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The Effects of Mother Training in Emotion-Rich, Elaborative Reminiscing on Children's Shared Recall and Emotion Knowledge

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The present study examined the impact of training mothers in high-elaborative, emotional reminiscing on children's autobiographical memory and emotion knowledge. Eighty mothers were randomly allocated to one of two training conditions: in the *reminiscing* condition, mothers were encouraged to reminisce by asking their children (aged 3.5 to 5 years) elaborative *Wh-* questions, providing detailed descriptions, and discussing emotions, and in the *control* condition, mothers were encouraged to play by following their children's lead. Forty-four mothers completed the study. Both immediately and 6 months after training, mothers in the *reminiscing* condition and their children each made more high-elaborative utterances and emotion references during shared recall than did mothers in the *control* condition and their children. Children of *reminiscing* mothers also showed better emotion cause knowledge after 6 months than did children of *control* mothers, but children's independent recall to an experimenter did not differ according to condition. The findings suggest that an elaborative and emotion-rich reminiscing style can be taught to parents, with potential benefits for children's shared (but not independent) memory contributions and for emotion knowledge development.

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Reminiscing conversations between parents and their preschoolers provide an important context for children's cognitive and socio-emotional development. Findings from concurrent and longitudinal studies demonstrate that individual differences in parents' (mostly mothers') style of reminiscing with their children have implications for the children's memory and narrative skills. Mothers using a high-elaborative style, including the use of open-ended questions and provision of rich detail, have children who also come to recount their experiences in a rich and detailed manner, first in shared conversations with their parents and, by age 5 or 6 years, when reminiscing with an independent adult (Fivush & Fromhoff, 1988; Reese & Fivush, 1993; Reese & Newcombe, 2007; see Fivush, Haden, & Reese, 2006, for review). The content of mother-child reminiscing—and in particular, the emotional content—similarly shapes the content of the children's autobiographical memories; parents who frequently refer to emotions typically have children who later come to do the same (Kuebli, Butler, & Fivush, 1995; Sales & Fivush, 2005; Welch-Ross, Fasig, & Farrar, 1999).

Recent experimental research has established a causal relation between adult-child conversation and children's recall. Findings of these studies, in which an event has been staged and the style and content of the experimenter-child conversation has been manipulated, show that high-elaborative reminiscing increases the amount of information that 3- and 5-year-old children report (Conroy & Salmon, 2006; McGuigan & Salmon, 2004; 2006). Moreover, when elaboration is standardized across experimental conditions, reminiscing that includes emotion can augment children's recall of the entire event and its emotional and non-emotional aspects (Van Bergen & Salmon, 2009a). Despite providing a more precise delineation of the relations between the style and content of reminiscing and children's recall, experimental studies have the limitation of failing to capture the influence of multiple, naturally occurring conversations between parents and their young children. Training parents to engage in elaborative and emotion-rich reminiscing is a powerful paradigm that can address this concern and, if successful, can strengthen the causal connection between the style and content of parental reminiscing and that of their children (e.g., Lohmann & Tomasello, 2003).

Two studies have established the effectiveness of reminiscing training with respect to boosting children's memory and narrative skill (see also Boland, Haden, & Ornstein, 2003, for findings that training parents to engage in an elaborative conversational style during an event boosts children's recall). In an important preliminary investigation, Peterson, Jesso, and McCabe (1999) trained 10 economically disadvantaged mothers to ask their 43-month-old children more open-ended and context-eliciting

questions and to encourage longer narratives through the use of back-channel responses (where previously discussed elements of an event are restated and drawn together). Relative to the children of 10 mothers not exposed to training, the children showed an immediate improvement in their vocabulary, and, 1 year later, produced memory narratives that included more context-setting descriptions. Low participant numbers and a large proportion of drop-outs (6 of the initial 20 participants) limited the robustness of these findings, however.

Reese and Newcombe (2007) trained 100 mothers to ask their 19-month-old toddlers open-ended questions and confirm their contributions during shared reminiscing conversations. Assessments when the toddlers were 21 and 34 months old revealed that trained mothers asked more open-ended questions than did mothers in a wait list control group (i.e., who had not yet been trained); when the children were 34 months, trained mothers also made more confirmations and statement elaborations, irrespective of their original reminiscing style. Moreover, at 34 months old, the children of trained mothers provided more memory elaborations during shared recall, and, if initially high in self-recognition, provided more memory elaborations with an experimenter. Of note, however, mothers who had received the training also provided more low-elaborative repetitions of their open-ended questions: according to the authors, there are “possibly deleterious effects of repetitive questions on children’s memory and participation” (Reese & Newcombe, p. 1166).

In the current study, we investigated the influence of training parents in elaborative, emotion-rich reminiscing on children’s shared and independent recall. We aimed to extend the existing research in two ways. First, we included an active control condition. In research to date, mothers who received training were also encouraged to spend additional time interacting with their child (Peterson et al., 1999; Reese & Newcombe, 2007). It is therefore unclear whether the improvements found in the children’s autobiographical recall were due entirely to the specific conversational elements of the intervention, or were in some part due to an increase in the amount of time mothers dedicated to child-focused interaction with their children or, indeed, time given to the parent by the researchers. Addressing this issue is particularly important given findings of Cleveland and Reese (2005) that “autonomy supportive” elements of reminiscing, in which mothers affirm and follow their children’s interests rather than controlling the interaction, are statistically independent of elaborative elements yet also predict recall. *Control* mothers in the current study were therefore trained to observe and encourage their children during play (child-directed play) (e.g., Hood & Eyberg, 2003; Kottler & McMahan, 2004).

Including a focus on emotion during reminiscing was the second novel aspect of the current study. Specifically, we wished to establish whether, in addition to altering their reminiscing style, parents can be taught to increase the emotional aspects of their reminiscing and whether this combination of high-elaborative and emotional reminiscing would influence the content of their children's own reminiscing contributions. Further, we asked whether training in high-elaborative, emotional reminiscing would alter children's emotion knowledge. Characterized by children's awareness and understanding of their own and others' emotional states, expressions, causes, and outcomes (Denham, 1998), emotion knowledge is a tool for predicting and adjusting to others' emotions and plays a critical role in their ability to communicate feelings with others and to engage in appropriate relationships. For example, superior emotion knowledge at preschool predicts social competence and empathy with peers and family, and conversely, impoverished emotion knowledge is associated with internalizing and externalizing problems throughout childhood (Denham et al., 2003; Hughes & Dunn, 1998; Izard et al., 2001; Fine, Izard, Mostow, Trentacosta, & Ackerman, 2003; Pons & Harris, 2005).

It is well established that children's emotion knowledge develops within the context of emotion-oriented discussions with their parents, and that the inclusion of emotion causes is a particularly strong predictor (Denham, Zoller, & Couchod, 1994; Dunn, Brown, & Beardsall, 1991; Garner, Carlson Jones, Gaddy, & Rennie, 1997; Martin & Green, 2005). Moreover, from a theoretical perspective, reminiscing conversations, when neither parent nor child is in a state of emotional arousal, might be a particularly important context for the development of emotion knowledge, enabling review and reinstatement of the information in memory (e.g., Denham & Burton, 2003; Fivush, Brotman, Buckner, & Goodman, 2000; Wareham & Salmon, 2006). Findings are nonetheless mixed with respect to the precise relation between the style and emotion content of reminiscing conversations and children's emotion knowledge (Laible, 2004a, 2004b; Laible & Song, 2006; Van Bergen & Salmon, 2009b). Training mothers to engage in elaborative emotion-rich reminiscing, in which the emotions are labeled and their causes and consequences discussed, constitutes a strong test of this association.

In summary, in the current study, mothers in the *reminiscing* condition were trained to use a high-elaborative style when reminiscing (by asking *Wh-* questions and providing detailed descriptions), and to discuss the emotional aspects of their shared past events including emotion causes. In the *control* condition, mothers were trained in child-directed play in which they were encouraged to follow the children's lead, play at the children's pace, and praise the children's efforts without criticizing or suggesting changes (Eyberg et al., 2001; Greco, Sorrell, & McNeil, 2001). In both conditions,

four sessions of video training and specific feedback were followed by reassessment at the end of the intervention and again 6 months later. We hypothesized that mothers in the *reminiscing* condition would increase their use of a high-elaborative style and emotion content following training, but mothers in the *control* condition would not. Furthermore, we hypothesized that, particularly at the 6-month assessment, children in the *reminiscing* condition (relative to the *control* condition) would also increase their high-elaborative and emotion-oriented utterances, during both shared and independent memory conversations, and would show superior emotion knowledge.

METHOD

Participants

Via advertisements placed in a free parenting magazine distributed throughout the metropolitan areas of Sydney, Australia, an initial sample of 80 mother-child dyads (children aged between 37 and 59 months; $M = 45.85$, $SD = 5.86$) was recruited to participate in a pre-training assessment session, training, post-training assessment, and 6-month follow-up assessment. With regard to child age and gender, dyads were randomly allocated to the *reminiscing* or the *control* condition. Nineteen dyads did not complete the post-training assessment session; eight of these did not continue after the pre-training assessment and thus did not participate in training. There was no significant difference between conditions in the number of non-continuing participants (referred to hereafter as “non-continuers”) ($\chi^2 = 0.83$, $p > .05$). Seventeen dyads who completed the post-training assessment session did not complete the 6-month follow-up assessment session, and again, there was no difference between conditions in the numbers of non-continuers ($\chi^2 = 0.04$, $p > .05$). Of the 44 dyads who completed all stages of the study, there were 13 boys and 10 girls in the *reminiscing* condition and 10 boys and 11 girls in the *control* condition. Child ages are presented in Table 1.

Measures and Procedure

Both *reminiscing* and *control* dyads individually participated in seven training and assessment sessions over a period of 8 months: the initial pre-training assessment, four training sessions, the post-training assessment session, and, 6 months later, the 6-month follow-up assessment. The pre-training assessment, training sessions, and post-training assessment were each held 1 week apart (note that there was a 2-week gap between the third and fourth training sessions).

TABLE 1
Average Pre-training Assessment Values as a Function of Condition, Including Standard Deviations

<i>Assessment value</i>	<i>Condition</i>			
	<i>Control</i>		<i>Reminiscing</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child age in months	46.16	4.86	45.00	3.92
Emotion knowledge scores				
Denham Task	40.89	4.03	39.64	4.87
Emotion Cause Knowledge Task	4.18	1.75	3.76	1.42
Language standard scores	120.26	14.26	118.14	11.49

All sessions were conducted in the Child Behavior Clinic of the University of New South Wales. One experimenter conducted the pre-training assessment and the four training sessions. To ensure that experimenters were unaware of the participants' conditions, different experimenters conducted the post-training assessment and 6-month follow-up. Experimenters were counterbalanced across training and assessment sessions.

Assessments

Assessment tasks measured mother-child and experimenter-child memory conversations, children's emotion knowledge, and children's receptive and expressive language. Language ability served as a control variable to ensure that the *reminiscing* and *control* groups did not differ at recruitment, given findings that language skill is associated with both children's recall and their emotion knowledge (e.g., McGuigan & Salmon, 2004; Pons, Lawson, Harris, & de Rosnay, 2003). Sessions were videotaped and audio-taped, and took approximately 90 minutes. Dyads were given a 30-minute break halfway through the session and were also given smaller breaks whenever the child showed signs of tiredness. During each break, dyads were encouraged to leave the room and go for a walk or have a snack.

Memory Conversations

Mother-child memory conversations. Each mother was asked to nominate on paper four events that were one-time occurrences and had been experienced by herself and her child in the past 1 to 4 weeks. The experimenter randomly selected two of these events. The mother was asked to discuss the selected events with her child, as she normally would, while the experimenter left the room.

Experimenter-child memory conversations. Following mother-child memory conversations, the experimenter discussed the remaining two events with the child. The experimenter commenced the discussion by saying “Your mum told me that you [event] the other day. Tell me everything you can remember about that.” The experimenter continued to use open-ended prompts such as, “Uh huh?” and, “Tell me more!” to encourage the child’s contributions but did not provide any further information. The mother was present but was asked not to contribute to the conversation.

Emotion Knowledge

Children’s emotion knowledge was measured in two ways. Firstly, all children were administered Denham’s Emotion Knowledge Task (Denham, 1986). The task has good internal reliability (Chronbach’s $\alpha = .95$; Denham, 1986) and is used frequently with children aged 2 to 5 years (e.g., Cutting & Dunn, 1999; Denham et al., 1994; Laible, 2004a, 2004b). Secondly, children were given an Emotion Cause Knowledge Task. Across studies, this task shows good inter-rater reliability (Cohen’s Kappa range 0.66–1.00) and suitability for children aged 2.5 to 6 years (see Denham & Zoller, 1991; Hughes & Dunn, 1998; Wang, Hutt, Kulkofsky, McDermott, & Wei, 2006). Although no measure of validity is available for the Emotion Cause Knowledge Task, researchers who have used the task in conjunction with other measures of emotion knowledge such as Denham’s Emotion Knowledge Task (1986), a Mixed Emotions Task (Gordis, Rosen, & Grand, 1989, in Hughes & Dunn, 1998), and an Emotion Judgment Task (Wang, 2003) show that individual differences in children’s emotion knowledge are consistent across measures (Hughes & Dunn, 1998; Wang et al., 2006).

Denham’s emotion knowledge task. Denham’s Emotion Knowledge Task measures emotion recognition and emotion perspective taking. In *emotion recognition*, children were shown four cloth faces that each had a different emotional expression (happy, sad, angry, scared). They were first asked to name each expression as the experimenter pointed to the faces in turn (expressive recognition), and then asked to point to the correct face as the experimenter named each expression (receptive recognition). Alternative labels, such as “mad” for angry and “frightened” for scared, were accepted. Children received a score of 2 for each correct answer, a score of 1 for incorrect answers of the right valence, and a score of 0 for incorrect answers of the wrong valence. Possible scores ranged from 0 to 16.

Before beginning the *perspective-taking* task, parents were given a questionnaire asking how they predicted their child would feel in each of

eight scenarios. Dolls were then used to enact 16 vignettes. The protagonist doll had a blank face to which children could affix the four cloth faces used for *emotion recognition*. In eight vignettes, the doll felt the way that most people would feel in that scenario (e.g., happiness at being given ice cream). The remaining eight vignettes depicted scenarios in which different emotions could be felt (e.g., upon seeing a big dog, a child may feel happy or scared). Using each parent's questionnaire responses, the doll was made to feel the opposite of how each individual child would feel in that situation. For each vignette, the experimenter used a tone of voice and facial expression consistent with the emotion depicted. Children were asked to nominate how the doll felt by choosing a face for the doll. Responses were scored as for the emotion recognition task. Possible scores ranged from 0 to 32, and possible overall emotion knowledge scores (emotion recognition + emotion perspective taking) ranged from 0 to 48.

Emotion cause knowledge task. Children were asked, "Tell me some things that make you feel happy;" findings of Wang et al. (2006) indicate that asking children to respond to a self-focused prompt focused on themselves yields the same results as does asking them to respond to prompts focused on others. Children were encouraged to continue providing causes until it became clear that they could provide no further information. They were then asked, "Tell me some things that make you feel sad/angry/scared," in turn. After each emotion prompt, they were encouraged to continue providing causes until they could provide no further information. Any unique, plausible emotion cause provided was given a score of 1, and total scores were tallied. Two researchers independently scored 25% of responses. Inter-rater reliability was 0.92 (range 0.50 to 1.00). Disagreements were discussed and consensus reached.

Language

The Preschool Language Scale (4th ed.) assessed children's expressive and receptive language ability (Zimmerman, Steiner, & Pond, 2002). It shows high test-retest, internal consistency, and inter-rater reliability (range 0.90–0.99), and good content, structural, and criterion validity (Zimmerman et al.). The expressive scale, used to measure expressive language ability, consists of 68 items, and the auditory scale, used to measure receptive language ability, consists of 62 items. Following standardized instructions, children began on age-appropriate items and, once having correctly completed three consecutive items, continued until they made seven consecutive errors. Raw scores were converted into receptive, expressive, and full-scale age norms.

Training

With regard to age and gender, dyads were randomly allocated to training condition. *Reminiscing* and *control* training programs were designed to match one another in terms of practice time but to differ in terms of what is being practiced. Mothers in the *reminiscing* condition were encouraged to frequently reminisce with their children using open-ended *Wh-* questions (rather than yes/no questions), using *detailed descriptions* that describe the event and build on the children's descriptions (but not repeating information), and discussing *emotions* and other emotion-focused information (e.g., the *causes* of the emotion). Mothers in the *control* condition were encouraged to frequently play with their children using child-directed play, which involved attending to each child fully, allowing each child to direct the play, and playing at each child's pace. Both programs encouraged parents to praise their children, and both encouraged parents to follow the children's lead (in reminiscing topic/direction or play activity/direction).

During the first training session, each mother watched a training video describing the interaction style (reminiscing or child-directed play according to condition) and was led through a training booklet by the experimenter. She then practiced the interaction style with her child, and was given feedback (for each *control* dyad practicing child-directed play, a dolls house, puppets, building blocks, and a magnetic balls and sticks game were provided). Finally, each mother was asked to practice the interaction style with her child once a day for 5 minutes and to record one practice session on audiotape (provided). The session took 1 hour.

During the second to fourth training sessions, each mother and the experimenter listened to the practice tape recorded during the week, and the experimenter gave feedback. Each mother then practiced with her child "on the spot," integrating the initial feedback, and was given further feedback. She was asked to continue practicing once a day for 5 minutes and, for second and third training sessions only, to record another practice to be used during her next training. The sessions each took 30 minutes. Following the fourth training, each mother was telephoned at four spaced intervals (duration: 1 week, 2 weeks, 1 month, 2 months) to encourage continued participation.

Training Video

Both videos were developed for the purposes of the study. The *reminiscing* video showed a mother discussing two past events with her child. Voice-over narration drew attention to the *Wh-* questions, detailed descriptions, and emotion talk. The *control* video showed parents playing with their children. Voice-over narration was used to draw attention to the child-directed play

elements: attending to the child, allowing the child to direct play, playing at the child's pace. Each training video was approximately 18 minutes long.

Training Booklet

A four-page booklet was created for each program and given to mothers to keep. The booklet outlined the key elements being trained, practice guidelines, and "troubleshooting" practice tips that outlined how to change non-targeted behavior into targeted components of reminiscing/child-directed play (e.g., rather than repeating a question, provide more detail or answer yourself; rather than making suggestions, praise aspects of the play that you like). In addition, the *reminiscing* booklet included a transcript of a high-elaborative, emotion-oriented parent-child past event discussion. No example was provided in the *control* booklet.

Coding

Mother-child and experimenter-child reminiscing conversations during assessment sessions were transcribed verbatim. Each utterance (subject-verb proposition) was coded once for style and once for emotion content. Parents' and children's utterances were coded separately. In addition, children's utterances were coded once during parent-child conversations and once during experimenter-child conversations.

With regard to style, each utterance was coded as high elaborative, low elaborative, or a confirmation (off-topic utterances were not coded). These categories were mutually exclusive (see Fivush, Berlin, Sales, Mennuti-Washburn, & Cassidy, 2003; Harley & Reese, 1999; Hudson, 1993; Peterson et al., 1999, for similar schemes).

1. High elaborative: open-ended *Wh-* questions and information statements. An information statement, or "memory elaboration," is an utterance that provides the conversational partner with information about the event, including information about people, places, occurrences, and other event details (e.g., "We went to the zoo!"). Tag questions (e.g., "We went to the zoo, didn't we?") were coded as information statements + confirmations.
2. Low elaborative: repetitions of information or information requests already provided and closed-ended yes/no questions and answers.
3. Confirmations: agreements or disagreements with information provided in the previous conversation turn (or requests for agreement).

The total number of high-elaborative, low-elaborative and confirmation utterances made by each participant was counted, and means per event were

calculated (e.g., Reese & Newcombe, 2007). Note that closed-ended yes/no questions in the current study were coded as low elaborative. There is some disparity in the coding of these questions in the extant research. Most researchers code such utterances as high elaborative and code only repetitions as low elaborative (e.g., Farrant & Reese, 2000; Leichtman, Pillemer, Wang, Koreishi, & Han, 2000; Reese & Brown, 2000; Wang & Fivush, 2005), although some code both yes/no questions and repetitions as low elaborative (e.g., Laible, 2004a; Laible & Song, 2006). Although evidence suggests that yes/no questions are a developmentally appropriate means of engaging very young children in reminiscing (Fivush et al., 2006; Hudson, 1993), for the current sample, that is, a community sample of preschoolers, we focused on *Wh*- questions that aimed to maximally elicit the child's engagement in the conversation. This follows our previous work in which we have found that a combination of detailed information provided by an adult and *Wh*- questions has a strong positive effect on children's recall (Conroy & Salmon, 2006; McGuigan & Salmon, 2004). Moreover, supplementary analyses found that the inclusion of yes/no questions as high rather than low elaborative did not alter the pattern of findings for either high- or low-elaborative utterances.¹

With regard to emotion content, utterances were each coded as factual, emotional, or preferential. Preference references included positive and negative evaluations of the event (e.g., "It was good, wasn't it?") that were not explicit emotion references. Following Fivush et al. (2003), who coded emotion attributions, causes, and consequences, emotional utterances were further categorized as being attributions, behaviors, causes, or outcomes. Each emotion reference was counted, and means per event were calculated (see Dunn et al., 1991; Fivush et al., 2000; Reese, Bird, & Tripp, 2007).

Inter-rater reliability was based on 25% of transcripts across the three assessment sessions and calculated using Cohen's Kappa. For style, inter-rater reliability was 0.82 for parents' utterances, 0.82 for children's utterances during parent-child conversations, and 0.89 for children's utterances during experimenter-child contributions. For emotion content, inter-rater reliability was 0.72 for parents' utterances, 0.86 for children's utterances during parent-child conversations, and 1.00 for children's utterances during

¹When yes/no questions were considered high rather than low elaborative, the time \times condition interaction and condition main effects were each significant for mothers' high-elaborative utterances (i.e., *Wh*- questions, information statements, and yes/no questions, summed), $F_s > 8.67$, $p_s < .05$, $\eta_p^2_s < .21$, but the time main effect was not, $F(1, 43) = 0.50$, $p > .05$. There were no significant effects for mothers' low-elaborative utterances (i.e., repetitions), $F_s < 1.70$, $p_s > .05$.

experimenter-child contributions. Disagreements were discussed and consensus reached.

RESULTS

Preliminary Analyses

As noted in the method, 72 of an initial 80 dyads were allocated to and commenced training, and 44 dyads completed all stages of the study. Causes of non-continuation were as follows: maternal commitments (e.g., returning to full-time work, pregnancy; 35%); lack of interest in the project or unable to be contacted (31%); moving interstate or overseas (21%); and reasons pertaining to the child (e.g., diagnosis of severe anxiety, noncompliance; 13%). The number of non-continuing participants and their reasons for not continuing did not differ as a function of condition, $\chi^2s < 0.83$, $ps > .05$. Furthermore, there were no significant differences on previous assessments between those who subsequently dropped out and those who completed the next assessment, $Fs < 2.73$, $ps > .05$. All subsequent analyses are based on the final subsample of 44 dyads that completed all training and assessments.

Table 1 presents initial age, pre-training emotion knowledge scores, and pre-training language scores for children in the final subsample. Preliminary analyses revealed no significant age or gender differences between conditions, $t(39) = 0.85$, $p > .05$; $\chi^2 = 0.21$, $p > .05$ respectively, and no pre-training differences between conditions on any dependent variable: children's emotion knowledge, the style and content of mothers' shared reminiscing, or children's shared and independent recall, $Fs(1, 43) = 1.46$, $ps > .05$. Finally, preliminary analyses revealed that children's standardized language scores did not differ as a function of time, condition, or time \times condition (all $Fs < 1.43$, all $ps > .05$). Thus, only initial language was included as a covariate in the repeated measures of analyses of variance (ANOVA), together with age.

Mothers' Reminiscing Style and Content, Children's Reminiscing Style and Content, and Children's Emotion Knowledge

A series of $2 \times (3)$ repeated measures of ANOVAs, based on the final subsample of 44 dyads, examined differences between dyads in the *reminiscing* and the *control* condition across the duration of the study; that is, pre-training, post-training, and at the 6-month follow-up assessment. For significant interactions, follow-up tests of simple effects were conducted, analyzing condition differences at each time point. Dependant variables were mothers' reminiscing style and emotion content, children's shared and independent

recall, and children's emotion knowledge, and covariates were children's initial age and initial language scores.

Mothers' Shared Reminiscing Style and Emotion Content

Reminiscing style. Mothers' total high-elaborative utterances, low-elaborative utterances, and confirmations were analyzed. Total high-elaborative utterances consisted of open-ended *Wh*- questions and information statements (memory elaborations), summed. Total low-elaborative utterances consisted of closed-ended questions and repetitions, summed.

With respect to high-elaborative utterances, the main effect of condition was significant, $F(1, 43) = 39.75, p < .01, \eta_p^2 = .52$, but the main effect of time was not, $F(1, 43) = 0.41, p > .05, \eta_p^2 = .01$. These findings were modified by a significant time \times condition interaction, $F(2, 42) = 9.67, p < .01, \eta_p^2 = .21$. Follow-up analyses of the interaction showed that there were no significant differences between conditions during the pre-training assessment, $F < 2.29, p > .05$. During both the post-training and 6-month follow-up assessments, however, mothers in the *reminiscing* condition made significantly more high-elaborative utterances than did mothers in the *control* condition, $F_s > 21.95, p_s < .01$ (see Figure 1).

For low-elaborative utterances, there was no significant main effect of time or condition and no significant time \times condition interaction, all $F_s < 3.76$, all $p_s > .05$ (combined $M = 4.32, SD = 3.51$). Likewise, for confirmations, there was no significant main effect of time or condition, and no significant time \times condition interaction, all $F_s < 1.64$, all $p_s > .05$ (combined $M = 10.70, SD = 7.13$).

Importantly, the pattern of results for each high-elaborative and each low-elaborative component individually did not differ from the pattern for total high-elaborative utterances (summed) and total low-elaborative utterances (summed), respectively. The time \times condition interaction was significant for mothers' *Wh*- questions, $F(1, 42) = 3.81, p < .05, \eta_p^2 = .10$, and for information statements, $F(1, 42) = 8.54, p < .01, \eta_p^2 = .21$, but not for yes/no questions or repetitions, $F_s < 1.52, p_s > .05$. The condition main effect was also significant for *Wh*- questions, $F(1, 43) = 14.65, p < .01, \eta_p^2 = .31$, and for information statements, $F(1, 43) = 31.89, p < .01, \eta_p^2 = .49$, but not for yes/no questions or repetitions, $F_s < 1.74, p_s > .05$. No time main effects were significant, $F_s < 1.02, p_s > .05$.

Emotion content. Total emotion references (that is, total emotion attributions, behaviors, causes, and outcomes, summed), were also calculated. The main effect of condition was significant, $F(1, 43) = 49.78, p < .01, \eta_p^2 = .57$, but as for mothers' high-elaborative utterances, the main effect

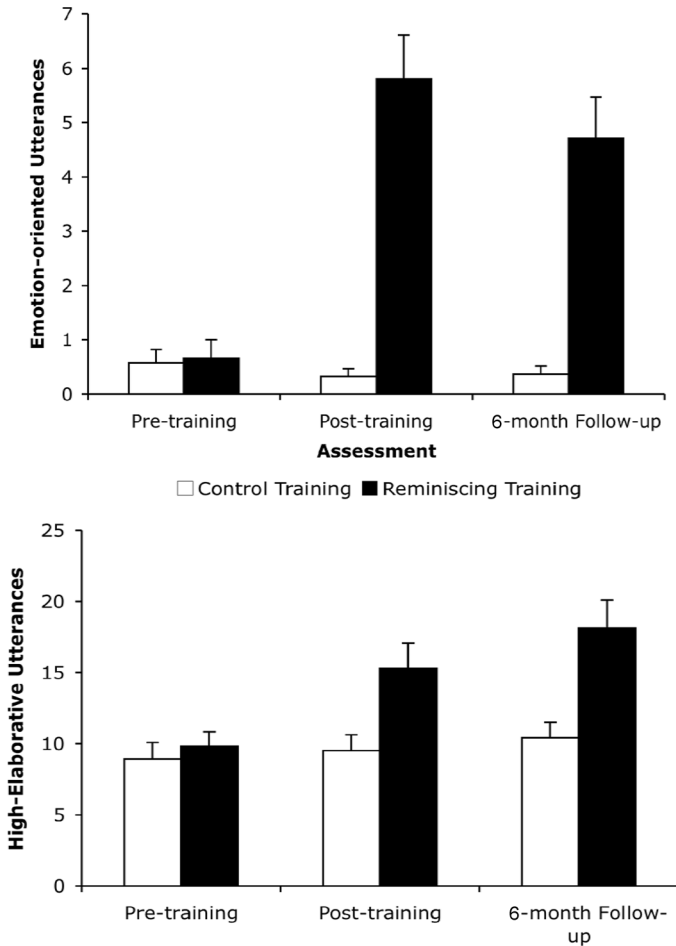


FIGURE 1 Mothers' average high-elaborative and emotion-oriented utterances per event during shared recall, as a function of time and training, and including standard error bars.

of time was not, $F(1, 43) = 0.29, p > .05$. These findings were modified by a significant time \times condition interaction, $F(2, 42) = 16.34, p < .01, \eta_p^2 = .31$. Follow-up analyses of the interaction showed no significant difference between conditions during the pre-training assessment, $F < 0.11, p > .05$. During both the post-training and the 6-month follow-up assessments, however, mothers in the *reminiscing* condition made significantly more emotion references than did mothers in the *control* condition, $F_s > 27.21, p_s < .01$ (see Figure 1).

As can be seen in Figure 1, a large number of mothers made no emotion references during the pre-training assessment, or if in the control condition, during other assessments. Skewness ranged from 0.09 ($SE=0.49$) to 3.34 ($SE=0.49$). To verify that the degree of skewness did not affect the findings, supplementary non-parametric tests of condition were conducted using the Mann-Whitney procedure. These findings mirrored those of the ANOVA procedure, with significant differences between conditions post-training and at the 6-month follow-up, $Us > 4.64$, $ps < .01$, but not pre-training, $U = 0.71$, $p > .05$.

With the exception of emotion outcomes, the pattern of results for each type of emotion reference considered independently—that is, emotion attributions, emotion causes, and emotion outcomes—did not differ from the pattern of results for total emotion references, summed. In each case, the condition main effect and time \times condition interaction was significant, all $F_s > 3.62$, all $ps < .05$, all $\eta_p^2 > .10$, but the time main effect was not, all $F_s < 1.87$, all $ps > .05$. References to emotion outcomes were rarely made in either condition or at any time point ($M_s < 0.17$) and were not analyzed further.

Children's Shared Reminiscing Style and Emotion Content

Reminiscing style. Children's total high-elaborative utterances (information statements) and total low-elaborative utterances (yes/no responses + repetitions) were analyzed. Children rarely asked questions of their mothers, and these did not contribute to total high- or total low-elaborative utterances.

For children's high-elaborative utterances during shared recall, the main effect of condition was significant, $F(1, 43) = 9.83$, $p < .01$, $\eta_p^2 = .21$, but the main effect of time was not, $F(1, 43) = 0.36$, $p > .05$, $\eta_p^2 = .01$. These findings were modified by a significant time \times condition interaction, $F(2, 42) = 3.65$, $p < .05$, $\eta_p^2 = .09$. Follow-up analyses of the interaction showed no significant difference between conditions during the pre-training assessment, $F < 0.17$, $p > .05$. During both the post-training and 6-month follow-up assessments, however, children in the *reminiscing* condition made significantly more high-elaborative utterances than did children in the *control* condition, $F_s > 6.67$, $ps < .05$ (see Figure 2). As only information statements contributed to children's high-elaborative utterances, it was not necessary to analyze components of the high-elaborative style separately.

For children's low-elaborative utterances, there were no significant effects of time or condition, nor a significant interaction, all $F_s < 1.86$, all $ps > .05$ (combined $M = 4.83$, $SD = 4.56$). The pattern of results for each low-elaborative component did not differ from the pattern of results for

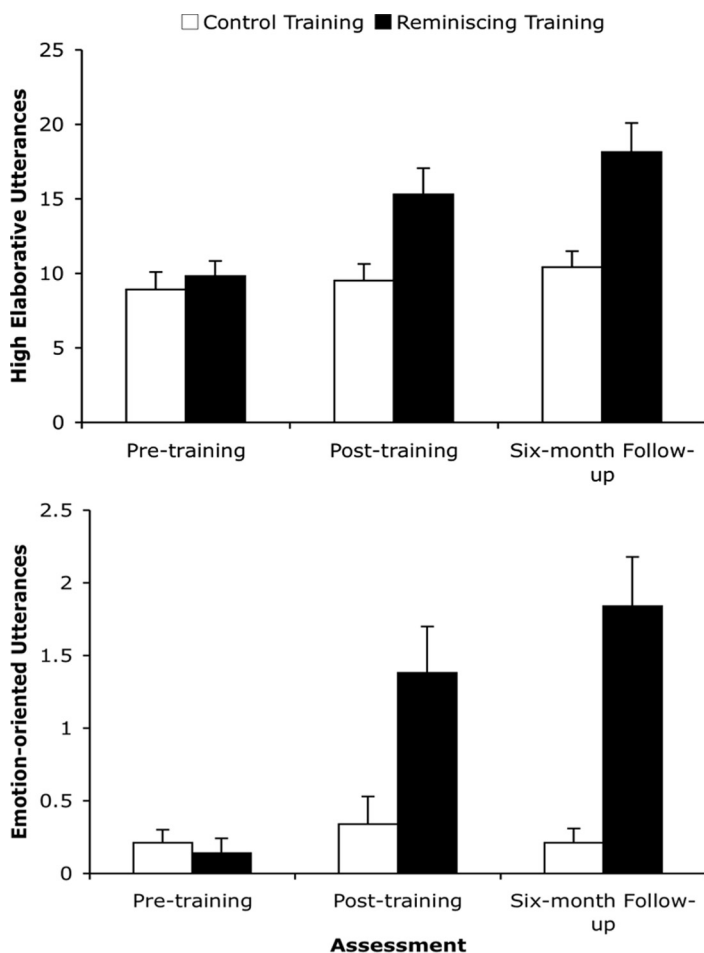


FIGURE 2 Children's average high-elaborative and emotion-oriented utterances per event during shared recall, as a function of time and training, and including standard error bars.

total low-elaborative utterances, with no significant time, or condition, or interaction effects for either yes/no responses or repetitions, $F_s < 1.86$, $p_s > .05$.

Emotion content. Total emotion references (that is, total emotion attributions, behaviors, causes, and outcomes, summed), were also calculated. The main effect of condition was significant, $F(1, 43) = 13.02$, $p < .01$, $\eta_p^2 = .28$, but as for children's high-elaborative utterances, the main effect of

time was not, $F(1, 43) = 0.54, p > .05, \eta_p^2 = .01$. These findings were modified by a significant time \times condition interaction, $F(2, 42) = 6.31, p < .01, \eta_p^2 = .16$. Follow-up analyses of the interaction showed no significant difference between conditions during the pre-training assessment, $F < 0.32, p > .05$. During both the post-training and 6-month follow-up assessments, however, children in the *reminiscing* condition made significantly more emotion references than did children in the *control* condition, $F_s > 7.78, p_s < .05$ (see Figure 2).

As was the case for mothers, a large number of children made no emotion references during the pre-training assessment, or if in the control condition, during other assessments. Skewness ranged from 0.45 ($SE = 0.49$) to 3.97 ($SE = 0.49$). To verify that the degree of skewness did not affect the findings, supplementary non-parametric tests of condition were conducted using the Mann-Whitney procedure. These findings mirrored those of the ANOVA procedure, with significant differences between conditions post-training and during the 6-month follow-up, $U_s > 2.82, p_s < .01$, but not pre-training, $U = 1.02, p > .05$.

When each type of emotion reference was considered independently, the pattern of results for emotion attributions and for emotion causes did not differ from the pattern of results for total emotion references, summed. In each case the condition main effect and time \times condition interaction was significant, all $F_s > 6.21$, all $p_s < .05$, all $\eta_p^2_s > .16$, but the time main effect was not, all $F_s < 2.22$, all $p_s > .05$. Children's references to emotion behaviors and outcomes were rarely made in either condition or at any time point ($M_s < 0.15$) and were not analyzed further.

Children's Independent Reminiscing Contributions

As experimenters provided children with open-ended prompts exclusively, high-elaborative information statements and low-elaborative repetitions were the only utterances that children could make in response. Low-elaborative repetitions were extremely rare at any time point ($M_s < 0.44$), as was emotion and preference content of any kind ($M_s < 0.27$); thus, these variables were not analyzed statistically. There was no significant time or condition main effect on children's high-elaborative information statements, and no interaction, all $F_s < 2.06$, all $p_s > .05$ (combined $M = 7.37, SD = 7.07$).

Children's Emotion Knowledge

Emotion knowledge was measured in two ways: using Denham's Emotion Knowledge Task, and using an Emotion Cause Knowledge Task.

Associations between scores on each task were investigated, controlling for age, standardized language ability, and condition. Concurrent Denham scores and Emotion Cause scores were moderately associated for both the post-training and 6-month follow-up assessments. This association was not significant post-training, $r = .20$, $p = .11$, but was significant after 6 months, $r = .29$, $p < .05$. Denham scores pre- and post-training were also moderately associated with Emotion Cause scores after 6 months ($r = .32$, $p < .05$; $r = .24$, $p = .06$, respectively), suggesting that early individual differences in emotion knowledge, as measured using the Denham task, are consistent with individual differences in Emotion Cause Knowledge 6 months later.

Repeated measures ANOVAs investigated time and condition effects for each measure, controlling for initial language and age. There was a significant main effect of time on children's Denham Emotion Knowledge Task scores, $F(1, 43) = 4.54$, $p < .02$, $\eta_p^2 = .11$, but no significant main effect of condition and no significant interaction, both $F_s < 0.58$, both $p_s > .05$. Over time, children's scores increased ($M = 40.21$, $SD = 4.49$ pre-training, $M = 42.35$, $SD = 2.82$ post-training, and $M = 45.00$, $SD = 1.60$ at the 6-month follow-up). Importantly, scores at the 6-month follow-up appeared to have reached ceiling levels: 65% of participants scored 45 or above out of 48, and variability was small.

The Emotion Cause Knowledge measure showed a different pattern of results. There was no significant main effect of time on children's emotion cause knowledge scores, $F(1, 43) = 0.69$, $p > .05$, $\eta_p^2 = .04$, and only a marginal main effect of condition, $F(1, 43) = 3.33$, $p = .07$, $\eta_p^2 = .08$; nonetheless, both time and condition were modified by a significant interaction, $F(2, 42) = 10.49$, $p < .01$, $\eta_p^2 = .22$. Follow-up analyses of the interaction showed no significant difference between conditions during the pre-training or post-training assessments, $F_s < 0.99$, $p_s > .05$. During the 6-month follow-up assessment, however, children in the *reminiscing* condition showed significantly higher emotion cause knowledge than did children in the *control* condition, $F > 7.46$, $p < .01$ (see Figure 3).

Given that initial scores on Denham's Emotion Knowledge Task were associated with Emotion Cause Knowledge scores at the 6-month follow-up assessment, a supplementary repeated measures analysis of Emotion Cause Knowledge development was conducted in which initial scores on the Denham Emotion Knowledge Task were controlled. Results of the supplementary analysis did not differ from those of the main analysis in which initial Denham scores were ignored (time: $F(1, 43) = 0.48$, $p > .05$, $\eta_p^2 = .01$; condition: $F(1, 43) = 3.94$, $p = .06$, $\eta_p^2 = .08$; time \times condition interaction: $F(2, 42) = 10.97$, $p < .01$, $\eta_p^2 = .23$).

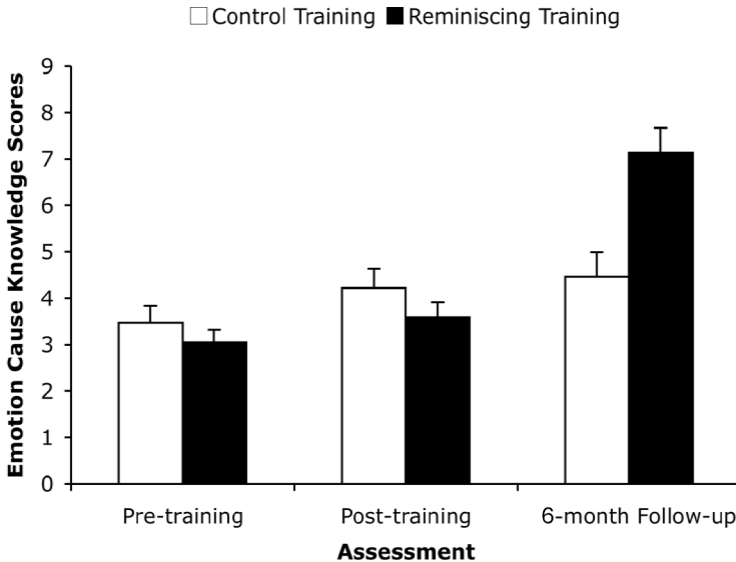


FIGURE 3 Children's average emotion cause knowledge scores, as a function of time and training, and including standard error bars.

DISCUSSION

The aim of the present study was to train mothers to increase their high-elaborative utterances and emotion content during reminiscing, and to assess the effects of training on the style and content of children's own memory reports and their emotion knowledge. By means of an active control condition, in which dyads practiced child-directed play, we attempted to disentangle the effects of elaborative, emotion-oriented reminiscing from the effects of increased maternal attention. Consistent with our hypotheses, findings showed that after training, mothers in the *reminiscing* condition increased both their high-elaborative utterances and emotion references, and maintained this pattern over the ensuing 6 months. Children in the *reminiscing* relative to the *control* condition also made more high-elaborative utterances and emotion references during shared recall, and after 6 months, demonstrated superior performance on a test of emotion cause knowledge. Moreover, unlike the findings of Reese and Newcombe (2007), our training did not simultaneously increase maternal repetitions, which, in requiring a child to recall specific, previously unrecalled information without further provision of linguistic or memory support, have been shown to impact negatively on both memory and participation (Fivush et al., 2006). That

we directly encouraged mothers not to repeat the same question, but rather to provide additional information to unresponsive children, may account for the difference in findings.

Despite the significant impact of reminiscing training on children's contributions to shared recall with their mothers, there were no differences between *reminiscing* and *control* children's independent recall with an experimenter either immediately following the intervention or 6 months later. There are three possible explanations for this finding. First, given that experimenter-child reminiscing conversations always occurred after parent-child reminiscing conversations, fatigue may have prevented children from discussing each event as fully as they might otherwise have. We think this possibility unlikely, however, as the experimenter-child conversations still occurred relatively early in the assessment session and the children were able to successfully complete subsequent language and emotion knowledge tasks with the experimenter.

Second, it is possible that demand characteristics influenced the pattern of findings. Mothers no doubt learnt what was expected of them during the training and assessment sessions, and may have responded by increasing their use of open-ended prompts, details, and emotion references during these monitored sessions but retaining their pre-training style of interaction at home. Although during follow-up phone calls, mothers in each condition reported practicing at least once every 2 days, our participants would likely have felt uncomfortable reporting a lack of practice. Against this explanation, however, is the finding that children in the *reminiscing* condition outperformed *control* children on the Emotion Cause Knowledge task during the 6-month follow-up assessment.

Third, the age of children and length of the intervention may play a role. In naturalistic contexts, it is not typically until age 5 or 6 that children fully internalize their parents' reminiscing style to the extent that it is manifested with an independent interlocutor—and of course, the children are likely to have been exposed to this style from age 18 to 20 months, the onset of mother-child reminiscing (e.g., Hudson, 1993; Leichtman et al., 2000; Reese & Newcombe, 2007). Similarly, although a subset of children in Reese and Newcombe's study manifested superior independent recall at age 3, this was some 15 months after initial maternal training. Whether these patterns would be found between conditions following a longer post-intervention follow-up remains to be established.

Training in elaborative, emotion-rich reminiscing also boosted mothers' and their children's references to emotion attributions, behaviors, and causes during shared reminiscing, together with their total emotion references. This suggests that the training resulted in richer emotion discussion in which antecedents and consequences were reviewed. Relative to simply

labeling the emotion, for example, this kind of full, causal, and explanatory discussion may provide the young children with the tools to discuss and interpret their own and others' emotional response. Awareness of one's own emotion states, others' emotion states, and the ability to use the vocabulary of emotion are all core skills of emotional competence. (Buckley, Storino, & Saarni, 2003).

We had also predicted that emotion-rich reminiscing might be associated with children's emotion knowledge. Several researchers have proposed that reminiscing conversations, when neither parents nor children are in a state of emotional arousal, might enable review and reinstatement in memory of information about emotions, their manifestations, and their causes (e.g., Denham & Burton, 2003; Fivush et al., 2000; McGuigan & Salmon, 2004). Moreover, observational research has shown that mothers' everyday emotion references predict children's emotion knowledge (e.g., Denham et al., 1994; Dunn et al., 1991), although the association between reminiscing and emotion knowledge has indeed been very varied in the small body of extant literature (Laible, 2004a, 2004b; Laible & Song, 2006; Van Bergen & Salmon, 2009b). Like previous research, our findings were mixed, varying with the assessment task in question. When emotion knowledge was measured by Denham's Emotion Knowledge Task (Denham, 1986), we failed to find differences between the *reminiscing* condition and *control* conditions with respect to recognition of emotion and emotion situation knowledge. It may be that emotion cause knowledge in particular, and not emotion recognition or emotion situation knowledge (as measured by the Denham task), was targeted by the intervention. Our findings of elevations in all types of emotion references but outcomes suggest this is unlikely, however. A more likely explanation is that the children had reached ceiling levels on the Denham task. Whereas this task is typically administered to children between the ages of 3 and 5 years (e.g., Cutting & Dunn, 1999; Denham et al., 1994), in the current study, 40% of children were aged between 4.5 and 6 at the third assessment, and 65% scored full or almost full marks (at least 45 out of 48).

In contrast, after 6 months, children in the *reminiscing* condition showed better performance on the Emotion Cause Knowledge Task than did children in the *control* condition. Past studies investigating the impact of reminiscing style and emotional content on emotion knowledge have not used this task (e.g., Laible, 2004a, 2004b; Laible & Song, 2006; Van Bergen & Salmon, 2009b), and our findings therefore extend this work. Nonetheless, a limitation is that, despite its reliability, convergence with other tasks of emotion knowledge (as found in the current study), and usefulness across a wide age range in the early years (e.g., Denham, 1998; Hughes & Dunn, 1998; Wang et al., 2006), no information about validity of the Emotion Cause

Knowledge Task is available. Replication of our findings using multiple measures of emotion knowledge is an important task for future research.

A further limitation of our study was the very high attrition rate. Almost half of all dyads (45%) failed to complete the intervention and both follow-up assessments. As these participants did not differ demographically from those who remained in the study at each time point, there is no reason to suspect that they would be differentially affected by training. Moreover, the rates at which participants dropped out and their reasons for dropping out were not differentially influenced by the intervention condition to which parents were assigned, and assessment scores did not differ between participants who continued to the next point in the study and those that subsequently left the program. Nonetheless, the high attrition rate undermines both the extent to which such a program may be useful for the individuals involved, and the extent to which the program could be extended to other groups. Given that our sample was, on average, highly elaborative even before training, it may be that some mothers were uninterested in participating in an intervention that encouraged a style of interaction already familiar to them, and an initially low-elaborative sample may benefit to a greater extent; although that the rate of dropping out of treatment was similar for both conditions suggests that this is not the sole contributing factor. Further, many mothers worked at least part time and the intensive nature of the assessments in combination with the duration of travel may have contributed to the low retention rates. In contrast, Reese and Newcombe (2007) retained a very high level of participant involvement in their training study, and one important difference from the current study was that participants were visited in their own homes.

Finally, a number of outstanding questions regarding the mechanisms underpinning our findings must be addressed. First, given our multiple foci, we cannot adequately determine which element of our reminiscing training, or combination of elements, influences children's shared recall and emotion cause knowledge development. Indeed, previous correlational findings suggest that elaborative reminiscing per se, without a specific focus on emotion, may also be associated with children's emotion knowledge (Van Bergen & Salmon, 2009b). The inclusion of an elaboration only (no emotion) intervention condition in future research, in addition to the two existing conditions, would go some way to disentangling these effects. Second, the short- and long-term impact of such training on children's emotional well-being should be addressed. Does an increase in emotion cause knowledge benefit children's overall social competence, and if so, does this advantage last, or do all children eventually reach the same skill level? Third, although the current study is unique in that it includes an active control condition (rather than a "wait list" control in which training is not provided until the conclusion of

the study), the effectiveness of this active control was not formally assessed. As child-directed play was used to control for additional time and attention provided by the parent to the child and by the researcher to the parent, and has also been used in clinical contexts to promote parents' responsiveness and children's compliance (e.g., Eyberg et al., 2001; Hood & Eyberg, 2003; Kottler & McMahon, 2004; see Greco et al., 2001), formal measures of both responsiveness and attention could be gathered in future work. Fourth, the aims and findings of our study are limited to a Western cultural context. Findings show that Asian parents are less preoccupied than are those from the West with helping their children talk about and understand emotion, emphasizing instead discipline and standards of behavior, and indeed, at times viewing emotion as disruptive (Wang et al., 2006). The current intervention may well be inappropriate in this context.

In summary, mothers who were instructed to engage in elaborative, emotion-rich reminiscing increased their high-elaborative utterances and emotion references (relative to mothers who engaged in child-led play), and sustained these differences over a period of 6 months. Moreover, their children increased their own elaborative and emotion references during shared recall and after 6 months, showed superior emotion cause knowledge. Despite the limitations of a high attrition rate and the ceiling effects on one measure of emotion knowledge, our findings add to a small but growing body of research highlighting the potential benefits to young children of training their parents in elaborative reminiscing.

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