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Looking Back to the Future: Māori and Pakeha Mother–Child Birth Stories

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Māori adults have earlier first memories than adults in any culture studied to date. To test the role of early memory socialization in this advantage, Māori ($n = 15$) and New Zealand European (or Pakeha, $n = 17$) mothers told birth stories and stories of shared past events to their children (3–4 or 7–8 years). Compared to Pakeha mothers, Māori mothers elaborated more in the birth stories, relative to their elaborations in stories about shared past events, and included more references to relational time and internal states in their birth stories. These data provide the first empirical evidence that Māori children experience a richer narrative environment than Pakeha children for significant events in their past.

Adults in all cultures have difficulty remembering experiences from their early childhood. Adults from some cultures, however, report earlier first memories than do adults from other cultures. Although individual differences in early memories within cultures are often large, there do appear to be some consistent differences between cultures in the age of earliest memories. In New Zealand, for example, young Māori adults date their earliest memories back to 2.5 years on average (MacDonald et al., 2000), which is the earliest age in any culture studied so far. In comparison, European New Zealanders (Pakeha) typically date their earliest memories back to an average age of 3.5 years (MacDonald et al., 2000), which is consistent with the average age of earliest memory in other European populations in the United States (e.g., Mullen, 1994). At the other end of the continuum, in some Asian and Asian American cultures, the average age of earliest memory is around 4 years (Mullen, 1994; Wang, 2001; see Wang, 2003, for review) and as late as 6 years for female Chinese New Zealanders (MacDonald et al., 2000).

Why might the age of earliest memory differ so dramatically within and across cultures? During infancy and early childhood, advances in the speed and efficiency of encoding, retention, and retrieval processes work together to produce age-related growth in memory ability and a corresponding decline in infantile amnesia (Hayne, 2004). These age-related changes in basic memory processes undoubtedly set the lower limit for the establishment and long-term maintenance of our memories; however, these changes cannot account for the 2-year cultural variation (on average) in the age of adults' earliest memories. Instead, we propose, along with other theorists (Leichtman, Wang, & Pillemer, 2003; Nelson & Fivush, 2004; Wang, 2003), that social and cultural processes are the primary contributors to individual differences in the age and content of our early autobiographical memories. In particular, cultural differences in the way adults talk with young children about the past may play a vital role in cultural differences in our early memories.

Adults vary a great deal in the way in which they converse about past events with young children. When talking about a shared past event, some adults are highly elaborative, providing rich detail about the event in their questions and statements (e.g., What scary animals did we see at the zoo?). When their children provide a memory response, these adults confirm that response and follow with another elaborative question or statement (e.g., Fivush & Fromhoff, 1988; Reese, Haden, & Fivush, 1993). Other adults are less elaborative, and instead tend to ask the same questions repeatedly (e.g., Did we see the lions?), regardless of the aspect of the event upon which the child wishes to focus. These differences in parental narrative style have major effects on children's memory development (see Fivush, Haden, & Reese, 2006, for a review). Parents who are more elaborative about past events have children who recall more about the past, both within the same conversation and later, with the same and with different conversational partners (e.g., Hudson, 1990; Leichtman, Pillemer, Wang, Koreishi, & Han, 2000; Reese et al., 1993). This relation between adults' reminiscing style and children's emerging memory skills holds even when controlling

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for child characteristics, such as language, self-awareness, and attachment security (Farrant & Reese, 2000; Reese, 2002a, 2000b). Recent experimental work, in which adults' reminiscing style was specifically manipulated, has verified the benefits of adults' elaborative reminiscing for young children's verbal memory (McGuigan & Salmon, 2004; Reese & Newcombe, 2007).

The exact mechanism through which the elaborative reminiscing style improves children's memory is still unknown. We do know, however, that the effect of adult elaboration is not restricted to children's verbal reports; rather, adult elaboration *after* an event also improves children's nonverbal memory for an event in the form of photo recognition (McGuigan & Salmon, 2004). We also know that adult elaboration *during* an event improves children's later verbal recall of event details (Boland, Haden, & Ornstein, 2003; e.g., that the hamburger bun had seeds on it) and their nonverbal recall in the form of behavioral reenactment (McGuigan & Salmon, 2006). Boland et al. (2003) argued that adults' elaborative talk during an event helps children's memory by directing their attention to event features and details, thus enriching encoding and storage. Past event elaborative talk may also help children's memory by reminding children of critical features and details, thus strengthening their existing representations. Past event elaborative talk may also fill in the gaps in children's memory, so to speak, by creating new aspects of a memory.

Thus, the past event elaborative style may be working in at least two ways to help children's memory: by strengthening and by enriching existing representations, both through the medium of language. Because as adults we attempt to retrieve our early memories verbally by trying to put them into words, the benefit of encoding and storing these memories in a verbal form may extend to the retrieval process. Importantly, an elaborative reminiscing style is hypothesized to have broad effects on children's autobiographical memory. A child who participates in elaborative reminiscing is predicted to have richer memories of many childhood events, not simply those that were discussed with the parent. In other words, what children are learning from elaborative reminiscing is a way of perceiving and remembering their experiences.

The link between children's early reminiscing environment and their earliest memories as adolescents and adults is only beginning to be established (Jack, MacDonald, Reese, & Hayne, 2007), but if adults' elaborative reminiscing is influential for the maintenance of early childhood memories, then adults with earlier memories might have experienced a parental elaborative reminiscing style in early childhood. Research on parent–child conversations about the past in Asian cultures is so far consistent with this prediction. Korean mothers initiate talk about past events with their preschoolers a third as often as do European American mothers (Mullen & Yi, 1995), and Chinese mothers are less elaborative when discussing shared past events with their preschoolers compared to European American mothers (Wang, Leichtman, & Davies, 2000). Whereas European American mothers use past-event conversations to emphasize their children's autonomy, Chinese mothers use past-event conversations to highlight the way their children can better fit into society (Miller, Wiley, Fung, & Liang, 1997).

Extending this line of argument, we might expect adults' reminiscing style in Māori culture to be more elaborative than adults' reminiscing style in other cultures, given the early age of first memory in Māori culture. Hayne and MacDonald (2003) tested this hypothesis by comparing mother–child talk about shared past events in Māori and Pakeha families with young children (3–4 or 7–8 years old). Critically, Māori and Pakeha mothers differed in their levels of elaboration about shared past events with their young children but not in the hypothesized direction. Māori mothers were much less elaborative than Pakeha mothers when discussing these typical past events with their young children. Despite this difference in maternal elaboration, however, there were no significant differences in children's memory with their mothers as a function of culture: Māori and Pakeha children recalled similar amounts of information despite their mothers' differences in level of elaboration.

This finding of lower elaboration among Māori parents is surprising given their earlier first memories and given the strong oral tradition in Māori culture. One prominent tradition, for instance, is the *whakapapa* or the oral transmission of the family ancestry across generations. Typically, select members of the *iwi* or tribe are entrusted with this responsibility and learn the descent lines through recitation with elders (Metge, 1995). Variants of the whakapapa that modern Māori parents practice with their children are *mihimihi* (shorter speeches for children on their *whanau* or extended family members) as well as the telling of legends (*purakau*) and the creation story (*putaio*). Many other oral traditions exist among contemporary Māori, such as *haka* (war chants, now practiced before sporting events), *waiata ringa* (action songs), and *karakia* (incantation of gratitude before a meal). Hayne and MacDonald (2003) argued, however, that in these oral traditions, accuracy is paramount, and thus,

elaboration on the facts of the ancestry or myths may be discouraged.

The interpretation that Māori parents are less elaborative during reminiscing than Pakeha parents because of an emphasis on accuracy in oral traditions, however, needs to be tested against another possible interpretation. The memory conversations in Hayne and MacDonald (2003), consistent with the large research base on maternal reminiscing style, were about relatively recent past events that mother and child experienced together (e.g., Fivush & Fromhoff, 1988; Reese & Fivush, 1993). Typically, the events chosen for these conversations are not of high significance in the long term (museum visits and special playgrounds). Given the pedagogical function of many of the oral traditions in Māori culture, it is possible that these child-centered, entertainment-oriented shared past events are not the kinds of events that Māori parents typically focus on when reminiscing with their children. Perhaps Māori parents are equally or even more elaborative about the past than are Pakeha parents but only about events that they view as more significant in their children's lives. In partial support of this hypothesis, Reese and Newcombe (2007) found that Māori mothers were equally elaborative as Pakeha mothers when discussing a significant separation or a child's misbehavior, but when discussing shared past events, Māori mothers became somewhat less elaborative than Pakeha mothers by the time their children entered preschool. Notably, separation and misbehavior events also afford a more instructional role for parents in the discussion (e.g., Remember the time you broke the car's headlamp? You hit it with a stick. Is that a good thing or a naughty thing for you to do?). In contrast, when conversing about a positive, child-centered event, perhaps Māori parents are more willing for their children to take the lead and remember the event relatively autonomously.

In order to assess fully the reminiscing environment for young Māori children, we need to collect stories about a wider range of past events, especially about past events that are more significant both to mother and to child. The stories that parents tell about their children's birth are an interesting counterpart to stories of recent shared past events. First, unlike many of the recent shared past events discussed in prior research, a child's birth is highly significant for both parent and child, and the story of the child's birth marks the first chapter of the child's autobiography as handed down from parent to child (Snow, 1990). Second, like the typical shared past events discussed in prior research, birth stories are also about a positive event. Third, the mother has privileged knowledge about the birth, so the structure of the birth story is more monologic (from parent to child) than dialogic (between parent and child; see Reese, 1996). Mothers whose preferred form of reminiscing is more pedagogical in tone would be expected to be more elaborative in this context relative to their discussion of a child-centered event, which may be more dialogic or even child led. We stress that in no way are we claiming that the birth story eventually becomes the child's earliest memory. Instead, we believe the birth story to be a more culturally appropriate test of Māori mothers' reminiscing style than are stories about typical shared past events, which tend to be both child centered and also less significant. Thus, the birth story may provide a better index of the style of event narration to which Māori children are typically exposed and in this way could account in part for earlier memories by Māori adults.

In the present study, some of the same parents in Hayne and MacDonald (2003) also told children's birth stories to their 3- to 4- or 7- to 8-year-old children. We coded the birth stories for maternal structure (elaborations and repetitions) and narrative quality along several dimensions. Clearly, childbirth is a highly significant event, regardless of one's culture, and we predicted that both Pakeha and Māori mothers would be more elaborative when telling the story of their children's birth compared to their stories about recent shared past events. If we are correct that maternal reminiscing during the birth story is a good index of maternal reminiscing style in general, then across both cultures, maternal reminiscing during the birth story should be a strong predictor of children's personal memory. Our next hypothesis was that Māori mothers would differentiate their reminiscing styles across the two story types to a greater extent than would Pakeha mothers. In other words, we expected Māori mothers to change their reminiscing styles more dramatically than Pakeha mothers as a function of the significance and pedagogical value of the event being narrated. Because we hypothesize that the early reminiscing environment for Māori children may be richer than that for Pakeha children, given the emphasis on oral tradition in Māori culture, we also expected that Māori mothers would tell richer narratives about their children's birth compared to Pakeha mothers. In our coding of narrative content, we were particularly interested in mothers' references to time, place, emotions, and interpersonal relationships, given the importance of these concepts in Māori culture (Metge, 1995; Te Maire Tau, 2003) and in autobiographical memory more generally (e.g., Fivush, 2001; Fivush & Nelson, 2006; Friedman, 2003).

Method

Participants

Thirty-eight mother–child dyads participated in a larger study of culture and memory (Hayne & MacDonald, 2003). Dyads were recruited from a number of sources, including public birth records, Te Kohanga Reo (Māori language preschools), Kura Kaupapa (Māori language schools or classrooms), and by word of mouth in Dunedin, New Zealand. In the larger sample, 18 of the children were Māori and 20 were Pakeha, with approximately equal numbers of younger (M age = 3.85 years, SE = 0.12) and older children (M age = 7.97 years, SE = 0.12) in each cultural group. Thirty-two mothers from this larger sample recorded a birth story: 15 Māori mothers (4 with younger girls, 3 with younger boys, 4 with older girls, and 4 with older boys) and 17 Pakeha mothers (3 with younger girls, 5 with younger boys, 4 with older girls, and 5 with older boys). Mothers' education was classified on a 6-point scale ranging from 1, *having completed fourth form* (U.S. Grade 8), to 6, *having completed postgraduate study*, with mothers having completed high school on average. Fathers' occupations were ranked along a 6-point scale as a measure of socioeconomic status (Elley & Irving, 2003). Fathers' occupations ranged from 1, *denoting professional occupations*, to 5, *representing semiskilled labor* (e.g., cattle farmworker), with fathers on average being of middle-class occupational status. Table 1 contains information on maternal education and paternal occupation as a function of culture and age of child.

Procedure

A female, culturally similar researcher visited each family two times in their home. Researchers left a tape recorder with mothers and asked them to discuss six recent shared past events with their children (see Hayne & MacDonald, 2003) and then to tell the children the story of their birth sometime over the ensuing week. In keeping with prior research (e.g., Cleveland & Reese, 2008; Reese & Brown, 2000), the shared past events that mothers selected to discuss with their children were primarily positive (93%), typically consisting of social gatherings (fish-and-chips night at kindergarten and staying at grandparents' house), holidays (mostly within New Zealand and Australia), outings (mostly to local museums and parks), and recreational activities (skiing, ice skating, biking, and bush walks). Only 5% of the events discussed could be considered highly significant (weddings, funerals, and sibling births), and these significant events were evenly distributed across the sample (three with younger Māori, three with older Māori, three with younger Pakeha, and three with older Pakeha children). A researcher transcribed all shared past event conversations and birth stories in full. Transcripts were marked with identification numbers prior to coding so that coders would be unaware of the child's culture, age, and gender.

Coding

Structural coding. We coded the shared past event conversations and birth stories for the amount and type of information mothers and children provided (Reese et al., 1993; see Hayne & MacDonald, 2003). The unit of coding was the utterance. Each maternal question or statement containing new information about the target event was coded as an *elaboration* (''What did you have to do with the helicopter?''; ''And the midwife's name was Jenny''). Each utterance in which the mother repeated her own previous question or statement was coded as a *repetition* (e.g., Mother asked ''What did you eat on the train?'' and in next conversational turn asked again ''What did you eat?''; Mother said ''You remember that Mum told you that she brought you home from the hospital?'' and later in the story said ''Mum brought you home from the hospital''). Mothers' *confirmations* (''Yeah, that's right'') and *negations* (''No, I went to the hospital to have you'') of children's event-related questions and statements were also coded but were not included in analyses because these utterances did not differ as a function of culture in Hayne and

Table 1
Demographic Variables as a Function of Children's Culture and Age

	Māori		Pakeha	
	Younger (n = 7), M (SD)	Older (n = 8), M (SD)	Younger (n = 8), M (SD)	Older (n = 9), M (SD)
Maternal education	3.86 (1.68)	3.62 (1.06)	3.46 (1.18)	4.89 (1.45)
Paternal occupation	3.43 (0.71)	2.60 (1.37)	2.96 (1.52)	3.22 (1.20)

MacDonald. Children's *contributions* were measured in terms of their utterances containing new information (e.g., ''The keas were up at the top'') or questions about the event (e.g., ''Was Dad there?''). Two coders coded 25% of the transcripts independently and achieved reliability for maternal codes of $\kappa = .88$ for everyday past events and .83 for birth stories. For children's codes, a reliability of $\kappa = .90$ was achieved for everyday past events and birth stories. The primary coder coded the remainder of the transcripts.

Narrative coding. We also coded each birth story for the narrative content of the information mothers provided (adapted from Haden, Haine, & Fivush, 1997). *Orientations* included maternal references to the time of the child's birth, which could refer to *specific time* (''You were born quarter past two in the morning''), to *relative time* (''You were born when I first started teaching''), to *people* (''We rang up Nana and Grandad''), or to *places* (''We lived in Hawea''). *Evaluations* included *internal state* references (both to *physical states* ''I felt yucky'' and to *psychological states* ''I was so happy'') and *subjective judgments*, either of the event (''Your birth was okay'') or of people (''You were really lovely''). The unit of narrative coding was the unique word or phrase within each utterance; a participant could receive credit for multiple uses of orientation and evaluation within one utterance, but each word or phrase could only count toward one type of narrative device. For instance, if a participant said ''Nana and Papa got to Hawea at 2 a.m.,'' then the participant received credit for two references to people, one reference to place, and one reference to specific time. Two coders coded 25% of the transcripts independently and achieved reliability of $\kappa = .86$. The primary coder coded the remainder of the transcripts.

Results

Preliminary Analyses

We first conducted Culture × Age analyses of variance (ANOVAs) to ensure that the groups were similar in terms of the socioeconomic indicators of maternal education and paternal occupation (only 17 mothers provided information on their own occupations, so this variable was not analyzed). There were no significant main effects of culture or age and no significant interaction between culture and age for either variable (see Table 1; $ps > .10$).

Second, we conducted Culture × Age ANOVAs on the types of events discussed in the shared past event conversations (see Table 2). There were no significant main effects of culture (all $ps > .10$) for types of events discussed. There were, however, two significant main effects of age, with mothers discussing a greater number of recreational events with older children, $F(1, 27) = 10.69$, $p < .01$, $\eta_p^2 = .28$, and a greater number of animal events (e.g., seeing penguins) with younger children, $F(1, 27) = 8.01$, $p < .01$, $\eta_p^2 = .23$. There were no significant interactions between culture and age for any event type (all $ps > .10$).

Table 2
Proportions of Types of Shared Past Events Discussed as a Function of Children's Culture and Age

	Māori		Pakeha	
	Younger ($n = 7$)	Older ($n = 8$)	Younger ($n = 8$)	Older ($n = 9$)
Family gatherings (57)	.33	.22	.27	.22
Holidays (43)	.21	.17	.20	.21
Outings (34)	.12	.18	.12	.18
Recreational (24)	.02	.29	.07	.15
Medical (13)	.12	.05	.04	.04
Animals (11)	.05	.00	.12	.00
Purchases (11)	.02	.03	.05	.09
Snow (6)	.02	.02	.04	.04
Other (6)	.05	.04	.02	.02

Third, we explored children's contributions of unique memory information to the conversations in a three-way mixed Culture × Age × Story Type ANOVA. There was a significant main effect of story type, $F(1, 28) = 26.34$, $p < .01$, $\eta_p^2 = .49$. Overall, children contributed far less to the birth stories than to stories of shared past events (see Table 3), confirming the monologic quality of the birth stories. There was also a significant interaction between children's age and story type for children's memory contributions, $F(1, 28) = 5.97$, $p < .05$, $\eta_p^2 = .18$. A follow-up one-way age analysis of covariance (ANCOVA) within-story type revealed a main effect of age only for the shared past events, $F(1, 30) = 6.25$, $p < .05$, $\eta_p^2 = .17$, and not for the birth stories, $F(1, 30) = 0.44$, *ns*. Thus, older children contributed more unique memory information than younger children to stories of shared past events but not to birth stories. There were no other significant main effects or interactions for children's memory contributions, confirming Hayne and MacDonald's (2003) finding of no significant cultural differences in children's memory with this smaller subsample. Because of the differences in children's memory contributions as a function of story type and age, we covaried children's memory contributions in all analyses of maternal reminiscing style.

Table 3
Mothers' Reminiscing During Shared Past Events and Birth Stories as a Function of Children's Culture and Age

	Māori		Pakeha	
	Younger (n = 7), M (SD)	Older (n = 8), M (SD)	Younger (n = 8), M (SD)	Older (n = 9), M (SD)
Shared Past Events (mean per event)				
Maternal elaborations	13.71 (4.41)	16.46 (8.68)	18.22 (11.59)	29.37 (15.31)
Maternal repetitions	5.67 (4.54)	6.54 (9.52)	3.74 (1.97)	4.11 (2.55)
Child memory	10.30 (6.21)	21.85 (17.36)	14.41 (6.45)	21.98 (9.38)
Birth Stories				
Maternal elaborations	32.28 (15.35)	88.25 (66.45)	32.62 (20.48)	62.67 (42.48)
Maternal repetitions	6.71 (4.92)	10.00 (9.34)	4.25 (2.25)	7.78 (8.68)
Child memory	5.86 (4.30)	4.38 (4.75)	6.63 (10.17)	5.00 (6.12)

Main Analyses

Correlations between maternal reminiscing and children's memory. First, we needed to establish that mothers' reminiscing during birth stories was indeed important for children's personal memory. We did not have a measure of the child's independent memory with a researcher in this study, but by age 3, New Zealand children's independent memory is correlated with the number of unique memory contributions they offer in mother–child memory conversations (Reese, 2002a). Hayne and MacDonald demonstrated that children's memory for everyday events in this sample was strongly correlated with mothers' elaborations in the same conversations at $r = .59$, $p < .01$. We conducted correlations between children's memory contributions about shared past events and mothers' structure and narrative content during the birth stories (see Table 4). Children's unique memory contributions for personally experienced events were strongly correlated with mothers' total elaborations during the birth story, and specifically with mothers' references to relative and specific time, places, people, and internal states, but not with mothers' repetitions or subjective judgments. Critically, several of these significant correlations between children's memory and mothers' reminiscing about the birth story (total elaborations, relative time, places, and internal states) remained significant even when we partialed out maternal elaborations during shared past events. This is a conservative test of the role of maternal reminiscing during the birth story given the strong role of mothers' elaborations about shared past events in children's personal memory, especially given that the covariate was measured during the same conversation in which children's memory was measured. Thus, maternal elaborative reminiscing during the birth story uniquely predicted children's memory for personally experienced past events.

Our second goal was to assess relative differences in maternal structure across the two story types as a function of culture. Our final goal was to explore the narrative content of the birth stories in more depth.

Maternal structure in birth stories and shared past events. Here, we wished to determine if there were differences in the level of structure that mothers provided to children as a function of culture and of the type of story told. Table 3 contains descriptive information on the structural codes for shared past events and birth stories. We ran three-way mixed Culture × Age × Story Type ANCOVAs on mothers' elaborations and repetitions during shared past events and birth stories, with children's contributions in both conversations as covariates. For mothers'

Table 4
Correlations Between Children's Memory for Personally Experienced Events and Mothers' Reminiscing During Birth Stories

	Total elaborations	Total repetitions	Relative time	Specific time	Place	Person	Subjective judgment	Internal states
Children's memory	.57**	.28	.40*	.41*	.55**	.40*	.26	.54**
Partial correlation[a]	.44**	.11	.36*	.22	.48**	.21	.12	.56**

[a]Maternal elaborations during shared past events partialed out.
*$p < .05$. **$p < .01$.

repetitions, there were no significant main effects of culture, age, or story type and no significant interactions among the three factors (all *p*s > .10). Mothers used similar numbers of repetitions regardless of culture, children's age, or story type. For mothers' elaborations, however, there was a significant interaction between culture and story type, $F(1, 26) = 4.45$, $p < .05$, $\eta_p^2 = .15$. Follow-up one-way culture ANCOVAs within story type, with children's contributions as the covariates, revealed that Pakeha mothers were more elaborative than Māori mothers during shared past events, $F(1, 28) = 4.87$, $p < .05$, $\eta_p^2 = .15$, consistent with Hayne and MacDonald's (2003) prior analyses on the larger sample. In contrast, Māori mothers used more elaborations than Pakeha mothers when talking about the child's birth story; however, this difference did not reach conventional levels of statistical significance because of the extremely large standard deviations in mothers' elaborations during the birth story, $F(1, 28) = 2.28$, $p = .14$, $\eta_p^2 = .08$. There was a main effect of children's age for mothers' elaborations, $F(1, 26) = 4.08$, $p = .05$, $\eta_p^2 = .14$, with mothers more elaborative overall with older than younger children. There was also a marginal interaction between age and story type, $F(1, 26) = 3.94$, $p = .06$, $\eta_p^2 = .13$. Follow-up one-way age ANCOVAs within story type revealed that once children's contributions were taken into account, there was no significant age difference in maternal elaborations for shared past events, $F(1, 28) = .36$, $p = .56$, $\eta_p^2 = .01$, but there remained a significant age difference in maternal birth story elaborations, $F(1, 28) = 4.16$, $p = .05$, $\eta_p^2 = .13$. Thus, mothers differentiated more on the basis of the child's age during birth stories than during everyday past event conversations, once children's contributions were taken into account. The main effects of culture and story type, the Culture × Age interaction, and the Culture × Age × Story Type interaction were not significant (all *p*s > .10).

Thus, the three-way ANCOVA revealed a significant interaction between culture and story type. The pattern of the means in Table 3 was in the predicted direction of Māori mothers being less elaborative about shared past events but more elaborative about birth stories than Pakeha. However, the variance in the birth story elaboration variable was extremely high, and this limited our ability to isolate fully the interaction effect and to establish definitively whether mothers were more elaborative during birth stories than during stories of a typical shared past event. To reduce the amount of variance in maternal elaborations, and to assess more directly our prediction that Māori mothers would change their reminiscing styles as a function of story type more dramatically than would Pakeha mothers, we computed a ratio variable of mothers' elaborations in the birth story divided by their average elaborations per shared past event conversation. This *elaboration ratio* assessed the degree to which mothers changed their elaborations across story type. The higher the elaboration ratio, the more elaborative the mothers were in the birth stories relative to their elaborations during a typical shared past event story.

Recall that our first hypothesis was that mothers would be more elaborative in general during birth stories than during stories of shared past events. To address this hypothesis, we computed the number of mothers with elaboration ratios greater than 1, which indicates a higher number of elaborations in the birth story relative to the stories of shared past events. Nearly all mothers (88%) were more elaborative during the birth stories than during stories about shared past events. Elaboration ratios ranged from 0.53 to 24.64, with only 4 mothers (three Pakeha and one Māori) having elaboration ratios less than 1. Preliminary analyses revealed an outlier on the elaboration ratio variable in which 1 Māori mother had a ratio score of over 24, with the next highest score (also from a Māori participant) at just over 8. We adjusted the outlier by replacing it with the next highest score and then subtracted 1 *df* from the error term in analyses (Tukey, 1977).

To address our second hypothesis of cultural differences in birth story elaborations relative to elaborations about shared past events, we conducted a two-way Culture × Age ANCOVA on mothers' elaboration ratio, with children's contributions as covariates. There was a significant main effect of culture, $F(1, 25) = 4.52$, $p < .05$, $\eta_p^2 = .15$. Māori mothers were more elaborative during birth stories than stories about shared past events compared to Pakeha mothers. There was also a marginally significant effect of children's age, $F(1, 25) = 3.31$, $p < .10$, $\eta_p^2 = .11$. Mothers of older children had a tendency to be more elaborative when telling birth stories than when they were discussing shared past events compared to mothers of younger children. There was no significant interaction between culture and age. Thus, although nearly all mothers were more elaborative during the birth story than during stories of shared past events, when compared to Pakeha mothers, Māori mothers made an even sharper distinction between birth stories and shared past events in their degree of elaboration.

Cultural and age differences in narrative content of birth stories. Our final goal was to explore cultural and age differences in the narrative content of the birth stories (see Table 5). We conducted a series of two-way

Table 5
Narrative Content of Mothers' Birth Stories as a Function of Children's Culture and Age

	Māori		Pakeha	
	Younger (n = 7), M (SD)	Older (n = 8), M (SD)	Younger (n = 8), M (SD)	Older (n = 9), M (SD)
Orientations				
Specific time	2.00 (2.58)	5.38 (2.92)	3.75 (3.61)	6.67 (5.87)
Relative time	1.71 (1.60)	4.13 (2.59)	1.00 (1.41)	1.78 (1.39)
Places	4.86 (1.95)	7.13 (5.30)	3.62 (2.67)	4.78 (1.99)
People	29.57 (13.49)	64.50 (51.71)	28.75 (16.39)	53.22 (35.85)
Evaluations				
Internal states	4.71 (2.93)	21.12 (19.87)	6.00 (6.91)	7.89 (5.97)
Subjective judgments	4.86 (3.62)	15.25 (15.00)	6.75 (4.53)	11.44 (10.40)

Culture × Age ANCOVAs on mothers' orientations (to time, place, and person) and evaluations (internal states and subjective judgments) during the birth stories, again with children's contributions as the covariates. Māori and Pakeha mothers were similar in their subjective judgments and their references to people, places, and specific time (all ps $> .10$), but there was a main effect of culture for mothers' references to relative time, $F(1, 27) = 5.51$, $p < .05$, $\eta_p^2 = .17$, and to internal states, $F(1, 27) = 4.24$, $p < .05$, $\eta_p^2 = .14$. Māori mothers made more references to relative time and to internal states than did Pakeha mothers. There were no significant interactions between culture and age for narrative content, but there was a marginally significant interaction between culture and age for mothers' internal state references, $F(1, 27) = 3.28$, $p = .08$, $\eta_p^2 = .11$, with a trend for Māori mothers to use an especially high rate of internal state references with older children.

There were also significant main effects of age for the orientation narrative variables. Mothers of older children referred more often to specific time, $F(1, 27) = 4.45$, $p < .05$, $\eta_p^2 = .14$; to relative time, $F(1, 27) = 5.96$, $p < .05$, $\eta_p^2 = .18$; and to people, $F(1, 27) = 6.13$, $p < .05$, $\eta_p^2 = .23$, than did mothers of younger children.

Discussion

Childbirth is a significant event for all families, and the mothers in this study told richly detailed and emotional stories about the birth of their children. In line with our hypotheses, we found that, irrespective of their cultural background, most mothers were more elaborative when telling the story of their children's birth compared to their stories about recent past events they had shared with their children. Mothers' elaborations during the birth stories and their references to time and internal states were strongly and uniquely linked to their children's memory for personally experienced events. Māori mothers, however, were even more elaborative than Pakeha mothers in their birth stories relative to stories of shared past events. Māori mothers' birth stories were also of a higher narrative quality compared to Pakeha mothers' birth stories. Specifically, Māori mothers made more references to relative time and to internal states in their birth stories compared to Pakeha mothers.

We conclude from these findings that cultural differences between Māori and Pakeha in narrative memory are likely to be highly context dependent. Specifically, Māori mothers were only less elaborative than Pakeha mothers when discussing shared past events that were somewhat trivial in nature. When narrating the more significant event of the child's birth, Māori mothers told richer stories compared to Pakeha mothers. Thus, cultural differences in reminiscing style depend on the type of memory that is being told. Perhaps stories about everyday shared past experiences are more prevalent, and hence more elaborated, among Pakeha than Māori families. Miller and colleagues (Miller, Potts, Fung, Hoogstra, & Mintz, 1990; Miller et al., 1997) noted cultural and social class differences in the types of past events that families discuss. In some cultures and classes, stories *about* the child are much more prevalent than stories of past events told *with* the child. It seems highly probable that stories of shared past events, with their focus primarily on the child, are simply more tellable in Western cultures, with their emphasis on the individual (although see Melzi & Fernandez, 2004, for a similar focus on shared past events in middle-class Peruvian families).

Although traditional Māori culture is characterized by a rich oral tradition (Biggs, 1970), these stories are not necessarily about everyday shared past events. Moreover, the stories told in Māori culture are passed down from elder to younger. The

expectation on the part of adults when telling stories of cultural importance is that children need to listen to the story, not necessarily collaborate on its telling (although see McNaughton, 1995, for examples of collaborative storytelling in Māori parent–child dyads). McNaughton argued that at least some Māori parents have more *pedagogical dexterity* than Pakeha parents, in that they are able to switch their conversational styles between a dialogic versus a monologic style more easily depending on the type of story told (e.g., a picture book vs. a Bible story). In our own data, we noticed a greater differentiation in Māori parents' than Pakeha parents' conversational style as a function of the type of story being told. Perhaps birth stories, because of their significance and because the adult has privileged knowledge of the event, are a closer analogue to the types of narratives that Māori children hear in their everyday lives. In cultures for which everyday shared past events are not as tellable, then, parents' stories about more significant and less child-centered events may offer a clearer picture of the full range of the child's reminiscing environment.

The finding that Māori mothers referred more often to relative time in their birth stories than did Pakeha mothers is particularly interesting given the relational notion of time in Māori culture:

> For Māori, ''time'' is established by whakapapa, which essentially consists of ''seemingly'' immovable stepping stones across spaces of time. Thus, myth templates may move from the distant past to be imprinted on recent events. . . . Whakapapa allowed us to place one ancestor chronologically in relation to others. (Te Maire Tau, 2003, pp. 259–261)

Relative time references, in contrast to specific time references, are more useful in placing events relative to each other along a timeline. A mature understanding of time involves the ability to order different life events relative to each other along a timeline, an ability that does not develop fully in Western samples until late-middle childhood or even early adolescence (Friedman, 2003). It would be interesting in future research to explore Māori mothers' references to time in other types of stories and to link these references to children's time concepts. It is possible that Māori children who are exposed more often to relative time references develop a mature understanding of time at earlier ages.

Our findings also have implications for the development of autobiographical memory in Māori and Pakeha children. We know that young Māori adults have earlier memories than adults in any other culture studied to date (MacDonald et al., 2000). Here, we provide the first evidence of the possible seeds for this memory advantage in early interactions between parents and children. Māori mothers with a highly elaborative style of discussing past events of cultural and familial significance may be helping their children to encode a wide range of early memories in a richer way and later to retain these early memories into adulthood. Māori mothers' specific emphasis on relative time in the birth stories, if indeed this emphasis extends to other significant events, may help children to better organize their early experiences along a timeline and later to facilitate retrieval of those early memories (see also Fivush & Nelson, 2006, for a similar argument). We speculate that greater coherence in the ordering of life events relative to each other may ultimately result in a more organized sense of self (Bird & Reese, in press). Māori mothers also referred more often to internal states than did Pakeha mothers, especially with their older children. Through their richer discussion of emotions, Māori mothers are providing a stronger evaluative framework for the event, thus making the story more memorable for their children (Fivush, 2001).

We acknowledge, however, that the differences we found between Māori and Pakeha mothers' birth stories were at best moderate, not large, with culture accounting for only about 14%–22% of the variance. Moreover, a substantial range in maternal reminiscing in both contexts existed within both cultures, indicating substantial stylistic differences among Pakeha and among Māori mothers. In contrast, the between-group differences between Pakeha and Māori adults' earliest memories are large (Hayne & MacDonald, 2003; MacDonald et al., 2000): Across two samples, Māori adults' earliest memories predated Pakeha adults' earliest memories by at least 10 months on average.

Most likely, factors other than the early narrative environment must come into play in explaining this large difference. One possibility is that Māori children simply experience more salient events in early childhood than do Pakeha children. As one example, a Māori funeral or *tangi* is much more elaborate and extended in time compared to a typical Pakeha funeral, and children are allowed and even encouraged to participate fully in the event from a very young age. For several Māori participants in the MacDonald et al. (2000) study, their first memories were of *tangi*. In the present study, however, when mothers were allowed to choose recent past events to discuss, Māori mothers were no more likely to nominate highly significant events than were Pakeha mothers. A second possibility is that Māori adults may have different criteria for what counts as an early memory. For instance, many of the earliest Māori

memories are in the form of image memories, not full-blown narrative memories (MacDonald et al., 2000). In further study with larger samples, it would be interesting to explore these differences in criteria in more depth. Finally, a third possible explanation is that we underestimated the narrative environment for Māori children by including only mothers and not other caregivers for the child. In contemporary Western Anglo culture, especially for young children, mothers simultaneously play the roles of caregiver, teacher, and friend (Thompson, 1999) and also appear to be the children's primary memory socialization agent (Haden et al., 1997). In Māori culture, both historically and currently, children experience a much broader caregiving environment involving their extended family or whanau, which includes blood relatives, such as grandparents, aunts, uncles, and older cousins, but also close friends of the family (Metge, 1995). Simply measuring the narrative input from the mother almost certainly underestimates the total narrative input that young Māori children receive, particularly about family history, which is more likely to come from an elder than from a parent. Of course, these three possibilities are not mutually exclusive. In combination, they may help us to begin to explain the large difference in early memories between Māori and Pakeha.

Children's age was also a strong predictor of maternal reminiscing style during both types of stories, but especially during the birth story. Mothers told richer birth narratives with older than with younger children after children's contributions had been taken into account. This finding contrasts with Reese (1996), who found that mothers included more interpersonal references in younger than in older preschoolers' birth stories, but that sample did not extend to middle childhood. The age differences we found in this study could in part be a function of repeated tellings of the birth story with older children; each time mothers tell the birth story, they may include more information. We did not collect information on how often mothers reported telling the birth story previously to the child, but we speculate that mothers have told the birth story more often with older children. Reese (1996) reported that middle-class Pakeha mothers reported telling the birth story marginally more often with their older than their younger preschoolers; however, frequency of retelling the birth story did not correlate with any measures of content or quality.

The age differences we found could also be a function of older children's greater interest and attention when hearing the stories. Our measure of children's verbal contributions did not tap children's nonverbal interest in hearing the stories. Regardless of the reason for these age differences, these results are in line with many other findings that mothers talk in more elaborative ways about past events with older children (e.g., Reese et al., 1993). Perhaps we are viewing a more general phenomenon of richer past event conversations with older children, regardless of the child's culture, the past event discussed, and children's participation. The implication is that parents may view middle childhood as a more appropriate time to reflect upon the child's early experiences, and there was some indication in the data that Māori mothers made this distinction even more sharply than did Pakeha mothers. Very little research exists on the form and function of parent–child reminiscing with children of this age (but see Fivush, Bohanek, Robertson, & Duke, 2004, for an exception). We should not restrict our exploration of social interaction effects to early childhood simply because the average age of earliest memory occurs during early childhood. Parent–child memory conversations during middle childhood and even adolescence may also affect the richness of early childhood memories.

Clearly, stories of everyday shared past experiences are a good indicator of parents' reminiscing style and a strong predictor of children's memory regardless of one's culture. However, these stories are not the only way that parents can help children develop a rich autobiographical memory of their early childhood, yet researchers have focused almost exclusively on these types of past events in their study of social interaction effects on remembering (but cf. Ackil, van Abbema, & Bauer, 2003; Bird & Reese, 2006). Although mothers' birth stories have been studied for other reasons, such as to measure maternal adjustment (diBlasio & Ionio, 2002) or coparenting harmony (Oppenheim, Wamboldt, Gavin, Renouf, & Emde, 1996), we propose that they can also be a useful method for accessing the way mothers portray their children, both as autonomous and as interdependent selves, from the moment they first draw breath. We view our results using mother–child birth stories, however, as simply the first piece in the puzzle of why Māori adults have such early memories and look forward to exploring a diverse range of adult–child interactions about myths and memories in explaining these differences.

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