low-stress condition. Furthermore, we predicted that having a supportive interviewer would encourage children to discuss their emotions more overall, but particularly more negative emotions if children were in the high-stress encoding condition and perhaps more positive emotions if they were in the low-stress condition. Logistic regressions were conducted separately predicting positive emotion term use and negative emotion term use. First, age, TSST-M condition, and interview condition were entered into a main effects model, followed by a separate model that included the TSST-M × Interviewer Support interaction.

With regard to positive emotion term use ($n = 169$), the TSST-M × Interviewer Support interaction was not significant, $Wald(1) = 2.53$, *ns*, $OR = 2.77$, 95% $CI = [0.79, 9.67]$; thus, we report only results from the main effects model. There were significant main effects of age, $Wald(1) = 4.08$, $p = .043$, $OR = 0.53$, 95% $CI = [0.28, 0.98]$, and interview condition, $Wald(1) = 4.13$, $p = .042$, $OR = 1.90$, 95% $CI = [1.02, 3.53]$. Adolescents were more likely to use positive emotion terms (59%) than children (47%), and positive emotion term use was more likely in the supportive interviewer condition (59%) compared with the nonsupportive interviewer condition (43%). There were no other significant effects for positive emotion term use. Next, the logistic regression models were repeated predicting children's use of negative emotion terms ($n = 169$). There were no significant main effects or interactions.

Discussion

Both the act of narrating about a stressful event and the variation in the specific content of those narrations have potential implications for developmental, psychological, and physical health

outcomes (Bird & Reese, 2006; Marin et al., 2008; Pennebaker et al., 1997; Reese et al., 2007; Rubin, 2011; Rude et al., 2004). Internal state language, distinct from other factual content included in past event narratives, has received increasing attention in the adult literature and is beginning to be explored in the developmental literature given that such language may indicate active processing of emotional information (for an extended discussion, see the special issue of the *Journal of Cognition and Development* on this topic; Fivush & Baker-Ward, 2005). However, previous work has given little insight into the causes of variations in internal state language use. In the current study, we integrated methods and findings from the developmental stress and memory literature and the narrative literature and used an experimental design to test the effects of encoding stress and retrieval context on the *content* of children's and adolescents' event reports.

Most noteworthy, stress experienced during a to-be-remembered event interacted with interviewer support to influence children's and adolescents' use of cognitive terms. More supportive interviewer behavior at retrieval seemed to encourage children who experienced a higher stress event to process their experience more deeply. This finding is in line with Reynolds, Brewin, and Saxton (2000), who found that 8- to 13-year-old children who wrote about moderately emotional events used more cognitive terms than children who wrote about neutral events. We propose that supportive interviewers help children to feel more at ease during the interview and to think more deeply about their prior experience, particularly about their interpretations of the event. Because the overall amount of detail provided did not differ, of importance, it appears that social support did not affect how much children said but instead affected what they said.

More broadly, our findings suggest that children's use of cognitive terms can be manipulated through the use of subtle strategies such as varying an interviewer's demeanor while talking with the children. Insofar as children's cognitive term use reflects the same processes as those in adults, simple changes in interviewer behavior, such as making eye contact, using open posture, and smiling, when talking to children about stressful past events may encourage children to engage in greater processing of stressful experiences. Furthermore, the interaction between encoding stress and interviewer support points to interview context being most important in terms of facilitating cognitive term use precisely when children are describing a stressful experience. Determining whether this pattern extends to traumatic events and actually facilitates children's recovery from these events, however, is an important next step (see, e.g., a recent issue of *Memory* exploring the consequences of deeper processing of traumatic events; Greenhoot & McLean, 2013).

We also predicted that the interaction between encoding stress and interviewer support would affect children's use of emotion terms. However, only child age and interviewer support directly predicted emotion term use. That adolescents were more likely to use positive emotion terms than children is unsurprising given that previous work has found that children's use of emotion terms increases with age, although it is somewhat surprising that the age effect emerged only for positive emotion terms (e.g., Fabes, Eisenberg, Hanish, & Spinrad, 2001; Lyon, Scurich, Choi, Handmaker, & Blank, 2012). That children were more likely to use positive emotion terms when interviewed supportively suggests that the nature or at least level of emotion experience at encoding may be less important than the immediate retrieval context for affecting emotional expression, at least when emotions at encoding are mild to moderate. The low level of emotional term use overall, particularly for negative terms, may also have inhibited our ability to detect other findings regarding emotion terms, encoding stress, and interviewer support. Had we prompted for evaluative or emotional details directly, we may have been better able to detect effects, a possibility in need of further investigation given that emotion prompts can be effective in increasing even young children's production of evaluative details (Lyon et al., 2012).

In line with our hypotheses, we found some hints at a trade-off between cognitive term use and term use in one other content category in the narratives of children who experienced the more stressful TSST-M. The high-stress TSST-M predicted the use of a lower proportion of relativity terms, the next largest category of terms used by children. This trade-off suggests that children to some extent focus selectively on either cognitive processing or relations among the components of the event, depending on the degree of stress associated with the to-be-remembered event. What such a trade-off might suggest about children's meaning making for salient experiences should be the focus of future research.

Few age differences emerged in the content of children's narratives, in partial contrast to Pasupathi and Wainryb's (2010) study. Children said less overall, used a smaller proportion of positive emotion terms, and included a smaller proportion of relativity terms compared with adolescents. The latter effect, however, appeared to be due largely to younger children's more limited references to time, replicating previous work (Friedman & Lyon, 2005; Wandrey, Lyon, Quas, & Friedman, 2012). It should be noted, however, that in the current study content scores were percentages of total word count. Pasupathi and Wainryb (2010), in contrast, used sum scores because they were interested in developmental differences in volume as well as content. As such, it is unsurprising that our results vary slightly. Nonetheless, additional developmental work on narrative content is certainly warranted.

Finally, gender played a minor role in predicting children's narrative content. Numerous previous studies have similarly reported gender differences in children's narrative content, particularly in children's use of internal state language (Adams, Kuebli, Boyle, & Fivush, 1995; Buckner & Fivush, 1998, 2000; Fivush, Brotman, Buckner, & Goodman, 2000; Fivush, Haden, & Reese, 2006; Greenhoot, Johnson, & McCloskey, 2005; McEwan, 1996; Pasupathi & Wainryb, 2010). In the current study, boys' cognitive term use was particularly affected by TSST-M condition. Although young boys had a low proportion of cognitive term use in the low-stress TSST-M condition, the proportion escalated to parallel that of girls and adolescent boys in the high-stress TSST-M condition. The mechanism for this process is unclear, but it suggests that perhaps young boys use cognitive terms only when needed to process stressful events.

Although our reliance on an experimentally controlled stressor was a unique strength of the study in that it allowed us to draw causal inferences, it also limits some types of conclusions. Our TSST-M manipulations led to two experiences: one relatively low stress and the other much more arousing both behaviorally and physiologically (see Quas et al., in press). Even so, the high-stress TSST-M was likely substantially less stressful than the types of highly distressing or traumatic experiences that have been the focus of some extant work on narrative content in adolescents and adults (Fivush, Edwards, & Mennuti-Washburn, 2003). Traumatic experiences vary on multiple dimensions, however, making it more difficult to directly compare narratives between individuals. Nonetheless, converging evidence across different types of events will provide the most comprehensive insight into how stress affects narrative content across development.

Second, our delay was relatively short. Children may engage in more active processing or gradually attempt to understand their experiences over time, requiring investigations of well-documented stressful experiences over longer delays. Third, the LIWC program dictionaries were originally created based on adults' written narratives about prior experiences, and there are likely to be differences in meaning for some terms between adults' written narratives and children's spoken narratives. For example, whereas the word *and* is included as a cognitive content variable in LIWC, it may serve as filler rather than as a true inclusive term in children's spoken narratives. However, it is still of note that our experimental manipulations were effective in shifting both children's and adolescents' overall use of terms from the cognitive content categories. Future work should examine whether the specific use of words such as *and* (as well as other potential fillers) are affected by stress and, if so, what mechanisms lead to these effects. Finally, we included only two age groups, possibly precluding detection of subtle or more complex age-related changes in how children, adolescents, and even young adults narrate about prior experiences. Subsequent research needs to expand the ages, including to later adolescence (where Pasupathi & Wainryb, 2010, found the most dramatic shifts in narrative content), to gain a greater understanding of potential differences in narrative processes across important developmental transition periods.

Together, our study is the first to demonstrate that stress at encoding and interviewer support at retrieval jointly affect the type of information children and adolescents elect to report about prior stressful experiences. These interactive effects are particularly illuminating given that they change children's use of words that indicate processing and rationalizing of past events. Overall, our current and ongoing research extends knowledge about how children come to understand and describe their experiences, and it identifies potentially simple, effective methods for influencing children's meaning making about personally relevant stressful experiences.

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Appendix

Examples of content terms from study transcripts.

Cognitive terms	
Insight	I just I knew if I had thought it was like a test in school, I probably failed it
Causation	I only looked at the pictures because she just said she was gonna be back and to sit or something
Discrepancy	They, they asked me, uh things, if I would, if I do or not do
	I said I could be a little aggressive sometimes when people talk about me
Tentative	Like two maybe
	Um, I guess that I'm a good person
Certainty	I never answered a question about my favorite foods
Inhibition	And I kinda stopped and then they asked me, "You still have time left"
Inclusive	Um, I had to take a math test and tell about like my life like a story and I had to listen to words
Exclusive	There was one more, but I couldn't remember
Affective terms	
Positive emotion	Um, I said that my whole family loves me and I have everything I usually want
	I said I'm a nice person
Negative emotion	I was pretty nervous 'cause it's so hard
Social terms	
Family	I got to spend some time with my family, and I did a lot of math
Friends	… they asked me to give a speech of why, uh, people, uh, would want to be friends with me or something like that
Humans	… this girl, she, she said I had to count like from 100 back 3
Relativity terms	
Motion	Just felt like something was moving or something
Space	… remember words and write them down on paper
Time	Then, um, after that it took a while, so I just colored

References

Adams, S., Kuebli, J., Boyle, P. A., & Fivush, R. (1995). Gender differences in parent–child conversations about past emotions: A longitudinal investigation. *Sex Roles, 33*, 309–323.

Almerigogna, J., Ost, J., Bull, R., & Akehurst, L. (2007). A state of high anxiety: How non-supportive interviewers can increase the suggestibility of child witnesses. *Applied Cognitive Psychology, 21*, 963–974.

Baker-Ward, L., Eaton, K. L., & Banks, J. B. (2005). Young soccer players' reports of a tournament win or loss: Different emotions, different narratives. *Journal of Cognition and Development, 6*, 507–527.

Bartsch, K., & Wellman, H. M. (1995). *Children talk about the mind*. New York: Oxford University Press.

Bird, A., & Reese, E. (2006). Emotional reminiscing and the development of an autobiographical self. *Developmental Psychology, 42*, 613–626.

Bluck, S., Alea, N., Habermas, T., & Rubin, D. C. (2005). A tale of three functions: The self-reported uses of autobiographical memory. *Social Cognition, 23*, 91–117.

Bohanek, J. G., Fivush, R., & Walker, E. (2005). Memories of positive and negative emotional events. *Applied Cognitive Psychology, 19*, 51–66.

Bottoms, B. L., Quas, J. A., & Davis, S. L. (2007). The influence of interviewer-provided social support on children's suggestibility, memory, and disclosures. In M. E. Pipe, M. E. Lamb, Y. Orbach, & A. C. Cederborg (Eds.), *Child sexual abuse: Disclosure, delay, and denial* (pp. 135–157). Mahwah, NJ: Lawrence Erlbaum.

Brenner, E. (2000). Mood induction in children: Methodological issues and clinical implications. *Review of General Psychology, 4*, 264–283.

Bretherton, I., & Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Developmental Psychology, 18*, 906–921.

Buckner, J. P., & Fivush, R. (1998). Gender and self in children's autobiographical narratives. *Applied Cognitive Psychology, 12*, 407–429.

Buckner, J. P., & Fivush, R. (2000). Gendered themes in family reminiscing. *Memory, 8*, 401–412.

Buske-Kirschbaum, A., Jobst, S., Wustmans, A., Kirschbaum, C., Rauh, W., & Hellhammer, D. H. (1997). Attenuated free cortisol response to psychosocial stress in children with atopic dermatitis. *Psychosomatic Medicine, 59*, 419–426.

Carter, C. A., Bottoms, B. L., & Levine, M. (1996). Linguistic and socioemotional influences on the accuracy of children's reports. *Law and Human Behavior, 20*, 335–358.
Davis, S. L., & Bottoms, B. L. (2002). Effects of social support on children's eyewitness reports: A test of the underlying mechanism. *Law and Human Behavior, 26*, 185–215.
Dunn, J., Brown, J., & Beardsall, L. (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology, 27*, 448–455.
Fabes, R. A., Eisenberg, N., Hanish, L. D., & Spinrad, T. L. (2001). Preschoolers' spontaneous emotion vocabulary: Relations to likability. *Early Education & Development, 12*, 11–27.
Fivush, R., & Baker-Ward, L. (2005). The search for meaning: Developmental perspectives on internal state language in autobiographical memory. *Journal of Cognition and Development, 6*, 455–462.
Fivush, R., Brotman, M. A., Buckner, J. P., & Goodman, S. H. (2000). Gender differences in parent–child emotion narratives. *Sex Roles, 42*, 233–253.
Fivush, R., Edwards, V. J., & Mennuti-Washburn, J. (2003). Narratives of 9/11: Relations among personal involvement, narrative content, and memory of the emotional impact over time. *Applied Cognitive Psychology, 17*, 1099–1111.
Fivush, R., Haden, C. A., & Reese, E. (2006). Elaborating on elaborations: Role of maternal reminiscing style in cognitive and socioemotional development. *Child Development, 77*, 1568–1588.
Fivush, R., Hazzard, A., Sales, J. M., Sarfati, D., & Brown, T. (2003). Creating coherence out of chaos?: Children's narratives of emotionally positive and negative events. *Applied Cognitive Psychology, 17*, 1–19.
Fivush, R., Sales, J. M., & Bohanek, J. G. (2008). Meaning making in mothers' and children's narratives of emotional events. *Memory, 16*, 579–594.
Friedman, W. J., & Lyon, T. D. (2005). Development of temporal-reconstructive abilities. *Child Development, 76*, 1202–1216.
Goodman, G. S., Bottoms, B. L., Rudy, L., & Schwartz-Kenney, B. M. (1991). Children's testimony about a stressful event: Improving children's reports. *Journal of Narrative and Life History, 1*, 69–99.
Greenhoot, A. F., Johnson, R., & McCloskey, L. A. (2005). Internal states language in the childhood recollections of adolescents with and without abuse histories. *Journal of Cognition and Development, 6*, 547–570.
Greenhoot, A. F., & McLean, K. C. (2013). Meaning in personal memories: Is more always better? *Memory, 21*, 2–8.
Kassam-Adams, N., Garcia-Espana, J. F., Miller, V. A., & Winston, F. (2006). Parent–child agreement regarding children's acute stress: The role of parent acute stress reactions. *Journal of American Academy of Child and Adolescent Psychiatry, 45*, 1485–1493.
Kirschbaum, C., Pirke, K. M., & Hellhammer, D. H. (1993). The Trier Social Stress Test: A tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology, 28*, 76–81.
Levine, L. J., Burgess, S. L., & Laney, C. (2008). Effects of discrete emotions on young children's suggestibility. *Developmental Psychology, 44*, 681–694.
Lyon, T. D., Scurich, N., Choi, K., Handmaker, S., & Blank, R. (2012). "How did you feel?": Increasing child sexual abuse witnesses' production of evaluative information. *Law and Human Behavior, 36*, 448–457.
Marin, K. A., Bohanek, J. G., & Fivush, R. (2008). Positive effects of talking about the negative: Family narratives of negative experiences and preadolescents' perceived competence. *Journal of Research on Adolescence, 18*, 573–593.
McEwan, S. (1996). Learning to speak like girls and boys: A developmental study in gender and narrative style. In B.-S. Park & J.-B. Kim (Eds.). *Language, information, and computation (PACLIC 11)* (pp. 449–458). Seoul, Korea: Language Education and Research Institute, Kyung Hee University.
McLean, K. C., & Thorne, A. (2003). Adolescents' self-defining memories about relationships. *Developmental Psychology, 39*, 635–645.
Nelson, K. (1993). The psychological and social origins of autobiographical memory. *Psychological Science, 4*, 7–17.
Nelson, K., & Fivush, R. (2004). The emergence of autobiographical memory: A social cultural development theory. *Psychological Review, 111*, 486–511.
Pasupathi, M., & Hoyt, T. (2010). Silence and the shaping of memory: How distracted listeners affect speakers' subsequent recall of a computer game experience. *Memory, 18*, 159–169.
Pasupathi, M., & Wainryb, C. (2010). On telling the whole story: Facts and interpretations in autobiographical memory narratives from childhood through mid-adolescence. *Developmental Psychology, 46*, 735–746.
Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). *Linguistic Inquiry and Word Count (LIWC 2007): A text analysis program [software program]*. Austin, TX: LIWC.net.
Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition and Emotion, 10*, 601–626.
Pennebaker, M. E., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology, 72*, 863–871.
Peterson, C., & Biggs, M. (1998). Stitches and casts: Emotionality and narrative coherence. *Narrative Inquiry, 8*, 51–76.
Pillemer, D. B. (1992). Remembering personal circumstances: A functional analysis. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall: Studies of "flashbulb" memories* (pp. 236–264). New York: Cambridge University Press.
Quas, J. A., Bauer, A., & Boyce, W. T. (2004). Physiological reactivity, social support, and memory in early childhood. *Child Development, 75*, 797–814.
Quas, J. A., Goodman, G. S., Bidrose, S., Pipe, M., & Craw, S. (1999). Emotion and memory: Children's long-term remembering, forgetting, and suggestibility. *Journal of Experimental Child Psychology, 72*, 235–270.
Quas, J. A., & Lench, H. C. (2007). Arousal at encoding, arousal at retrieval, interviewer support, and children's memory for a mild stressor. *Applied Cognitive Psychology, 21*, 289–305.
Quas, J. A., Rush, E., Yim, I., & Sumaroka, M. (in press). Effects of stress on memory in children and adolescents: Testing causal connections. *Memory*.
Quas, J. A., Yim, I., Edelstein, R., Cahill, L., & Rush, E. (2011). The role of cortisol reactivity in children's and adults' memory of a prior stressful experience. *Developmental Psychobiology, 53*, 166–174.
Quas, J. A., Yim, I. S., Rush, E., & Sumaroka, M. (2012). Hypothalamic pituitary adrenal axis and sympathetic activation: Joint predictors of memory in children, adolescents, and adults. *Biological Psychology, 89*, 335–341.

Reese, E., Bird, A., & Tripp, G. (2007). Children's self-esteem and moral self: Links to parent–child conversations. *Social Development, 16*, 460–478.
Reynolds, M., Brewin, C. R., & Saxton, M. (2000). Emotional disclosure in school children. *Journal of Child Psychology and Psychiatry, 41*, 151–159.
Rubin, D. C. (2011). The coherence of memories for trauma: Evidence from posttraumatic stress disorder. *Consciousness and Cognition, 20*, 857–865.
Rude, S. S., Gortner, E. M., & Pennebaker, J. W. (2004). Language use of depressed and depression-vulnerable college students. *Cognition and Emotion, 18*, 1121–1133.
Rush, E., Quas, J. A., Yim, I., Clark, S. E., & Larson, R. P. (2013). *Stress, interviewer support, and children's identification accuracy*. Manuscript submitted for publication.
Sales, J. M., Fivush, R., Parker, J., & Bahrick, L. (2005). Stressing memory: Long-term relations among children's stress, recall, and psychological outcome following Hurricane Andrew. *Journal of Cognition and Development, 6*, 529–545.
Taumoepeau, M., & Ruffman, T. (2008). Stepping stones to others' minds: Maternal talk relates to child mental state language and emotion understanding at 15, 24, and 33 months. *Child Development, 79*, 284–302.
Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*, 24–54.
Wandrey, L., Lyon, T. D., Quas, J. A., & Friedman, W. J. (2012). Maltreated children's ability to estimate temporal location and numerosity of placement changes and court visits. *Psychology, Public Policy, and Law, 18*, 79–104.
Yim, I. S., Quas, J. A., Cahill, L., & Hayakawa, C. M. (2010). Children's and adults' salivary cortisol responses to an identical psychosocial laboratory stressor. *Psychoneuroendocrinology, 35*, 241–248.