Maternal Reminiscing, Socio-Cultural Contexts, and the Development of Children's Autobiographical Memory

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Table of Contents

List of Tables

List of Figures

Abstract

Research into mother-child reminiscing and child autobiographical memory has progressed remarkably over the last few decades. However, the existing empirical evidence has predominantly focused on one aspect of child autobiographical memory (i.e., child memory elaboration). Many aspects of child autobiographical memory (e.g., memory specificity) and their associated developmental outcomes remain under-researched. In addition, despite rich theoretical perspectives suggesting the important influence of culture on child memory development, past research has been predominately conducted in Western industrialised societies. Therefore, the objective of this thesis was to extend the cross-cultural understanding of the relationships between maternal reminiscing, child autobiographical memory, and child socioemotional functioning. The thesis is comprised of a meta-analytic review (Study 1) and a series of empirical studies (Studies 2, 3, and 4). By conducting a systematic review and meta-analyses on research that has investigated the relationship between maternal elaborative reminiscing and child memory elaboration, Study 1 provided strong evidence indicating that high elaborative maternal reminiscing is associated with child memory elaboration, both concurrently and longitudinally. In addition, Study 1 revealed that the positive association between maternal elaborative reminiscing and child memory elaboration was also observed in cross-sectional studies conducted using dyads from different socioeconomic and cultural backgrounds. The methodology adopted in the empirical studies was a combination of individual assessments of autobiographical memory specificity, a joint reminiscing task about past emotional events and a maternal questionnaire. Specifically, by using a community sample of Australian preschool-aged children (N=40, M= 5.0 years) and their mothers, Study 2 found maternal supportive reminiscing was positively associated with mothers' and children's memory specificity. Further, Study 2 provided the initial evidence of an indirect pathway between maternal memory specificity and child memory specificity

through mothers' supportive guidance during reminiscing. Study 3 employed a cross-cultural investigation of children (N=103, M=4.34 years) and mothers from two cultural contexts—China and Australia. In particular, Study 3 found significant cultural differences in maternal reminiscing styles and mother-child autobiographical memory features, except for child memory specificity. In addition, Study 3 found that cultural context and maternal reminiscing styles significantly predicted child memory elaboration. Child memory specificity was only predicted by child age and linguistic skills. Study 3 also found a significant interaction effect was observed between maternal elaborative and supportive reminiscing in predicting child memory specificity. Specifically, when mothers were high in supportive reminiscing, maternal elaborative reminiscing was positively associated with child memory specificity. Study 4 consisted of 94 Australian and Chinese mother-child dyads (M= 4.34 years). Study 4 revealed child memory elaboration was a unique predictor of child prosocial behaviours. Furthermore, there was a significant indirect effect of child memory elaboration on the relationship between maternal supportive reminiscing and child prosocial behaviours in both cultural contexts. There was no evidence to suggest that child memory specificity was associated with children's prosocial or disruptive behaviours. Overall, this thesis provided empirical evidence to support the existing theories, which posit a pan-cultural influence of maternal elaborative and supportive guidance during reminiscing on child autobiographical memory development and positive socioemotional functioning.

General Declaration

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes two original papers published in peer reviewed journals and two submitted paper (under review). The core theme of the thesis is the relationships between maternal reminiscing, chid autobiographical memory and socioemotional functioning across cultures. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the Department of Psychology under the supervision of Dr Laura Jobson and Associate Professor Peter Anderson.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of four chapters, my contribution to the work involved the following:

Thesis Chapter	Publication Title	Publication Status	Nature and % of candidate contribution	Co-author name(s) and nature of contribution	Co-author(s), Monash student
4	Maternal Reminiscing and Child Autobiographical Memory Elaboration: A Meta-Analytic Review	Published	80%. Concept, data extraction, coding, analysis, and manuscript write-up	1) Laura Jobson, input into manuscript 20%	1) No
5	Investigating whether Maternal Memory Specificity is Indirectly Associated with Child Memory Specificity through Maternal Reminiscing	Published	40%. Concept, data coding, analysis, and manuscript write-up	1) Laura Jobson, input into manuscript 60% 2) Kimberly Burford, data collection 3) Breana Burns, data collection 4) Amelia Baldry, data collection	1) No 2) Yes 3) Yes 4) Yes
6	Maternal Reminiscing and Autobiographical Memory Features of Mother-Child Dyads in a Cross-cultural Context	Accepted	75%. Concept, data collection, coding, analysis, and manuscript write-up	1) Laura Jobson, input into manuscript 20% 2) Zijing He, participant recruitment, input into manuscript 5%	1) No 2) No
7	Investigating Maternal Emotional Reminiscing, Child Autobiographical Memory, and Socioemotional Functioning in Pre-schoolers: A Cross-Cultural Examination	Submitted	75%. Concept, data collection, coding, analysis, and manuscript write-up	1) Laura Jobson, input into manuscript 20% 2) Zijing He, participant recruitment, input into manuscript 5%	1) No 2) No

I have renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

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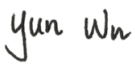
Student signature:  **Date:** 03/09/2019

I hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor name: Laura Jobson

Main Supervisor signature:  **Date:** 03/09/2019

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CHAPTER 1: Overview

‘What the child can do in cooperation today he can do alone tomorrow.’

—Lev Semenovich Vygotsky, 2012, Thought and Language

Early childhood is a critical developmental period for shaping autobiographical memory—the distinct and long-lasting memory of an individual’s significant personal experiences (Goodman, Quas, & Ogle, 2010; Wang, 2004). Autobiographical memory is fundamental in shaping an individual’s emotions, maintaining a sense of self, providing candidate solutions for problem-solving, and providing materials for social interactions and future planning (Dalgleish & Werner-Seidler, 2014). Given the importance of autobiographical memory to these central psychological phenomena, significant research has considered the formation of autobiographical memory in early childhood. In particular, Nelson and Fivush’s (2004) social-cultural development theory has been particularly influential in guiding this literature. From the social-cultural developmental perspective, autobiographical memory is understood to emerge gradually across the preschool years through an ongoing social collaboration between adults and children. Specifically, the shared discussion between parents (especially mothers) and children about past events of their lives (i.e., mother-child reminiscing) is considered as a powerful context for shaping children’s early autobiographical memory.

Under the influence of Nelson and Fivush’s (2004) theory, researchers have investigated the association between mother-child reminiscing and young children’s autobiographical memory development. Such research has typically assessed children’s ability to provide new unique memory information when discussing the past with their mothers (i.e., *child memory elaboration*). It is proposed that children of mothers with a high elaborative reminiscing style tend to have greater autobiographical memory elaboration.

Researchers suggest that *maternal elaborative reminiscing* (i.e., how mothers structure their conversation with their children) is uniquely important for children's memory of past events because coherent and elaborative narratives are often more memorable than isolated and repeated comments (Reese & Newcombe, 2007). Additionally, there is growing research demonstrating the equally important role *of maternal supportive reminiscing* (i.e., mothers' enthusiasm for sharing memories, support for autonomy and emotion, and appropriate response to children's need) in fostering children's autobiographical memory (Cleveland & Reese, 2005; Larkina & Bauer, 2010).

However, empirical evidence in this area has predominately focused on mother-child dyads from Western industrialised societies (e.g., the United States), with less research investigating the benefit of maternal reminiscing on child autobiographical memory in non-Western industrialised societies. Theorists posit that autobiographical memory is valued differently across cultures, and such a difference in cultural norms may reinforce mothers' preferences in remembering and memory-sharing behaviours (Bluck, 2015). This is because what one remembers and how one remembers is fundamental in defining, shaping, and maintaining a sense of self in relation to cultural demands (Nile & Van Bergen, 2015). Despite cultural variations observed in maternal reminiscing styles and child memory elaboration, there is inconsistent evidence regarding whether the relationships between maternal reminiscing styles and child memory elaboration are culturally similar (e.g., Schröder, Keller, & Kleis, 2013; Wang, 2006, 2007). Therefore, research is still needed to understand the role of maternal reminiscing in children's early memory development in different cultural contexts.

Furthermore, like any form of memory, autobiographical memory is not unitarily constructed (Schneider, 2015). Many aspects of child autobiographical memory (apart from memory elaboration) remain under-researched. For example, *memory specificity*—a concept

that has been well-recognised in adult and adolescent literature as a unique predictor of mental health – has not yet been sufficiently explored in children (Hitchcock, Nixon, & Weber, 2014; Williams et al., 2007). Recently, Valentino (2011) proposed a developmental model positing certain risk and protective factors that operate at multiple levels of ecology (e.g., family, culture) that contribute to the typical and atypical development of child memory specificity. Similar to the social-cultural account, Valentino also proposed that mother-child reminiscing plays a central role in shaping child memory features. There is now increasing evidence suggesting that maternal supportive reminiscing contributes to child memory specificity (e.g., McDonnell, Valentino, Comas, & Nuttall, 2016; Valentino, McDonnell, Comas, & Nuttall, 2018). However, most empirical evidence to date has centered on at-risk children in the United States. Thus, it is unclear whether such findings can be replicated in the broader population and other cultural contexts.

Finally, though research into mother-child reminiscing and the formation of young children's autobiographical memory has progressed remarkably over the last thirty years, there seems to be a lack of empirical evidence demonstrating how young children's autobiographical memory abilities are indeed related to developmental outcomes. The findings of a few recent studies seem to suggest that different aspects of child autobiographical memory predict different aspects of child *socioemotional functioning* (e.g., Song & Wang, 2013; Valentino et al., 2018). In particular, the results showed that child memory elaboration during reminiscing of past emotional events significantly predicted child social competency (i.e., prosocial behaviors), whereas child memory specificity uniquely predicted child disruptive behaviors. However, once again, such empirical investigation has been mainly focused on Western industrialized societies. As autobiographical memory is not necessarily the norm across cultures, and thus may not always be beneficial to individuals'

psychological functioning (Wang, Hou, Koh, Song, & Yang, 2018), it is unclear whether these associations can be observed in non-Western industrialized cultural contexts.

Therefore, the aim of the current research was to build upon existing research and extend our cross-cultural understanding of relationships between maternal reminiscing and child autobiographical memory, and their implications for child socioemotional functioning. In particular, this thesis aimed to address the following three research questions, using two distinct cultural contexts (China and Australia):

1) How do mother-child dyads from different cultural contexts differ in their reminiscing styles and autobiographical memory features?
2) How do developmental factors (i.e., cultural context, maternal reminiscing; factors that proposed by Nelson and Fivush's social-cultural developmental account and Valentino's developmental model) predict different aspects of child autobiographical memory (i.e., elaboration and specificity)?
3) What are the relationships between maternal reminiscing styles, dyads' autobiographical memory features and child socioemotional functioning?
    a. In particular, can the relationships that have been observed in Western industrialized societies be replicated in other cultural contexts and outside the United States?

To investigate these questions, this thesis starts with a review of the existing theoretical and empirical literature pertaining to preschool-aged children's autobiographical memory development (Chapter 2). Chapter 3 provides a summary of the literature review and followed by a detailed description of how the research aims would be addressed in the four studies included in this thesis. Chapter 4 further reviews how maternal elaborative reminiscing and child memory elaboration was assessed in past literature; and examines whether a consistent relationship between maternal elaborative reminiscing and child

memory elaboration could be established regardless of social-cultural factors. In Chapter 5, this thesis presents the preliminary evidence of the relationship between maternal guidance during reminiscing (i.e., elaborative and supportive reminiscing styles) and mother-child autobiographical memory specificity in typically developing children from an Australian community sample. Chapter 6 discussed the cultural differences in maternal elaborative and supportive guidance during reminiscing and mother-child dyads' autobiographical memory features and presented the cross-cultural applicability of the social-cultural development theory and developmental model of memory specificity. In Chapter 7, this thesis presented the benefit of maternal supportive guidance during reminiscing on children's memory and socioemotional development. Finally, Chapter 8 integrated the findings from these four studies, reviewed the contribution of current research and discussed the possible directions for future research.

CHAPTER 2: Literature Review

2.1 Autobiographical Memory

Memory—an individual's capacity to retrieve previously stored information—is an important psychological process that is fundamental to complex human cognition (Foster & Jelicic, 2012; Schneider, 2015). It allows us to remember things that occurred a few hours ago to experiences that occurred several years ago (Foster & Jelicic, 2012). Without memories, central human functioning, such as problem-solving, decision-making, concept formation, perception understanding, and self-definition, would be near impossible (Schneider, 2015). One crucial aspect of memory is autobiographical memory, the distinct, long-lasting memory of significant personal experiences (Wang, 2004). Autobiographical memory can be defined and used in many ways (Rubin, Deffler, & Umanath, 2019). For example, early researchers tended to conceptualise autobiographical memory as a type of episodic memory (i.e., memory of richly detailed, personally experienced events that can be tied to a specific time and place) (Baddeley, 1992; Nelson, 1993). However, current opinions suggest a distinction between these two components of memory. In general, it is posited that episodic memories entail the memory of '*what happened*' in the past, whereas autobiographical memory includes an additional interpretive layer of the subjective sense of self (i.e., '*what happened to me*') and personal history (Fivush, 2010; Sutton, 2002). Autobiographical memories build on the episodic memory system by involving an individual's representation of self as an 'experiencer' of the events, linking the past with the current experiences, generating meanings for self-concept and life, and establishing self-continuity across the lifespan (Fivush, 2011). In other words, researchers suggested that autobiographical memory is infused with a sense of personal involvement in the events that happened in the past and with thoughts, emotions, feelings, and reactions associated with those events (Bauer, 2007). With this in mind, it is not surprising that the self and autobiographical memory are closely related (Prebble, Addis, & Tippett, 2013).

2.2 The Construction of Autobiographical Memory

Theorists and researchers have long debated whether the sense of self is the foundation for the construction of autobiographical memory (Beike, 2013). Conway's influential self-memory system (SMS) clearly articulates how autobiographical memory and personal knowledge interact to help individuals mentally construct their conscious memory of the past (Conway, 2005; Conway & Pleydell-Pearce, 2000). According to Conway and Pleydell (2000), the SMS consists of two components: an autobiographical knowledge base and a 'working self'. It is suggested that autobiographical memories are dynamic mental constructions generated from an underlying knowledge base that contains knowledge of one's past experiences at different levels of specificity. That is, the SMS suggests that three broad levels of specificity exist in the autobiographical knowledge base: 1) lifetime periods are at the most general and abstract level (e.g., *when I was a child*); 2) general events capture more specific experiences (e.g., *the first time I visited a zoo*); and 3) event-specific knowledge consist of highly specific details of a particular experience (e.g., *I was happy when I saw a koala*) (Conway, 2005). The working self is a mental model reflecting one's desired self-images and is associated with goals, expectations, and motivations (Mutlutürk & Tekcan, 2015). The function of the working self is to encode individuals' autobiographical memories into the autobiographical knowledge base and support the construction of specific memories that aid in identity construction (Conway, 2005). The working self simultaneously ensures that the retrieval of particular memories of one's personal past are consistent with the personal goals of the self (Rathbone & Moulin, 2014). In short, the SMS posits that 'who we are' influences what we store and retrieve, and what we retrieve contributes to 'who we are' (Mutlutürk & Tekcan, 2015). This interplay between the self and autobiographical memory is empirically well established (e.g., Conway, 2005; Jetten, Haslam, Pugliese, Tonks, & Haslam, 2010; J. Ross, Hutchison, & Cunningham, 2019).

However, it is important to note that the construction of autobiographical memory also relies on non-self-related memory organisation processes (see Beike, 2013, for a review). Though the construction of any memory is inseparable from the basic neurological and cognitive underpinning processes of memory, the unique nature of autobiographical memory means that the creation of significant personal stories from one's life experiences is inevitably shaped by social interactions and cultural environments (Reese, 2009). Theorists have thus posited that socialisation is a foundation of autobiographical memory (e.g., Nelson & Fivush, 2004). The notion that autobiographical memory is socially determined can be understood in a several ways. First, people constantly organise their memories to create life stories that can be shared with others, as well as to communicate, persuade, offer advice, build connection, elicit empathy, or maintain intimacy in relationships (Rasmussen & Habermas, 2011). The decision to retain particular personal information may thus be highly variable to the functional significance of such information in sustaining personal goals, desired self-images, attitudes, and beliefs (Wang & Conway, 2004). What makes an experience become part of an individual's autobiography is determined by whether the stories regarding the experience can be told to and accepted by other audiences in one's sociocultural environments (McLean, Pasupathi, & Pals, 2007). Conversely, the stories that are untold, or that have received little attention from their listeners, may be deemed as unimportant or socially undesirable, and they are thus less likely to be remembered (Pasupathi, 2001).

Second, the effect of socialisation on the construction of autobiographical memory is particularly evident in the early development of personal memory. The emergence of the autobiographical memory system is well recognised as typically occurring during the second and third years of life when children's basic language skills and sense of self begin to develop (Fivush, 2007; Howe & Courage, 1997). Indeed, the establishment of the cognitive-

self sets a founding framework for young children to organise their memories as personally meaningful (Courage & Howe, 2010). However, as young children are not yet capable of independently constructing coherent narratives of their past experiences, caregivers assist in the social process of conversations, and this significantly contributes to the construction of children's autobiographical memories (Beike, 2013; J. Ross et al., 2019). Through exchanging messages of 'my', 'your', and 'our' experiences in conversations about past experiences, children's memories become personalised and autobiographical (i.e., memories of something happened to 'me', rather than memories for something just happened) (Courage & Howe, 2010; Fivush & Haden, 2003; Howe, 2000). Given these points, it is important to recognise that the construction of autobiographical memory is not the result of a single developmental pathway.

2.3 Early Development of Autobiographical Memory

With research demonstrating that children can make their first self-referential memories as early as 18 months old (for a review, see Howe & Courage, 1993), substantial research has investigated the development of autobiographical memory in early childhood.

2.3.1 Developmental social-cultural model of autobiographical memory

One influential theory guiding the literature in this field is the social-cultural development theory of autobiographical memory by Nelson and Fivush (2004). In this theory, autobiographical memory is understood to emerge gradually across the preschool years in the context of developments in language, memory systems, narrative comprehension, memory talk with parents or others, a subjective sense of self, and conceptual understandings (i.e., temporal, psychological). In particular, language is proposed to be an essential sociocultural instrument vital to the development of autobiographical memory, as language is fundamental to creating narratives that can be expressed and shared with others (Salmon & Reese, 2015). The process of sharing memories is a learning process that enables individuals

to consciously consider their memory organisation and their current thoughts and perceptions of past experiences (Schank, 1990). In this way, alongside the development of language skills, young children gain the ability to discuss past experiences with others so that they become better at developing organised representations of past personal experiences.

From such a perspective, Nelson and Fivush (2004) have proposed that the manner in which autobiographical memory is encoded and retrieved in childhood is a consequence of co-construction between children and their significant others, such as parents (Wang & Fivush, 2005). Specifically, it is assumed that children's shared reminiscing of past experiences with their parents has a profound impact on how children remember those events (Schneider, 2015). Parent-child reminiscing functions not only as a way of eliciting children's memories about the past (Sales, Fivush, & Peterson, 2003). Indeed, during shared reminiscing, the conversational guide provided by parents teaches the child certain concepts, such as which types and aspects of events are considered memorable, how to organise events in a temporal sequence, how to evaluate behaviours and intentions, and how to make inferences about causality (Mullen & Yi, 1995). Children, in turn, learn the forms and functions of memory, ways in which to remember personal experiences, and methods for processing the information that they encounter in ways that are valued by others in their environment (Mullen & Yi, 1995; Sales et al., 2003; Schneider, 2015). Early longitudinal research has demonstrated that the socialisation of remembering is already observable in preschool years (Fivush and Hammon, 1990; as cited in Reese & Brown, 2000). Four-year-old children recall significantly more distinctive aspects (rather than routine aspects) of unique events when compared to 2-year-old children (Fivush, 1994; Reese & Brown, 2000). This supports the notion that children in preschool years are already socialised to understanding that distinctive information is more tellable than mundane information (Reese & Brown, 2000).

In brief, the social-cultural development model suggests that children's early autobiographical memories are co-constructed within the social interactions with their parents. However, it is important to highlight that those types of memories are inextricably formed and informed by both social and cultural frameworks (Fivush, Habermas, Waters, & Zaman, 2011).

2.3.1.1 The role of culture in child memory formation

Cognitive scientists and psychologists typically define culture as a shared system of behaviours, knowledge, beliefs, and expectations that is produced, disseminated, and reproduced among a network of interacting individuals (Grossmann & Na, 2014; Raval & Walker, 2019). These shared beliefs and behaviours provide resources for guiding individuals to achieve personal and collective goals and to facilitate the co-ordination of activities that are necessary for adaption to the environment and developmental challenges (Lehman, Chiu, & Schaller, 2004). Given this, cultural psychologists have posited that the understanding of any psychological process needs to include consideration of the particular cultural context in which psychological processes are embedded (Grossman & Na, 2014). Cultural contexts are often the manifestations of the meaning systems of a group of individuals' shared cognitions as well as behavioural and normative practices (Innis, 2014; Lehman et al., 2004). For example, it is well recognised that cultural beliefs about the self-concept and self-other relationships are particularly relevant in understanding psychological processes (Raval & Walker, 2019). These self-related cultural beliefs are often differentiated into two basic human needs: the need for autonomy and the need for relatedness (Schröder, Keller, Kärtner, et al., 2013). Cultural contexts differ in terms of the amount of emphasis individuals place on autonomy (i.e., *self* is mainly defined in relation to personal goals desires, needs, abilities, and personality traits) and relatedness (i.e., *self* is defined in relation to an individual's relationship with others) (Kärtner et al., 2007; Wang, 2016).

In autonomy-oriented cultural contexts (often featured in individualistic countries, such as the United States and Australia), individuality, autonomy, self-expression, and personal uniqueness are valued (Maki, Kawasaki, Demiray, & Janssen, 2015), whereas in relatedness-oriented cultural contexts (often featured in collectivistic countries, such as China and Japan), group harmony, conformity, and interpersonal relationships are emphasised (Maki et al., 2015). In the process of autobiographical memory construction, decisions are often made to determine whether a piece of memory information is self-relevant (Beike, 2013). These decisions are often a result of culturally defined values regarding whether a particular experience is considered to be personally relevant or merely life happening. Culture is thus central to the understanding of why we remember and what we want to remember (M. Ross & Wang, 2010). In addition, these two independent dimensions of the cultural model of self—namely autonomy and relatedness—are also seen as the essential frameworks for shaping parental ideas about what constitutes effective child rearing (Keller et al., 2006). Given this, theorists of social-cultural developmental theory have further proposed that narratives defined by culture provide the organising and evaluative framework to inform the ways in which individuals come to remember their past, and those narratives guide the parent-child social interactions (Fivush, 2011; Fivush et al., 2011). Specifically, the shared reminiscing that occurs between parent (especially mother) and child, and its influence on child autobiographical memory development, has been studied both within and between cultures (Boyer & Wertsch, 2009).

Researchers have demonstrated that mothers' culturally shaped beliefs influence their style in mother-child reminiscing, which in turn influences the development of children's autobiographical memories (e.g., Kulkofsky, Wang, & Koh, 2009; Wang & Fivush, 2005). For example, in autonomy-oriented cultural contexts, in which the individual self is highly valued, having and telling one's autobiography is highly valued and is seen as an ordinary

activity that children and adults are expected to engage in daily (Fivush, Haden, & Reese, 2006). Therefore, mothers from autonomy-oriented cultures are more likely to provide rich and embellished information about the event being discussed and to elaborate and augment children's responses. This in turn helps children to construct evaluative and coherent personal stories of the past that they can further utilise to build their unique identity (Boyer & Wertsch, 2009; Wang, 2006). In contrast, in relatedness-oriented cultural contexts, in which group identity and conformity are valued, mothers are less likely to use embellished information or follow up on children's responses (Wang & Fivush, 2005). Instead, mothers from relational cultures tend to frequently repeat questions to elicit more information about the event under discussion (Boyer & Wertsch, 2009; Kulkofsky et al., 2009; Wang & Fivush, 2005). As a result, children from autonomous cultural contexts tend to recall more elaborate and detailed autobiographical memories than children from relational cultural contexts, especially in cross-cultural comparisons of Western European versus East Asian children (Wang, 2016).

In essence, the social-cultural developmental model of autobiographical memory construes that children's autobiographical memories gradually emerge across the preschool years through a process of social interaction between parents and children. By participating in parent-guided conversations, children learn the skills to create coherent and connective narratives and to define the self and the social relations that are valued by their sociocultural environment (Fivush et al., 2006).

2.4 Maternal Reminiscing Styles and Child Memory Formation

Under the influence of the social-cultural development models, substantive research has explored how parent-child reminiscing (especially mother-child reminiscing) influences children's early autobiographical memory formation (see Fivush, 2011; Salmon & Reese, 2016, for reviews). There is now robust evidence suggesting that there are enduring

differences in the way in which mothers reminisce with their children about past experiences, and such differences lead to individual differences in children's autobiographical memory abilities (Reese, Meins, Fernyhough, & Centifanti, 2018). In particular, how mothers scaffold the conversation to support their children's memory recall during reminiscing has received the most attention. Research has demonstrated that maternal reminiscing styles vary along the dimension of elaborativeness (e.g., Farrant & Reese, 2000; Fivush & Fromhoff, 1988; Leyva, Reese, Grolnick, & Price, 2009; Reese, Haden, & Fivush, 1993). Highly elaborative mothers have been found to talk more frequently about the past, engage in long and detailed conversation about what occurred with their children, and encourage children to share the past experience with them (Wareham & Salmon, 2006). Moreover, highly elaborative mothers are likely to continue the conversation, even if their children are not able to contribute substantially (Nelson & Fivush, 2004). Thus, highly elaborative mothers provide sufficient memory information and encourage children's contribution so that by the end of the conversation, a rich, coherent account of the past has often been shared with their children (Fivush, 2011).

In contrast, low elaborative mothers do not talk about the past as frequently, and when they do, they tend to ask few and redundant questions (Boyer & Wertsch, 2009). In the instance of a low elaborative mother, even when her children recall some information, she often does not follow up and elaborate on the memory (Wang, 2007; Wareham & Salmon, 2006). Hence, there tends to be no development of a story or coherent narrative for children. Researchers have found that mothers who discuss past events in an elaborative way during reminiscing are more likely to have children with greater memory elaboration (i.e., the unique memory information about the event under discussion and that was not previously mentioned by the mothers) when compared to children of mothers who use repeated questioning about the event with little new information, both cross-sectionally and

longitudinally (for reviews, see Fivush, 2011; Fivush et al., 2006; Nelson & Fivush, 2004; Salmon & Reese, 2015).

Several researchers have also noted the importance of identifying other dimensions of maternal reminiscing that influence children's autobiographical memory development. For instance, just because a mother is elaborative during reminiscing does not ensure that she is supportive and open to the child's perspectives and encouraging of the child's recall and expression of feelings (Cleveland & Reese, 2005; Larkina & Bauer, 2010). Holding a positive and supportive parenting style has been well recognised to be associated with positive child outcomes in developmental research, including better cognitive development, academic achievement, social competence, and more adaptive emotional regulation skills (Cui et al., 2018; Poon, Zeman, Miller-Slough, Sanders, & Crespo, 2017). Accordingly, it is suggested that the quality of mothers' supportive reminiscing (e.g., the extent of autonomy and emotional support, enthusiasm for sharing memories, and the ability to respond to children's needs in appropriate manners) can influence their children's engagement in talking about the past (Cleveland & Reese, 2005; Larkina & Bauer, 2010; McDonnell et al., 2016; Wang & Fivush, 2005).

In support of this, Cleveland and Reese (2005) have found that children of mothers who adopted both highly elaborative and highly autonomy-supportive reminiscing styles have the greatest memory during reminiscing than children whose mothers were low on both dimensions. Furthermore, Larkina and Bauer (2010) have found that the quality of mothers' instruction during reminiscing and their respect for child autonomy (i.e., mothers validating the child's perspective and individuality) significantly predict children's memory elaboration. Similarly, Valentino et al. (2018) have found that mothers' supportive guidance during reminiscing (indexed by mothers' focus on tasks, acceptance and tolerance, involvement and reciprocity, the resolution of negative feelings, structuring, story adequacy, and coherence)

significantly predict child memory elaboration. Overall, these studies have provided preliminary evidence that mother's supportive reminiscing is another important dimension of a maternal reminiscing style that is associated with children's early autobiographical memory development.

Notably, the majority of research regarding reminiscing and child autobiographical memory literature has been mainly conducted in Western industrialised societies (e.g., the United States); less research has investigated the benefit of maternal reminiscing on children's autobiographical memory development in non-Western industrialised society.

2.4.1 Maternal reminiscing and child memory across cultures

As has been noted in previous subsections, two decades of cross-cultural research has demonstrated profound cultural differences in maternal reminiscing styles. In general, research has found that mothers from autonomy-oriented cultural contexts are more elaborative and evaluative during reminiscing than mothers from relational cultural contexts (Mullen & Yi, 1995; Wang, 2007). Similarly, children from autonomous cultures have also been found to recall more memory information during reminiscing than children from relational cultural contexts. However, it is important to realise that cultural differences in the means of memory recall do not imply significant differences in the positive associations between maternal reminiscing styles and the development of child autobiographical memory.

Indeed, autobiographical memory is considered to be a universal developmental pathway to an individual's self-construction and shared reminiscing functions to assist children's development of personal memory (Chasiotis, Bender, Kiessling, & Hofer, 2010). However, cultural norms (whether a detailed and elaborative autobiographical memory is valued and emphasised in a particular culture) can reinforce mothers' preferences in remembering and memory-sharing behaviours (Bluck, 2015). This, in turn, can influence children's likelihood of becoming more involved in talking about the past (Larkina & Bauer,

2010). Theorists have suggested that depending on the cultural contexts, mothers may either focus on the child as the main character or stress the child's social responsibilities during the shared reminiscing process (Chasiotis et al., 2010). For example, in some relatedness-oriented cultural contexts (e.g., China), mothers are more likely to use shared reminiscing as an instrument for teaching and moralising so that their children can develop a sense of self that is focused on common narratives and interrelatedness (Wang & Conway, 2004). In those cultures, mothers' elaborative reminiscing may consequently be less important for children's memory elaboration in the reminiscing of personal past events. The strength of the relationship between maternal reminiscing and child memory elaboration may thus vary depending on the cultural context.

In support of this, Wang (2006) found that the effect of maternal elaboration on child memory was only significant for European-American mother-child dyads, but not Chinese dyads. Nonetheless, in another study conducted by Wang (2007), maternal elaboration was positively associated with children's memory elaboration, both concurrently and longitudinally, regardless of cultural contexts. Similarly, a study comparing reminiscing in an autonomous context (i.e., Berlin) and a relational context (i.e., Delhi) has found that mothers' elaboration significantly predicted children's memory elaboration in both contexts, with similarly large effect sizes (Schröder, Kärtner, Keller, & Chaudhary, 2012). Therefore, inconsistencies still seem to exist in the literature regarding whether the relationships between maternal elaborative reminiscing and young children's memory elaboration are culturally similar (e.g., Schröder, Keller, Kärtner, et al., 2013; Schröder, Keller, & Kleis, 2013). Furthermore, even though there is accumulating research examining maternal reminiscing and child elaboration during shared recall in cross-cultural contexts, no studies have yet investigated the associations between a maternal supportive reminiscing style (i.e., recognising, supporting, and validating children's contributions and perspectives) and child

memory elaboration in a non-Western cultural context and outside the United States. Research is therefore still needed to understand the role of maternal reminiscing styles in children's early memory development in different cultures.

Overall, there are now rich theoretical perspectives and growing empirical evidence demonstrating the influences of maternal reminiscing styles on young children's autobiographical memory development. Nonetheless, existing evidence mainly focuses on the examination of children's ability to provide new, unique memory information during shared reminiscing (i.e., child memory elaboration) (Haden, 1998). In prior literature, one point that is often overlooked is that children's development of autobiographical memory is multifaceted (Valentino et al., 2018). Many aspects of child autobiographical memory still remain under-researched.

2.5 Early Development of Child Memory Specificity

Child memory specificity is one aspect of child autobiographical memory development that has received growing attention in recent years. Autobiographical memory specificity is a concept that has been widely investigated in adult literature. Specific autobiographical memories are memories of events that occurred on a particular day at a specific place and time (e.g., '*Going over to Sam's place to play last Saturday*'), whereas general autobiographical memories are memories of events that either took place repeatedly or have occurred over an extended period of time (e.g., '*Going on playdates*') (Valentino, Bridgett, Hayden, & Nuttall, 2012; Woody, Burkhouse, & Gibb, 2015). Difficulties in retrieving specific autobiographical memories, also known as over-general memories (OGMs), have been theoretically (e.g., CaR-FA-X model; Williams, 2006) and empirically demonstrated to be unique predictors of the emergence and persistence of emotional disorders such as depression (Sumner, Griffith, & Mineka, 2010; Vreeswijk & Wilde, 2004; Williams et al., 2007). In addition, such difficulties in retrieving specific memories have been

found to be associated with impaired problem-solving, unhealthy repetitive thinking, and trauma-related experiences (D. W. Brown et al., 2007; De Decker, Hermans, Raes, & Eelen, 2003; Maurex, Nilsonne, Andersson, Åsberg, & Öhman, 2010; Raes et al., 2005; Stange, Hamlat, Hamilton, Abramson, & Alloy, 2013). With accumulating evidence demonstrating the associations between mental health issues and difficulties in retrieving specific memories in adolescent and adult studies, there is a growing interest in the developmental processes that contribute to the emergence of autobiographical memory specificity in children (Bosmans, Dujardin, Raes, & Braet, 2013; Vrielynck, Deplus, & Philippot, 2007; Woody et al., 2015).

2.5.1 Differentiating child memory specificity and memory elaboration

Child memory specificity and memory elaboration may appear to be similar concepts. However, in the child autobiographical memory literature, memory specificity often refers to children's ability to retrieve specific memories of a past event (i.e., how specific their memory responses were). Whereas, memory elaboration often refers to children's ability to recall new and relevant memory information about a past event (i.e., how much memory information and details they could retrieve) (Nuttall, Valentino, Comas, McNeill, & Stey, 2014). Hence, to capture as many memory information as possible, child memory elaboration is typically assessed in the context of adult-child reminiscing, with a scaffolded conversational structure (Fivush, 2011). Children who provide a high level of details during reminiscing may be seen as displaying high specificity in memory recall (Roberts, Yanes-Lukin, & Kyung, 2018). Nonetheless, a specific memory can contain a range of details from very little information, such as '*When I first got bitten by my dog*', to plentiful details, such as '*When it was my birthday, I had fun, and I got together with my friend, and my friends had fun together. And the most important thing is that we ate cake*'. A memory can hence be considered to be specific if it is self-referent and concerns a single past event that occurred at a specific time (Nuttall et al., 2014). In order to yield specific memory responses, researchers

often use specific questions with emotional cue word prompts (e.g., '*Can you think of a time that you felt happy?*') to assess child memory specificity (McDonnell et al., 2016; Valentino, 2011). Child memory specificity and memory elaboration thus differ in that memory specificity reflects a child's ability to generate and retrieve specific memories of personal events (often in independent recall), whereas memory elaboration refers to the amount of new and event-relevant information provided by the child (often in shared recall) (Valentino et al., 2014).

2.5.2 Developmental psychopathology model of memory specificity

To understand the normative pathways of how memory specificity or over-generality evolves with age, Valentino (2011) has proposed a developmental psychopathology model of OGMs. Valentino has suggested that there are certain risk and protective factors operating at multiple levels of an ecology—the *microsystem* (e.g., mother-child reminiscing), *exosystem* (e.g., community), and macrosystem (e.g., culture)—interacting with an individual's *ontogenic development* (e.g., self-system, executive function) contributing to the typical and atypical development of memory specificity. Furthermore, Valentino suggested that factors operating at the level of ecology that are more proximal to the individual (i.e., the *microsystem*) have the most the direct influence on child memory specificity development, relative to the factors at more distal ecological levels (i.e., the *macrosystem*). Integrating the social-cultural developmental theory and existing research on the influence of maternal reminiscing on children's memory elaboration, Valentino has proposed that mother-child reminiscing may also play a critical role in shaping child memory specificity.

Indeed, a few earlier studies have provided preliminary evidence for the unique role of maternal reminiscing styles in predicting children's independent recall of past events with an experimenter (i.e., Larkina & Bauer, 2010; Reese & Fivush, 2008). These studies have specifically found that mothers who were more supportive (i.e., recognising and validating

children's contributions, perspectives, and individuality) during joint reminiscing, had children who recalled more memories during independent reminiscing. With the development of the pre-schoolers' version of the Autobiographical Memory Test (i.e., the most commonly used measure for assessing memory specificity in adult literature; Williams & Broadbent, 1986), researchers have commenced examining the associations between maternal reminiscing and child memory specificity in the preschool period (Nuttall et al., 2014). By examining a sample of financially disadvantaged children aged between 3.5 and 6 years old, researchers have found that mothers' supportive guidance during reminiscing was directly associated with children's memory specificity, whereas mothers' elaborative reminiscing was not (e.g., McDonnell et al., 2016; Valentino et al., 2018; Valentino et al., 2014). Researchers have hence proposed that the extent to which details of memories are rehearsed and elaborated (elaborative reminiscing) may not be related to children' ability to retrieve specific memories (Valentino et al., 2014). Instead, children's memory specificity is developed through mothers' sensitive and supportive guidance to facilitate children in making sense of past experiences, and through the promotion of children's intrinsic motivation to engage in the memory conversation (Larkina & Bauer, 2010; Valentino et al., 2014).

Nonetheless, in a recent study using maltreated preschool-aged children, neither maternal elaborative reminiscing nor its affective quality significantly predicted child memory specificity (Lawson, Valentino, Speidel, McDonnell, & Cummings, 2018). Rather, the researchers have found a significant interaction effect of maternal elaborative and affective reminiscing in promoting children's memory specificity. This result provides support to past similar findings that have suggested that the association between maternal elaborative reminiscing and child memory abilities may depend on the emotional elements or affective quality of maternal reminiscing (Cleveland & Reese, 2005; Larkina & Bauer, 2010; McDonnell et al., 2016). It is thus unclear how maternal reminiscing influences children's

development of autobiographical memory specificity. It is possible that both maternal elaborative and affective-supportive reminiscing serve to facilitate young children's abilities to retrieve specific autobiographical memories. However, the relationship between maternal elaborative reminiscing style and child memory specificity would only be significant when mothers reminisce in an emotionally coherent, sensitive, and supportive manner (Lawson et al., 2018). Given that this area is still relatively new, and with the empirical evidence only available in at-risk children from the United States (Lawson et al., 2018; McDonnell et al., 2016; Valentino et al., 2018; Valentino et al., 2014), more research is needed to examine whether these findings can be replicated in a broader population with more diverse cultural backgrounds.

2.5.2.1 How culture influences the retrieval of memory specificity

Both the social-cultural developmental account (Nelson & Fivush, 2004) and developmental psychopathology model (Valentino, 2011) hold the fundamental assumption that the construction of children's autobiographical memory is scaffolded by multiple mechanisms. As has been discussed above, culture-specific socialisation can significantly influence maternal reminiscing styles and dyads' memory sharing behaviours when discussing personal past events. Likewise, the developmental psychopathology model proposes that culture plays a role in shaping children's autobiographical memory specificity (Valentino, 2011). Cultural differences in self-views can influence an individual's processing, encoding, and retention of memories, and in turn, they can manifest in differences in memory specificity (Wang, 2016). Indeed, an individual's self is developed to reflect both personal uniqueness and the commonalities he or she shares with others. Nevertheless, the importance of these features varies across cultures, depending on their emphasis on uniqueness and commonalities (Wang & Ross, 2005). For example, theorists have proposed that in autonomous cultural contexts, people tend to perceive themselves as unique and distinct from

others and their social contexts (Wang, 2016). As a result, individuals from autonomous cultures may be more sensitive and responsive to self-focused event information, and they are thus more likely to process and remember distinct information that can be further utilised to differentiate themselves from others (e.g., '*The day I got promoted*') (Wang, 2008). In contrast, in relational cultural contexts, people are more likely to perceive themselves as inextricably connected to others within a web of relationships and social hierarchy (Wang & Ross, 2005). Individuals from relational cultures may consequently be motivated to pay more attention to information about significant others with social interactions and group activities (e.g., '*My family gather together every weekend*') (Wang, 2016).

Research in the last two decades has constantly found that European-American (an autonomous context) children and adults report greater episodic memory specificity than East-Asian (a relational context) children and adults when recalling autobiographical events (for a review, see Wang, 2009; Wang, Capous, Koh, & Hou, 2014). It seems then that cultural differences during early socialisation are already being reflected in children's memories about themselves (Wang, 2004). Yet, there is a lack of empirical studies investigating the possible mechanisms (in the context of shared reminiscing) underlying the development of child autobiographical memory specificity in cross-cultural contexts. By examining maternal reminiscing and the independent memory recall of 3-year-old children from China and America, Wang (2006) has found that mothers' low-elaborative reminiscing style partly explains the lower episodic specificity in Chinese children than in European-American children. It may be worth noting that this study has examined children's specific memories in shared reminiscing, rather than the commonly used cue-word paradigm, to assess autobiographical memory specificity. It is hence unclear whether the recent findings that maternal supportive reminiscing style influences a child's ability to independently retrieve specific memories could also be observed in a non-American context. In addition,

given that research has demonstrated that young children at 3 years of age have been found to adopt their mothers' reminiscing style when recalling past experiences (Wang, 2016), it may be possible that children's memory specificity in early childhood also mirrors that of their mothers. Therefore, despite considerable research having demonstrated that cultural norms play a reduced role in memory specificity in non-autonomous cultural contexts (J. Ross et al., 2019), especially in East-Asian culture, empirical work exploring when and how these cultural differences emerge still remains limited.

2.6 Consequences of Early Autobiographical Memory Development

On the whole, as presented in the preceding sections, research into mother-child reminiscing and the formation of young children's autobiographical memory has progressed remarkably in the last few decades. However, there seems to be a lack of empirical evidence demonstrating how young children's developing autobiographical memories are indeed related to their developmental outcomes—an important aspect to understand when considering child development.

From the literature discussed above, we know that autobiographical memory is more than a factual description of an individual's personal memories of past experiences; it is infused with an individual's thoughts, emotions, feelings, beliefs, and sense of self (Bauer, 2007). An individual's autobiographical memory is hence often accompanied by various features, such as the level of memory specificity, the amount of detail it entails, and the emotional intensity it carries (Vanderveren, Bijttebier, & Hermans, 2019). These varying features have been found to link differently to psychological wellbeing and psychopathology in adolescent and adult literature (Vanderveren et al., 2019). The associations between reduced autobiographical memory specificity and vulnerabilities to some behavioural problems and emotional disorders have been particularly well established (for reviews, see Hitchcock, Werner-Seidler, Blackwell, & Dalgleish, 2017; Williams et al., 2007). However,

compared to a sizable amount of literature examining adult and adolescent autobiographical memory to those individuals' psychological wellbeing, less is known about the relation between young children's memory abilities (e.g., memory elaboration and specificity) and psychological or socioemotional wellbeing (Laible, Murphy, & Augustine, 2013b; Song & Wang, 2013; Valentino et al., 2018; Wang et al., 2018).

In particular, a few researchers have found that child memory elaboration (assessed during mother-child reminiscing) is significantly associated with better emotional and moral understanding, and higher social competency (e.g., Laible et al., 2013b; Song & Wang, 2013). It is worth noting, these studies emphasised that it is children's memory contribution during shared discussion of past emotional events with their mothers which contributes to children's socioemotional functioning. Socialisation theorists have long proposed mother-child discussion of emotions as a powerful context promoting children's socioemotional development (Eisenberg, Cumberland, & Spinrad, 1998; Johnson, Hawes, Eisenberg, Kohlhoff, & Dudeney, 2017). However, researchers have only recently begun to empirically examine the mother-child discussion of past emotional events (i.e., emotional reminiscing) and its influence on child development (for reviews, see Fivush et al., 2006; Salmon & Reese, 2016; Wareham & Salmon, 2006). One of the main developmental tasks children face during this period is making sense of what happens to them (Messina & Zavattini, 2014). Being able to differentiate between experiences that generate wellbeing and those experiences that cause distress may be particularly essential for children's socioemotional development (Messina & Zavattini, 2014). Unlike mother-child discussions about emotions that occur during an event, mother-child discussions of past emotional events have been proposed to be especially beneficial in creating an optimal environment for children to reflect and re-evaluate their past experiences (Van Bergen, Salmon, & Dadds, 2018). In this case, it is likely that children's memory contribution during reminiscing provides a rich source of information to guide

mothers when managing children's inappropriate behaviours and encouraging prosocial behaviours (Grusec & Davidov, 2014; Laible et al., 2013b). Meanwhile, by engaging in reminiscing activities about past emotional events, and with proper support from mothers, children are gaining knowledge concerning important social skills, such as clarification of emotional causes and exploration of possible resolutions, which could be applied to similar situations in the future (Laible, 2011).

Moreover, a few recent studies have also investigated the relation between children's memory specificity and their socioemotional functioning. Similarly to the findings obtained in the adult literature, Valentino et al. (2018) have found that preschool-aged children's memory specificity (but not memory elaboration) is significantly and negatively associated with those children's problem behaviours (i.e., both internalising and externalising problems). This study has provided support for the notion that autobiographical memory specificity is a unique marker for negative psychological functioning (Hitchcock et al., 2017; Williams et al., 2007). Children entering preschool years are entering into a world with complex social networks and a variety of new experiences (Shatz, 1994). In such demanding contexts with increasing challenges in preschool settings and social situations, children's cognitive resources are often overloaded with new information (Shatz, 1994). Their memory specificity (assessed in the emotional cue words paradigm) may signify their ability to identify and appropriately respond to emotional cues, which are important elements in emotional knowledge of themselves, and to successfully interact with others (Campbell et al., 2016). In addition, such an ability to locate events and experiences in time may also indicate children's ability to comprehend the temporal relation between past events, inhibit irrelevant recall, control attention, and utilise cognitive processing resources (Bauer, 2007; Shatz, 1994).

However, even though preliminary evidence suggests that child memory specificity is negatively associated with children's problem behaviours, a recent study (Wang et al., 2018) has found no significant positive relationship between children's memory specificity of autobiographical events and child prosocial and desirable behaviours. This result might not be surprising given that past research has demonstrated that the presence of behavioural problems does not preclude the presence of social and emotional competencies in young children (Halle & Darling-Churchill, 2016). It is possible that akin to adult autobiographical memories, different features of child autobiographical memory may be related to different aspects of their socioemotional functioning. As this evidence is still preliminary, more research is required to explore the relationships between children's autobiographical memories and their socioemotional functioning. Another key point that is worth noting from Wang et al.'s (2018) study is that although no significant relationship was observed between memory specificity and desirable behaviours in European-American pre-schoolers, a significant negative relationship was found in Chinese immigrant children. This finding once again illustrates the importance of taking culture into consideration when examining children's autobiographical memories. As discussed in the preceding sections, detailed remembering of one's personal past is not necessarily the norm across cultures and thus may not always be beneficial to individuals' psychological functioning (M. Ross & Wang, 2010; Wang et al., 2018). Furthermore, the construction of children's autobiographical memory is understood to be a result of ongoing social collaboration (i.e., through reminiscing) between children and their mothers (Wang & Fivush, 2005). It is likely that during the preschool period, children have been socialised to consider these cultural values when recalling personal past events (Wang, 2016).

In general, there is some preliminary evidence demonstrating the consequences of children's early autobiographical memory on different aspects of their socioemotional

functioning. However, it is important to realise that these empirical investigations have mainly focused on Western industrialised societies and were conducted with participants of European descent (Laible et al., 2013b; Song & Wang, 2013; Valentino et al., 2018; Wang et al., 2018). More research is thus needed to examine whether these associations between child autobiographical memories and socioemotional functioning can be replicated in cultural contexts in the non-Western industrialised societies.

CHAPTER 3: Thesis Conceptualisation

Early childhood is one of the most important developmental periods for shaping autobiographical memory (Dunn et al., 2016; Goodman et al., 2010). Rich theoretical accounts propose that parent-child reminiscing (especially mother-child reminiscing) is a fundamental social-cultural tool that is essential to the development of autobiographical memory (Nelson & Fivush, 2004; Valentino, 2011). Over the last few decades, substantial research has supported this idea, suggesting that there are enduring individual differences in the ways in which mothers reminisce with their children, which lead to individual differences in children's autobiographical memory (Reese et al., 2018). In particular, researchers suggest that mothers with a highly elaborative reminiscing style tend to have children with greater memory elaboration during shared reminiscing. However, empirical support for the positive association between maternal elaborative reminiscing and child memory elaboration in cultural contexts outside autonomy-oriented industrialised societies is still mixed (e.g., Schröder, Keller, Kärtner, et al., 2013; Schröder, Keller, & Kleis, 2013).

In addition, compared to the abundant research examining maternal elaborative reminiscing style and child memory elaboration, little research has investigated other aspects of maternal reminiscing styles (e.g., supportive reminiscing) or other facets of child autobiographical memory (e.g., memory specificity). For example, there is accumulating evidence indicating that maternal supportive reminiscing (i.e., recognising, supporting, and validating children's contributions and perspectives) is equally important in predicting children's memory elaboration in both shared and independent reminiscing (Larkina & Bauer, 2010; McDonnell et al., 2016). However, research support for this premise comes predominately from research conducted in autonomy-oriented cultural contexts. It is thus still unclear whether these relationships can be replicated in other cultural contexts. Moreover, with increasing evidence documenting the importance of autobiographical memory specificity to psychological wellbeing in adolescent and adult literature (Hitchcock et al.,

2014; Williams et al., 2007), awareness regarding the need to understand the development of memory specificity in early childhood is growing. Preliminary evidence demonstrates the critical role of maternal reminiscing styles in memory specificity development. However, this area is still in its infancy (Larkina & Bauer, 2010; Lawson et al., 2018; McDonnell et al., 2016) and has thus far focused on at-risk children. Therefore, a research need exists for studies investigating whether maternal reminiscing styles predicts child memory specificity in a broader community sample and in other cultural contexts.

Furthermore, though research into child autobiographical memory has progressed remarkably in recent years, one key point that is often overlooked is how child memory is specifically related to children's socioemotional functioning. Initial evidence suggests that children's specific and detailed autobiographical memories are associated with certain aspects of child socioemotional functioning when investigated in a Western industrialised society (i.e., United States) (Laible et al., 2013b; Song & Wang, 2013; Valentino et al., 2018; Wang et al., 2018). Given that detailed remembering of one's personal past is not always the norm in every cultural context, and since parents hold different socialisation goals in rearing competent children (M. Ross & Wang, 2010), it is important to take culture into consideration when examining child memory and socioemotional development.

Therefore, the primary aim of the research presented in this thesis is to extend current understanding of the relationships between maternal reminiscing styles, children's autobiographical memory, and children's socioemotional functioning. In terms of children's autobiographical memory, the thesis aims to examine two features of child autobiographical memory: memory specificity and memory elaboration. In addition, given the apparent importance of cultural influence on maternal reminiscing styles and child autobiographical memory development, the current research also aims to investigate these variables and the

relationships between them in cross-cultural contexts, namely China (a relatedness-oriented cultural context) and Australia (an autonomy-oriented cultural context).

Four studies were conducted to address these aims. First, as discussed above, while impressive theoretical accounts and substantive research exists examining the association between maternal elaborative reminiscing styles and child memory elaboration, a systematic review and meta-analysis has not been conducted to date. By conducting a systematic review of past literature, Study 1 (Paper 1) first explored how maternal elaborative reminiscing and child memory elaboration have been investigated in previous studies. Then, using meta-analytic techniques, Study 1 examined whether a consistent relationship between maternal elaborative reminiscing and child memory elaboration could be established and how social-cultural factors (e.g., cultural context) might influence this relationship.

Second, given that limited research has examined mother-child reminiscing and child memory specificity in typically developing preschool children, Study 2 was a pilot study that investigated the relationships between maternal reminiscing styles and child memory specificity in an Australian community sample (Paper 2). In addition, based on the notion that children as young as 3 years old have already adopted their mothers' reminiscing style when recalling past experiences, Study 2 explored whether children's memory specificity in early childhood is associated with maternal memory specificity.

Finally, to address our primary aims, two cross-cultural studies were conducted to investigate the relationships between maternal reminiscing of past emotional experiences, child autobiographical memory, and child socioemotional functioning. Study 3 (Paper 3) specifically examined the cultural variations in maternal reminiscing styles and mother-child autobiographical memory features. Based on the theoretical conceptualisation outlined in and the findings of Study 2, Study 3 also explored whether there were cultural differences in the relationships between maternal reminiscing styles and mother-child memory features.

Thereafter, Study 4 (Paper 4) examined the way in which maternal support during emotional reminiscing and child autobiographical memory are related to different aspects of child socioemotional functioning (i.e., prosocial and disruptive behaviours).

CHAPTER 4: Study 1

Maternal Reminiscing and Child Autobiographical Memory Elaboration:

A Meta-Analytic Review

(Paper 1)

4.1 Declaration for Chapter 4

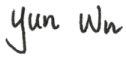
Declaration of the Candidate: In the case of Chapter Four, the nature and extent of my contribution to the work was the following:

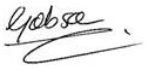
Nature of Contribution	Extent of Contribution
Conceptualisation, literature search, data extraction, coding, analysis, and manuscript write-up.	80%

The following co-authors contributed to the work:

Name	Nature of Contribution
Laura Jobson	*Discussion of ideas expressed in the manuscript, data extraction, coding, and critical review of manuscript.*

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate and co-authors' contributions to this work.

Candidate's Signature: 

Main Supervisor's Signature: 

Original article

Maternal Reminiscing and Child Autobiographical Memory Elaboration: A Meta-Analytic Review

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This chapter constitutes a manuscript accepted for publication in *Developmental Psychology* and is formatted in accordance with requirements set by the journal, which included a structured abstract. References have been changed to APA citation format to be consistent with the remainder of the thesis.

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4.2 Abstract

Significant research has investigated the relationship between mother-child reminiscing and children's autobiographical memory development. It has been suggested that mothers who adopt a high elaborative reminiscing style tend to have children who provide greater memory elaboration during joint reminiscing, yet the empirical findings are somewhat mixed. To address this issue, a systematic review and meta-analyses were conducted to investigate the relationship between maternal elaborative reminiscing and child autobiographical memory elaboration. Thirty-four cross-sectional and longitudinal studies from peer-reviewed journals and published dissertations were included in the review. Of those, 31 studies had available data for meta-analytic analyses of the maternal reminiscing variables identified in the review. Findings from this study provided strong evidence indicating that high elaborative maternal reminiscing was associated with children's ability to provide greater detailed personal memory, both concurrently and longitudinally. Among maternal elaborative reminiscing elements identified, mothers' open-ended elaboration and positive evaluation were found to be most related to child memory elaboration. More research is needed to identify the effects of sociocultural contexts on the relationship between maternal elaborative reminiscing and child memory elaboration.

Keywords: mother-child reminiscing, autobiographical memory, elaborative reminiscing, memory elaboration, sociocultural influence

4.3 Introduction

Autobiographical memory is the recollection of personally experienced and relevant events from one's lifetime (Lewis, 1999). It is fundamental in understanding personal experiences, defining identity, providing guidance and candidate solutions to problem-solving, establishing and maintaining interpersonal relationships, and providing support for emotion regulation (Bluck, Alea, Habermas, & Rubin, 2005; Wang & Conway, 2004). Given the importance of autobiographical memory to these central psychological phenomena, there is accumulating research exploring its formation. The social-cultural developmental theory of autobiographical memory (Nelson & Fivush, 2004) has been particularly influential in guiding this literature. It posits that an individual's autobiographical memory gradually emerges across the preschool years through a process of social interaction between adults and children. In particular, the reminiscing about past events between children and their primary caregivers (often mothers) is considered to have a profound influence on the development of autobiographical memory. Thus, researchers have focused on investigating the relationship between mother-child reminiscing and children's ability to recall detailed personal memories (i.e., child memory elaboration) in joint reminiscing. Despite the existence of impressive theoretical accounts and several decades of research investigating the relationship between maternal reminiscing and child memory elaboration, a quantitative synthesis and meta-analysis of this literature have not been conducted. The aim of the current study, therefore, was to conduct the first systematic review and meta-analyses examining the relationships between maternal reminiscing and child autobiographical memory elaboration during joint past event discussion.

Accumulating cross-sectional and longitudinal research indicates that mother-child reminiscing has a significant impact on children's autobiographical memory development (see Fivush, 2011; Fivush, Haden, & Reese, 2006; Nelson & Fivush, 2004; Salmon & Reese,

2015, for qualitative reviews). Over the past two decades, research has demonstrated that there are substantial individual differences in how mothers reminisce about past experiences with their pre-schoolers (Fivush, 2011; Salmon & Reese, 2015). In particular, maternal elaborative reminiscing (i.e., how mothers guide and structure their conversations with their children) has received considerable focus (Coppola, Ponzetti, & Vaughn, 2014; Reese, Haden, & Fivush, 1993). There is a general consensus that *elaborativeness* (i.e., how elaborate mothers are when constructing a shared recollection of past event with their children) is a critical dimension along which mothers' reminiscing style varies (Fivush, 2007; Nelson & Fivush, 2004).

Mothers who are elaborative during reminiscing often demonstrate characteristics of positive engagement in detailed discussion with their children about the past, inclusive of considerable description and evaluation (Fivush, 2011). More specifically, mothers who adopt a high-elaborative reminiscing style tend to use open-ended questions that encourage their children to provide further details, positive evaluations that allow children to understand that contributions to the discussions are valued, and provide children with specific details about the event regardless of children's contribution (Fivush, 2011; Valentino et al., 2014). In particular, mothers' use of open-ended questions is suggested to be an especially influential reminiscing element on children's memory (Wareham & Salmon, 2006). On the contrary, mothers who adopt a low-elaborative style tend to use close-ended questions (often designed to elicit a particular answer), engage in repetitions of information or their own questions, and provide few additional details (Wareham & Salmon, 2006). Importantly, research indicates that mothers who engage in a high-elaborative style tend to have children who provide more detailed and coherent narratives about their personal experiences during shared reminiscing (e.g., Cleveland & Reese, 2005; Leyva, Reese, Grolnick, & Price, 2009; Reese, 2008; Reese et al., 1993).

Nevertheless, some studies have found that maternal elaborativeness was not related to child memory elaboration (e.g., Fivush & Vasudeva, 2002; Schröder, Keller, & Kleis, 2013a; Schröder et al., 2011). One possible explanation for this inconsistency in the literature is that researchers have employed differing conceptualizations of mothers' elaborativeness. Even early on, Fivush and colleagues (2006) noted that elaborative reminiscing style had been conceptualized in various ways across studies. They highlighted the importance of understanding that an elaborative reminiscing style is comprised of many elements, with maternal elaboration and evaluation being two critical aspects. But as yet there still seems to be no consistent conceptualization of what constitutes an elaborative reminiscing style. While reminiscing variables such as elaboration, evaluation, and repetition are generally considered as the primary elements to investigate when considering an elaborative reminiscing style, researchers have employed a variety of calculation methods when examining mothers' elaborativeness. In particular, sheer total elaboration (often examined in terms of mothers' use of questions and statements that contain new memory information) has been the most commonly used method to indicate maternal elaborativeness (e.g., Farrant & Reese, 2000; Schröder, Kärtner, Keller, & Chaudhary, 2012). Additionally, researchers have also used calculation methods, such as elaborative-repetition ratio (i.e., the number of maternal utterances in elaboration relative to repetition), classification analyses and the creation of composite/difference scores, as overall indicators for elaborativeness (e.g., Bauer & Larkina, 2014; Haden, 1998; Reese & Fivush, 2008; Schröder et al., 2013a). Thus, it is unclear whether these differing calculation methods systematically influence the strength of the relationship between maternal overall elaborative reminiscing style and child memory elaboration.

In general, mothers' elaborative reminiscing style has been found to be consistent across time (Reese et al., 1993) and with different children within families (Haden, 1998).

However, maternal reminiscing style seems to be responsive to the broader societal and cultural contexts, as a primary child-rearing goal of parents is to help their children build competence in their particular sociocultural environments (Kärtner et al., 2007; Salmon & Reese, 2015). For instance, reminiscing is generally valued and practised more by women than men in most societies (Zaman & Fivush, 2013). With the influence of social norms and expectations, girls are likely to be socialised through maternal reminiscing to have more elaborative narratives, as this conforms to societal expectations of female roles and behaviours (Fivush & Zaman, 2014; Grysman & Hudson, 2013). Hence, girls may be more dependent than boys on mother-child talk about the past, as such a mechanism facilitates an expression of feelings and experiences in personal narratives (Grysman, Merrill, & Fivush, 2017). In support of this, research has found that the significant relationship between mothers' high-elaborative reminiscing and children's memory elaboration only held for mother-daughter dyads, but not mother-son dyads (e.g., Fivush & Vasudeva, 2002).

Furthermore, mothers tend to differ in their level of elaboration during reminiscing as a function of culture (Schröder et al., 2013b; Schröder et al., 2013a; Wang, 2007). Mothers from autonomy-oriented cultures (e.g., individualistic) tend to be more elaborative and more likely to encourage their children to actively participate in the creation of their own life story than mothers from relatedness-oriented cultures (e.g., collectivistic) (Mullen & Yi, 1995; Wang, 2007; Wang & Fivush, 2005). It is suggested that such differences reflect the different cultural emphases and value on the detailed remembering of one's personal past (Wang, Hou, Koh, Song, & Yang, 2018). For example, in contemporary autonomous cultures (e.g., United States), child-rearing practices have become increasingly child-centred, with great emphasis on freedom of expression and intense focus on self (Nelson, 2003). Thus, the cultural norms require individuals, even from the preschool years, to have a personal story which emphasizes one's unique individuality (Nelson, 2003). With this in mind, in autonomous

cultures, mothers tend to use shared reminiscing as a mechanism to ensure their children successfully develop the ability to provide elaborative personal memories.

However, detailed and elaborate autobiographical memory is not necessarily valued and emphasized in all cultures. In relational cultures (e.g., China), which emphasize and encourage common values and group identification, the cultural norms tend to downplay personal uniqueness and self-focus (Wang et al., 2018). In this case, mothers in relational cultures tend to use shared reminiscing as an instrument for teaching and moralising to ensure their children develop a sense of self that is focused on interrelatedness and common narratives (Wang & Conway, 2004). These stylistic cultural differences are proposed to influence the relationship between maternal reminiscing and child memory elaboration (Wang, 2006). It has been suggested that in relational cultures maternal reminiscing may be less important for child elaboration, with other factors contributing to child memory elaboration (Schröder et al., 2012). In support of this, researchers have found that there was a significant interactive effect of culture and maternal reminiscing on child memory elaboration during shared reminiscing. For example, Wang (2006) found that the effect of maternal elaboration on child memory elaboration was only significant for European American mother-child dyads ($\beta = .42$, $p < .001$), but not for Chinese dyads ($\beta = .14$, $p = .11$). Furthermore, Schröder and colleagues (2013b) also found that the variance explained by maternal reminiscing in child memory elaboration was highest in the autonomous–relational cultural contexts (71%), intermediate in the autonomous cultural contexts (58%), and lowest in the relational cultural contexts (38%). Therefore, the relationship between maternal reminiscing and child memory elaboration of personal events is likely to be stronger in autonomous cultures than in relational cultures.

Research in this area has predominately focused on middle-class families (Fivush, 2011). Thus, less is known about the relationship between maternal reminiscing and child

memory elaboration in dyads from working-class families and low-income families. It is well-established that family socioeconomic status (SES) is a powerful predictor of many aspects of child development (Hoff, 2003). The significant effect of financial disadvantage on children's cognitive and socioemotional development has been demonstrated in previous studies (Alvarado, 2016; Salmon & Reese, 2016), especially on delayed language abilities (e.g., Engel, Santos, & Gathercole, 2008). Although language skills do not determine one's autobiographical memory skills, language provides a narrative organisation that is vital for children to understand and share their past experiences with others (Fivush, 2011). Additionally, low SES status is often related to increased life stressors within families, which may increase parents' psychological distress and in turn be associated with less sensitive parenting practice (Cassells & Evans, 2017). Thus, it may be reasonable to expect that the relationship between maternal reminiscing and child memory elaboration differs between mother-child dyads from middle-class families and dyads from financially disadvantaged families. Nonetheless, the few empirical studies that have investigated child memory suggest the benefit of maternal elaborative reminiscing is not limited to middle-class families (Leyva et al., 2009; Valentino et al., 2014). There is a need, therefore, to take into account the family SES when examining the relationship between maternal reminiscing and child memory elaboration.

4.3.1 Review aims

While several excellent reviews have provided impressive syntheses of the literature investigating the associations between maternal elaborative reminiscing and child memory development, the conclusions drawn in these reviews have not been based on a systematic search of the literature nor a quantitative summary of previously published effect sizes. Therefore, the aims of the current study were to 1) conduct the first systematic search of literature examining the relationship between maternal elaborative reminiscing and child

memory elaboration during joint reminiscing; and 2) quantify effect sizes using meta-analytic techniques to determine whether a consistent relationship between maternal elaborative reminiscing and child memory elaboration could be established, with a focus on both overall maternal elaborativeness and the individual elements of an elaborative reminiscing style. This study also aimed to provide a narrative review of the included studies to assist with the interpretation of the meta-analysis findings. Additionally, it aimed to explore the influence of elaborativeness calculation method and sociocultural factors (child gender, cultural background, SES) on the relationship between maternal elaborative reminiscing and child elaboration. We hypothesized that child gender and the dyads' cultural background would moderate the relationship between maternal reminiscing and child memory elaboration, with the association between these variables being stronger for girls than boys, and for dyads from autonomy-oriented cultures than relatedness-oriented cultures. While SES plays an important role in influencing parent-child interactions and child development, there was not sufficient evidence in the child memory elaboration literature to generate hypotheses for SES; thus, the SES moderation analyses were exploratory. Finally, as no research has compared the difference between elaborativeness calculation methods, the moderation analysis for calculation methods was also exploratory.

4.4 Method

Methods of analysis and inclusion criteria were specified in advance and documented in a protocol that was registered on the Prospero International Prospective Register of Systematic Reviews (Registration No.: CRD42016039952).

4.4.1 Literature search

A systematic search of the literature was conducted in December 2016 according to the PRISMA statement (Moher et al., 2009; see Table S1 for PRISMA checklist). Electronic databases Scopus, PubMed, Medline, PsycINFO, and ProQuest Dissertation & Theses Global

were searched using the search terms (memor* or recall or remember*) AND (reminisc* or conversation) AND (mother or maternal). Searches were limited to "preschool age (2-5)" and "school age (6-12)" in PsycINFO and Medline. A fourth search term of (child* or preschool*) was added in the databases Scopus and PubMed, as no age range can be applied. Searches were limited to "English language" for all databases. No publication date or publication status was imposed. In addition, nineteen additional articles were identified by hand searching reference lists of previous reviews identified as relevant to the current review (i.e., Fivush, 2007, 2011; Fivush et al., 2006; Nelson & Fivush, 2004; Wareham & Salmon, 2006).

4.4.2 Eligibility criteria

Studies were included in the current review if they met the following criteria: a) were longitudinal or cross-sectional study design; b) published in a peer-reviewed journal or dissertation repository (dissertations were also included in attempt to reduce publication bias); c) assessed mother's elaborative reminiscing style during joint reminiscing; d) included one or more maternal elaborative reminiscing element as a predictor in the analysis; e) examined child memory of past events that were shared by the child and his/her mother; f) included child memory elaboration (of the shared events that reminisced with the child's mother) as an outcome variable in the analysis; and g) the mean age of the child participants were between 3-12 years of age when the child's memory was measured.

Studies were excluded from the review if they met any one of the following criteria: a) the article was a review, case report, comment, or reported a therapy/treatment-based intervention; b) was published in a language other than English; c) examined a non-community population sample (e.g., children with language impairments); d) did not include an outcome variable that assesses children's autobiographical memory elaboration; e) included an outcome variable that assessed children's ability to recall a personal memory, but

not a memory of recent past events (e.g., birth story); and g) did not investigate the relationship between maternal elaborative reminiscing style and child memory elaboration.

4.4.3. Data extraction

The first author screened the titles and abstracts of all citations to exclude obviously irrelevant studies. The second author screened the extraction record to verify the accuracy of the extraction by the first author. Any discrepancies were resolved by discussion between the two authors; if no agreement could be reached, it was planned that a third researcher would decide. However, the third researcher was not required. Any articles with inclusion potential were further checked in full-text, and the eligibility criteria mentioned above were applied.

For all of the included studies, a standard extraction sheet was used to extract and collate the data from all qualified studies. Data extracted included descriptive information about the study (e.g., date of publication), study design (cross-sectional versus longitudinal), study location, number of dyads, sample characteristics (e.g., mean age of child, gender of child, maternal background), characteristics of events reminisced, measures used to assess maternal reminiscing and child memory report, the *p* values, unadjusted effect sizes and direction of effects. Each included study was independently reviewed by the first author and inspected by the second author. In addition, the second author also independently extracted data for 25% of the included studies to verify accurate extraction by the first author. Complete agreement was found for the factual information extracted (i.e., study design, study location, sample characteristics) and inter-rater reliability was satisfactory (Cohen's kappa = .81) for the extraction of effect sizes. Discrepancies were resolved through discussion and the final coding reflected the consensus of the authors.

Decision hierarchies were developed to manage articles that report multiple associations between relevant variables and studies reporting duplicate data (see *Supplement 2* for more about the inclusion/exclusion criteria and decision rules). Where available,

gender-, SES- and culture-specific associations were extracted separately. In the case where an article only reported data separately for independent groups (e.g., grouped by ethnicity), all associations were included in the review. In the case where multiple articles were based on an overlapping sample which contributed to the same memory reminiscing variable, the finding from the article that reported the most robust measurement tool, unadjusted results, largest sample size and longest follow-up-period (if longitudinal study) was included. If multiple studies were based on an overlapping sample, but the reported data contributed to different maternal reminiscing style variables, all studies were included.

4.4.4 Data analysis

4.4.4.1 Risk of bias assessment

The present study constructed a customised risk of bias form that was based on the *Quality Assessment Tool for Observational Cohort and Cross-sectional Studies* (NIH, 2014). Both authors independently completed the form for 30% of the studies and responses were compared with 89% of the inter-rater agreement. The rest were independently completed by the first author and inspected by the second author. Any disagreements were resolved through discussion.

4.4.4.2 Stouffer's p

The findings relating to each maternal reminiscing variable and child's memory elaboration were first synthesised using Stouffer's method (Stouffer, Suchman, DeVinney, Star, & Williams, 1949) to generate a combined significance level of the investigated associations. To combine the *p* values of included studies, Stouffer's *z* was calculated dividing the sum of $z(p_i)$ values by the square root of *k*, with *k* being the number of tests (Whitlock, 2005). Then each resulted *z* score was converted to one-tailed p-values to test directional hypotheses. If the resulting Stouffer's *z* corresponded to a probability level of $p<.05$, the null hypothesis of no effect was rejected. This approach has been used in previous

similar reviews with similar heterogeneity (e.g., Cairns, Yap, Pilkington, & Jorm, 2014; Dowling et al., 2017; Yap & Jorm, 2015). In the current review, Stouffer's *z* was calculated using the MetaP program (Ge, 2009) when there were at least three independent estimates reporting a *p*-value for the relationship between a maternal reminiscing style variable and child's memory elaboration. When an exact *p*-value could not be derived, the *p*-value was assigned the value of .50 when the result was reported as non-significant or assigned the value of the boundary that was reported (i.e., if a *p*-value was reported to be <.05, the value of .05 was assigned). In case when the same reminiscing variables were used in multiple analyses within one article/independent sample, *p*-values based on unadjusted results were preferred (for more details of the decision rules in the assignment of p-values for a combined Stouffer's *p*, see *Supplement 2*).

4.4.4.3 Meta-analysis procedures

Given the sample sizes for mother-child reminiscing study were often modest, a meta-analysis was conducted for each maternal reminiscing style variable with at least three independent effect sizes estimates (from at least two independent studies for each variable) to ensure a sufficient number of participants was included in the meta-analyses and reliable between-studies variance. All analyses were conducted using *Comprehensive Meta-Analysis (CMA) Version 3* (Borenstein, Hedges, Higgins, & Rothstein, 2009). The correlation coefficient *r* was used as the measure of effect size because this was most commonly reported in the studies included in the review. In case that multiple non-independent effect sizes were reported for one reminiscing variable taken on the same sample, all reported effect sizes were entered into CMA to generate a single combined effect size for that particular sample. For studies that did not report a correlation coefficient but reported alternative effect size measures that were accepted by CMA (which can convert these measures into *r*), the original forms of these effect sizes were entered in CMA for synthesis. For example, if the study

reported an association as non-significant but without the corresponding *r*, the *p*-value, effect size direction and sample size were entered into CMA to generate an *r* equivalent (Rosenthal & Rubin, 2003) for the association. We used the Meta-Analysis Calculator (Lyons & Morris, 2017) to convert the results reported from two-group comparison (i.e., mothers with high vs. low elaborative reminiscing style) tests, and the results reported in mean and standard deviations (i.e., Coppola et al., 2014; Lewis, 1999; Melzi, Schick, & Kennedy, 2011; Reese et al., 1993; Schröder et al., 2013b) to correlation coefficients. Given the expected heterogeneity between articles, a random effects model was used. When interpreting the mean effect sizes, Cohen (1992)'s guidelines were employed, whereby *r* of at least .1= *small*, .3= *medium*, and .5= *large*. The null hypothesis was rejected when the *p*-value for the meta-analytic result corresponded to a probability level of <.05. Given some meta-analyses in the current review only involved a small number of studies, I^2 statistics and its confidence intervals were computed to determine the proportion of variance across articles that is attributable to heterogeneity (Rao et al., 2017). When interpreting the I^2 statistics, we used the guideline suggested by the Cochrane handbook for systematic reviews (Deeks, Higgins, & Altman, 2008), whereby a I^2 <40% might not be important, while a I^2 between 30-60% represents moderate heterogeneity, 50-90% represents substantial heterogeneity, and 75%-100% represents considerable heterogeneity. The confidence intervals for I^2 (i.e., the strength of the evidence for heterogeneity) were used to assist in the interpretation of the importance of I^2 obtained in each meta-analysis.

The presence of publication bias was examined by visual inspection of the funnel plot produced by Duval and Tweedie's (2000) trim-and-fill analysis and by using Egger's test (p<.05) (Egger, Smith, & Phillips, 1997). In the case of an asymmetrical funnel (which indicates the likelihood of publication bias), the classic Fail-safe N was computed to estimate the number of unpublished studies that would bring the result to drop to a non-significant

level (Rosenthal, 1991). Results are considered robust if the fail-safe number exceed Rosenthal (1979)'s tolerances level, which N is greater than or equal to the number of included studies times 5 and then plus 10.

Sensitivity analyses were conducted to examine whether the findings were robust to the methodologies used by included articles (Stroup et al., 2000) and the decisions made during data extraction. These involved conducting the meta-analysis for each variable a second time to examine the effect of small sample size (n<20), adjusted and unadjusted results, scoring method (i.e., "proportion" vs. "frequency"), and follow-up length ("less or equal to one year" vs. "longer than one year") for variables that reported longitudinal associations. Where there were two or more independent estimates known to be eligible, a sensitivity analysis for each reminiscing variable was conducted.

4.4.4.4 Subgroup analyses

To explore the effect of child gender, culture, SES and calculation method, subgroup analyses were conducted where there were at least three independent associations in each group variable available in each meta-analysis. Regarding culture, we adopted Schröder and colleagues' (2013b) approach and categorised the samples included in each study into three cultural models: autonomy-oriented, autonomy-relatedness (i.e., where both autonomy and relatedness are valued), relatedness-oriented (see Table S2 for more detailed cultural models categorisation). In the case where a study did not specify whether the sample was autonomy-oriented, autonomy-relatedness, or relatedness-oriented, we assigned the sample to one of the cultural groupings based on the individualism score of the country of origin of the sample (as reported on "Country Comparison", *Hofstede Insights*). All studies were independently reviewed and coded by the authors (Cohen's kappa = .93). Discrepancies were resolved by discussion. Given limited data available on studies that included dyads from autonomy-relatedness culture background, this group category was not included in subgroup analyses.

SES was categorised as middle/upper-middle class and low-income. When interpreting the subgroup analyses results, a significant $Q\text{-}_{between}$ (an index of the variability between group means) indicated that the mean effect sizes across groups differed by more than sampling error.

4.5 Results

4.5.1 Search results

The literature search yielded 294 references and a total of 103 full-text papers were retrieved. Figure 4.1 summarizes the results of the study retrieval and selection strategy. Overall, 34 papers (28 published articles[1], 6 dissertations) were included in the current review.

4.5.2 Characteristics of included studies

Among the 34 papers included, 24 employed a cross-sectional design and 10 used a longitudinal design, with follow-up periods ranging from 6-72 months. Twelve papers (10 cross-sectional, 2 longitudinal) included cultural investigations. The study characteristics of the included studies[2] are presented in Tables 4.1 and 4.2.

All cross-sectional studies (k=24) were conducted in preschool-aged children (i.e., 3-6 years old), with child mean age range from 36 to 65 months. For longitudinal studies, the mean age of the child ranged from 36-80 months at the first eligible evaluation point. Most studies reported that participant samples were recruited from the USA (k=22), with the remaining samples recruited from New Zealand, Germany, China, Korea, Sweden, Estonia,

[1] Of the 28 published articles included, 3 cross-sectional articles (i.e., Haden, 1998; Kulkofsky, Wang, & Koh, 2009; Reese, 2008) employed data from other longitudinal studies which also included in the review (i.e., Farrant & Reese, 2000; Reese et al., 1993; Wang, 2007). Two cross-cultural articles (i.e., Schröder et al., 2013a; Tõugu, Tulviste, Schröder, Keller, & De Geer, 2011) included samples that partly overlapped with other cross-cultural articles also included in the review (i.e., Schröder et al., 2013b; Schröder et al., 2011). Two longitudinal articles (i.e.,Cleveland & Reese, 2005; Reese & Cleveland, 2006) reported sample overlap with participants reported in Farrant and Reese (2000). Therefore, 21 studies published in 28 articles were included in this review.

[2] To avoid confusion, "studies" will be used in this review to refer all included papers, including published articles and dissertations.

Cameroon, Italy, Peru, Turkey, Greece, Mexico, Costa Rica and India. Four studies did not report information on the SES of the dyads, 22 studies reported the sample as middle- or upper-middle class families, 3 studies described the sample as middle- and working-class families, 2 studies described the sample as low-income, and 3 studies included families from mixed SES backgrounds. Most studies examined the dyads' conversations using a reminiscing task that was undertaken either at home or in the laboratory. Only one study (i.e., Stone, 2014) examined the mother-child conversation using natural observation drawn from a database (i.e., audio recordings of the conversation related to past events that naturally happened during the day). Mothers in the included studies were often asked to reminisce events that happened within the past "1 week" to "1 year" with children at the time of data collection. Two studies did not report the children's gender make-up of the sample, while most studies reported having nearly equal numbers of girls and boys included in each sample.

4.5.3 Review of included studies

Commonly reported maternal elaborative reminiscing elements were identified, definitions and examples for these elements are presented in Table 4.3. These variables were predominately developed to examine the conversational structure of maternal reminiscing style and were often investigated based on the quantification measure obtained from the mother-child conversation transcripts (Larkina & Bauer, 2010). In addition, the variables were coded based on conversational utterance types, with coding schemes mostly adapted from the early child autobiographical memory literature (i.e., Fivush & Fromhoff, 1988; Haden, 1998; Reese et al., 1993). All included studies adopted a *proposition* coding system, whereby the coding units were independent clauses, with each unique or implied verb forming a new proposition unit. For example, "I waited and waited" was one proposition, whereas "I sat and waited" was two proposition units. All included studies scored maternal reminiscing variables based on the *frequency* of each utterance type except three studies (i.e.,

Sales, Fivush, & Peterson, 2003; Shin, 2007; Stone, 2014), which examined the proportions of each specific utterance type divided by the total number of propositions.

Review of these studies showed that, as expected, maternal elaborativeness had been examined differently in the literature (see Table 4.4 for a summary). As shown in Table 4.4, the sheer number of total elaborations was the most commonly used method to calculate an elaborative reminiscing style followed by elaboration ratio and classification analyses. Furthermore, a few studies in recent years have used calculation methods such as a composite score, rating scale, and elaboration-repetition difference score. Reminiscing elements, such as elaboration (i.e., wh-question, yes/no question, elaborative statement), repetition, and confirmation/affirmation, were often included in the analysis of overall elaborativeness. Additionally, several studies also included maternal autonomy support (i.e., the degree to which the mother acknowledges the validity of the child's perspective and individuality) and meta-memory talk as part of a maternal overall elaborative reminiscing style.

Children's memory elaboration, like that of mothers, was coded based on independent clauses. Some studies (e.g., Bauer, Burch, Van Abbema, & Ackil, 2007; Farrant & Reese, 2000; Haden, 1998; Leyva et al., 2009; Schröder et al., 2011; Wang, Leichtman, & Davies, 2000) focused only on children's provision of new/unique memory information about the events being discussed. Whilst other studies also included children's utterances that "requested information about the event", and utterances that "moved conversation to a new aspect of the event" in the definition of child elaboration (e.g., Kulkofsky et al., 2009; Reese et al., 1993; Tõugu et al., 2011). While all studies examined children's memory elaboration in shared recall with their mothers during reminiscing, a few studies also assessed children's elaboration in independent recall with an experimenter. Of these studies, five studies also reported the association between mothers' elaborative reminiscing and children's independent memory elaboration of the dyads' shared experiences (Bauer & Larkina, 2014;

Farrant & Reese, 2000; Reese, 2008; Rudek, 2004; Stone, 2014). Specifically, all these studies required the child to independently recall the same events that have been previously discussed with their mothers during the reminiscing task, with the exception of Brown (2006) which asked the child to recall an event that the child and mother had experienced together during a laboratory session. Due to methodological variations and limited data available, we could not conduct a meta-analysis on the association between maternal elaborative reminiscing and child independent memory elaboration.

4.5.4 Risk of bias assessment

In terms of quality assessment, all studies were rated ‘strong’ and to have a 'low risk' of bias (see Table S3 and Table S4). Selection of a representative sample was an area of 'high risk' in more than 50% of the studies. It was found that half of the included studies’ results cannot be readily generalised to a broader population other than middle- to upper-middle-class, European descent mother-child dyads. While 12 studies considered cross-cultural differences in the relationship between maternal elaborative reminiscing and child elaboration, half of these studies were limited to small sample size and mothers from middle-class, well-educated backgrounds. For the longitudinal studies, the retention rates in the reported articles ranged from 72-92%, with all studies having a retention rate of at least 70% at six months.

4.5.5 Meta-analysis

To estimate the magnitude of potential associations between maternal reminiscing variables and child memory elaboration, meta-analyses were conducted separately for each identified variable. Three papers were not included in the meta-analyses because the associations between the investigated maternal reminiscing variable and child elaboration were not based solely on reminiscing about past events (i.e., Sahin, 2011), included several fathers in the analysis (i.e., Sales et al., 2003), or included participant data taken from a

database (i.e., Stone, 2014). While not included in the below quantitative synthesis, these studies will be considered in the discussion section when interpreting the results.

4.5.6 Cross-sectional associations

Due to insufficient data, meta-analyses were not conducted on the following variables: maternal talkativeness, associative talk, meta-memory talk, off-topic talk and negation. Table 4.5 shows the summary statistics for Stouffer' *p* and meta-analyses results for each reminiscing variable, including I^2 statistics and the Egger's test. The forest plots for each meta-analysis are presented in *Supplement 5*. Subgroup findings for each available meta-analysis are presented in Table 4.6. Subgroup analyses could not be conducted for gender due to insufficient reported data. SES subgroup analyses could only be conducted for overall maternal elaborativeness, due to insufficient reported data for the individual elements. For all variables reported below, sensitivity analyses suggested that these results were robust to the inclusion of articles using converted effect size, adjusted effect size and studies with small sample size.

4.5.6.1 Maternal elaborativeness

Thirty-two cross-sectional associations linking maternal elaborativeness and child memory elaboration yielded a large mean effect size. There was substantial heterogeneity in effect size estimates between associations but no significant publication bias. Subgroup analyses revealed no moderation by SES or cultural background. Due to insufficient information, subgroup analyses for calculation method could only compare studies that used total elaboration, elaboration-ratio and classification analyses. The result of $Q\text{-}_{between}$ value indicates that there was a large variability between group means in calculation method, but this difference did not reach statistical significance (p= .09).

4.5.6.2 Elements of an elaborative reminiscing style

The results of the associations between each of the individual elements in an elaborative reminiscing style and child memory elaboration are provided below.

4.5.6.2.1 Open-ended question

Ten cross-sectional associations examining open-ended question and child memory elaboration yielded a significant large mean effect size. However, there was high heterogeneity in effect sizes but no evidence of significant publication bias. Due to insufficient information, subgroup analyses were not conducted.

4.5.6.2.2 Close-ended question

Seven cross-sectional associations examining close-ended questions and child memory elaboration yielded a significant medium-to-large effect size, but a non-significant combined *p*-value. There was high heterogeneity in effect sizes but no evidence of significant publication bias. Due to insufficient information, subgroup analyses were not conducted.

4.5.6.2.3 Elaborative statement

Ten cross-sectional associations examining elaborative statements and child memory elaboration yielded a significant medium effect size, but a non-significant combined *p*-value. There was high heterogeneity in effect sizes but no evidence of significant publication bias. Subgroup analyses were not conducted due to insufficient data.

4.5.6.2.4 Evaluation

Fifteen cross-sectional associations linking maternal evaluation and child elaboration yielded a significantly large effect size with substantial heterogeneity. The result of Egger's test was significant suggesting possible publication bias. However, the Duval and Tweedie's trim and fill results showed a symmetrical funnel plot with no missing study. The classic fail-safe N showed that the number of missing studies that would be required to bring the results non-significant was 1726. Thus, it is unlikely that the estimated effect size is an artefact of a

bias. Sensitivity analyses suggested that these results were robust to the inclusion of studies that only reported mothers' "confirmation/affirmation" utterances (i.e., Burch, Austin, & Bauer, 2004; Larkina & Bauer, 2010; Reese & Neha, 2015; Shin, 2007; Tõugu et al., 2011). Subgroup analysis showed that this relationship did not differ depending on culture.

4.5.6.2.5 Repetition

Sixteen cross-sectional associations linking maternal repetition and child elaboration yielded a significant medium mean effect size, but a non-significant combined *p*-value. Subgroup analysis showed that this relationship did not differ depending on culture.

4.5.6.2.6 Deflection

Five cross-sectional associations linking maternal deflection and child memory elaboration yielded a significant medium mean effect size, but a non-significant combined *p*-value. The I^2 statistic showed that there was zero heterogeneity; however, its confidence interval suggested moderate heterogeneity between studies. Inspection of the funnel plot showed one study missing, but the result of Egger's test suggested no publication bias. The classic fail-safe N showed that the number of missing studies that would be required to bring the results non-significant was 34. Therefore, the estimated effect size seems unlikely to be a result of publication bias. Due to insufficient information, subgroup analyses were not conducted.

4.5.7 Longitudinal associations

Due to insufficient information, meta-analysis was only conducted for longitudinal studies examining overall maternal elaborativeness (see Table 4.5). No subgroup analyses were conducted due to insufficient data. Six independent longitudinal associations linking high elaborative reminiscing with higher child memory elaboration yielded a medium mean effect size, with moderate heterogeneity. Sensitivity analysis suggested that this result was robust to the inclusion of articles using effect size estimates other than *r*. However, the funnel

plot revealed a significant asymmetry in the studies and Egger's test was significant. Though the classic Fail-safe N showed that the number of missing studies that would be required to bring the results to non-significant was 71, the estimated mean effect size could be a possibility of publication bias.

4.6 Discussion

The current study aimed to conduct the first systematic review of the literature examining the relationships between maternal elaborative reminiscing and child memory elaboration and to verify and clarify the elaborative reminiscing elements related to child memory elaboration using meta-analytic techniques. A secondary aim was to investigate whether sociocultural factors moderated these relationships. This systematic review and meta-analyses identified several maternal elaborative reminiscing elements for which there is a sound or emerging evidence base, with significant effect sizes that were modest to large in magnitude.

4.6.1 Maternal elaborativeness

Maternal overall elaborative reminiscing style was significantly positively related to child memory elaboration, both cross-sectionally and longitudinally. These findings support current theoretical models, including the social-cultural developmental theory (i.e., Nelson & Fivush, 2004) and the emergent recollection theory (i.e., Reese, 2009), that posit that maternal elaborativeness in mother-child reminiscing plays an important role in shaping child memory elaboration. It is worth noting, however, that there was substantial heterogeneity in this relationship. This may be accounted for by differing elaborativeness calculation methods and results that vary from no relationship (e.g., Fivush & Vasudeva, 2002) to those closely related to child elaboration (e.g., Schröder et al., 2013b). However, given the limited data available, the current study can only conclude that this relationship did not differ significantly between the three predominant calculation methods (i.e., total elaboration, elaboration-ratio,

classification analyses). Despite this non-significant group difference, it is worth noting that only studies which used "total elaboration" demonstrated a consistently strong relationship between maternal elaborativeness and child memory elaboration (large effect size with narrow confidence interval). Though moderate-to-large mean effect sizes were obtained for studies that used "elaboration-ratio" and "classification analyses", the confidence intervals were wide and effect sizes ranged from small to large.

4.6.2 Individual elements of elaborative reminiscing

While substantial research has investigated maternal elaborativeness, several studies have also examined the individual elements that constitute an elaborative reminiscing style. Our review showed that open-ended questions and positive evaluations were considered the main characteristic features of an elaborative reminiscing style. In support of this, we found large positive associations between mothers' use of these two reminiscing elements and children's elaboration, though significant heterogeneity was also reported for these variables. Thus, our results support previous research that has identified that maternal open-ended question elaboration and positive evaluation (i.e., affirmation/confirmation) are two critical aspects of an elaborative reminiscing style (i.e., Fivush et al., 2006; Wareham & Salmon, 2006). Mothers with high-elaborative reminiscing style are both providing structure to facilitate a detailed discussion about the past with their children and affirming their children's contribution to the discussion (Fivush et al., 2006). Close-ended questions and elaborative statements were not significantly related to child memory elaboration. This may reflect the nature of close-ended questions and elaborative statements. While both elements aim to provide memory information that encourages and elicits children's memory responses, both elements can be less effective when the mother contributes substantially more details than the child (i.e., if the mother is driving the reminiscing and offering fewer opportunities for the child to contribute).

Maternal repetition, an element often conceptualised as an indication of a low elaborative reminiscing style, was not significantly associated with child memory elaboration. However, the positive direction of the moderate relationship suggests that repetition may not necessarily have a negative influence on child memory elaboration. Mothers may use "repetition of child utterances" as a strategy to encourage their children to join the conversation, especially when their children are early in language development (Zevenbergen, Holmes, Haman, Whiteford, & Thielges, 2016). For future studies, therefore, it may be worth differentiating between repetitions that facilitate child talk and repetitions that impede the mother-child reminiscing. Maternal deflection, an element that is similar to maternal repetition, was also not significantly related to child memory elaboration. Deflection and repetition are similar in that they do not provide any new information to elicit a child's response. However, they differ in that in repetitions, mothers tend to specify the topic she wants her child to pursue, while deflections are considered as mothers' specific invitations of the child's perspective on the events discussed (Burch et al., 2004). Though our study revealed a non-significant mean effect on child elaboration in cross-sectional studies, it is worth noting that maternal deflections have been found to significantly contribute to the preservation of child early event memories in a longitudinal study (Bauer & Larkina, 2014). The researchers proposed that different elements of maternal reminiscing facilitate in different aspects of child autobiographical memory, specifically, the development or the longevity of earliest memories. Therefore, maternal deflection may influence child memory elaboration over the longer-term.

There were several maternal reminiscing structural elements (i.e., talkativeness, meta-memory talk, and associative talk) that had limited data and thus meta-analyses could not be conducted. However, our review of the included studies showed that these elements might interact with other maternal reminiscing elements to influence on child memory elaboration.

For instance, studies have found that the associations between several common maternal reminiscing elements (e.g., elaboration, repetition, affirmation) and child elaboration were no longer significant when the level of maternal talkativeness was controlled for (i.e., Burch et al., 2004; Larkina & Bauer, 2010). Further research investigating these variables is required.

4.6.3 Moderators

Due to insufficient data, we were unable to conduct subgroup analyses on child gender. The lack of separate associations reported for mother-daughter and mother-son dyads is likely due to the non-significant group differences in child memory and/or maternal reminiscing variables obtained at the preliminary stage of analysis. As a consequence, child gender was often not considered in subsequent analyses. Hence, it is premature to conclude whether the association between maternal elaborative reminiscing and child elaboration differs between genders. Review of the included studies, showed that early research tended to indicate that mothers were more elaborative and evaluative with daughters than sons, and girls were more elaborative than boys by the end of preschool years (Fivush, Berlin, Sales, Mennuti-Washburn, & Cassidy, 2003; Reese et al., 1993). However, recent research suggests that mothers do not differ in how they reminisce with boys or girls and children's memory does not differ as a function of child gender (Coppola et al., 2014; Kulkofsky et al., 2009; Larkina & Bauer, 2010; Melzi et al., 2011; Schröder et al., 2013a). This tendency may reflect current society in which mother-child reminiscing may now be less considered a gender-oriented activity. There is also accumulating evidence suggesting that child memory elaboration is closely related to school relevant competencies, such as language and literacy development (Schröder et al., 2013a). As the goal of parent-child reminiscing is to help children build competence in their particular sociocultural environment, it might be equally important for mothers of daughters and of sons to help their children to develop an elaborative autobiographical memory to achieve academic and educational success.

Contrary to our hypothesis, we found no evidence that the associations between maternal elaborative reminiscing and child elaboration were moderated by cultural background. These non-significant differences may reflect the fact that the comparisons were made between well-educated middle-class families from both autonomy-oriented and relatedness-oriented cultures. Under the influence of globalisation, with rapid urbanisation and high levels of formal education, there is an increase in the emphasis of autonomy in places that have traditionally been regarded as relatedness-oriented, such as China and India (Schröder et al., 2013b; Y. Wang, 2006). In addition, mothers' education level—a factor that is often overlooked in past studies, has also been found to have a significant effect on child memory elaboration. Specifically, less educated mothers and their children were less elaborative and evaluative than well-educated mother-child dyads during reminiscing (Reese & Newcombe, 2007). Therefore, categorising mothers into cultural groups merely based on the cultural contexts, may not be an accurate reflection of mothers' individual cultural orientation, and consequently, is less sensitive in detecting the cultural differences that may exist in this relationship. Additionally, SES did not significantly moderate the relationship between the maternal elaborativeness and child elaboration. A highly positive relationship was found in studies that examined dyads from low-income and middle/upper-middle-class families. It is worth noting that there has been significantly less focus on low-income families. Therefore, given the significant influence of maternal elaborative reminiscing on child memory elaboration, it would be beneficial for future research to further explore the benefits of maternal reminiscing in financially disadvantaged families.

4.6.4 Limitations and future research directions

Several limitations are worth considering. First, the intrinsic nature of meta-analytic techniques is acknowledged as the outcome of meta-analyses depends entirely on the studies included (Piras, Piras, Orfei, Caltagirone, & Spalletta, 2016). Though efforts were made to

include all relevant investigations (e.g., emailing authors for unreported data), we realise that some studies with relevant effect sizes (that were not reported due to non-significant findings) may have been missed. There was also a limited number of studies eligible for inclusion in some analyses. Thus, the results of these variables should be treated with caution. Second, the research strategy of this review was confined to peer-reviewed literature written in English, which might have introduced publication bias. However, based on the subsequent publication bias analyses conducted above, we do not think this was a significant source of bias. Excluding studies that are published in languages other than English may limit our knowledge of the role of culture as a moderator. In addition, as one of the exclusion criteria was intervention studies, baseline assessment data from these studies that were not included may have influenced the findings. Third, the current meta-analyses only included studies that examined memory conversations recorded during a reminiscing task. Therefore, questions remain regarding the generalizability of findings to daily life. Fourth, many of the results reported were based on concurrent associations, rather than longitudinal correlations. Finally, given the review of the literature was conducted in 2016-2017, the current study may not include several recently published investigations.

Despite these limitations, the findings provide important insights for future research. Similar to previous reviews (e.g., Fivush, 2011), we found that most developmental autobiographical memory research focused on the preschool years. Thus, little is known about children's memory elaboration later in childhood. It is well-recognised that a child's memory and linguistic skills develop rapidly from the age of 3 (when the child begins to participate in conversation fully) to 6 years old (when the child is competent in narrating experiences) (Reese et al., 1993). As children develop a more sophisticated autobiographical memory system and have the capacity to remember more, their conversations about the past may become more collaborative with their mothers (Fivush, 2011; Valentino, 2011). Greater

cross-sectional and longitudinal research into the impact of maternal reminiscing on child memory development beyond the age of 6-year-old is needed. Second, studies have primarily investigated the relationships between maternal reminiscing and child memory elaboration using laboratory-based reminiscing tasks. One study (Stone, 2014) extracted data from a database in which mother-child conversations have been recorded in a natural environment and found that child elaboration might not be related to mother's elaborative reminiscing style in particular, but general reminiscing more broadly. However, it is possible that the non-significant relationship finding is a result of small sample size. More research is required to confirm whether the findings of the current meta-analyses can be generalised to mother-child reminiscing in daily life.

Third, the concept of an elaborative reminiscing style has been measured differently in past research. Such variation is not only reflected in the many different calculation methods (i.e., elaboration ratio vs total elaboration) but also variation within each type of calculation methods. For example, while some researchers referred to elaboration ratio as participants' number of elaborations divided by the number of repetitions, other researchers chose to include evaluation in the denominator or replaced repetition with mothers' total utterances (i.e., talkativeness). Given maternal elaborativeness has been conceptualised differently, we recommend the development of a standardised definition and measuring method. Additionally, given the influence of maternal talkativeness on the relationship between maternal reminiscing and child elaboration, future research could investigate the possible mechanisms underpinning the elicitation of children's memory response. This may be especially beneficial for future studies that aim to develop training programs targeting elaborative reminiscing.

Fourth, the current study only included research that examined maternal elaborative reminiscing and child memory elaboration in shared recall, which is only one aspect of child

autobiographical memory development and mother-child reminiscing. In our review of the current study, we found that past researchers have also examined the influence of maternal reminiscing style on child memory elaboration from different perspectives, such as mothers' level of affective and behavioural support, maternal warmth and autonomy support (i.e., Cleveland & Reese, 2005; Fivush & Vasudeva, 2002; Larkina & Bauer, 2010). Notably, autonomy support has been proposed in recent studies as an important and independent dimension of maternal reminiscing style (i.e., Cleveland & Reese, 2005; Kulkofsky, 2011; Larkina & Bauer, 2010; Leyva et al., 2009). In addition, recent research on children's earliest memory, memory specificity and life story development also provided new sights into the importance of maternal elaborative reminiscing on different aspects of child autobiographical memory development, beyond shared memory elaboration (e.g., Jack, MacDonald, Reese, & Hayne, 2009; Leichtman, Steiner, Camilleri, Pillemer, & Thomsen, 2019; McDonnell, Valentino, Comas, & Nuttall, 2016). Given that relatively few studies have examined these areas, future research could explore the effects of different aspects of maternal reminiscing to gain a more comprehensive understanding of its influence on child autobiographical memory development. Finally, we recommend future cross-cultural research shifts focus from the dyads' cultural background to the mothers' individual cultural orientations and beliefs regarding child-rearing goals. Also, given the significant effect of familial influence on child development, it is important to also assess family education level and SES.

4.6.5 Conclusion

In sum, based on the currently available evidence, the results of this study demonstrated that maternal elaborative reminiscing style is closely related to early child memory elaboration during shared reminiscing, with a large mean effect size observed. Given the limited data available for moderator analyses, it is premature to conclude the effects of sociocultural contexts on this relationship. Future research should focus on developing

standardised operational methods, examine individuals from various sociocultural backgrounds and evaluate the relationships longitudinally.

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Table 4.1

Characteristics of Cross-sectional Studies Included in Qualitative Synthesis

Article	Year	Demographics							Past Event Characteristics				
		Country	No. of dyads	Child mean age (month)	Child gender (%male)	Maternal education †	Ethnicity of majority dyads (80%)	SES	Events assessed	*N* of shared events assessed	Events within	Event Type
Haden^	1998	USA	46	54	50	96%	Caucasian	M	RT	4	1 year	non-N
Lewis^	1999	USA	32	51	50	100%	Caucasian	M	RT	3~5	-	non-N
Reese & Brown	2000	New Zealand	40	49	50	50%	Caucasian	-	RT	2	-	P
Fivush & Vasudeva	2002	USA	37	49	49	-	Caucasian	M	RT	2	-	P
Sales et al.	2003	USA	67	52*	54	-	Caucasian	Mix	RT			Mixed
Burch et al.	2004	USA	46	39	50	-	Caucasian	M/UM	RT	6	6 months	Mixed
Brown	2006	USA	40	48	53	-	Caucasian	M	RT	2	1 year	Mixed
Reese	2008	New Zealand	31	65	-	14 years	Caucasian	M/W	RT	4	1 year	Mixed
Leyva et al.	2009	USA	60	51	52	13 years	Mixed[1]	Low	RT	1	-	P
Larkina & Bauer	2010	USA	30	48	47	72%▾	Caucasian	M/UM	RT	4	4 months	non-N
Kulkofsky	2011	USA	53	53	49	47%▾	Mixed[2]	-	RT	2	2 months	Mixed
Stone	2014	USA	32	CD[1]	53	-	-	-	NO	-	-	-
Coppola et al.	2014	Italy	40	44	53	14 years	Caucasian	M	RT	4	1 year	Mixed
Reese & Neha	2015	New Zealand	41	52	-	CD[2]	Maori	-	RT[1]	1	recent	non-N*
Cross-cultural Studies												
Wang et al.	2000	China USA	20 21	41 40	48 50	100%	Chinese Caucasian	M/UM	RT	2	1 month	non-N*
Wang & Fivush	2005	USA China	31 30	40	55 47	CD[3]	Chinese Caucasian	M	RT	2	1 year	Mixed
Shin	2007	USA Korea	30 28	45 48	50 43	97% 86%	Caucasian[1] Korean	M	RT	3	1 year	Mixed
Kulkofsky et al.	2009	USA China	63 47	54 54	55 51	92% 85%	Caucasian Chinese	M	RT	2	2 months	Mixed
Sahin	2011	USA	25	CD[4]	36	52%	Caucasian	M/UM	RT	2	2 weeks	-

		Turkey-I	30		40	74%	Turkish					
		Turkey-G	32		44	53%						
		USA	32				Caucasian					
Melzi et al.	2011	Peru	32	53	50	17 years	Peruvian	M/UM	RT	6	-	-
		Germany-B	35		55	15 years		M				
		Sweden	42		50	15 years	Caucasian*	M				
Schröder et al.	2011	Estonia	38	48	63	16 years	African	M	RT	2	1 month	-
		Cameroon	33		42	7 years		L				
		Germany-B	35		55	15 years						
Tõugu et al.	2011	Sweden	42	48	50	15 years	Caucasian*	M	RT	2	1 month	-
		Estonia	38		63	16 years						
		Costa Rica	18		73	13 years	South					
Schröder et al.	2013a	Mexico	12	36	58	15 years	American	M	RT	2	1 month	-
		Germany-O	18		44	15 years	Caucasian					
		Germany-B	36		53	15 years		M				
		Greece	12		50	15 years	Caucasian	M				
		CAM U	12		42	14 years	African	-				
Schröder et al.	2013b	CAM R	28	36	36	7 years	Indian	L	RT	2	1 month	Mixed
		India U	31		52	16 years	South	M				
		India R	23		48	4 years	American	L				
		Costa Rica	19		42	14 years		M				

Note. CD= cannot determine; *SES*=socioeconomic status; *M*= middle-class; *M/UM*= middle or upper middle-class; *M/W*= middle/working-class; *P*= positive; *N*= negative; *non-N*= non-negative; *RT*= reminiscing task; *NO*= natural observation; *CAM U*= Cameroon (urban); *CAM R*= Cameroon (rural); *India U*= India (urban); *India R*= India (rural); *Germany-O*= Osnabrück, Germany; *Germany-B*= Berlin, Germany; *Turkey 1*= Izmir, Turkey; *Turkey 2*= Gaziantep, Turkey.

^: sibling study (mothers with two children). †: reported in either the percentage (%) of mothers attended college, or the number of years received education. *: inferred from the article. ▾: held a college degree. Mixed[1]: 23 Hispanic, 20 White, 17 Black. Mixed[2]: Half mothers were European American, and half were Hispanic. CD[1]: child involved in the conversation must been between 2-6 years old. CD[2]: Mothers on average scored 4.26 on an education scale in which 4= some tertiary education but no degree. CD[3]=with the majority of the mothers in both cultures having at least a college degree. CD[4]: mean age not reported, but claimed all participants were mothers and their pre-schoolers. Caucasian[1]: approximately 25% of participating families were minority ethnic/racial status. RT[1]: The researcher left the house to allow the mother and child to complete the conversation in private and returned later (either on that day or up to a week later, as requested by the family) to collect the tape recorder.

Table 4.2

Characteristics of Longitudinal Studies Included in Qualitative Synthesis

Article	Year	Demographics									Past Event Characteristics			
		Country	No. of dyads at 1st Eva	Child mean age at 1st Eva (month)	Follow-up interval length (month)	Retention rate (%)	Child gender (%male)	Maternal education †	Ethnicity of majority dyads (80%)	SES	Events assessed	*N* of shared events assessed	Events within	Event Type
Reese et al.	1993	USA	19	40	30	79%	58%	100%	Caucasian	M	RT	3	-	-
Rudek	2004	USA	56	43	18	92%	55%	-	Caucasian	M/UM	RT	2~3	-	-
Farrant & Reese^	2000	New Zealand	58	19	21	89%	52%	13 years	Caucasian	M	RT	-	-	P
Cleveland & Reese	2005	New Zealand	50	40	25	77%	50%	13 years	Caucasian	M/W	RT	3	-	-
Reese & Cleveland	2006	New Zealand	50	40	11	77%	50%	13 years	Caucasian	M/W	RT	3	-	-
Bauer et al.	2007	USA	29	80*	6	96%	61%		Caucasian	M/UM	RT	3	-	Mixed
Langley	2013	USA	159	36	36	72%	51%	-	Mixed[1]	Low	RT	3	1 month	-
Bauer & Larkina	2014	USA	83	40	72*	-	47%	-	Caucasian	M/UM	RT	4~6	-	non-N
Cross-cultural studies														
Wang	2007	USA-1 USA-2 China	60 71 58	36	18	81%	50% 52% 57%	CD[1]	Immigrant Caucasian Chinese	M	RT	2	2 months	Mixed
Schröder et al.^	2012	Germany India	33 25	19	17	-	50% 56%	16 years 16 years	Caucasian Indian	M	RT	2	1 months	-

Note. CD= cannot determine. *SES*= socioeconomic status; *M*= middle-class; *M/UM*=middle or upper middle-class; *M/W*= middle/working-class; *P*= positive; *N*= negative; *non-N*= non-negative; *USA-1*= Chinese immigrant in USA; *USA-2*= Euro-American in USA.

^: only time points within eligible age range was included. †: Reported in either the percentage (%) of mothers attended college, or the number of years received education. *: mean of the age groups or follow-up intervals included in that study. CD[1]: Majority of mothers had college education or beyond. Mixed[1]: Half of the families were classified as European-American and half of the families were classified as African American.

Table 4.3

Individual elements of maternal reminiscing identified in included studies that measures the structural aspect of mother-guided conversation

Elements	Definition	Example	Example Studies
Elaboration	Mother's comments which either introduced a topic for discussion, provided new information, or moved the conversation to a different aspect of an event. Elaboration is often reflected in three main forms: open-ended questions, close-ended questions, and elaborative statement.	"Do you remember when you went to zoo?"	Reese et al., 1993 Lewis, 1999
Open-ended Questions	Mother's questions that asked children to provide a new piece of memory information about an event. This category included all *wh*- and *how* questions.	"What happened to us on our walk?"	Reese & Brown, 2000 Wang & Fivush, 2005
Close-ended Questions	Mother's questions that required the child to confirm or deny a piece of memory information provided by the mother.	"You know when we went to aquarium?"	Schröder et al., 2013a McDonnell et al. 2016
Elaborative Statements	Mother's declarative comments containing new information about the event.	"You were playing with their friends there."	Reese & Brown, 2000 Coppola et al., 2014
Evaluation	Mother's utterances that confirmed or negated a child's previous utterance, and often included child's previous comments along with "right", "yes" or "no".	"Very good!" "A Mommy? I think you are right!"	Haden, 1998 Wang et al., 2000
Confirmation/ Affirmation	Mother's utterances that confirmed the correctness of their child's response either explicitly ("Yeah", "Good Job") or repeating (implicitly) the child's exact utterances.	Child: "We saw monkeys." Mother: "We saw monkeys, that's right!"	Reese, 2008 Larkin & Bauer, 2010
Negation*	Mother's utterances that negated a child's previous utterance.	Child: "We saw monkeys." Mother: "No, we didn't see monkeys."	Shin, 2007 Reese, 2008
Repetitions	Mothers either repeated the exact content or gist of their own previous utterance or tried to elicit information from their children but provided no new information. Repetition could be in the form of questions or statements.	Mother asks, "Who was there?" and in her next conversational turn repeats, "Do you remember?", "Tell me about it."	Reese et al. 1993 Wang et al. 2000

Deflection	Mothers turned the conversational back to the child but provided no specific information, usually were coded when the function of the maternal utterance was to involve the child in the conversation, or to respond to the child's participation. This category included tag questions.	"What happened?" "Tell me more" "It was cold, Wasn't it?"	Burch et al. 2004 Bauer et al. 2007
Type of Talk			
Associative	Mother's statements or questions not specifically about the particular past event under discussion but related to the event. This include 1) talk concerning about past event related to the event under discussion; 2) facts about the world which arose in conjunction with the event in question or the story; 3) talk concerning the event in question couched with fantasy rather than factual terms; 4) comments on a culture occurrence of the particular event in questions.	Mother: "Did you get wet in the ocean?" Child: "Yeah, what's ocean mean?" Mother: "A lot of water."	Reese et al. 1993 Schröder et al. 2013
Meta-memory	Mothers' remarked on the process of remembering and knowing, or about their own or their children's cognitive performance.	"I'd forgotten about that."	Wang et al. 2000 Reese & Cleveland, 2006
Off-topic*	Within a conversation about a past event, mothers talked about topics which, in contrast to associative talk, were not related to the event being discussed.	-	Wang et al. 2000 Schröder et al. 2013
Talkativeness	The total number of utterances or propositions that mothers produced during the discussion of the events and thus provided a measure of maternal talkativeness.	-	Burch et al. 2004 Bauer et al. 2007

Note. *variables often not reported due to infrequent occurrence.

Table 4.4

Calculation methods of maternal elaborativeness identified in included studies

Calculation Method	Study Name	Conceptualization
Total Elaboration	Reese et al. 1993*	General Elaboration Description [a]
	Wang et al., 2000	General Elaboration Description [a]
	Burch et al., 2004	General Elaboration Description [a]
	Wang, 2007*	General Elaboration Description [a]
	Kulkofsky, 2011*	General Elaboration Description [a]
	Schroder et al., 2012	General Elaboration Description [a]
	Lewis,1999*	*N* of (Memory Q + Statement)
	Wang & Fivush, 2005	*N* of (Memory Q [b] + Y/N-Q + Statement)
	Rudek, 2004	*N* of (Wh-Q + Y/N-Q + Statement)
	Reese & Cleveland, 2006	*N* of (Wh-Q + Y/N-Q + Statement)
	Reese & Neha, 2015	*N* of (Wh-Q + Y/N-Q + Statement)
	Farrant & Reese, 2000	*N* of (Wh-Q + Y/N-Q + Statement+ Tag Q)
	Reese & Brown, 2000	*N* of (Wh-Q + Y/N-Q + Statement+ Tag Q)
	Tõugu et al., 2011	*N* of (Wh-Q + Y/N-Q + Statement+ Tag Q)
	Schroder et al., 2013b*	*N* of (Wh-Q + Y/N-Q + Statement+ Tag Q + RO)
Elaboration Ratio	Reese et al., 1993*	*N* of Elab / *N* of Rep
	Lewis, 1999*	*N* of Elab / *N* of Rep
	Wang, 2007*	*N* of Elab / *N* of Rep
	Bauer et al., 2007	*N* of Elab / *N* of Rep
	Kulkofsky et al., 2009	*N* of Elab / *N* of Rep
	Schröder et al., 2011	*N* of Elab / *N* of Rep
	Brown, 2006	*N* of Elab/ Total Utterance
	Shin, 2007	*N* of Elab/ Total Utterance
	Stone, 2014	*N* of Elab/ Total Utterance; *N* of Elab / *N* of Rep
	Fivush & Vasudeva, 2002	*N* of Elab / *N* of (Elab + Rep)
	Kulkofsky et al. 2011*	*N* of (Elab + Conf) / *N* of (Rep + 1)
	Sahin, 2011	*N* of (Elab + Eva) / *N* of (Elab + Eva + Rep)
	Bauer & Larkina, 2014	*N* of (Elab + Aff) / *N* of (Elab + Aff + Rep)
Classification Analyses	Haden, 1998	Clustering analysis (4 stylistic dimensions)
	Melzi et al., 2011	Clustering analysis (elicitor vs. constructor)
	Schroder et al., 2013b*	Pattern analysis on elab/eva/rep ratio
	Coppola et al., 2014	Clustering analysis (high vs. low)
	Cleveland & Reese, 2005	Median split on (elaboration + autonomy support)
Composite Score	Reese, 2008	*N* of (*Wh*-Q + Conf)
	Langley, 2013	*z*-score of (Total Elab + Total Asso + average Conf +average Meta)
Elaboration-Repetition Difference Score	Schroder et al., 2013a	*N* of (*Wh*-Q + Y/N-Q + Statement + Conf) – Rep
Rating Scale	Leyva et al., 2009	5-point scale on elaborative style

Note. N=number; *Q*= question; *Elab*=elaboration; *Rep*=repetition; *Wh-Q*= Wh/open-ended question; *Y/N Q*=yes-no/close-ended questions; *Aff*=affirmation; *Conf*=confirmation; *Eva*=evaluation; *Meta*= meta-memory talk; *RO*=Repeat Orders; *Asso*= Associative Talk

* Studies included both total elaboration and alternative methods to indicate maternal elaborativeness.

[a] Mothers' comments that introduced an event to discuss, provided new information, or moved the conversation to a different aspect.

[b] Any questions that asked the child to provide information regarding the event under discussion, including *wh*-questions and "do you remember" questions.

Table 4.5

Meta-analyses Results for the Associations between maternal reminiscing and child memory elaboration

	N of articles	*N* of independent associations in Stouffer's *p*	*N* of independent associations in meta-analysis	Stouffer's *p*	*r* (95% CI)	*p* value for *r*	I^2 (95% CI)	Egger's test two tailed *p*
Concurrent								
Elaborativeness	25	32	32	<.001	.58 (.50, .64)	<.001	73.31 (46.41.86.70)	.35
Individual Elements								
Open-ended question	8	10	10	<.001	.54 (.38, .67)	<.001	75.36 (54.16, 86.76)	.12
Close-ended question	4	7	7	.50	.42 (.28, .54)	<.001	38.56 (46.07, 74.15)	.41
Statement	7	10	10	.50	.33 (.17, .47)	<.001	64.53 (30.20, 81.97)	.60
Repetition	12	16	16	.49	.33 (.20, .44)	<.001	64.51 (40.29, 78.91)	.51
Evaluation	11	15	15	<.001	.68 (.58, .75)	<.001	77.65 (63.53, 86.30)	.04
Deflection	3	5	5	.50	.35 (.23, .46)	<.001	0.00 (31.11, 52.47)	.86
Longitudinal								
Elaborativeness	6	6	6	<.001	.33 (.24, .41)	<.001	0.00 (30.17, 73.79)	.04

Note. *N* = total number; *r* = mean effect size; *CI* = confidence interval; I^2 = indicator of heterogeneity in percentages.

Table 4.6

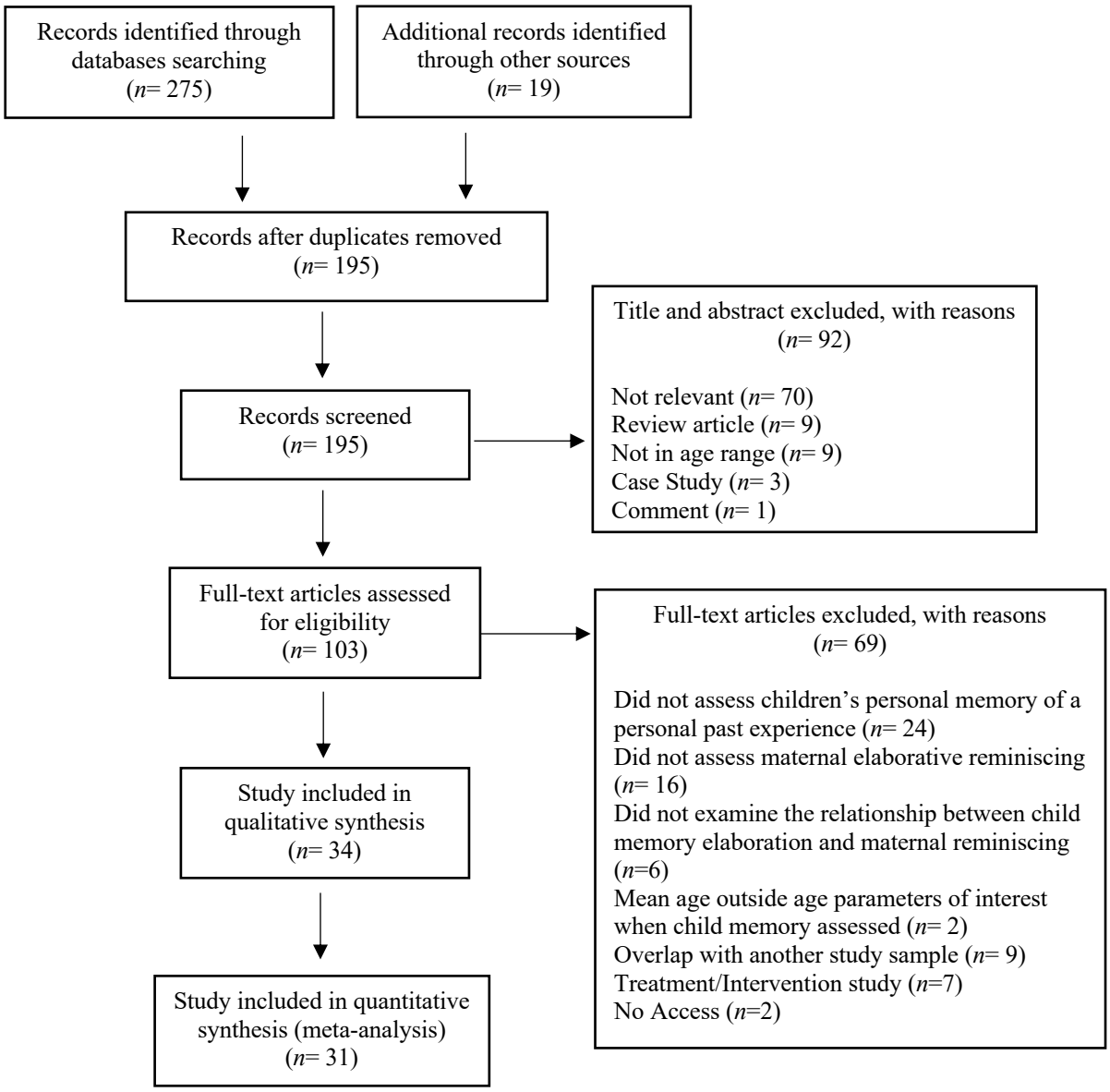
Results of Moderators for the Concurrent Associations between Maternal Reminiscing and Child Memory Elaboration

Maternal Reminiscing Variables	Moderators	*k*	*r*	95% Confidence Interval		*Q*-between
				Low Estimate	High Estimate	
Elaborativeness	Calculation Method	27	.55	.48	.62	4.77^{+}
	Total Elaboration	17	.63	.53	.71	
	Elaboration Ratio	7	.45	.29	.58	
	Classification Analyses	3	.53	.38	.61	
	Socio-economic Status	29	.59	.51	.65	1.27
	Middle/Upper-middle class	25	.56	.46	.64	
	Low income	4	.64	.52	.74	
	Cultural Background	32	.56	.48	.63	.86
	Autonomy-oriented	22	.55	.46	.62	
	Relatedness-oriented	7	.64	.43	.79	
	Mixed	3	.57	.24	.79	
Repetition	Cultural Background	15	.40	.27	.52	.39
	Autonomy-oriented	12	.42	.28	.54	
	Relatedness-oriented	3	.32	-.01	.58	
Evaluation	Cultural Background	13	.64	.53	.73	.86
	Autonomy-oriented	10	.65	.52	.74	
	Relatedness-oriented	3	.62	.32	.81	

Note. k = number of studies; r = mean effect size. $^{+}$ $p < .1$

Figure 4.1

The PRISMA Diagram



4.8 Supplements

Supplement 1

Table S1

PRISMA Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	36
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	39
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	40-45
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	45-46
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	46
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	47-48
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	46-47
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	46-47 Supplement 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	48-49 Supplement 2
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	48-49
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Supplement 2 Table 4.3
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	49
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	49-53

Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	49-53
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	49-53
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	52-53 Table S2
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	53 Figure 4.1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	54-60 Table 4.1 Table 4.2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	56 Table S3 Table S4
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Table 4.1 Table 4.2 Table 4.4 Table S3 Supplement 5
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	54-60 Table 4.5
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	54-60
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	54-60 Table 4.6
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	60-64
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	64-67
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	67-68
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	-

Supplement 2

Search Strategy

Electronic Database Search

PsycINFO

#1: memor* OR recall OR remembering
2: reminiscing OR conversation
3: mother OR maternal
4: 1 AND 2 AND 3

#5: Limit Research to “Preschool age and School (6-12)”, “English”

Medline

#1: memor* OR recall OR remembering
2: reminiscing OR conversation
3: mother OR maternal
4: 1 AND 2 AND 3

#5: Limit Research to “Preschool child and Child (6-12)”, “English”

PubMed

#1: memor* OR recall OR remembering
2: reminiscing OR conversation
3: mother OR maternal
4: child* OR preschool*
#5: 1 AND 2 AND 3 AND 4

Scopus

#1: memor* OR recall OR remembering
2: reminiscing OR conversation
3: mother OR maternal
4: child* OR preschool*
#5: 1 AND 2 AND 3 AND 4

#6: Limit research to “English”

ProQuest Dissertation & Theses Global

#1: memor* OR recall OR remembering
2: reminiscing OR conversation
3: mother OR maternal
4: 1 AND 2 AND 3

#5: Limit research to “English”

Decision Rules for Estimates and *P* Values

1. If both unadjusted and adjusted (i.e., for covariates) analyses are provided, select the former.
2. If only adjusted associations are available, extract the simplest model with the least covariates.
3. When exact p-value is not quoted:
    a. Attempt to calculate p-value from available data (e.g., estimate + confidence interval is reported, or using estimate + exact n for specific analysis is reported), if this is not possible:
        i. Allocate a non-significant association a *p* value of 0.5
        ii. Allocate a significant association the *p*-value boundary that was reported (e.g., if p-value is reported as "<.05", p-value is assigned value of .05).
4. For the purpose of meta-analysis, if a sample size for a specific analysis (e.g., subgroup analysis) is not reported, use the *n* that is reported for the overall articles at the time point child memory response was assessed
5. If the sample was divided into age groups for the analysis, the results for each age group is included in the analysis but calculated as a unit of analysis in CMA if the participants in these age groups were repeatedly measured (e.g., mothers with two children).
6. If the analysis is performed for girls and boys separately, both values are included, but calculated as a unit of analysis in CMA if the participants in these age groups were repeatedly measured (e.g., mothers with two children).
7. If the articles report results using the same measures but for independent samples (e.g., United States, New Zealand, China) all of the associations are included.
8. If the article presents the results with categorical variables, always select the most extreme comparison results.
9. If the article reports cross-sectional association at several time points, the results for each time point was entered into CMA to generate a mean effect size for these time points.
10. If longitudinal associations are examined, extract the association with longest time-period between the predictor and outcome variables being measured.
11. When two different articles sharing the same sample of participants have results for the same variable:
    a. Select the article with the longest follow-up period
    b. Select the article with unadjusted results
    c. Select the association that uses the most robust measurement tool

When an article has multiple results that contribute to the same variable, select the variable that have greatest magnitudes of measurement (e.g., reminiscing elements frequency is preferred over the reminiscing elements proportion in the case of memory talk)

Supplement 3

Table S2

Cultural Group Comparison Results

Study Name	Study Location	Individualism Score	Ethnicity	SES
Autonomy-Oriented				
Reese et al., 1993	USA	91	Caucasian	M
Haden, 1998	USA	91	Caucasian	M
Lewis, 1999	USA	91	Caucasian	M
Wang et al., 2000 (USA)	USA	91	Caucasian	M/UM
Fivush & Vasudeva, 2002	USA	91	Caucasian	M
Fivush et al., 2003	USA	91	Caucasian	M
Burch et al., 2004	USA	91	Caucasian	M/UM
Rudek, 2004	USA	91	Caucasian	M/UM
Sales et al., 2003	USA	91	Caucasian	Mixed
Wang & Fivush, 2005(USA)	USA	91	Caucasian	M
Shin, 2007(USA)	USA	91	Caucasian	M
Bauer et al., 2007	USA	91	Caucasian	M/UM
Larkina & Bauer, 2010	USA	91	Caucasian	M/UM
Sahin, 2011	USA	91	Caucasian	M/UM
Melzi et al., 2011(USA)	USA	91	Caucasian	M/UM
Kulkofsky, 2011	USA	91	Mixed	-
Bauer & Larkina, 2014	USA	91	Caucasian	M/UM
Langley, 2013	USA	91	Mixed	Low
Stone, 2014	USA	91	-	-
Leyva et al., 2009	USA	91	Mixed	Low
Reese & Brown, 2000	New Zealand	79	Caucasian	-
Reese, 2008	New Zealand	79	Caucasian	M/W
Farrant & Reese, 2000	New Zealand	79	Caucasian	M
Cleveland & Reese, 2005	New Zealand	79	Caucasian	M/W
Reese & Cleveland, 2006	New Zealand	79	Caucasian	M/W
Coppola et al., 2014	Italy	76	Caucasian	M
Schröder et al., 2011(Sweden)	Sweden	71	Caucasian	M
Tõugu et al., 2011(Sweden)	Sweden	71	Caucasian	M
Schröder et al., 2011(Germany)	Germany	67	Caucasian	M
Tõugu et al., 2011(Germany)	Germany	67	Caucasian	M
Schröder et al., 2012(Germany)	Germany	67	Caucasian	M
Schröder et al., 2013a(Germany)	Germany	67	Caucasian	M
Schröder et al., 201b(Germany)	Germany	67	Caucasian	M
Schröder et al., 2011(Estonia)	Estonia	60	Caucasian	M
Tõugu et al., 2011(Estonia)	Estonia	60	Caucasian	M
Autonomy-Relatedness Oriented				
Schröder et al., 2012 (India)	India-Delhi†	48	South Asian	M
Schröder et al., 2013b (India)	India-Delhi^	48	South Asian	M
Schröder et al., 2013b (Costa Rica)	Costa Rica-San Jose^	15	Latin American	M
Schröder et al., 2013b (Carmeroon-U)	Cameroon-urban Nso^	n/a	African	M
Relatedness-Oriented				
Reese & Neha, 2015	New Zealand	79	Māori*	-
Schröder et al., 2013b(India-R)	India-rural	48	South Asian	Low
Sahin, 2011(Turkey-I)	Turkey-Izmir	37	Turks	M/UM

Sahin, 2011(Turkey-G)	Turkey-Gaziantep	37	Turks	M/UM
Schröder et al., 2013b(Greece)	Greece	35	Greeks	M
Schröder et al., 2013a(Mexico)	Mexico	30	Latin American	M
Wang et al., 2000 (China)	China	20	East Asian	M/UM
Wang & Fivush, 2005 (China)	China	20	East Asian	M
Wang, 2007	China	20	East Asian	M
Kulkofsky et al., 2009 (China)	China	20	East Asian	M
Shin, 2007 (Korea)	Korea	18	East Asian	M
Melzi et al., 2011 (Peru)	Peru	16	Peruvian	M
Schröder et al., 2013a (Costa Rica)	Costa Rica	15	Latin American	M
Schröder et al., 2011(Cameroon-R)	Cameroon-rural	n/a	African	L
Schröder et al., 2013b(Cameroon-R)	Cameroon-rural	n/a	African	L

Note. † India is suggested by Hofstede Insights as a society with both collectivistic and individualistic traits.
* Reese & Neha (2015)'s study is categorized into the relatedness-oriented group, based on Māori culture has a strong emphasis on the social origin in terms of connections to other family members across generations.
^ Identified by the authors as "autonomy-relatedness" cultural background.

Supplement 4

Table S3

Methodological quality of cross-sectional studies of included in qualitative analysis

Criteria	*Haden, 1998*	*Lewis, 1999*	*Reese & Brown, 2000*	*Fivush & Vasudeva, 2002*	*Sales et al., 2003*	*Burch et al., 2004*	*Leyva et al., 2009*	*Reese, 2008*	*Larkina & Bauer, 2010*	*Kulkofsky, 2011*	*Coppola et al., 2014*	*Stone, 2014*
Participants												
Source population well described?	Y	NR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eligible population representative of the source population?	CD	CD	Y	Y	Y	Y	Y	Y	Y	Y	Y	CD
Method of sample selection well-described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sample size sufficient for the study aims and to warrant the conclusion drawn?	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y
Data collection												
Inter-rater bias reduced in the transcription of mother-child reminiscing?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Research Methodology												
Research methodology clearly stated at a level of detail that would allow its replication?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Confounding Variable												
Confounding variables identified and controlled?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was this control adequate to justify author's conclusion?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Analytical Methods												
Analytical methods appropriate for all outcomes?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sub-group analyses pre-specified?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Outcome												
The outcome clearly stated and discussed in relation to the data collection?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
All the results clearly outlined?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Confounding variables accounted for?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Conclusion accurately reflect the analysis?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Any suggestions provided for further areas to research?	NR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
External Validity												
Were the results of the study can be generalized to a broader population?	N	N	N	N	Y	N	Y	N	N	Y	N	Y
Overall Quality Rating (High, Low, or Unclear)	L	L	L	L	L	L	L	L	L	L	L	L

Criteria	*Brown, 2006*	*Reese & Neha, 2015*	*Wang et al., 2000*	*Wang & Fivush, 2005*	*Kulkofsky et al. 2009*	*Tõugu et al. 2011*	*Schröder et al. 2011*	*Melzi et al, 2011*	*Schröder et al. 2013*	*Schröder et al. 2013b*	*Shin, 2007*	*Sahin, 2011*
Participants												
Source population well described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eligible population representative of the source population?	Y	CD	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Method of sample selection well-described?	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sample size sufficient for the study aims and to warrant the conclusion drawn?	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Data collection												
Inter-rater bias reduced in the transcription of mother-child reminiscing?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Research Methodology												
Research methodology clearly stated at a level of detail that would allow its replication?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Confounding Variable												
Confounding variables identified and controlled?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was this control adequate to justify author's conclusion?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Analytical Methods												
Analytical methods appropriate for all outcomes?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sub-group analyses pre-specified?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Outcome												
The outcome clearly stated and discussed in relation to the data collection?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
All the results clearly outlined?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Confounding variables accounted for?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Conclusion accurately reflect the analysis?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Any suggestions provided for further areas to research?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
External Validity												
Were the results of the study can be generalized to a broader population?	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y
Overall Quality Rating (High, Low, or Unclear)	L	L	L	L	L	L	L	L	L	L	L	L

Note. L= low risk of bias; *Y*=Yes; *N*=No; *NR*= Not Reported; *CD*= Cannot Determine.

Table S4

Methodological quality of longitudinal studies of included in qualitative analysis

Criteria	*Reese et al., 1993*	*Rudek, 2004*	*Wang, 2007*	*Farrant & Reese, 2000*	*Cleveland & Reese, 2005*	*Reese & Cleveland, 2006*	*Bauer et al., 2007*	*Schroder et al.,2012*	*Bauer & Larkina, 2014*	*Langley, 2013*
Participants										
Source population well described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eligible population representative of the source population?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Method of sample selection well-described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sample size sufficient for the study aims and to warrant the conclusion drawn?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Data collection										
Inter-rater bias reduced in the transcription of mother-child reminiscing?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Research Methodology										
Research methodology clearly stated at a level of detail that would allow its replication?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was the period of follow-up sufficient to see the desired effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was loss to follow-up after baseline 20% or less?	Y	Y	Y	Y	Y	Y	Y	NR	Y	N
Confounding Variable										
Confounding variables identified and controlled?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was this control adequate to justify author's conclusion?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Analytical Methods										
Analytical methods appropriate for all outcomes?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sub-group analyses pre-specified?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Outcome										
The outcome clearly stated and discussed in relation to the data collection?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
All the results clearly outlined?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Confounding variables accounted for?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Conclusion accurately reflect the analysis?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Any suggestions provided for further areas to research?	NR	Y	NR	Y	Y	Y	Y	Y	Y	Y
External Validity										
Were the results of the study can be generalized to a broader population?	N	Y	Y	Y	Y	Y	N	Y	N	Y
Overall Quality Rating (High, Low, or Unclear)	L	L	L	L	L	L	L	L	L	L

Note. L= low risk of bias; *Y*=Yes; *N*=No; *NR*= Not Reported; *CD*= Cannot Determine.

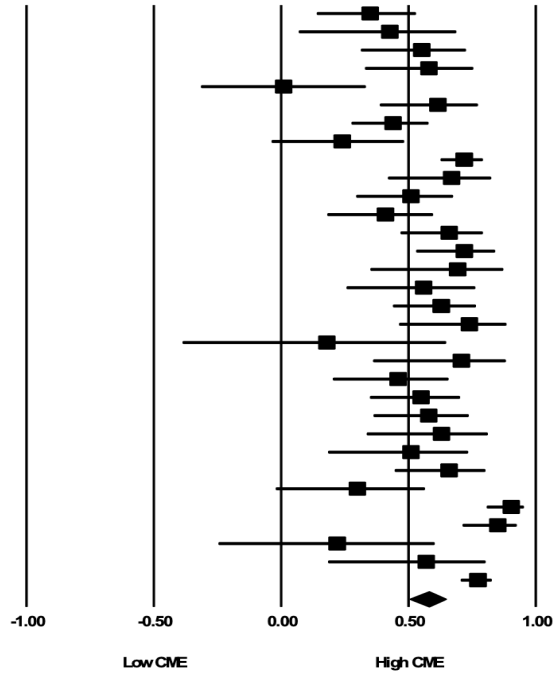
Supplement 5

Meta-Analysis Outputs

Maternal Elaborativeness

Forest plot of the Concurrent Association between Maternal Elaborativeness and Child Memory Elaboration (CME)

Study name	Subgroup within study	Outcome	Time point	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Bauer & Larkina, 2014	Blank	Blank	Blank	0.350	0.140	0.530	3.186	0.001
Bauer et al., 2007	Blank	Combined	Combined	0.427	0.068	0.688	2.305	0.021
Burch et al., 2004	Blank	Combined	Blank	0.553	0.312	0.726	4.079	0.000
Coppola et al., 2014	Blank	Combined	Blank	0.581	0.329	0.756	4.037	0.000
Fivush & Vasudeva, 2002	Blank	Blank	Blank	0.010	-0.315	0.333	0.058	0.954
Haden, 1998 ^	Combined	Blank	Blank	0.616	0.387	0.773	4.543	0.000
Kulkofsky et al., 2009	Blank	Blank	Blank	0.440	0.275	0.579	4.885	0.000
Kulkofsky, 2011	Blank	Combined	Blank	0.240	-0.038	0.484	1.696	0.090
Langley, 2013	Blank	Blank	Combined	0.720	0.625	0.793	10.267	0.000
Lewis, 1999	Blank	Blank	Blank	0.670	0.419	0.826	4.366	0.000
Leyva et al., 2009	Blank	Blank	Blank	0.510	0.294	0.676	4.249	0.000
Melzi et al., 2011	Blank	Blank	Blank	0.410	0.181	0.597	3.374	0.001
Reese & Cleveland, 2006	Blank	Blank	Combined	0.660	0.468	0.793	5.441	0.000
Reese & Neha, 2015	Blank	Blank	Blank	0.720	0.530	0.841	5.595	0.000
Reese et al., 1993	Blank	Blank	Combined	0.694	0.350	0.873	3.420	0.001
Reese, 2008	Blank	Blank	Blank	0.560	0.257	0.763	3.349	0.001
Rudek, 2004	Blank	Blank	Combined	0.629	0.439	0.765	5.385	0.000
Schroder et al., 2011-rural Nso	Blank	Blank	Blank	0.740	0.463	0.885	4.143	0.000
Schroder et al., 2013a-Guanajuato	Blank	Blank	Blank	0.180	-0.388	0.649	0.604	0.546
Schroder et al., 2013a-Onsnabruck	Blank	Blank	Blank	0.708	0.361	0.883	3.424	0.001
Schroder et al., 2013b-autonomy	Blank	Blank	Blank	0.460	0.202	0.658	3.336	0.001
Schroder et al., 2013b-auto-related	Blank	Blank	Blank	0.550	0.348	0.703	4.750	0.000
Schroder et al., 2013b-relatedness	Blank	Blank	Blank	0.580	0.362	0.738	4.590	0.000
Shin, 2007-korea	Blank	Blank	Blank	0.630	0.336	0.812	3.707	0.000
Shin, 2007-u.s.	Blank	Blank	Blank	0.510	0.183	0.735	2.924	0.003
Tougu et al., 2011-stockholm	Blank	Blank	Blank	0.660	0.445	0.803	4.951	0.000
Tougu et al., 2011-tallin	Blank	Blank	Blank	0.300	-0.022	0.565	1.831	0.067
Wang & Fivush, 2005-china	Blank	Combined	Blank	0.904	0.807	0.954	7.772	0.000
Wang & Fivush, 2005-u.s.	Blank	Combined	Blank	0.851	0.711	0.926	6.671	0.000
Wang et al., 2000-china	Blank	Blank	Blank	0.220	-0.247	0.604	0.922	0.356
Wang et al., 2000-u.s.	Blank	Blank	Blank	0.570	0.183	0.804	2.747	0.006
Wang, 2007	Blank	Blank	Combined	0.774	0.705	0.828	13.251	0.000
				0.578	0.504	0.643	12.386	0.000

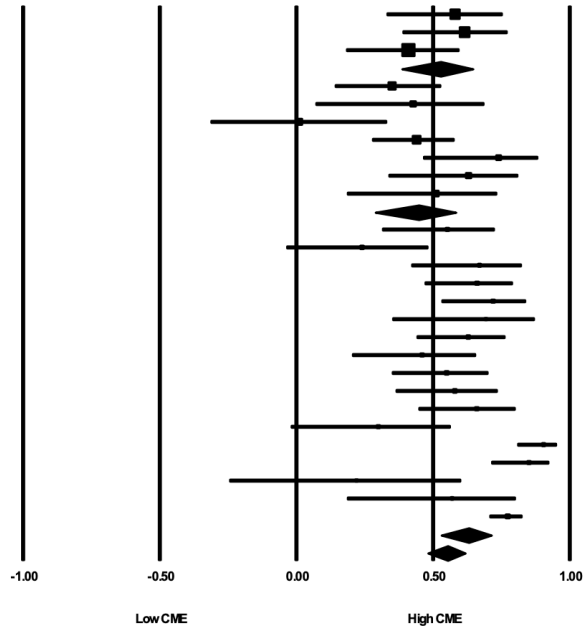


Note. ^ subgroups were combined in this study because mothers were repeatedly measured in older sibling and younger sibling groups.

Maternal Elaborativeness

Concurrent Associations between Maternal Elaborativeness and Child Memory Elaboration (CME) Grouped by Calculation Method

Group by Calculation Method	Study name	Subgroup within study		Time point	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Classification Analyses	Coppola et al., 2014	Blank	Combined	Blank	0.581	0.329	0.756	4.037	0.000
Classification Analyses	Haden, 1998 ^	Combined	Blank	Blank	0.616	0.387	0.773	4.543	0.000
Classification Analyses	Melzi et al., 2011	Blank	Blank	Blank	0.410	0.181	0.597	3.374	0.001
Classification Analyses					0.525	0.383	0.643	6.375	0.000
Elaboration Ratio	Bauer & Larkina, 2014	Blank	Blank	Blank	0.350	0.140	0.530	3.186	0.001
Elaboration Ratio	Bauer et al., 2007	Blank	Combined	Combined	0.427	0.068	0.688	2.305	0.021
Elaboration Ratio	Fivush & Vasudeva, 2002	Blank	Blank	Blank	0.010	-0.315	0.333	0.058	0.954
Elaboration Ratio	Kulkofsky et al., 2009	Blank	Blank	Blank	0.440	0.275	0.579	4.885	0.000
Elaboration Ratio	Schroder et al., 2011-rural Nso	Blank	Blank	Blank	0.740	0.463	0.885	4.143	0.000
Elaboration Ratio	Shin, 2007-korea	Blank	Blank	Blank	0.630	0.336	0.812	3.707	0.000
Elaboration Ratio	Shin, 2007-u.s.	Blank	Blank	Blank	0.510	0.183	0.735	2.924	0.003
Elaboration Ratio					0.445	0.285	0.580	5.080	0.000
Total Elaboration	Burch et al., 2004	Blank	Combined	Blank	0.553	0.312	0.726	4.079	0.000
Total Elaboration	Kulkofsky, 2011	Blank	Combined	Blank	0.240	-0.038	0.484	1.696	0.090
Total Elaboration	Lewis, 1999	Blank	Blank	Blank	0.670	0.419	0.826	4.366	0.000
Total Elaboration	Reese & Cleveland, 2006	Blank	Blank	Combined	0.660	0.468	0.793	5.441	0.000
Total Elaboration	Reese & Neha, 2015	Blank	Blank	Blank	0.720	0.530	0.841	5.595	0.000
Total Elaboration	Reese et al., 1993	Blank	Blank	Combined	0.694	0.350	0.873	3.420	0.001
Total Elaboration	Rudek, 2004	Blank	Blank	Combined	0.629	0.439	0.765	5.385	0.000
Total Elaboration	Schroder et al., 2013b-autonomy	Blank	Blank	Blank	0.460	0.202	0.658	3.336	0.001
Total Elaboration	Schroder et al., 2013b-auto-related	Blank	Blank	Blank	0.550	0.348	0.703	4.750	0.000
Total Elaboration	Schroder et al., 2013b-relatedness	Blank	Blank	Blank	0.580	0.362	0.738	4.590	0.000
Total Elaboration	Tougu et al., 2011-stockholm	Blank	Blank	Blank	0.660	0.445	0.803	4.951	0.000
Total Elaboration	Tougu et al., 2011-tallin	Blank	Blank	Blank	0.300	-0.022	0.565	1.831	0.067
Total Elaboration	Wang & Fivush, 2005-china	Blank	Combined	Blank	0.904	0.807	0.954	7.772	0.000
Total Elaboration	Wang & Fivush, 2005-u.s.	Blank	Combined	Blank	0.851	0.711	0.926	6.671	0.000
Total Elaboration	Wang et al., 2000-china	Blank	Blank	Blank	0.220	-0.247	0.604	0.922	0.356
Total Elaboration	Wang et al., 2000-u.s.	Blank	Blank	Blank	0.570	0.183	0.804	2.747	0.006
Total Elaboration	Wang, 2007	Blank	Blank	Combined	0.774	0.705	0.828	13.251	0.000
Total Elaboration					0.627	0.528	0.710	9.613	0.000
Overall					0.550	0.479	0.615	12.414	0.000

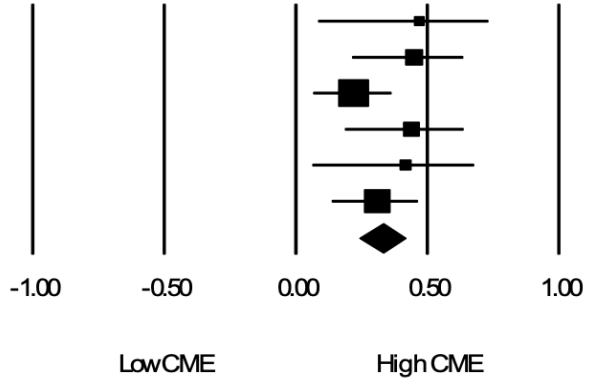


Note. ^ subgroups were combined in this study because mothers were repeatedly measured in older sibling and younger sibling groups.

Maternal Elaborativeness

Forest plot of the longitudinal association between Maternal Elaborativeness and Child Memory Elaboration (CME)

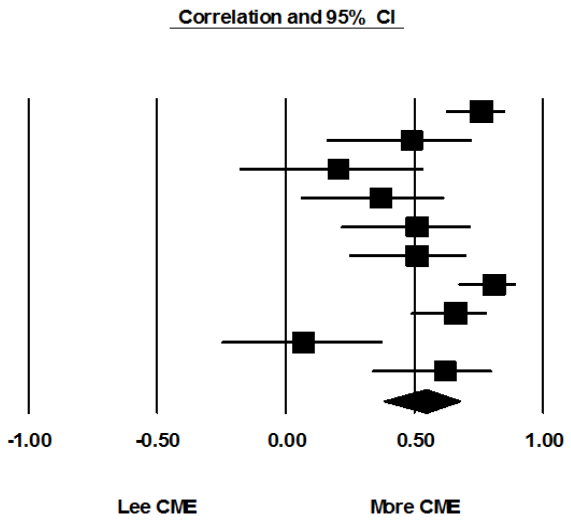
Study name	Outcome	Statistics for each study				
		Correlation	Lower limit	Upper limit	Z-Value	p-Value
Reese et al., 1993	Blank	0.470	0.082	0.734	2.337	0.019
Rudek, 2004	Blank	0.450	0.212	0.637	3.529	0.000
Wang, 2007	Blank	0.220	0.064	0.366	2.739	0.006
Cleveland & Reese, 2005	Blank	0.440	0.184	0.640	3.237	0.001
Bauer et al., 2007	Combined	0.418	0.061	0.680	2.269	0.023
Langley, 2013	Blank	0.310	0.135	0.467	3.392	0.001
		0.329	0.240	0.412	6.904	0.000



Maternal Open-ended Elaboration

Forest plot of the Concurrent Association between Maternal Open-ended Elaboration and Child Memory Elaboration (CME)

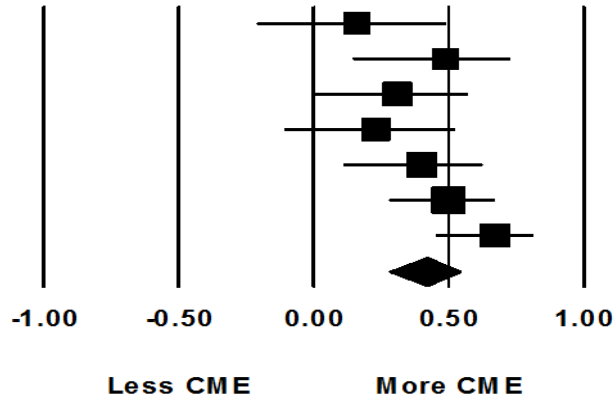
Study name	Outcome	Time point	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Rudek, 2004	Blank	Combined	0.760	0.622	0.853	7.260	0.000
Shin, 2007-u.s.	Combined	Blank	0.490	0.158	0.723	2.787	0.005
Shin, 2007-korea	Combined	Blank	0.206	-0.181	0.537	1.043	0.297
Tougu et al., 2011-estonia	Blank	Blank	0.370	0.057	0.617	2.298	0.022
Tougu et al., 2011-germany	Blank	Blank	0.510	0.213	0.721	3.183	0.001
Tougu et al., 2011-swden	Blank	Blank	0.510	0.244	0.705	3.514	0.000
Reese & Neha, 2015	Blank	Blank	0.810	0.669	0.895	6.947	0.000
Farrant & Reese, 2000	Blank	Blank	0.660	0.484	0.785	5.880	0.000
Reese & Brown, 2000	Blank	Blank	0.070	-0.251	0.377	0.421	0.674
Larkina & Bauer, 2010	Blank	Blank	0.620	0.334	0.801	3.767	0.000
			0.542	0.379	0.672	5.716	0.000



Maternal Close-ended Elaboration

Forest plot of the Concurrent Association between Maternal Close-ended Elaboration and Child Memory Elaboration (CME)

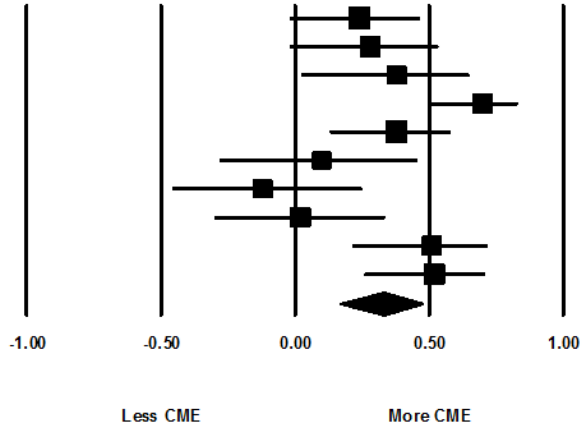
Study name	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Shin, 2007-U.S	0.160	-0.213	0.492	0.839	0.402
Shin, 2007-Korea	0.490	0.143	0.730	2.680	0.007
Tougu et al., 2011-Estonia	0.310	-0.011	0.573	1.896	0.058
Tougu et al., 2011-Germany	0.230	-0.112	0.523	1.325	0.185
Tougu et al., 2011-Sweden	0.400	0.109	0.628	2.646	0.008
Farrant & Reese, 2000	0.500	0.278	0.672	4.074	0.000
Reese & Brown, 2000	0.670	0.450	0.814	4.864	0.000
	0.417	0.277	0.540	5.440	0.000



Maternal Elaborative Statements

Forest plot of the Concurrent Association between Maternal Elaborative Statements and Child Memory Elaboration (CME)

Study name	Subgroup within study	Time point	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Farrant & Reese, 2000	Blank	Blank	0.240	-0.020	0.469	1.815	0.069
Haden, 1998^	Combined	Blank	0.281	-0.021	0.536	1.830	0.067
Larkina & Bauer, 2010	Blank	Blank	0.380	0.023	0.651	2.079	0.038
Reese & Brown, 2000	Blank	Blank	0.700	0.493	0.832	5.204	0.000
Rudek, 2004	Blank	Combined	0.378	0.128	0.583	2.898	0.004
Shin, 2007-Korea	Blank	Blank	0.100	-0.284	0.456	0.502	0.616
Shin, 2007-U.S	Blank	Blank	-0.120	-0.460	0.251	-0.627	0.531
Tougu et al., 2011-Estonia	Blank	Blank	0.020	-0.302	0.338	0.118	0.906
Tougu et al., 2011-Germany	Blank	Blank	0.510	0.213	0.721	3.183	0.001
Tougu et al., 2011-Sweden	Blank	Blank	0.520	0.257	0.711	3.599	0.000
			0.328	0.166	0.473	3.857	0.000

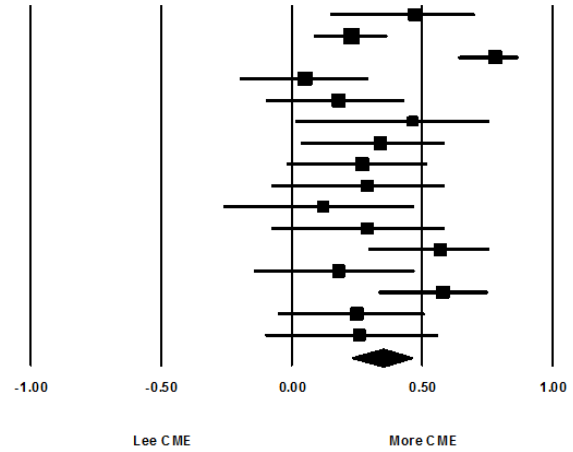


Note. ^ subgroups were combined in this study because mothers were repeatedly measured in older sibling and younger sibling groups.

Maternal Repetition

Forest plot of the Concurrent Association between Maternal Repetition and Child Memory Elaboration (CME)

Study name	Subgroup within study	Outcome	Time point	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Lewis, 1999	Blank	Blank	Blank	0.470	0.145	0.703	2.747	0.006
Wang, 2007	Blank	Blank	Combined	0.230	0.082	0.368	3.011	0.003
Schroder et al., 2013b-Autnonomy	Blank	Blank	Blank	0.780	0.637	0.871	7.013	0.000
Schroder et al., 2013b-Auto Related	Blank	Blank	Blank	0.050	-0.202	0.296	0.384	0.701
Schroder et al., 2013b-Related	Blank	Blank	Blank	0.180	-0.101	0.434	1.261	0.207
Reese et al., 1993	Blank	Blank	Combined	0.464	0.012	0.758	2.008	0.045
Reese & Brown, 2000	Blank	Blank	Blank	0.340	0.032	0.589	2.154	0.031
Burch et al., 2004	Blank	Combined	Blank	0.270	-0.022	0.520	1.819	0.069
Shin, 2007-U.S.	Blank	Blank	Blank	0.290	-0.078	0.589	1.551	0.121
Shin, 2007-Korea	Blank	Blank	Blank	0.120	-0.265	0.472	0.603	0.547
Larkina & Bauer, 2010	Blank	Blank	Blank	0.290	-0.078	0.589	1.551	0.121
Tougu et al., 2011-Sweden	Blank	Blank	Blank	0.570	0.292	0.759	3.663	0.000
Tougu et al., 2011-Estonnia	Blank	Blank	Blank	0.180	-0.148	0.472	1.077	0.282
Reese & Neha, 2015	Blank	Blank	Blank	0.580	0.332	0.753	4.084	0.000
Haden, 1998^	Combined	Blank	Blank	0.250	-0.054	0.512	1.615	0.106
Reese, 2008	Blank	Blank	Blank	0.260	-0.104	0.563	1.408	0.159
				0.347	0.229	0.456	5.479	0.000

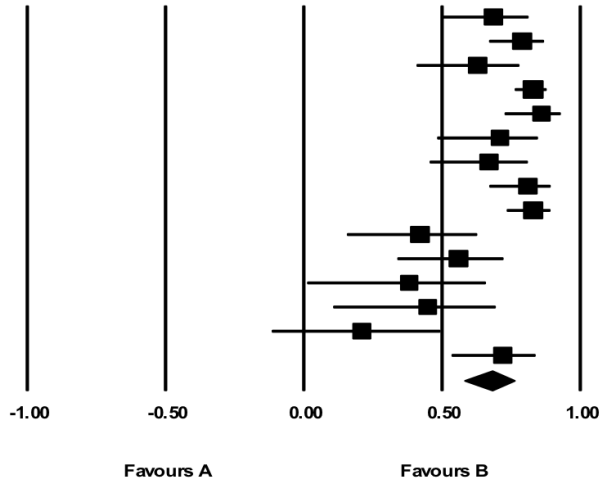


Note. ^ subgroups were combined in this study because mothers were repeatedly measured in older sibling and younger sibling groups.

Maternal Evaluation

Forest plot of the Concurrent Association between Maternal Evaluation and Child Memory Elaboration (CME)

Study name	Subgroup within study	Outcome	Statistics for each study				
			Correlation	Lower limit	Upper limit	Z-Value	p-Value
Burch et al., 2004	Blank	Combined	0.686	0.495	0.814	5.514	0.000
Farrant & Reese, 2000	Blank	Blank	0.790	0.668	0.871	7.946	0.000
Haden, 1998^	Combined	Blank	0.629	0.406	0.782	4.683	0.000
Kulkofsky et al., 2009	Blank	Blank	0.830	0.761	0.880	12.290	0.000
Larkina & Bauer, 2010	Blank	Blank	0.860	0.724	0.932	6.720	0.000
Lewis, 1999	Blank	Blank	0.710	0.480	0.849	4.778	0.000
Reese & Brown, 2000	Blank	Blank	0.670	0.453	0.812	4.932	0.000
Reese & Neha, 2015	Blank	Blank	0.810	0.669	0.895	6.947	0.000
Schroder et al., 2013b-Auto Related	Blank	Blank	0.830	0.732	0.894	9.126	0.000
Schroder et al., 2013b-Autonomy	Blank	Blank	0.420	0.154	0.629	3.003	0.003
Schroder et al., 2013b-Related	Blank	Blank	0.560	0.336	0.724	4.384	0.000
Shin, 2007-Korea	Blank	Combined	0.382	0.010	0.661	2.010	0.044
Shin, 2007-U.S.	Blank	Combined	0.448	0.105	0.696	2.506	0.012
Tougu et al., 2011-Estonia	Blank	Blank	0.210	-0.118	0.496	1.261	0.207
Tougu et al., 2011-Sweden	Blank	Blank	0.720	0.533	0.840	5.668	0.000
			0.678	0.578	0.757	9.799	0.000

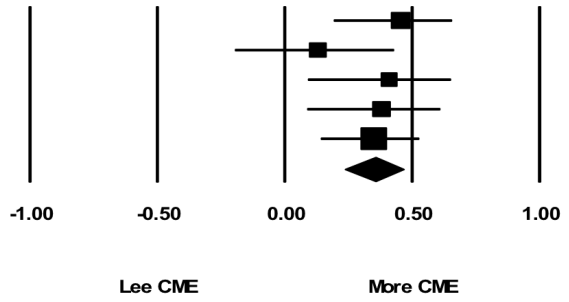


Note. ^ subgroups were combined in this study because mothers were repeatedly measured in older sibling and younger sibling groups.

Maternal Deflection

Forest plot of the Concurrent Association between Maternal Deflection and Child Memory Elaboration (CME)

Study name	Outcome	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Burch et al., 2004	Combined	0.455	0.190	0.659	3.223	0.001
Tougu et al., 2011-Estonia	Blank	0.130	-0.198	0.432	0.773	0.439
Tougu et al., 2011-Germany	Blank	0.410	0.089	0.654	2.464	0.014
Tougu et al., 2011-Sweden	Blank	0.380	0.086	0.613	2.498	0.012
Bauer & Larkina, 2014	Blank	0.350	0.140	0.530	3.186	0.001
		0.353	0.234	0.462	5.535	0.000



CHAPTER 5: Study 2

Investigating whether Maternal Memory Specificity is Indirectly Associated with Child Memory Specificity through Maternal Reminiscing

(Paper 2)

5.1 Declaration for Chapter 5

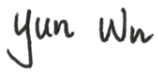
Declaration of the Candidate: In the case of Chapter Five, the nature and extent of my contribution to the work was the following:

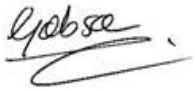
Nature of Contribution	Extent of Contribution
Discussion of ideas expressed in the manuscript, data coding, manuscript write-up	40%

The following co-authors contributed to the work:

Name	Nature of Contribution
Laura Jobson	*Conceptualisation, literature review, data coding, analysis, and manuscript write-up*
Kimberly Burford	*Data collection*
Breana Burns	*Data collection*
Amelia Baldry	*Data collection*

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate and co-authors' contributions to this work.

Candidate's Signature: 

Main Supervisor's Signature: 

Original article

Investigating whether Maternal Memory Specificity is Indirectly Associated with Child Memory Specificity through Maternal Reminiscing

Authors:

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This chapter constitutes a manuscript published in *Memory* and is formatted in accordance with requirements set by the journal, which included a structured abstract. References have been changed to APA citation format to be consistent with the remainder of the thesis.

Jobson, L., Burford, K., Burns, B., Baldry, A., & Wu, Y. (2018). Investigating whether maternal memory specificity is indirectly associated with child memory specificity through maternal reminiscing. *Memory, 26*(10), 1335-1343. doi:10.1080/09658211.2018.1474929

5.2 Abstract

Maternal reminiscing and remembering has a profound influence on the development of children's autobiographical remembering skills. The current study investigated the relationships between maternal memory specificity, maternal reminiscing and child memory specificity. Participants consisted of 40 mother-child dyads. Children's age ranged between 3.5 and 6 years. Mothers and children participated in individual assessments of autobiographical memory specificity. Dyads participated in a joint reminiscing task about three past emotional (happy, sad, stressful) events. A positive moderate association was found between maternal autobiographical memory specificity and child autobiographical memory specificity. Maternal autobiographical memory specificity was significantly correlated with mothers' focus on the task, involvement and reciprocity, resolution of negative feelings, and structuring of narratives in the mother-child reminiscing task. Moderate positive associations were found between maternal focus and structuring and child memory specificity. There was no evidence to suggest maternal elaborative reminiscing style was significantly positively correlated with mother or child memory specificity. Finally, there was support for an indirect pathway between maternal memory specificity and child memory specificity through quality of support and guidance provided by the mother in maternal reminiscing. Theoretical and clinical implications are considered.

Keywords: *Autobiographical memory*, *mother-child reminiscing*, *overgeneral memory*, *memory specificity*

5.3 Introduction

Autobiographical memory is fundamental to human functioning (Conway & Pleydell-Pearce, 2000). Considerable attention has been given to one feature of autobiographical remembering; the ability to provide specific autobiographical memories of one-time personally experienced events (Williams et al., 2007). Difficulties in retrieving specific autobiographical memories, a phenomenon known as overgeneral memory (OGM), has important implications for the functionality of everyday cognition and is closely associated with psychopathology of emotion (Williams et al., 2007). Importantly, OGM has been found to elevate risk for psychological distress, signify vulnerability to depression, and independently predict poorer depression and posttraumatic stress disorder symptom outcomes (Gibbs & Rude, 2004; Kleim & Ehlers, 2008; Sumner, Griffith, & Mineka, 2010; Van Daele, Griffith, Van den Bergh, & Hermans, 2014; van Minnen, Wessel, Verhaak, & Smeenk, 2005). Notably, OGM has also been observed and implicated in depression maintenance in children and adolescents (see Hitchcock, Nixon, & Weber, 2014, for review). Moreover, emerging evidence indicates that OGM may be a vulnerability factor for depression in young people (e.g., Champagne et al., 2016; Hipwell, Sapotichne, Klostermann, Battista, & Keenan, 2011; Rawal & Rice, 2012). Given OGM is associated with emotional disorders and difficulties in managing challenging life experiences (Kuyken & Dalgleish, 2011), researching the normative development of memory specificity is imperative (Valentino et al., 2014).

The social-cultural developmental theory of autobiographical memory posits parent-child reminiscing (i.e., the conversations between parents and their children about past events) is critical in the emergence and construction of autobiographical memory in the early years of life (Fivush, 2011; Nelson & Fivush, 2004). Thus, mother's (as often the primary caregiver) reminiscing with the child may be especially pivotal to understanding the

normative development of memory specificity (Valentino, 2011). While almost all mothers reminisce with their preschool aged children about shared past experiences, there are profound individual differences in the way in which this is performed and such differences influence children's development of autobiographical memory (see Fivush, 2011, for a review). Research has shown that mothers differ in their reminiscing style (i.e., the way in which mothers talk about past events with their child), with some mothers demonstrating a highly elaborative style, whilst other mothers demonstrating a low elaborative style (Fivush, 2007, 2011). High elaborative reminiscing style is generally accompanied by more frequent use of elaborative questions (i.e., open-end questions, yes-no questions) that encourage the child to recall further information, elaborative statements that provide the child with new information about the shared past event and evaluative feedback that provides positive affirmation of the child's contribution to the narrative (e.g., Fivush, Haden, & Reese, 2006; see also Fivush, 2007, 2011). In turn, mothers who engage in a high elaborative reminiscing style tend to have children who are capable of discussing the past in a more elaborative and detailed manner, when compared to children of mothers who engage in low elaborative style (e.g., Fivush et al., 2006; Reese & Newcombe, 2007). Research has demonstrated that maternal reminiscing style is a consistent behaviour across time (e.g., Reese, Haden, & Fivush, 1993).

Research investigating individual differences in maternal reminiscing style has predominantly focused on the quantitative variability (e.g., the frequency of use of elaborative statements, questions, positive affirmation) in mothers' verbal behaviour (Reese & Brown, 2000; Reese & Neha, 2015; Tõugu, Tulviste, Schröder, Keller, & De Geer, 2011). By frequently using these utterance types, mothers can provide an effective structure for the child's narrative (Leyva, Reese, Grolnick, & Price, 2009). However, just because a mother is elaborative does not ensure she is supportive and open to the child's point of view during

reminiscing, and encouraging of child recall (Cleveland & Reese, 2005; Larkina & Bauer, 2010). Therefore, researchers have also considered the observed qualities of maternal reminiscing style that encourage children's interest and engagement in reminiscing, such as autonomy support (Cleveland & Reese, 2005; Leyva et al., 2009), supportive guidance (Larkina & Bauer, 2010) and emotional coherence (Fivush, Berlin, McDermott Sales, Mennuti-Washburn, & Cassidy, 2003; McDonnell, Valentino, Comas, & Nuttall, 2016; Wang & Fivush, 2005). A mother's enthusiasm for sharing memories, her ability to respond to her child's need in an appropriate manner and her emotional support in conversations can influence the child's involvement in talking about the past and predict children's independent remembering (Larkina & Bauer, 2010). A maternal reminiscing style that scaffolds an organized and coherent narrative of past emotional events has been found to be associated with children being able to make better sense of the discussed experience and aids understanding of how the experience fits into the child's autobiography (Bird & Reese, 2006). The emotional coherence of maternal reminiscing may therefore assist children in integrating memories into autobiography thereby improving connections between memories, which, may improve later retrieval (Fivush, 2011).

The manner in which a child develops their autobiographical memory skills is, therefore, profoundly influenced by the way in which a mother reminisces about past events. Given, substantial research has demonstrated that mother's elaborative reminiscing has an important influence on child's memory elaboration (see Fivush, 2007, 2011), it is conceivable that mother's level of memory specificity is associated with child's memory specificity. It is timely that research focuses on child memory specificity in the preschool period because research has predominantly focused on child memory elaboration (i.e., the child's ability to provide new memory information). Specifically, studies that have investigated the characteristics of child autobiographical memory have mainly observed child memory

characteristics in the context of mother-child reminiscing of events, in which the events have been selected for the child (Valentino et al., 2014). The gold-standard assessment of memory specificity involves individuals independently being asked to provide specific memories in response to emotion cue words (Williams & Broadbent, 1986). This approach allows for evaluation of child memory independent of mother and with a focus on specific memory retrieval, irrespective of level of detail or elaboration provided by the mother and child (Valentino et al., 2014).

Maternal memory specificity is likely to be associated with the way in which a mother reminisces about past experiences. Autobiographical memories are proposed to be stored hierarchically with general summaries of broad categories of lifetime periods at the top and increasingly specific details of individual events lower down. Voluntary retrieval of specific event details typically requires navigating down this hierarchy and is cognitively effortful (see Conway & Pleydell-Pearce, 2000). Therefore, a specific autobiographical memory style indicates that an individual routinely employs a remembering style that retrieves more specific and better integrated event memories and is non-avoidant of specific affect-laden memories (Williams et al., 2007). A specific autobiographical memory style is therefore likely to be associated with an elaborative, supportive and coherent style of reminiscing about past personal (including emotional) experiences. While this theoretical account of autobiographical remembering is routinely used to account for memory specificity, and thus was adopted here, it is important to note that these commonly held beliefs about the retrieval of autobiographical memories have recently been challenged (e.g., Uzer & Brown, 2017). The argument has been made elsewhere that difficulties recalling specific memories (i.e., OGM) could be in part the consequence of maladaptive mother-child reminiscing (e.g., Bosmans, Dujardin, Raes, & Braet, 2013; Valentino, 2011). Through collaborative reminiscing children learn to be competent in retrieving appropriate information about

specific past episodes (i.e., specific autobiographical memories) (Larkina & Bauer, 2010). Valentino (2011; Valentino et al., 2014) outlines that high elaborative maternal reminiscing is likely to aid the development and retrieval of specific remembering in children because it functions as a rehearsal of event specific information, facilitates an organized and coherent narrative of past emotional events, and promotes the discussion of the causes and consequences of emotion. The quality of supportive guidance provided by the mother during reminiscing is also proposed to support the development of memory specificity as it helps children learn to represent, understand and attribute meaning to their personal experiences (e.g., Fivush, 2011; Koren-Karie, Oppenheim, & Getzler-Yosef, 2008; Laible & Thompson, 1998). Thereby, aiding the integration and contextualization of autobiographical memories and appropriate engagement with affect-laden memories; processes posited as integral to specific autobiographical remembering (see Williams et al., 2007).

Despite these assertions, and the importance of the development of memory specificity, little research has considered mother-child reminiscing and autobiographical memory specificity (Bosmans et al., 2013). Bosmans and colleagues (2013) found, in a sample of young adolescents, that perceived communication with mother was related to autobiographical memory specificity. However, this study focused on the period of adolescence and mother-child communication was assessed using self-report rather than observational data (i.e., coding of mother-child reminiscing), as most commonly used in this area of research. As far as we are aware, Valentino and colleagues (e.g., McDonnell et al., 2016; Valentino et al., 2014) have conducted the only study examining maternal-reminiscing and memory specificity in pre-schoolers. They demonstrated that maternal reminiscing (particularly the quality of supportive guidance in reminiscing) was significantly associated with preschool age children's autobiographical memory specificity (Valentino et al., 2014).

The aim of the current study was to investigate the relationships between mother and child memory specificity and maternal reminiscing style. We hypothesized that maternal specificity would be associated with child specificity. Second, we hypothesized that maternal specificity would be associated with maternal reminiscing (both elaborative reminiscing style and supportive guidance in reminiscing). Third, we aimed to explore the associations between maternal reminiscing and child memory specificity. We hypothesized, based on the findings of Valentino et al. (2014), that maternal reminiscing, and in particular maternal supportive guidance in reminiscing, would be significantly associated with child memory specificity. Fourth, we hypothesized that maternal memory specificity would be indirectly associated with child memory specificity through maternal reminiscing (i.e., maternal memory specificity would influence child memory specificity through maternal reminiscing style).

5.4 Method

5.4.1 Participants

Forty mother-child (16 girls) dyads participated in the study. The mean age of mothers was 37.43 years (*SD*= 5.61 years; range 28-50 years) and mean age of the children was 5.0 years (*SD*= 1.06 years; range 3.5-6 years). The sample was majority Caucasian (90%; Asian-10%). Mothers and children were recruited through local child-care centres, advertisements placed around the general community, social media and by word of mouth. Inclusion criteria were mothers had to have a child aged between 3.5-6 years of age and both mother and child had to be able to complete the tasks in English. Given the reliance on language in the reminiscing and memory tasks, as in Valentino et al. (2014), participants were excluded if mother's language, as measured using the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007), was more than two standard deviations below the mean of the standardization sample. No dyads were excluded because of these factors.

5.4.2 Measures

5.4.2.1 Mother-child reminiscing

Adopting a similar protocol to that utilized in the maternal-child reminiscing literature, mother-child dyads were asked to discuss several events in response to positive and negative cues. In this research area, studies vary in the number of tasks dyads are asked to discuss (e.g., Fivush et al., 2003; Valentino et al., 2014; Wang & Fivush, 2005). Despite this variation, what has been shown to be important is the discussion of both negative and positive events, as differences in parental reminiscing have been found when reminiscing about positive and negative events (e.g., Sales, Fivush, & Peterson, 2003). In the current study mothers were first asked to write down three past shared events that they considered to be a 'happy', a 'sad' and an 'acutely stressful' event. Adopting a similar procedure to Valentino and colleagues (2014), all dyads sat in a quiet room and were instructed to discuss each of the three events in turn with their child "as if they were at home." The experimenters were not present during this time. All dyads discussed the happy event first followed by the other two events, which were counterbalanced. Participants typically completed the reminiscing task in 5-15 minutes. The reminiscing task was audio-recorded and transcribed verbatim.

5.4.2.2 Autobiographical memory test (AMT)

The gold-standard test of memory specificity is the AMT (Williams & Broadbent, 1986). We used the written format (Debeer, Hermans, & Raes, 2009). Participants were given a booklet containing 5 positive and 5 negative cue words: *confidence (trust), scared, pleasurable, angry, courage, sad, calm (at ease), bold, surprised, stupid*. Each cue word was printed on a separate page. Participants received the minimal set of instructions (Debeer et al., 2009); participants were asked to generate memories in response to the cues, without stressing that these should be specific. All of the cues were presented in the sentence ''Can

you write down an event that the word X reminds you of?''. There were no examples or practice items provided. Participants were given 30 seconds to write down a memory in response to each cue. Participants were instructed to not use an event from the past week or one that had been used for a previous cue word. Minimal instruction was selected as it was designed for use with non-clinical populations and assesses an individual's memory style (i.e., their tendency towards retrieving memories in a more or less specific way) (Griffith et al., 2012).

5.4.2.3 Autobiographical memory test-preschool version (AMT-PV)

The AMT-PV (Nuttall, Valentino, Comas, McNeill, & Stey, 2014) was used to assess child memory specificity. Derived from the original AMT (Williams & Broadbent, 1986), the AMT-PV is specifically designed for preschool aged children and the cue words are developmentally appropriate. The AMT-PV contains 5 positive and 5 negative cues which were presented in an oral and visual form in the following order: *happy, mad, surprised, sad, lucky, scared, strong, tired, smart, hungry*. The researcher asked the child to provide a specific memory of an event in response to each cue (e.g., "Can you think of one time you felt x and tell me about it?"). The child was given 60 seconds to respond to each cue word, and when necessary prompted for a specific memory with the sentence "Can you think of just *one* time you felt that way?". The task was audio-recorded. All recordings were transcribed verbatim.

5.4.2.4 Peabody picture vocabulary test - fourth edition (PPVT-4)

The PPVT-4 (Dunn & Dunn, 2007) was used to assess vocabulary in both the mothers and children. It is an individually administered, standardized, norm-referenced test that can be administered to participants aged from 2 to 90^{+} years old.

5.4.3 Coding and Reliability

All coding was carried out by two independent coders who were blind to the study's aims and hypotheses.

5.4.3.1 Mother-child reminiscing task

As used in Valentino et al. (2014), the mother-child reminiscing task transcripts were coded for both elaborative reminiscing style and supportive guidance (hereon called 'maternal support') in reminiscing. Elaborative reminiscing style was coded using a frequency-based scheme in which each utterance (subject-verb proposition) was coded. Utterances were coded for the use of *wh*-questions (open-ended elaborative questions), yes/no questions (close-ended questions), elaborative statements (utterances that provided the child with new information about the event) and confirmation (maternal positive affirmation of child contributions to the discussion). The total number of each type of elaborative reminiscing style variable (*wh*-questions, close-ended questions, elaborative statements and confirmations) made by each mother was tallied for each event discussion. Interrater reliability was assessed for all the transcripts and intraclass correlation coefficients exceeded .96.

Maternal support in reminiscing of the three-event discussion was coded using the Autobiographical Emotional Events Dialogue scheme (AEED; Koren-Karie, Oppenheim, Haimovich, & Etzion-Carasso, 2000). The AEED is a series of Likert scales (ranged from 1 to 9, with high scales indicating higher levels of the behaviour) used, as in Valentino et al. (2014), to rate (1) Focus on the task (mother stays focused on the task and on the child's experiences), (2) Acceptance and tolerance (mother shows openness and encouragement of the child's emotions and ideas), (3) Involvement and reciprocity (mother is genuinely interested in the child and contributes positively to the task), (4) Resolution of negative feelings (mother steers negative events/emotions towards positive resolutions that focus on

the child's strengths), and (5) Structuring (mother guides and supports her child to provide coherent, rich structured narratives). Two additional scales related to the overall structure and coherence of the interaction: (1) Adequacy of the stories (the discussed events matched the emotions dyads were asked to describe), and (2) Coherence (dyads worked together to construct coherent stories). Reliability was acceptable (all intra-class coefficients exceeded .78).

6.4.3.2 AMT and AMT-PV

The first memory provided in response to a cue word was coded as either specific (scored as 1) or overgeneral (scored as 0). Specific memories were defined as those memories that occurred within the course of one day and referred to a particular event. Overgeneral memories were classified as repeated events or events that lasted for extended periods of time (Valentino et al., 2014). An omission was defined as the participant not providing a memory in response to a cue and was coded as 0. Following previous research, our analyses focused on total number of specific memories (Valentino et al., 2014). Interrater reliability was excellent (AMT κ=.96; AMT-PV κ=.94).

5.4.4 Procedure

Ethics approval was obtained from the Monash Human Research Ethics Committee. Each mother-child dyad completed one laboratory session, which took approximately 120 minutes. After obtaining informed consent, mothers were asked to complete a questionnaire booklet which contained the AMT and demographic questions. Whilst the mothers were completing their questionnaires, the second researcher administered the AMT-PV with the child. Following this, mothers and children participated in the joint-reminiscing task. The reminiscing task was always administered after completion of the AMT and AMT-PV so as not to influence responses (Valentino et al., 2014). The PPVT-4 was administered last. Following testing, participants were debriefed and thanked for their time. The children were

given a small token of appreciation (magnifying glass) and mothers were entered into a prize draw for a chance to win one of two movie tickets.

5.4.5 Data analysis plan

Data screening revealed that one mother-child dyad did not complete the reminiscing task. It was decided to retain this dyad in the study as all other data for this dyad was complete, and, therefore, this dyad was only excluded when addressing hypotheses related to the maternal reminiscing variables. An analysis of scatterplots revealed that there were no outliers in the data. However, as shown in Table 5.1, several violations of normality were present. In order to address the issue of non-normal data, transformations were conducted. However, this did not alter the skew of distributions or the relationships with other variables in a meaningful way. Therefore, for *Hypotheses 1-3*, the bootstrapping method was chosen as the technique for conducting the correlation analyses given that bootstrapping is considered a robust non-parametric method for dealing with problems of non-normal data (Field, 2018)[1]. In all hypotheses-related analyses outlined below, bootstrapping with 5000 resamples with replacement was used (Preacher & Hayes, 2008). When interpreting mean effect sizes, Cohen's (1992) guidelines were employed, whereby *r* of at least .10= *small,* .30= *medium*, and .50= *large*.

For *Hypothesis 4*, a multiple mediation analysis (Preacher & Hayes, 2008) examined whether there was an indirect relationship between maternal memory specificity and child memory specificity via maternal reminiscing (maternal support in reminiscing and elaborative reminiscing style). This analysis was conducted using bootstrapping procedures recommended for smaller samples (Preacher & Hayes, 2008). Analyses were conducted using the macro for SPSS that estimates path coefficients in a multiple mediator model, facilitates

[1] We also conducted the analyses using non-parametric analyses and a similar pattern of findings emerged.

the use of non-parametric bootstrapping and generates bootstrap confidence intervals (Preacher & Hayes, 2008). In our analyses we used 5,000 bootstrap resamples of the data with replacement. Child PPVT scores and child age were included as covariates (Valentino et al., 2014). Statistical significance (α=.05) was indicated by the 95% confidence intervals not crossing zero.

5.5 Results

Descriptive statistics are presented in Table 5.1. As there was no significant difference between the elaborative reminiscing variables scored in association with the 'sad' and 'stressful' events, the sad and stressful events were combined and averaged to provide 'negative event' scores[2]. The variables *wh*-questions, $t(37)=3.60$, $p= .001$, $d= .51$, and confirmations, $t(37)=3.92$, $p< .001$, $d= .67$, were significantly higher for the happy event when compared to the negative event. The maternal support in reminiscing ratings were considered overall across all three events, as done in previous research (Valentino et al., 2014) and instructed by the AEED manual (Koren-Karie et al., 2000).

5.5.1 Hypothesis 1: maternal memory specificity and child memory specificity

Given the relatively broad child age range employed in the current study, we controlled for age in the following analysis. We found that while maternal memory specificity was not significantly correlated with child memory specificity, $r(37)=.30$, $p=.06$, 95%CI [$-.04 < r < .66$], a moderate positive association was observed3. When we also controlled for child receptive vocabulary this relationship was slightly smaller, $r(36)=.25$, $p=.13$, 95%CI [$-.07 < r < .60$].

[2] We also conducted the analyses keeping the three event types separate and a similar pattern of results emerged.

[3] A similar finding emerged when age was not included as a covariate, $r(38)=.29$, $p=.07$, 95%CI[$-.04<r< .62$]

5.5.2 Hypothesis 2: maternal memory specificity and maternal reminiscing

Correlation analyses were used to explore the relationships between maternal memory specificity and maternal reminiscing variables. Results are displayed in Table 5.2. Support for *Hypothesis 2* was mixed. In terms of elaborative reminiscing style, for both the negative and happy events, maternal memory specificity was not significantly correlated with any of the maternal elaborative variables, with negligible to small effects observed. In terms of maternal support in reminiscing, as predicted, maternal memory specificity was significantly correlated with the variables; focus, involvement, closure and structuring, with moderate effect sizes observed.

5.5.3 Hypothesis 3: child memory specificity and maternal reminiscing

As in *Hypothesis 1*, given the relatively broad child age range employed in this study, partial correlation analyses, controlling for child age, were conducted to examine the relationships between maternal reminiscing and child memory specificity (see Table 5.2). We found no support for *Hypothesis 3* in terms of elaborative reminiscing style; negligible non-significant correlations were found between child memory specificity and maternal elaborative reminiscing variables. In terms of maternal support in reminiscing, as predicted, positive significant correlations were found between focus and structuring and child memory specificity, with moderate effect sizes observed. Negligible to small non-significant positive correlations were found between the other variables and child autobiographical memory specificity. When we also controlled for child receptive vocabulary a similar pattern of results emerged.

5.5.4 Hypothesis 4: mediation analysis

To test this hypothesis, we created two composite variables of reminiscing. The four elaborative reminiscing variables were averaged together to form an elaborative reminiscing composite variable (α=.76) and the five maternal support variables were averaged together to

form a maternal support composite variable (α=.92). As shown in Table 5.2, there was a moderate, positive, significant association between the maternal support composite variable and maternal memory specificity. The correlation between the maternal support composite variable and child memory specificity was small, positive and non-significant. The correlations between elaborative reminiscing composite variable and both maternal memory specificity and child memory specificity were negligible and non-significant. There was a large, positive association between the two reminiscing composite scores, $r(37)= .53$, $p =.001$, 95%CI [.28, .72].

A multiple mediation analysis (Preacher & Hayes, 2008) examined whether there was an indirect effect of maternal memory specificity via maternal support in maternal reminiscing and elaborative reminiscing style on child memory specificity (Table 5.3). The 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect for maternal support in reminiscing was, *LL*=.002, *UL*=.45, suggesting that there was an indirect effect of maternal specificity via maternal support in reminiscing on child memory specificity. There was no evidence to suggest that there was an indirect effect of maternal specificity via elaborative maternal reminiscing on child memory specificity, *LL*=-.19, *UL*=.20.

5.6 Discussion

The current study investigated the relationships between mother and child memory specificity and maternal reminiscing style. In regard to *Hypothesis 1*, while not significant, a positive moderate association was observed between child memory specificity and maternal memory specificity. For the first time, this provides preliminary support that the specificity of maternal and child autobiographical remembering may be associated. In support of *Hypothesis 2*, maternal memory specificity was significantly correlated with maternal focus, involvement, closure and structuring of the narrative in reminiscing, with moderate effect

sizes observed. Thus, mothers who engaged in specific autobiographical remembering also tended to be more likely during reminiscing with their child to focus on the task, be genuinely interested and involved in their child's story, guide their child towards positive resolutions and facilitate their child in providing rich and coherent stories. However, contrary to *Hypothesis 2*, maternal memory specificity was not significantly correlated with any of the maternal elaborative reminiscing variables, with negligible to small effects observed. Therefore, while maternal support in reminiscing was significantly associated with maternal memory specificity, there was no evidence to suggest that the higher elaborative reminiscing style was associated with greater maternal specificity. When considering *Hypothesis 3*, there were significant moderate positive associations between child memory specificity and both maternal focus on the task and structuring. However, there was no evidence to suggest that maternal elaborative style was positively associated with child memory specificity. Finally, as predicted, we found that there was an indirect effect of maternal specificity via maternal guidance and support in reminiscing on child memory specificity. There was no evidence to suggest that there was an indirect effect of maternal specificity via elaborative reminiscing style on child memory specificity (*Hypothesis 4*).

It is worth firstly considering our findings in light of Valentino and colleagues' (2014) results. Valentino and colleagues found that maternal guidance and support, but not elaborative reminiscing style, was related to child memory specificity. In the current study we similarly found evidence for maternal support and guidance in reminiscing being associated with child memory specificity but no support for elaborative reminiscing style being associated with child memory specificity. Additionally, our findings furthered Valentino's research by providing support for an indirect pathway between maternal memory specificity and child memory specificity through maternal guidance and support in reminiscing, but not through maternal elaborative reminiscing. Therefore, both studies highlight the important role

maternal guidance and support in reminiscing may play in child memory specificity. Furthermore, the findings of both studies suggest maternal elaborative reminiscing style may play less of a role. Thus, it seems that it is not the extent to which the mother facilitates rehearsal and elaboration of memory details that is associated with child memory specificity but rather the support and guidance provided by the mother that may be important to child memory specificity (Valentino et al., 2014).

Our finding of an indirect effect of maternal memory specificity on child memory specificity through maternal guidance and support in reminiscing is an important finding. It indicates for the first time that maternal guidance, support, and sensitivity in reminiscing may be one mechanism by which maternal memory specificity influences child memory specificity in this important developmental period. Mothers who have a specific memory retrieval style may influence their child's memory specificity indirectly by engaging in co-constructed dialogues that guide and support children's representation, understanding, organization and remembering of their emotional experiences in a meaningful way (Bird & Reese, 2006; Koren-Karie et al., 2008; Laible & Thompson, 1998). This is consistent with previous accounts that suggest that a mother's enthusiasm for sharing memories, her ability to appropriately respond to her child's need and her emotional support in conversations can influence the child's independent remembering (Larkina & Bauer, 2010). Such support during reminiscing may aid the integration and contextualization of autobiographical memories and encourage appropriate engagement with affect-laden memories (Bird & Reese, 2006; Fivush, 2011); processes integral to specific autobiographical remembering (see Williams et al., 2007).

Unfortunately, the conclusions that can be drawn in relation to our elaborative reminiscing style findings are less clear. In many instances negligible to small associations were observed between elaborative reminiscing and memory specificity. It is surprising that

stronger relationships were not observed, given the immense literature demonstrating the importance of these variables on child memory development. However, our findings align with Valentino and colleagues' (2014) findings. Thus, it is possible that that elaborative reminiscing has differing relationships with child memory specificity and child memory elaboration. It is also possible that maternal elaboration style and maternal support in reminiscing play different roles in child's development of memory specificity (e.g., Leyva et al., 2009; Valentino et al., 2014). Additionally, it is possible that these findings reflect methodological differences. The use of AMT-PV, as an independent measure of child's remembering, differs in its measurement of child memory to the way in which child memory is assessed using the routinely employed reminiscing task. Specifically, the coding of child memory in the reminiscing task is influenced by the information provided by the mother (Valentino et al., 2014). It is premature to derive conclusions regarding the relationship between elaborative reminiscing and child memory specificity and thus, there is a clear need for further research in this area.

While this study provides preliminary findings in this area, it is important that research in this area continues as there are important potential applied implications. For instance, OGM has been observed in children and adolescents and has been implicated in depression maintenance even in young people (Hitchcock et al., 2014). Therefore, researching the normative development of memory specificity is imperative to better understand OGM. Furthermore, emerging research indicates that training programs targeting memory specificity can enhance memory specificity (Moradi et al., 2014; Neshat-Doost et al., 2012) and research indicates that teaching parents the elements of an elaborative reminiscing style can result in children providing richer memories during reminiscing (see Fivush, 2011). Therefore, it is important to further explore these relationships, as this may aid intervention development.

There are several limitations that need to be considered when interpreting the findings. First, the cross-sectional design means that causal interpretations cannot be drawn. Therefore, future longitudinal research is required. Second, our sample size was small and thus, the findings are somewhat exploratory. It is possible that a lack of significant findings and failure to replicate some of the findings from the original Valentino et al. (2014) paper (N= 95) were the result of limited power. Therefore, we have focused not only on significance of findings but also effect sizes. The study would benefit from replication with a larger sample size. Third, future research would benefit from examining how maternal psychopathology influences memory specificity and reminiscing style. Fourth, it is also important to consider self-understanding. The self has been found to be fundamental in autobiographical remembering (Conway & Pleydell-Pearce, 2000) and autobiographical remembering is linked to self-understanding as it aids self-definition, self-in-relation and self-regulation (Fivush, 2007). Moreover, Valentino and colleagues' conceptual model included the mediating effects of child positive self-concept as accounting for the associations between reminiscing and child memory specificity. While it was beyond the scope of the current investigation, future research should consider self-representation when investigating the variables examined in the current study. Finally, in the current study dyads discussed three past events. In Valentino and colleagues' study, dyads discussed four events with slightly differing topics to that used in the current study. Thus, our design reduced the range of observations which may have reduced power. Despite these limitations, our study found support for an indirect pathway between maternal memory specificity and child memory specificity through support and guidance of maternal reminiscing.

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Table 5.1

Means and Standard Deviations of Study Variables

Variable	Mean (SD)	Range	Skew	Kurtosis	Kolmogorov-Smirnov	Shapiro-Wilk
Mother memory specificity	5.82 (2.44)	1-10	-.19	-.61	.09	.97
Child memory specificity	3.95 (2.88)	0-9	.03	-1.32	.16*	.92*
Maternal Elaborative Reminiscing						
Happy Event						
Wh-questions	4.62(3.12)	0-10	.24	-1.21	.13	.93*
Yes/No questions	6.36 (4.25)	0-22	1.28	3.34	.16*	.91**
Elaborative Statements	5.18 (5.48)	0-25	1.89	3.90	.23**	.80**
Confirmations	5.15 (3.38)	0-15	1.09	1.62	.20*	.90**
Negative Event						
Wh-questions	3.25 (2.20)	0-8.50	.55	-.34	.13	.95
Yes/No questions	5.28 (2.78)	0-12	.46	-.31	.12	.97
Elaborative Statements	4.83 (4.31)	0-17	1.17	.61	.20**	.87**
Confirmations	3.16 (2.51)	0-10.50	1.15	1.33	.13	.91**
AEED						
Focus	6.72 (2.31)	1-9	-.87	-.37	.25**	.86**
Acceptance	7.28 (1.75)	1-9	-1.46	3.01	.20**	.85**
Involvement	7.00 (1.89)	1-9	-1.18	1.29	.24**	.86**
Closure	5.38 (1.87)	1-9	-.04	-.46	.14*	.96
Structuring	6.36 (1.91)	1-9	-.81	.24	.17**	.92**
Adequacy	6.64 (1.99)	2-9	-.38	-.78	.19**	.90**
Coherence	6.31 (2.03)	1-9	-.50	-.23	.17**	.94*

Note: AEED = Autobiographical Emotional Events Dialogue scheme. $^{*}p < .05$; $^{**}p < .01$

Table 5.2

Correlation Coefficients Between Maternal Reminiscing and Maternal and Child Memory Specificity

	Maternal Specificity		Child Specificity [a]	
	r	95%CI	*r*	95%CI
Maternal elaborative reminiscing Happy				
wh questions	-.02	-.31-.30	-.02	-.33-.27
Yes/No questions	.19	-.18-.45	.04	-.41-.38
Elaborative	-.26	-.51-.03	-.02	-.30-.36
Confirmations	.23	-.08-.51	.05	-.35-.41
Maternal elaborative reminiscing Negative				
wh questions	-.02	-.33-.29	-.06	-.37-.25
Yes/No questions	.15	-.16-.41	.03	-.29-.36
Elaborative	-.09	-.42-.24	-.08	-.37-.26
Confirmations	.08	-.27-.38	-.10	-.39-.17
Maternal supportive guidance in reminiscing				
Focus	.40**	.13-.65	.32+	-.02-.59
Acceptance	.27	-.17-.58	.05	-.32-.37
Involvement	.34*	.04-.55	.18	-.16-.47
Closure	.36*	.10-.64	.29	-.06-.55
Structuring	.36*	.07-.61	.33*	.06-.58
Overall Adequacy	.01	-.29-.28	.07	-.25-.35
Overall Coherence	.22	-.14-.51	.27	-.06-.52
Total Quantity	.02	-.33-.35	-.06	-.42-.29
Total Supportive	.40**	.07-.67	.28	-.07-.57

Note. Total supportive = Total maternal supportive guidance in reminiscing.

[a] Partial correlations were conducted, controlling for child's age.

+ p =.05, * p <.05; ** $p \leq .01$

Table 5.3

Summary of Results of the Mediation Analyses Where Maternal Memory Specificity is the Independent Variable, Maternal Reminiscing the Mediators and Child Memory Specificity the Dependent Variable and Child Age and Child Vocabulary (PPVT) as Covariates

	B	*SE*	*t*
Group to mediators (*a* paths)			
Reminiscing elaborative	-.03	1.63	.02
Reminiscing supportive	1.37	.53	2.55*
Direct effects of mediators on child memory specificity (*b* paths)			
Reminiscing elaborative	-.05	.02	2.82**
Reminiscing supportive	.12	.06	2.05*
Total effect of mother memory specificity on child memory specificity (*c* path)	.25	.16	1.54
Direct effect of mother memory specificity on child memory specificity (*c'* path)	.09	.17	.52
Partial effect of control variables on child memory specificity			
Child Age	.43	.35	1.24
Child PPVT	.09	.02	4.08**

Note. PPVT = Peabody picture vocabulary test - 4th edition. Supportive = maternal supportive guidance in reminiscing.
*p<.05; **p<.01 R^2=.45, F (4, 34) = 7.04, p< .001

CHAPTER 6: Study 3

Maternal Reminiscing and Autobiographical Memory Features of Mother-Child Dyads in a Cross-Cultural Context

(Paper 3)

6.1 Declaration for Chapter 6

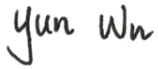
Declaration of the Candidate: In the case of Chapter Six, the nature and extent of my contribution to the work was the following:

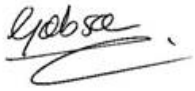
Nature of Contribution	Extent of Contribution
Conceptualisation, literature review, data collection, coding, analysis, and manuscript write-up	75%

The following co-authors contributed to the work:

Name	Nature of Contribution
Laura Jobson	*Discussion of ideas expressed in the manuscript, data analysis, and critical review of manuscript*
Zijing He	*Measures preparation, data collection, and review of manuscript*

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate and co-authors' contributions to this work.

Candidate's Signature: 

Main Supervisor's Signature: 

6.2 Abstract

Maternal reminiscing styles and mother-child memory features were examined in a cross-cultural context. Fifty-five Chinese (Guangzhou, China) and 48 Australian (Melbourne, Australia) mother-child dyads (child age: 3-6 years) independently retrieved autobiographical memories and jointly discussed past events. Australian mothers used greater elaborative and supportive reminiscing and provided more specific memories than Chinese mothers. Australian children provided greater memory elaboration than Chinese children, but they did not differ in memory specificity. Maternal reminiscing styles and cultural group were independently predictive of child memory elaboration but not specificity. Nonetheless, moderation analyses showed that the two maternal reminiscing styles (elaborative and supportive) interacted to predict child memory specificity. These findings indicate the importance of culture and types of reminiscing on memory development.

Keywords: maternal reminiscing, autobiographical memory, culture

6.3 Introduction

The ability to consciously remember personally experienced events and recall them as coherent narratives, plays an important role in defining identity, engaging in social interactions, and providing direction in life (Berntsen & Rubin, 2012; Bluck, 2003). Such memories, known as autobiographical memories, emerge in the early years of life (Reese, 2009). Though very young children can provide some memories of their lives, their ability to coherently construct stories of the past is not fully developed until the acquisition of more advanced language and memory skills, and importantly, the understanding of self and social processes (Fivush, 2011). As autobiographical memory is central to human functioning, researchers have had a substantial interest in understanding the emergence of autobiographical memory (Williams et al., 2007). Nelson and Fivush's (2004) social-cultural developmental theory has been particularly influential in guiding research in this area. An important assumption of this theory is that engaging in conversations with others (especially adults) is fundamental to the development of autobiographical memory. Through joint conversations about life experiences with others, children learn how and why things happen, and why certain experiences are personally meaningful. In turn, children gain the ability to connect discrete information about the past into a coherent autobiography (Bird & Reese, 2006). As parents are those primarily involved in conversations with their children, Nelson and Fivush proposed that parent-child reminiscing (i.e., the process by which parents and children construct interactive dialogues to discuss past events) is a critical component in facilitating the integration of children's experiences into autobiographical memories.

Guided by the social-cultural developmental theory, many researchers have used the concept of parent-child reminiscing (especially mother-child reminiscing) as a way to investigate the processes underpinning the development of child autobiographical memory. Research has identified maternal reminiscing style as a stable individual difference that

contributes to the marked individual differences in pre-schoolers' developing memory (Fivush, 2011). Maternal reminiscing style varies in two predominant ways; the way in which the mother structures and scaffolds the conversation (i.e., elaborative reminiscing style), and in the level of emotional coherence and sensitive guidance the mother shows for her child during reminiscing (i.e., supportive reminiscing style) (Larkina & Bauer, 2010; Valentino et al., 2014). In particular, the positive relationship between maternal elaborative reminiscing style and child memory elaboration (i.e., the ability to provide new and unique memory information) has been well-documented, both cross-sectionally and longitudinally (for a review, see Wu & Jobson, 2019). High elaborative maternal reminiscing style is characterized by frequent use of questions and statements that add richly detailed information to the ongoing narrative and positive evaluative feedback that encourages child participation (Fivush, Haden, & Reese, 2006). On the contrary, mothers with a less elaborative style tend to use repetitive questions with no new information and provide fewer details about past events (Fivush, 2011). Consequently, mothers with a high elaborative reminiscing style tend to have children who construct more elaborative narratives when compared to children of mothers with a low elaborative reminiscing style (Wang, 2007).

Moreover, a small but growing number of studies have demonstrated the equally important role of maternal supportive reminiscing style in child memory elaboration. Researchers have conceptualized maternal elaborative and supportive reminiscing as distinct and independent components of maternal reminiscing style. For example, Cleveland and Reese (2005) suggested that just because a mother is highly elaborative does not ensure she is also supportive and encouraging to her child during reminiscing. There is increasing evidence demonstrating that the extent of maternal supportive reminiscing is also positively associated with child memory elaboration (Cleveland & Reese, 2005; Larkina & Bauer, 2010; Reese, Meins, Fernyhough, & Centifanti, 2018).

While the critical role of maternal reminiscing in predicting child autobiographical memory is well-established (Waters, Camia, Facompré, & Fivush, 2019), this research has primarily focused on child memory elaboration (Nuttall, Valentino, Comas, McNeill, & Stey, 2014). It is important to note that autobiographical memory is multifaceted. For instance, researchers recently explicitly indicated that child memory specificity and memory elaboration were two distinct components of child autobiographical memory (Valentino, McDonnell, Comas, & Nuttall, 2018). Child memory elaboration often refers to children's ability to recall unique memory information about a past event and is typically assessed in shared reminiscing (Wu & Jobson, 2019). Whereas, child memory specificity reflects children's ability to independently generate and retrieve specific memories of personal events (i.e., memories of events happened on a particular day) and is often assessed in a series of questions using emotional cue word prompts (Valentino et al., 2014). Memory specificity has received considerable attention in the adolescent and adult literature, whereby the importance of memory specificity for daily cognitive functioning and wellbeing is well-documented, including in cross-cultural contexts (Dritschel, Kao, Astell, Neufeind, & Lai, 2011; Hitchcock, Nixon, & Weber, 2014; Jobson & Cheraghi, 2016; Williams et al., 2007). There is some evidence that specific autobiographical memories emerge in the preschool years and continue to develop throughout the middle childhood (Y. Chen, McAnally, & Reese, 2013; Piolino et al., 2007). However, current understanding of autobiographical memory specificity in young children is still limited.

In addition, very few studies have examined the factors contributing to the development of memory specificity in children (McDonnell, Valentino, Comas, & Nuttall, 2016). Valentino (2011) proposed a developmental model outlining the possible factors contributing to the typical and atypical development of child memory specificity. In particular, the model illustrated that there are certain risk and protective factors which operate at multiple levels of

ecology: macrosystem (e.g., culture practices), exosystem (e.g., community), microsystem (e.g., family environment), and ontogenic (e.g., early developmental challenges). Akin to the social-cultural developmental theory, Valentino predicts that mother-child reminiscing (within the microsystem) has a crucial role in shaping child memory specificity. In support of this theoretical model, several recent studies have found that maternal supportive reminiscing was significantly associated with child memory specificity (Jobson, Burford, Burns, Baldry, & Wu, 2018; Valentino et al., 2018; Valentino et al., 2014). However, maternal elaborative reminiscing, whilst related to child memory elaboration, was not directly related to child memory specificity (McDonnell et al., 2016). Instead, researchers have found that the association between maternal elaborative reminiscing and child memory specificity was only significant when mothers reminisced in an emotionally coherent, sensitive and supportive manner (Lawson, Valentino, Speidel, McDonnell, & Cummings, 2018; McDonnell et al., 2016). These findings suggest that maternal elaborative and supportive reminiscing may interact in their facilitation of child memory specificity (Lawson et al., 2018). Given research exploring child memory specificity is still relatively recent, with past studies focusing on at-risk children (e.g., Lawson et al., 2018; McDonnell et al., 2016; Valentino et al., 2018), further research is needed to understand the associations between maternal reminiscing and child memory specificity.

Additionally, while preschool-aged children tend to adopt their mothers' reminiscing style when recalling past experiences (Wu & Jobson, 2019), it remains unknown whether children's memory specificity also mirrors maternal memory specificity. It is widely accepted that the voluntary retrieval of specific event details is a cognitive effortful action that requires deliberate search and reconstruction of memory information (Aizpurua & Koutstaal, 2015). As children learn from their mothers what, how, and why to remember (Ross & Wang, 2010) and maternal elaboration is strongly associated with child memory elaboration, it seems

likely that maternal memory specificity is also significantly associated with child memory specificity. In support of this, Jobson and colleagues (2018) recently provided initial support for a positive moderate relationship between mother and child memory specificity. However, further research in this area is still needed. Therefore, based on these gaps in the literature, the current study investigated the relationships between maternal reminiscing and different child autobiographical memory features (elaboration and specificity) and the relationship between maternal memory specificity and child memory specificity.

As highlighted in the social-cultural development theory (Nelson & Fivush, 2004) and Valentino's (2011) model, the development of autobiographical memory is intimately intertwined with a child's social-cultural environment. The knowledge of social roles, individual goals, self-theories, and beliefs all shape individuals' interpretations of their behaviours and perspectives, thereby, enabling individuals to determine the retention of particular personal information that can sustain these belief systems (Berntsen & Rubin, 2012; Wang & Conway, 2004). For example, in Western cultural contexts (e.g., United States, Australia), where individual uniqueness and autonomy are highly valued (autonomy-oriented), autobiographical memories of specific events with distinct personal experiences are critical for individuals to distinguish themselves from others (Ho, Chen, Hoffman, Guan, & Iversen, 2013). As a result, individuals from these cultural contexts are particularly motivated to remember specific details so their unique identity can be cemented (Wang, Hou, Koh, Song, & Yang, 2018). Whereas in Asian cultural contexts (e.g., China, Japan), where conformity and a relational self are valued (relatedness-oriented), personal memories with idiosyncratic details are less prominent (Ho et al., 2013; Wang & Fivush, 2005). For this reason, individuals may avoid detailed memories of one's own experiences, as this may signal an excessive focus on oneself that is incongruent with cultural norms (Wang et al., 2018). Indeed, two decades of cross-cultural research has consistently demonstrated cultural

differences (particularly East Asian versus European American) in autobiographical memory recall, including maternal reminiscing style in shared recall (Ross & Wang, 2010).

Research has shown that mothers from autonomy-oriented cultural contexts (e.g., Germany, United States) tend to adopt a more elaborative reminiscing style and have greater focus on the child, than mothers from Asian relatedness-oriented cultural contexts (e.g., China, India) (Schröder, Kärtner, Keller, & Chaudhary, 2012; Schröder et al., 2013; Wang, 2007). As maternal reminiscing influences child autobiographical remembering, it is not surprising then that children of autonomy-oriented cultural contexts tend to provide more elaborate memories than children from relatedness-oriented cultural contexts (Schröder et al., 2013; Wang, 2007). Despite these observed cultural differences, research has found that maternal elaborative reminiscing is positively related to child memory elaboration, regardless of cultural context (Schröder et al., 2013; Wang, 2007). However, current knowledge in this area is still limited. For instance, there is a lack of studies that have cross-culturally examined the role of maternal supportive reminiscing on child memory development. Additionally, while recent studies have revealed that adults from autonomous cultural contexts tend to report more specific memories than adults from Asian relational cultural contexts (e.g., Jobson & Cheraghi, 2016), it remains unknown whether these cultural differences extend to child memory specificity in the preschool years. A few studies have found that the specificity of American children's memory contributions were greater than Chinese children in early preschool and elementary years (Wang, 2004, 2008). However, in these studies, child memory specificity was assessed within the context of mother-child reminiscing (where events were selected for the child and conversations were scaffolded by the mother) rather than examined in the child's independent recall (Nuttall et al., 2014). Hence, in the current study, we examined our aim—to investigate the relationships between maternal reminiscing

and different child autobiographical memory features (elaboration and specificity)—in two distinct cultural contexts.

6.3.1 The present study

The current study first aimed to examine cultural variations in maternal reminiscing and mother-child autobiographical memory features. Second, we aimed to explore cultural differences in the relationships between maternal reminiscing styles and mother-child memory features. Third, as Valentino's (2011) model is relatively new, we also aimed to test aspects of this model; specifically, how cultural group (macrosystem) and mother-child reminiscing (microsystem) predict child memory specificity in preschool years. To investigate these aims, we selected samples from China and Australia. Previous cross-cultural studies have predominately focused on cultural variations in East Asians and European-descent North Americans. While American and Australian samples have both been associated with autonomous values, cultural differences in the perceived satisfaction of autonomy have been found between these two cultural groups (Church et al., 2012). Thus, it is important to focus on other autonomous cultural groups beyond European North Americans. Further, while several studies have been conducted in China, these studies have all been conducted using mother-child dyads from Beijing. There is considerable linguistic, ethnic, cultural and geographic diversity in China. Therefore, there is a need to extend findings beyond Beijing. In an attempt to improve the generalizability of current cross-cultural findings, we selected a sample from Guangzhou, China (i.e., one of the largest cities in China located in the Southern Chinese province of Guangdong).

First, we hypothesized that there would be significant cultural differences in maternal reminiscing styles; Australian mothers would be significantly more elaborative and supportive in reminiscing than Chinese mothers (*Hypothesis 1*). Second, we predicted that Australian children would provide significantly more memory elaborations than Chinese

children during mother-child reminiscing (*Hypothesis 2*). While cross-cultural differences in pre-schoolers' independent memory specificity have not been examined, based on memory specificity research in adults, we hypothesized that Australian mothers and children would provide more specific memories than Chinese mothers and children *(Hypothesis 3*). Fourth, we predicted that maternal memory specificity would be significantly associated with child memory specificity (*Hypothesis 4*). Given a lack of cross-cultural research examining mother-child memory specificity, we were unable to predict how this association would vary as a function of cultural group. Finally, in line with the current theoretical accounts regarding the emergence of autobiographical memory (e.g., Fivush, 2011; Valentino, 2011), it was hypothesized that cultural group and maternal reminiscing would significantly predict children's memory elaboration and memory specificity in preschool years (*Hypothesis 5*).

6.4 Methods

6.4.1 Participants

A total of 103 mothers (*M*= 35.49 years, *SD*= 4.63 years) and their preschool-aged children (*M*= 52.12 months, *SD*= 13.16 months) from Melbourne, Australia and Guangzhou, China participated in the study. Participants were recruited through flyers, advertisements, social media adverts, and contacts with local preschools. The Australian sample consisted of 48 mother-child dyads, with the majority of mothers (83.3%) identifying as Caucasian. The Chinese sample consisted of 55 mother-child dyads, with 54 mothers identifying as Han Chinese and one mother identifying as Man Chinese (i.e., one of the 56 minority groups in China).

Table 6.1 presents the sample characteristics for each cultural group. As shown in Table 1, there were no significant group differences in children's mean age, linguistic skills or gender distribution. However, Chinese mothers were significantly younger than Australian mothers. Mothers from both cultural groups had a high degree of formal education, with at

least 80% of mothers holding an undergraduate degree or above. Notably, significantly more Australian mothers reported holding a postgraduate degree. In both groups, the majority of mothers were employed or self-employed. The two groups differed in terms of family models. Specifically, the Australian sample reported that only 'parents' were primarily involved in raising the child. In contrast, the Chinese sample reported 'mixed raising' models, with over half of the Chinese mothers reporting that both parents and grandparents were involved in raising the child. In addition, the majority of Chinese children came from one-child families, where most Australian children came from families with multiple children. All Australian mothers reported speaking English at home with their children. In the Chinese sample, 25 mothers reported speaking Mandarin at home with their children, 28 mothers reported speaking Cantonese at home with their children, and two mothers reported using both languages. Except for two Chinese mothers and one Australian mother, all mothers reported being the primary caregiver.

6.4.2 Materials

6.4.2.1 Autobiographical memory test (AMT)

The AMT (Williams & Broadbent, 1986) is the gold-standard laboratory measure of memory specificity. The AMT consists of 10 cue words (i.e., 5 positive and 5 negative). Participants were asked to retrieve a specific memory in response to each cue word. These cues words were presented in a fixed order: happy, sorry, safe, angry, interest, clumsy, success, hurt, surprise, and lonely. Participants were told that the event could have happened recently (but not within the past seven days) or a long time ago, and that could be important or trivial to them. Participants were requested to write about a different memory in response to each cue word. Given the sample was non-clinical, we adopted DeBeer and colleagues' (2009) AMT-minimal instructions. Thus, no examples or practice items were provided. For each cue, a time limit of 60 seconds was given. The Chinese version of AMT was obtained

from the translation provided in Liu and colleagues' (2010) meta-analysis. In the current study, both versions of the AMT demonstrated satisfactory internal consistency (Australia, Cronbach's α= .76; China, Cronbach's α= .69).

6.4.2.2 Autobiographical memory test-preschool version (AMT-PV)

The AMT-PV (Nuttall et al., 2014) is an adaptation of the original AMT designed to be developmentally appropriate for preschool children (i.e., includes more developmentally appropriate cue words). The AMT-PV consists of 10 cue words that are presented orally and visually in a fixed order to the children: happy, mad, surprised, sad, lucky, scared, strong, tired, smart, and hungry. Children were asked to generate a specific memory in response to each cue word (e.g., '*Think of one time that you felt…and tell me about it*'). The participants were given up to one minute to generate a specific memory and were prompted when necessary (i.e., '*Can you tell me just one time when you felt that way?*'). Researchers refrained from giving additional instructions or helping to explain the cue words. The cue words used in the Chinese version of AMT-PV were translated from Nuttall and colleagues' (2014) work: 高兴 (happy), 生气 (mad), 惊喜 (surprised), 难过 (sad), 幸运 (lucky), 害怕 (scared), 坚强 (strong), 厌烦 (tired), 聪明 (smart), 饥饿 (hungry). Cue words were translated and back-translated by the researchers involved in the current study, BLINDED and BLINDED (see *Supplemental Materials* for detailed information of the translation and examples of AMT-PV administration for the Chinese children). These words were orally presented by bilingual researchers in either Mandarin or Cantonese, depending on the dyads' self-reported predominant language used at home. The AMT-PV responses were audio-taped and subsequently transcribed verbatim for coding. The AMT-PV was found to be a reliable measure of child memory specificity in both samples (Australia, Cronbach's α= .87; China, Cronbach's α= .90).

6.4.2.3 Mother-child reminiscing

Following the procedure adopted in past cross-cultural mother-child reminiscing research (i.e., Wang, 2001), each dyad reminisced about four past shared events in which the child's emotion centred. Prior to the reminiscing task, mothers were asked to nominate on paper a happy, sad, mad and scared event that happened recently. Mothers were informed that the nomination aimed to facilitate the conversation flow during reminiscing. Mothers were also encouraged to select events that were distinctive and that spanned no longer than one day. Mothers were instructed to discuss the events with their children as natural as possible and for as long as they wish, without the researcher being present. The task typically lasted 5-10 minutes and the entire conversations were audio-taped and subsequently transcribed verbatim (see *Supplemental Materials* for an example of mother-child conversations of past events).

6.4.3 Coding

All coding was carried out by bi-lingual researchers who were blind to the study's aims and hypotheses, with 25% of the transcripts for each measure being coded by two independent coders, and inter-rater reliabilities were calculated.

6.4.3.1 AMT and AMT-PV

As is standard for coding of the AMT (Williams & Broadbent, 1986), participants' *first memory responses* to each cue word (prior to any researcher prompting) were coded for memory specificity. In line with previous cross-cultural AMT research (Dritschel et al., 2011; Jobson & Cheraghi, 2016), each response was coded according to whether it was a specific, extended, categorical, or semantic associate. Memories were coded as specific if the memories were of an event that occurred for no longer than a day (e.g., '*The day my daughter was born*'). Non-specific memories were qualified as either extended (memory of an extended period; e.g., '*Last year*'); categoric (memory of repeatedly occurring events; e.g.,

'*Taking a bath*'); and, semantic associates/non-memories (verbal association to the cue; '*My brother*'). A no response was classified as an omission. After rating each memory response, the frequency for each type of memory response was calculated. Following past research (Jobson et al., 2018; Valentino et al., 2014), in the current study number of specific memories was the focus of analyses. The memories were coded in their original language and coders were blind to the study's aims and hypotheses. Inter-rater reliability was good for both the Chinese coding (AMT *k*= .70, AMT-PV *k*= .71) and Australian coding (AMT *k*= .77, AMT-PV *k*= .86).

6.4.3.2 Mother-child reminiscing

As used in Valentino et al. (2014), the mother-child reminiscing transcripts were first coded for *maternal elaborative reminiscing style*. Maternal elaborative reminiscing was coded using the classic frequency-based scheme in which each utterance (i.e., subject-verb proposition) was coded (Reese, Haden, & Fivush, 1993). Thus, independent clauses were the coding unit for most codes, with each unique or implied verb in an independent clause forming a new proposition unit. Utterances were coded for the use of elaborative utterances (including *wh*-question, e.g., '*What emotion did you feel*?'; yes/no questions, e.g., '*Did you say anything?*'; elaborative statement, e.g., '*You also got to put make-up on*'; and confirmation, e.g., '*Yes, you're right!*'). For confirmation, instances of occurrence were used as coding units instead of independent clauses. Each maternal proposition unit was assigned as one of the utterance types mentioned above, in a mutually exclusive and exhaustive manner. The frequency for each type of maternal utterances was calculated and averaged across the four events discussed during reminiscing. To account for the potential differences in talkativeness, we also coded for the total number of utterances mothers used and averaged across the four events discussed. Children's utterances that provided new information about the past events being discussed were coded as *child memory elaboration*. Inter-rater

reliability was assessed for all of the transcripts and intraclass correlation coefficients exceeded .84 for the Australian transcriptions and .81 for the Chinese transcriptions.

Maternal supportive reminiscing was coded using Autobiographical Emotional Events Dialogue Scheme (AEED; Koren-Karie, Oppenheim, & Getzler-Yosef, 2008). The AEED is a series of Likert scales (ranging from 1 to 9, with high scales indicating higher levels of the behaviour), which assess the overall affective quality of mother-child conversation. Following Valentino et al. (2014) and Jobson et al. (2018), mothers were rated on their 1) focus on discussion of child's emotional experiences; 2) acceptance and tolerance to child's thoughts and feelings; 3) involvement and reciprocity to keep child engaged in conversation; 4) resolution of negative feeling and emphasis on child's coping, strength and wellbeing; 5) structuring and elaboration to assist child's provision of narratives; 6) adequacy of the narrative topics; and 7) coherence of the stories co-constructed. Inter-rater agreement between the two coders was established based on the instruction provided in the AEED manual. High agreement was obtained for each subscale in both the Australian sample (ranging from .75 to .92) and the Chinese sample (ranging from .73 to .87).

Following past studies that have investigated children's verbally accessible autobiographical memory (e.g., Valentino et al., 2014), child linguistic ability was also examined. Due to the cross-cultural nature of the current study, *child's mean length of utterance in words* (MLU-word; R. Brown, 1973) was used to examine children's linguistic skill at the time of the study. MLU-word is a very effective measure of young children's linguistic skill that can be readily and reliably used across various languages (Ezeizabarrena & Garcia Fernandez, 2018; Parker & Brorson, 2005). In line with past mother-child reminiscing studies that have used MLU-word cross-culturally (e.g., Wang, Leichtman, & Davies, 2000), Chinese children's utterances were translated to English by a bilingual researcher before coding, as it would be inappropriate to compare the number of Chinese

words (characteristics/syllables) with English words. Another trained bicultural researcher checked the translations (including gist and semantic details). The coding procedure followed Santos, Lynce, Carvalho, Cacela, and Mineiro (2015). Specifically, any sequence that was semantically interpretable and delimited by blank spaces or punctuation marks were defined as 'word'. The 'word' was only counted once, except for the cases in which the child repeated the word to stress an idea. Contractions, clitics, compounds, fixed expressions and onomatopoetic words were all counted as one word. Words that were intelligible or discourse auxiliaries (e.g., exclamations) were not counted. All MLU-word coding was first counted by a trained examiner and checked by another trained researcher. Inter-rater reliability exceeded the recommend 80% agreement and disagreements were resolved through discussion.

6.4.4 Procedure

Ethical approval was obtained by BLINDED (Australia) and BLINDED (China). Each mother-child dyad completed one 60-minute testing session together. Prior to the start of testing activities, mothers were provided with explanatory statements and signed consent forms were obtained. Mothers were told that the study was a cross-cultural study aiming to understand how children remember past experiences. Then mothers were asked to complete the questionnaire booklet which contained the AMT and demographic questions. Prior to the administration of AMT-PV, a 10-15 minute free-play time (with researchers) was given to assist the child in being comfortable with researchers. Whilst the mothers were completing the questionnaire, the researchers administered the AMT-PV to the child. During this time, the mother and child were both in the same room, but the researchers ensured the tasks were completed separately and independently. Following administration of these tasks, the mother and the child completed the joint-reminiscing task. The researchers were not present during this task and waited outside the room. Participants were offered breaks before and after the reminiscing task. Participants were debriefed and thanked for their time at the end of testing

sessions. Each mother who completed the study received $15 cash payment (¥100 for Chinese sample) and the child was given a small gift as a token of appreciation.

6.4.5 Data analysis plan

Data analyses were conducted using SPSS statistics version 25. Boxplots and histograms were inspected for each variable of interest to identify potentials outliers within each sample. Extreme cases that exceeded *z* score of 3 were winsorized to the next highest/lowest score that is not considered as an outlier (Field, 2018). In several instances the data still demonstrated non-normality and transformations were applied. However, transformations did not alter the skewness of these variables (i.e., child memory specificity, maternal confirmation and talkativeness). Therefore, the bootstrapping method (i.e., a robust non-parametric method for dealing with violations of assumptions and outliers) with 5000 resamples was applied in subsequent analyses. Prior to hypothesis-testing, the relationships between the primary study variables and child age and linguistic skill were examined. Child linguistic skill and age were positively associated with child memory variables. Analyses of variances (ANOVAs) were performed to examine the influence of demographic differences (i.e., maternal education, family raising model, number of children in the family) and child gender on main study variables. The results showed that there was no significant effect of these demographic factors, or the interaction between these factors and cultural group, on any of the maternal or child variables. However, there was a significant effect of gender on child memory elaboration. Given cultural group differences in maternal age, we also conducted correlation analyses between maternal age and the primary study variables. None of the associations was significant. Thus, child age, gender, and linguistic skill were included as covariates in subsequent analyses. Finally, given the recent theoretical emphasis on formal schooling as an important activity in modern societies to promote an individual's cultural-oriented self (e.g., autonomy-oriented or relatedness-oriented)—a salient element influencing

one's reminiscing and autobiographical memory (de la Mata et al., 2019; Reese et al., 2018), maternal education was also entered as a covariate in the following analyses.

To examine *Hypothesis 1*, two multivariate analysis of covariances (MANCOVAs) were conducted to compare the two groups on the reminiscing variables (elaborative and supportive). To examine *Hypotheses* 2 and 3, three one-way analysis of covariances (ANCOVAs) were used, with maternal memory specificity, child memory elaboration and child memory specificity as the dependent variables. To assess *Hypotheses 4*, Pearson correlations were performed separately for both Chinese and Australian groups to examine the association between maternal and child memory specificity. A moderation analysis was also performed to explore whether cultural group moderated the associations between maternal and child memory specificity when examining this association in the whole sample. Finally, to estimate the proportion of variance in preschool children's memory (elaboration and specificity) that could be accounted for by cultural group and maternal reminiscing, two hierarchical multiple regressions, controlling for child mean age, gender, linguistics skill and maternal education, were performed (*Hypothesis 5*).

6.5 Results

Descriptive statistics including means, standard deviations, and group differences in maternal and child variables are presented in Table 6.2.

6.5.1 Cultural differences in maternal reminiscing and dyads' memory features

In support of *Hypothesis 1*, there was a significant cultural group difference for the maternal elaborative reminiscing variables, Pillai's trace =.25, F (5, 91) = 6.07, p<.001, partial η^2= .25. Follow-up univariate analyses showed that Australian mothers produced significantly more *wh*-questions and confirmations than Chinese mothers. Australian mothers were also significantly more supportive during reminiscing than Chinese mothers, Pillai's trace =.28, F (7, 89) = 5.02, p<.001, partial η^2= .28. Follow-up univariate analyses showed

that Australian mothers scored significantly higher on focus on the task, acceptance/tolerance, involvement/reciprocity and negative feeling resolution than Chinese mothers. In support of *Hypothesis 2*, Australian children provided significantly more elaborate memories during the reminiscing task than Chinese children (even when controlling for child age, gender, linguistic skill and maternal education). There was partial support for *Hypothesis 3*. Australian mothers provided significantly more specific memories (as indexed on the AMT) than Chinese mothers. However, Chinese and Australian children did not differ significantly in memory specificity (as indexed on the AMT-PV).

Table 6.3 presents the correlations among the primary study variables in each cultural group. In contrast to *Hypothesis 4*, maternal memory specificity was not significantly related to child memory specificity in either group. Additionally, cultural group did not moderate this association.

6.5.2 Predicting child autobiographical memory

Prior to conducting regression analyses, factor analyses were performed on the maternal elaborative and supportive reminiscing variables. *Wh*-questions, elaborative statements and confirmations loaded onto a single factor (accounting for 63.00% of the total variance in the overall sample; 52.74% Chinese group; 50.78% Australian group). Yes/no questions did not load onto this factor, which aligns with the literature suggesting yes/no question may be associated with low elaborative reminiscing (Fivush, 2011). Following the approach used in past studies (Valentino et al., 2018; Valentino et al., 2014), we composed an overall score for maternal elaborative reminiscing (i.e., *wh*-question, elaborative statement and confirmation) (internal consistency: Australian α= .74; Chinese α= .71). In order to control for mother's talkativeness, we adopted the elaboration-ratio approach that has been used in past research (e.g., Bauer & Larkina, 2014; Wang, 2007). Specifically, for each mother, we divided their overall elaborative reminiscing score by their talkativeness score. For the AEED coding, all

variables loaded onto a single factor (accounting for 75.52% of the total variance in the overall sample; 78.76% Chinese group, 64.02% Australian group). The seven AEED categories were averaged to form a composite variable for maternal supportive reminiscing (Australian sample α= .91; Chinese sample α= .95).

Table 6.4 presents the hierarchical regression analyses in predicting child memory elaboration and memory specificity. There was partial support for *Hypothesis 5*. As can be seen in Table 6.4, child mean age, gender, linguistic skill and maternal education were entered at Step 1, explaining 28.6% of the variance in child memory elaboration, $F(4, 96)= 9.64$, $p<.001$. In Step 2, cultural group was added to the regression and accounted an additional 4.5% of the variance in child memory elaboration. The total variance explained by the model was 33.2%, $F(5, 95)= 9.43$, $p<.001$. In Step 3, the two maternal reminiscing variables were entered and accounted for an additional 19.4% of the variance in child memory elaboration. In combination, the six predictor variables explained 52.6% of the variance in child elaboration, $F(7, 93)=14.73$, $p<.001$. By Cohen (1988) conventions, a combined effect of this magnitude can be considered large (f^2=.38). Notably, when all predictors were combined in Step 3, child linguistic skill (sr^2= .22) and maternal supportive reminiscing (sr^2= .36) emerged as unique predictors of child elaboration. Maternal elaborative reminiscing was approaching significance (p=.07, sr^2= .13).

In terms of child memory specificity, as shown in Table 6.4, child mean age, gender, linguistic skill and maternal education collectively accounted for 33.3% of the variance in child memory specificity, $F(4, 95)=11.87$, $p<.001$. Following entry of cultural group at Step 2, the total variance explained by the model as a whole was 33.5%, $F(5, 94)=9.49$, $p<.001$; cultural group was not capable of significantly accounting for any additional variance in memory specificity. The two maternal reminiscing variables were entered at Step 3. Similarly, at Step 3, maternal reminiscing variables did not account for any additional

variance in the model. The seven predictors collectively accounted for 33.6% of the total variance in child memory specificity, $F(7, 92)=6.65$, $p<.001$, with a small to medium effect size obtained ($f^2=.12$). Notably, the only significant predictors of child memory specificity across the three models were child age ($sr^2= .30$) and linguistic skill ($sr^2=.30$).

6.5.3 Exploratory analyses: interaction effect of elaborative and supportive reminiscing

As elaborative and supportive maternal reminiscing did not significantly predict child memory specificity and recent research suggests maternal elaborative and supportive reminiscing may interact to influence child memory specificity (Lawson et al., 2018), we conducted exploratory analyses examining whether there was an interaction between elaborative and supportive reminiscing in relation to child memory specificity (and memory elaboration). Table 6.5 presents the mean-centred moderation analyses results. There was no evidence to indicate that maternal elaborative and supportive reminiscing significantly interacted to predict child memory elaboration. However, a significant interaction effect between maternal elaborative and supportive reminiscing was obtained for child memory specificity ($p= .04$), even after controlling for child age, gender, linguistic skill, maternal education and cultural group. Figure 6.1 presents the visualisation of the moderation effect of maternal supportive reminiscing on the relationship between elaborative reminiscing and child memory specificity. To further illustrate the nature of the interaction effect, the Johnson-Neyman technique was used to probe the pattern of significant interaction (Preacher, Rucker, & Hayes, 2007). As shown in Figure 6.2, the conditional effect of high maternal elaborative reminiscing and child memory specificity was statistically significant for mothers with high levels of supportive reminiscing (with a standardized supportive reminiscing score of 2.48), $b= 6.59$, $SE= 3.21$, $p= .05$, 95% CI [.0001, 12.74]. Though Figure 1 demonstrated a possible negative association between maternal elaborative reminiscing and child memory specificity in the context of low maternal support, probing the interaction showed this

association was not statistically significant (95% confidence interval around the simple slope includes zero).

6.6 Discussion

This study aimed to systematically investigate cultural differences in the characteristics of maternal reminiscing and mother-child autobiographical memory in two diverse cultural contexts—China and Australia. In support of *Hypothesis 1*, Australian mothers displayed significantly greater elaborative and supportive reminiscing than Chinese mothers. Second, Australian children provided significantly greater memory elaboration than Chinese children (*Hypothesis 2*). There was partial support for *Hypothesis 3*; while Australian mothers recalled more specific memories than Chinese mothers, the two cultural groups did not differ significantly for child memory specificity. Third, we found no evidence to suggest that maternal memory specificity was associated with child memory specificity (*Hypothesis 4*). Fourth, cultural group and maternal reminiscing styles independently predicted child memory elaboration, but not child memory specificity (*Hypothesis 5*). Finally, exploratory analyses revealed a moderation effect of maternal supportive reminiscing on the relationship between maternal elaborative reminiscing and child memory specificity. Specifically, we found that at higher levels of maternal supportive reminiscing, the association between elaborative reminiscing and child memory specificity was significant and positive.

Consistent with previous research comparing dyads (of similarly well-educated urban background) from autonomy-oriented and relatedness-oriented cultural contexts (e.g., Schröder et al., 2012; Wang, 2007), our findings indicated that Australian mothers were more elaborative than Chinese mothers during reminiscing. Specifically, Australian mothers used significantly more *wh*-questions and confirmations (i.e. the two critical aspects of an elaborative reminiscing style that have been identified in past research; for a review, see Wu & Jobson, 2019) than Chinese mothers. In addition, Australian mothers were rated as

significantly more supportive (in recognizing, validating, and encouraging children's contribution to the conversation) than Chinese mothers in reminiscing. Such a finding aligns with past research demonstrating that mothers from autonomy-oriented contexts (e.g., United States) tend to give their children greater autonomy during mother-child interactions than Chinese mothers (Sun & Rao, 2017). Further, we found that Australian mothers tended to place greater focus on the child's emotional experiences and the provision of positive resolutions to the child's negative feelings than Chinese mothers. This aligns with past research indicating that when resolving children's negative feelings, American mothers tended to reassure the child, whereas Chinese mothers tend to instead adopt a 'moral lesson' resolution in order to teach children the appropriateness of their emotional experiences (Wang & Fivush, 2005). Hence, it is possible that the cultural group differences in maternal supportive reminiscing in part reflect the cultural emphasis on different types of emotion resolution provided to children when recalling emotional events.

In terms of memory specificity, Australian mothers recalled more specific memories of personal events than Chinese mothers. Such a finding provides support to past research which also found significant cross-cultural differences in adults' autobiographical memory specificity (e.g., Jobson & Cheraghi, 2016). Specific personal memories reflect a unique and autonomous sense of self, which is vital to the development and maintenance of the independent self for those from autonomous cultures (Fivush et al., 2006; Ross & Wang, 2010). Consequently, specific autobiographical memories may be more accessible to Australian mothers. Whereas, a sense of uniqueness and specific personal memories are less relevant to the self-definition of individuals from relational cultural contexts (Ross & Wang, 2010; Wang et al., 2018). Therefore, Chinese mothers may be less likely to provide specific memories on the AMT to avoid presenting excessive focus on a unique self.

Nonetheless, contrary to our expectation, child memory specificity did not differ cross-culturally. This is surprising given that past research has found that American children provided greater memory specificity than Chinese children during shared conversations in early childhood years (Wang, 2004, 2008). One possible explanation for this difference is that the children in our study provided specific memories during an independent assessment of memory (AMT-PV), while in Wang's studies specificity was examined during scaffolded conversations. In addition, our Chinese sample was largely bilingual (with at least half of the Chinese children reporting that they speak both Cantonese and Mandarin). There is some evidence demonstrating the benefit of bilingualism on children's cognitive development (Bialystok, Craik, & Luk, 2012). Given language is fundamental in the construction of autobiographical memory, it is possible that bilingualism may enhance the development of memory specificity. However, in the current study we were unable to test these hypotheses and thus, future research is required. The significant group difference observed in maternal memory specificity, and not child memory specificity, may exemplify the importance of social-cultural factors in shaping an individual's development of autobiographical memory across the lifespan. In the early years of life, children's memory specificity may be less culturally influenced; rather, children gradually learn the cultural expectations regarding the value of a unique and detailed autobiography.

Furthermore, contrary to Jobson and colleagues' (2018) findings, pre-schoolers' memory specificity was not associated with maternal memory specificity in either cultural groups, with small to negligible effect sizes obtained. It is unclear at this stage why this association was not significant in the current study. One possible explanation is that maternal memory specificity is not directly related to child memory specificity. In Jobson and colleagues' study, mothers' memory specificity was found to have an influence on children's memory specificity indirectly via maternal supportive reminiscing. However, in the current

study, maternal memory specificity was not associated with any of the maternal reminiscing variables in both groups; suggesting that a mother with high memory specificity does not necessarily adopt a more elaborative or supportive reminiscing style. Given very little research has explored the relationship between mother and child memory specificity, further research is needed to gain a firm conclusion.

Concerning the factors predicting children's autobiographical memory, a model that combines child age, gender, language, maternal education, cultural group, and maternal reminiscing had a strong predictive ability of child memory elaboration. In particular, maternal reminiscing independently predicted a high proportion of variance, even after controlling for other factors. Thus, our findings further support a pan-cultural association between maternal reminiscing styles and child memory elaboration (Nelson & Fivush, 2004; Schröder et al., 2012; Wang, 2007; Wu & Jobson, 2019). Nonetheless, only child age and language emerged as unique predictors of child memory specificity. This is in line with past research that found the ability to independently recall past experiences in young children is dependent on verbal abilities and age (Farrant & Reese, 2000; McDonnell et al., 2016; Nieto, Ros, Mateo, Ricarte, & Latorre, 2017; Reese et al., 2018). In the AMT-PV, for a memory to be considered as 'specific', children are required to generate a sentence which contains an event that happened on a particular day. Whereas in reminiscing, any piece of new memory information that the child provided is considered as a 'memory elaboration'. Hence, the retrieval of specific memories may require more difficult generative retrieval processes that largely rely on pre-schoolers' language and cognitive abilities. In addition, it has been suggested that children's ability to recall specific memories may not be fully achieved until the age of 4½ years (Nieto et al., 2017). Given the mean age of the children in our study was 4 years of age, the finding that cultural group did not uniquely contribute to child memory

specificity might suggest that the cultural value of specific memories has not been readily internalized by children in early preschool years.

Of importance, there was a significant interaction effect of the two reminiscing styles in predicting child memory specificity, which was not observed for child memory elaboration. The interaction for maternal elaborative and supportive reminiscing on child memory specificity aligns with previous research (e.g., Lawson et al., 2018; McDonnell et al., 2016). Thus, accumulating evidence—including now in cross-cultural community samples: Chinese and Australian families—indicates that maternal elaborative reminiscing facilitates child memory specificity only under conditions of high maternal support in reminiscing. Interestingly, while the current study differed from past studies (e.g., Lawson et al., 2018; McDonnell et al., 2016) in terms of sample characteristics (e.g., culture, socioeconomic status, developmental risk) and methodological operationalisations of key construct (e.g., adjusting for overall talkativeness for maternal elaboration), similar results emerged providing some confidence that these findings may be generalizable. These findings are especially important for informing theoretical models of the development of autobiographical memory and suggest that the theoretical perspectives for the development of memory specificity may differ to those accounting for the development of child memory elaboration (Lawson et al., 2018; Valentino, 2011). They are also important when considering future parental reminiscing training programs targeting the development of child memory specificity. More research is needed to continue to examine how maternal reminiscing contribute to child memory specificity.

There are several limitations that should be acknowledged. First, our current findings were based on cross-sectional observations. Longitudinal research is needed to further understand the emergence of child memory specificity. Second, though our sample sizes were comparable to past research that examined similar research questions, future research with

larger sample sizes is required to test the theoretical models. Third, our study only examined aspects (i.e., macro and micro) of Valentino's model. Future research could explore factors from other ecological levels in predicting child memory specificity. Fourth, although an attempt was made to increase cultural generalizability, our sample was limited to well-educated urban samples from both cultural groups. Future research could examine participants with more diverse socioeconomic backgrounds and education levels. Fifth, though our results showed no effect of demographic differences on the main study variables, it is unclear whether this was influenced by the unequal sample sizes included in each subgroup. Future research could examine how these demographic factors influence on the relationship between maternal reminiscing and child memory development.

Sixth, it is worth highlighting that both the social-cultural developmental theory and the developmental model of memory specificity were developed in Western autonomous cultural contexts and thus, possibly hold certain inherent assumptions about memory and child behaviour. In addition, while the current study adopted a coding system routinely used in previous research (e.g., Valentino et al., 2018), future research would benefit from conducting qualitative analysis (e.g., content analysis) of the conversations and memories to further explore commonalities and differences between the two cultural groups. Seventh, while the AMT has been used cross-culturally, both the AMT and AMT-PV needs further psychometric testing in Chinese cultural contexts. Thus, the findings should be interpreted taking this into consideration. Further, it is suggested that individuals' performance in specific memory retrieval can vary with the degree to which respondents relate to cue presentations important to self-regulation (Griffith et al., 2012). Given the idiosyncratic meaning of the cues can vary for participants from different cultural backgrounds and potentially across developmental stages, it is important for future research to further assess the validity and reliability of the AMT measures. Eighth, while we adopted the approach to

the mother-child reminiscing task used in past cross-cultural research (e.g., Wang, 2001), it is worth noting that we could have employed stricter selection criteria of the reminisced events to ensure that the child clearly remembered the event specified by the mothers. Ninth, although MLU-word has been suggested to be an very effective measure of young children's linguistic skill, using a measure of language ability that was not independent of the key memory task (i.e., memory elaboration) may have influenced the results. Future cross-cultural research could use a standardized test that is internationally reliable to assess children's language.

Finally, our study only included mothers (as often considered as the primary caregiver) in the investigation. There is research evidence suggesting differences in how mothers and fathers reminisce with their children (Bost, Choi, & Wong, 2010; Buckner & Fivush, 2000). However, empirical investigations of the role of paternal reminiscing on child autobiographical memory are often absent in the literature. In addition, in the current study, several mothers reported a joint raising model in the family (i.e., parents and grandparents raising the child together). This is especially prevalent in the Chinese sample, as parents in China often rely on help from grandparents to balance the needs of work and childcare (F. Chen, Liu, & Mair, 2011). Though our results showed that the joint-raising model was rare in the Australian sample, research showed that there is a growing tendency of co-residence between grandparents and grandchildren in Western cultures (K. Brown et al., 2017). Therefore, when examining children's autobiographical memory development, it is important to take the influence of other primary caregivers into consideration, especially in countries where intergenerational relationships are common. Notably, our results showed that over 80% of the Australian mothers and around 30% of the Chinese mothers reported having more than one child at home. Past findings are mixed in terms of the developmental advantages of being an only child in different cultural contexts (W. Liu, 2017). Given sibling relationships

are often the first peer experience most children encounter (Healy, 2018), it is important to consider the influence of siblings on child memory development. Given our sample size, it is not feasible to explore the influences of bilingualism, the number of children and child-rearing model on the relationships studied. Thus, further research is needed.

Despite these limitations, our results demonstrated the systematic differences in different maternal reminiscing dimensions across cultural contexts. We also confirmed the critical role of maternal reminiscing on child autobiographical memory elaboration and the interactive effect of elaborative and supportive reminiscing on child memory specificity. The findings demonstrate that the processes associated with child memory elaboration and child memory specificity may differ. Thus, highlighting a need for further research. This research area is important as it can inform the development of more effective training or intervention programs that target maternal reminiscing during the preschool period.

6.7 References

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Table 6.1

Mother and Child Sample Characteristics by Cultural Group

Characteristics	Australian Group (n= 48)		Chinese Group (n= 55)		*Group Difference*
	M	*SD*	*M*	*SD*	
Mother Age (years)	38.29	4.24	33.04	3.42	t= 6.96**
Child Age (months)	53.88	13.37	50.58	12.90	t= 1.27
Child MLU-w	4.82	.83	4.64	.94	t=.97
	n	*%*	*n*	*%*	
Child Gender					χ^2= 1.78
Girl	29	60.4	26	47.3	
Boy	19	39.6	29	52.7	
Attending Preschool					χ^2= 1.79
Yes	43	89.6	44	80.0	
No	5	10.4	11	20.0	
Only-Child					χ^2= 32.37**
Yes	8	16.7	40	72.7	
No	40	83.3	15	27.3	
Maternal Education					χ^2= 21.10**
Postgraduate	31	64.6	11	20.0	
Undergraduate and below	17	35.4	44	80.0	
Employment Status					χ^2= 1.22
Employed/Self-employed	38	79.2	48	87.3	
Part-time employed/ Full-time mom	10	20.8	7	12.7	
Family Raising Model					χ^2= 22.97**
Grandparents & Parents	6	5.8	35	63.6	
Parents Only	42	87.5	20	36.4	
Primary Caregiver					χ^2= .22
Mother	47	97.9	53	96.4	
Father	1	2.1	2	3.6	

Note. Child MLU-w= Mean Utterance of Length-words. * p< .05; ** p< .01

Table 6.2

Reminiscing and Memory Features of Mother-Child Dyads by Cultural Group

Variables	Australian Group			Chinese Group			*Group Difference*	
	n	*M*	*SD*	*n*	*M*	*SD*	*F*	η^2
Maternal Reminiscing								
Elaborative Reminiscing [a]	47			54				
Wh-questions		2.96	1.77		2.15	1.42	4.63*	.05
Yes/No questions		4.11	2.07		3.32	1.75	3.89^{+}	.04
Statements		6.60	3.88		4.61	3.59	.93	.01
Confirmations		2.11	1.77		.46	.50	28.68***	.23
Talkativeness		25.31	10.02		21.03	9.66	.64	.01
Supportive Reminiscing [a]	47			54				
Focus on Task		7.09	1.92		5.43	2.04	14.90***	.12
Acceptance/Tolerance		7.53	1.33		5.81	2.09	16.25***	.15
Involvement/Reciprocity		7.19	1.57		5.46	2.03	13.75***	.11
Negative Feeling Resolution		6.30	1.56		5.15	1.52	11.51**	.11
Structuring		6.49	1.64		5.78	1.89	1.21	.01
Adequacy		6.96	2.02		5.81	2.14	3.44	.04
Coherence		5.91	1.95		5.22	1.89	3.68	.04
Mother Memory Specificity [b]	48	6.33	2.38	55	4.15	2.12	14.90***	.13
Child Memory Specificity [a]	48	3.71	2.55	53	3.76	2.99	.31	.00
Child Memory Elaboration [a]	47	16.89	11.14	54	10.60	8.65	6.44*	.06

Note. Raw means and standard deviations are presented. Bootstrapping with 5000 resamples were applied. $^{+}$ p=.05, * p<.05, ** p<.01, *** p<.001.

[a] controlling for child age, language, gender, and maternal education

[b] controlling for maternal education

Table 6.3

Correlations among Primary Study Variables

	1	2	3	4	5	6	7
Australia							
1. Child Memory Specificity	-						
2. Child Memory Elaboration	.36*	-					
3. Maternal Elaborative	.27+	.38**	-				
4. Maternal Supportive	.33*	.56**	.31*	-			
5. Maternal Specificity	.16	-.07	-.24	-.08	-		
6. Child Age	.39**	.19	.14	.13	.21	-	
7. Child MLU-w	.57**	.53**	.21	.60**	.01	.27+	-
China							
1. Child Memory Specificity	-						
2. Child Memory Elaboration	.21	-					
3. Maternal Elaborative	.09	.42**	-				
4. Maternal Supportive	.10	.65**	.44**	-			
5. Maternal Specificity	-.05	.05	-.01	.12	-		
6. Child Age	.53**	.30*	.30*	.17	-.26	-	
7. Child MLU-w	.40**	.50**	.29*	.28*	-.16	.44**	-

Note. Bootstrapping with 5000 resampling were applied. Child MLU-w = Child mean length of utterance-word. + $p<.10$, * $p<.05$, ** $p<.01$.

Table 6.4

Hierarchical Multiple Regression for Model Predicting Child Memory Features

Variables	Unstandardized coefficients *B*	*SE*	Standardized coefficients *β*	R^2	Adj R^2	*F* change
Child Memory Elaboration [a]						
Step 1				.29	.26	9.66**
Child Age	.06	.06	.10			
Child MLU-w	4.18	.86	.46**			
Child Gender [c]	-1.18	1.44	-.07			
Maternal Education [d]	2.05	1.45	.12			
Step 2				.33	.30	6.44*
Child Age	.04	.06	.06			
Child MLU-w	4.13	.83	.45**			
Child Gender [c]	-.90	1.40	-.06			
Maternal Education [d]	.30	1.57	.02			
Cultural Group [e]	-3.95	1.56	-.24*			
Step 3				.53	.49	19.02**
Child Age	.02	.05	.04			
Child MLU-w	2.39	.77	.26**			
Child Gender [c]	-.85	1.19	-.05			
Maternal Education [d]	.03	1.34	.00			
Cultural Group [e]	-.63	1.45	-.04			
Maternal Supportive	2.17	.43	.44**			
Maternal Elaborative	9.89	5.34	.16+			
Child Memory Specificity [b]						
Step 1				.33	.31	11.87**
Child Age	.07	.02	.32**			
Child MLU-w	1.07	.28	.34**			
Child Gender [c]	-.30	.48	-.05			
Maternal Education [d]	-.77	.48	-.14			
Step 2				.34	.30	.31
Child Age	.07	.02	.33**			
Child MLU-w	1.07	.28	.34**			
Child Gender [c]	-.32	.48	-.06			
Maternal Education [d]	-.64	.53	-.11			
Cultural Group [e]	.29	.53	.05			
Step 3				.34	.29	.04
Child Age	.07	.02	.33**			
Child MLU-w	1.08	.31	.35**			
Child Gender [c]	-.31	.48	-.06			
Maternal Education [d]	-.65	.54	-.12			
Cultural Group [e]	.47	.55	.08			
Maternal Supportive	-.03	.17	-.02			
Maternal Elaborative	.57	2.20	.03			

Note. [a] *N*= 101, [b] *N*= 99. [c] girl= 0, boy= 1. [d] undergraduate and below= 0, postgraduate= 1. [e] Australia= 0, China= 1. Child MLU-w = Child mean length of utterance-word. Bootstrapping with 5000 resampling were applied. +p<.10, * p<.05, ** p<.01.

Table 6.5

Results of the Mean-Centred Moderation Analyses for Memory Elaboration and Specificity

Variables	Unstandardized coefficients		t	LLCI	ULCI
	B	*SE*			
Child Memory Elaboration [a]					
Elaborative	10.31	5.89	1.75^{+}	-1.38	22.00
Supportive	2.26	.45	5.05^{**}	1.37	3.15
Elaborative x Supportive	2.41	2.69	.90	-2.93	7.74
$R^2 = .53^{**}$					
Child Memory Specificity [b]					
Elaborative	1.39	2.31	.60	-3.20	5.98
Supportive	.04	.18	.21	-.31	.39
Elaborative x Supportive	2.24	1.05	2.12^{*}	.14	4.33
$R^2 = .37^{**}$					

Note. Controlling for child age, gender, language, maternal education and cultural group. [a] $N = 101$, [b] $N = 99$. LLCI= lower level confidence interval. ULCI= upper level confidence interval. Bootstrapping with 5000 resampling were applied. $^{+}p<.10$, $^{*}p< .05$, $^{**}p<.01$.

Figure 6.1

Interaction of Maternal Elaborative and Supportive Reminiscing on Child Memory Specificity

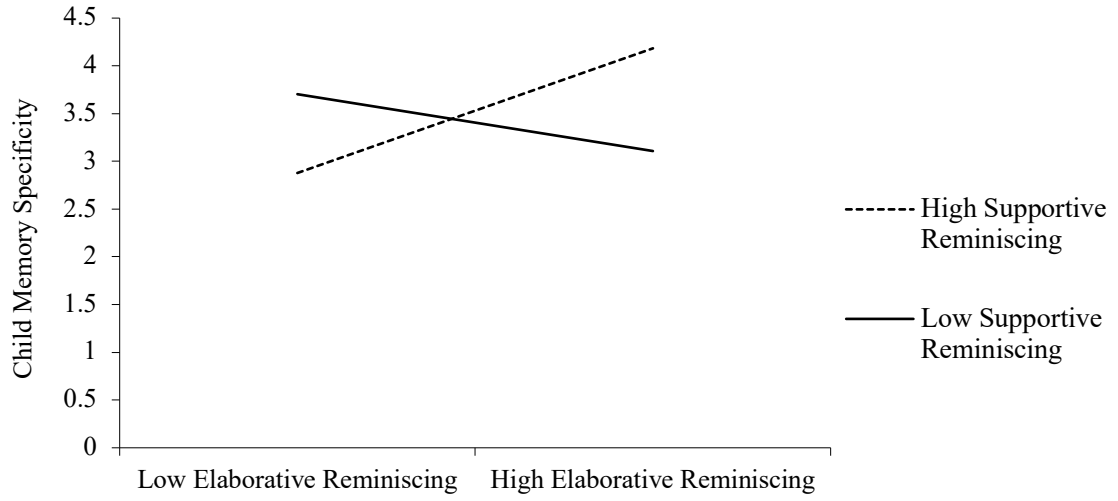
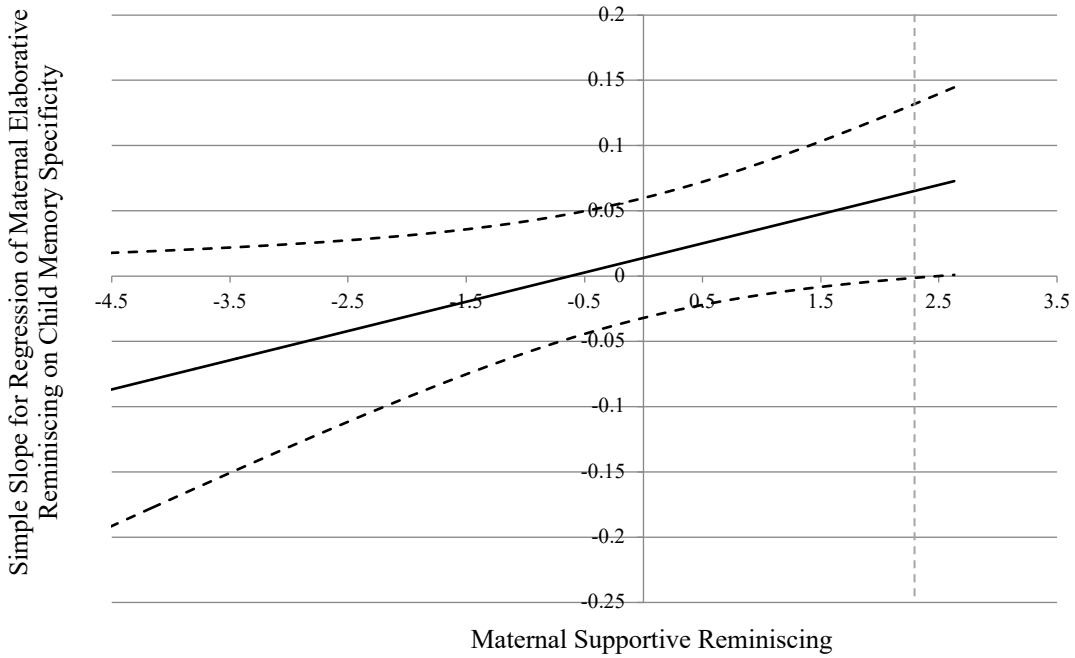


Figure 6.2

Region of Significance for the Conditional Relation between Maternal Elaborative Reminiscing and Child Memory Specificity as a Function of Supportive Reminiscing



Note. Solid diagonal line indicates the regression coefficient for maternal elaborative reminiscing along supportive reminiscing continuum. Dashed diagonal lines are confidence bands—upper and lower bounds of 95% of confidence interval for maternal elaborative reminiscing along supportive reminiscing continuum. The dashed vertical line denotes the turning point from non-significance to significance of the effect of maternal elaborative reminiscing.

6.8 Supplements

Words Used in AMT-PV Chinese Version

Happy	高兴 (gāo xìng)
Mad	生气 (sheng qì)
Surprised	惊喜 (jīng xǐ)
Sad	难过 (nán guò)
Lucky	幸运 (xìng yùn)
Scared	害怕 (hài pà)
Strong	坚强 (jiān qiáng)*
Tired	厌烦 (yàn fán)
Smart	聪明 (cōng míng)
Hungry	饥饿 (jī è)

* Note that though the word “坚强(jiān qiáng)” can be translated and back-translated to “Strong” in English, it is deemed as a word that may be hard to understand for children who just reached 3 years old. Given “坚强勇敢” are two positive words that often presented together in Chinese and shares some characters of a courageous definition. Therefore, when administering the cue word “坚强(jiān qiáng; strong)”, researchers were allowed to include the word “勇敢 (yǒng gǎn, brave)” to prompt children’s response. However, for all the other cue words, researchers were refrained from giving additional instructions or helping to explain the cue words.

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Two examples of the Chinese version AMT-PV administration are presented below:

Example 1

Participant No.: XX		**AMT-PV**	1	0			
AMT-PV			Specific Memory	Non-Specific Memory			
Language	Ma			RC	EP	NM	O
Starting	0:10						
Ending	7:41						
高兴 (Happy)		R: 现在姐姐有 10 个问题要问你，好不好？ Now, JieJie [*researcher referring to herself*] has ten questions for you, is that okay? C: 好 Okay R: 想一想，有没有一件事情，以前的事情，你觉得特别开心的啊？想一想，然后跟姐姐分享一下。 Have a think, was there a time, in the past, that you felt really happy? Think about it and share with JieJie. C: 嗯…我想到啦！就是妈妈刚开始送这个给我的时候。 Em…I know! It's the time when mom gave me this. R: 哦，买这个手表给你的时候，你就很开心，是不是？ Oh, the time when (mom) bought you this watch, you were really happy, right? C: 对 Yes R: 好棒，那你还能告诉姐姐一些更多的吗？ Good job. Can you tell JieJie more about it? C: 还有啊？ More? R: 嗯 Em C: 就是爸爸给我买卡片的时候 It's the time when dad bought me cards. R: 啊，爸爸给你买卡片的时候啊。好的。你看, 我们已经完成第一个问题啦，我们到下一个问题好不好？ Ah, the time when dad bought you cards. Great. You see, we have finished the first question, shall we move on to the next question? C: 好 Okay	1				
生气 (Mad)		R: 那你能不能想到一个时候是你觉得很生气的啊？ Then, can you think of a time that you felt really mad? C: 有 Yes R: 嗯？跟姐姐说一下好不好？ Em? Can you tell JieJie about it? C: 就是，老是想睡觉。就是我之前想睡觉，又不许睡觉的时候。 It's… always want to sleep. It's the time when I wanted to go to sleep but was not allowed to sleep. R: 很好，第二件事情就讲完啦。 Good job. The second question is finished.	1				

惊喜 (Surprised)	R: 现在还剩 8 个问题了。那姐姐想问你，你能不能想到一件事情是觉得很惊喜的啊？ There are eight questions left now. JieJie wants to ask you, can you think of a time that you felt surprised? C: 嗯…我不知道 Em…I don't know R: 不知道吗？想一想呢。 Don't know? Have a think. C: 我不知道有一件事情很开心。我就是…我想一想是什么时候我就觉得很开心。 I don't know a time that (I) was happy. It's…Let me think about when I felt really happy. R: 对啊，是不是有一个时候你觉得很开心？而且那个时候发生了你就觉得很惊喜？ That's right, was there a time that you felt really happy? And at that time when it happened you felt really surprised? C: 就是本来以为我不会去溜冰，但是我就是去溜冰啦。 It's when (I) thought I would not go ice-skating, but I did go ice-skating. R: 好棒，那我们下一个问题好不好啊？ Good job, shall we move on to next question?	1				
难过 (Sad)	R: 下一个问题，[*child's name*]要想一想，然后跟姐姐讲一讲，能不能想到一件好难过的事情啊？ Next question, [*child's name*] need to have a think, and then tell JieJie, can you think of a time that you felt really sad? C: 嗯. . . Em... R: 你觉得很伤心难过的时候。能想得起来吗？ The time that you felt really sad. Can you think of one? C: 就是我很想很想爸爸，妈妈。又想爸爸又想妈妈的时候。 It's when I really really miss dad, mom. Time when (I) miss both mom and dad. R: 就是你想念爸爸和妈妈的时候，对不对？ It's the time that you miss mom and dad, right? C: 嗯. . . Em... R: 好的，那下一个好不好？ Okay, how about next one?		0			
幸运 (Lucky)	R: 那姐姐要问你，你能不能想一想有没有一个时候，你觉得自己好幸运的啊？运气好好的时候？ Then, JieJie going to ask you, can you think of a time that you felt really lucky? Like very lucky? C: 有 Yes R: 有啊？ Yeh? C: 上次我去玩夹公仔。人家夹了一个公仔夹了半天，我一次就夹到啦 Last time I went to play Clip Doll. Someone played so long to get one doll, it only took me one time to get it. R: 这么厉害啊, 姐姐也不太会玩夹娃娃。	1				

	That's impressive, JieJie is also not very good at playing Clip Doll. C: 我价了很多块钱，就夹了三个 I spent a lot of money and got three. R: 哇，夹了三个吗？我还一个没夹到过呐 Wow, got three? I haven't even got one yet. C: 我家都有一堆公仔啦 I have a bunch of dolls at home.					
害怕 (Scared)	R: 好的，接下来，姐姐要问[*child's name*]，有没有一个时候你觉得好害怕的啊？ Okay, next, JieJie is going to ask [*child's name*], was there a time that you felt really scared? C: 有，就是我本来很想很想去鬼屋，但是后来又不想去了。 Yes, it's when I really really wanted to go to the Haunted House, but later (I) didn't want to go. R: 鬼屋吗？我也有一点害怕。 The Haunted House? I am also a bit scared. C: 哈哈哈，我也是。我的老师也不敢进去，就一些小朋友敢进去。他们进去，我都听到大叫了。 Hahaha, me too. My teacher also dared not to go in, only a few kids dare to go in. They went in, and I heard screams. R: 那是其他小朋友进去了，然后你听到他们害怕的大叫了？ So other kids went in, and then you heard that they were frightened and screamed out loud? C: 嘿嘿 Hehe	1				
坚强 (Strong)	R: 那接下来姐姐问你，[*child's name*]想不想得起来有一个时候，是你觉得自己很坚强的时候？ Next, JieJie is going to ask you, can [*child's name*] think about a time, a time that you felt really strong? C: 打针的时候。 When getting injection. R: 打针时候啊，那你能不能多跟姐姐讲一下这个打针的事情啊？ Getting injection, then can you tell JieJie more about this time of getting injection? C: 妈妈一直说给我买玩具，所以我就一直做那个事情 Mom was keep saying to buy me toys, so I kept doing that thing. R: 是不是想到玩具，你就没那么害怕打针啦？ Was it that when thinking about the toys, you feel less scared about getting the injection? C: 对 Yes R: 嗯，好的。最后三个问题啦. Em, okay. The last three questions.	1				
厌烦 (Tired)	R: 那你想一想，有没有一个时候你觉得很厌烦的啊？ Then have a think, can you think of a time that you felt really tired? C: 写字的时候 When writing		0			

	R: 写字的时候你就觉得很烦，是不是？ You felt tired when writing, right? C: 嗯 Em R: 还有吗？ Anything else? C: 没有了 No					
聪明 (Smart)	R: 那[*child's name*]能不能告诉姐姐，有没有一个时候你就觉得自己好聪明好棒的啊？ Then can [*child's name*] tell JieJie, was there a time that you felt yourself really smart? C: 就是我打武术的时候 It's when I play martial arts R: 好厉害！那你就是说自己打武术的时候，你觉得自己很聪明，对不对？ That's amazing! Are you saying that when you played martial arts, you felt yourself smart, right? C: 是 Yes R: 嗯。好的。最后一个问题啦。 Em. Okay. Last question.		0			
饥饿 (Hungry)	R: 那[*child's name*]想一想，有没有一个时候觉得自己特别特别饿的啊？ Then can [*child's name*] have a think, was there a time that you felt really really hungry? C: 有，就是我一直都觉得很饿很饿。可是妈妈就一直说“哎呀，做完这个事情，做完这个事情”。还有我特别睡觉的时候，肚子很饿，妈妈也不给我吃东西。 Yes, it's when I felt very hungry, very hungry. But mom was keep saying that “Finish this thing first, finish this thing first.”. And particularly when I sleep, (I) felt hungry, mom also didn't allow me to eat.	1				

Note. Ma= Mandarin. AMT-PV= Autobiographical Memory Test-Preschool Version. R= researcher, C= child. RC= repeated categorical; EP= extended periods; NM= non-memories; O= omission.

Example 2

Participant No.: XX		**AMT-PV**	1	0			
AMT-PV				Non-Specific Memory			
Language	Ca		Specific Memory	RC	EP	NM	O
Starting	0:10						
Ending	7:16						
高兴 (Happy)		R: 那姐姐现在开始要问你十个问题，问完了我们就去玩，好不好？ Now JieJie [*researcher referring to herself*] is going to ask you ten questions. We can go play toys after these questions, what do you think? C: 嗯 Em R: 那 [*child's name*] 能不能想一想, 有没有一件事情，是你觉得特别开心的啊？ Then, [*child's name*], can you think of a time that you felt really happy? C: (no response) R: 那你要不要和小猪爸爸(指沙发上的玩偶)说一说，有没有什么事情，或者什么时候是你觉得很开心的呀？ Would you like to talk to Papa Pig [*referring to the toy on the sofa*], was there anything, or any moment that you felt really happy? C: 嗯…滑滑梯 Em…playing on slides R: 滑滑梯的时候吗？你就觉得很开心，对不对？ Playing on slides? That made you happy, right? C: 嗯 Em R: 那你还有别的想跟姐姐说的吗？ Is there anything else you want to tell JieJie? C: 没有 No R: 那好的，我们下一个，好不好。 Okay. How about we move to next question? C: 嗯 Em		0			
生气 (Mad)		R: 你看，还有九个。*child's name* 想一想，有没有一个时候你觉得好生气啊？ See, there are only nine [questions] now. [*child's name*], Can you have a think, was there a time that you felt really mad? C: 没有 No R: 那没有很生气的时候呀？ So, there wasn't a time you felt mad? C: 嗯 Em R: 那有没有什么事情让你觉得很生气的啊？ Then was there anything that made you feel really mad? C: (no response) R: 没有什么时候让你觉得特别生气的, 对吗？					0

	There wasn't a time that you felt really mad, right? C: 嗯 Em					
惊喜 (Surprised)	R: 那行，我们下一个。那你能不能想的起来有一个时候你觉得好惊喜啊？ Okay. Let's move on to next question. Can you think of a time that you felt so surprised? C: (no response) R: 想一想，有没有这种感觉的时候啊？ Can you think about a time you felt that way? C: 没有 No R: 有没有呀？ Yeh? C: 没有 No					0
难过 (Sad)	R: 那行，我们下一个。那你能不能想的起来，有没有一个时候你觉得很难过的啊？ Okay. Let's move on to next question. Can you remember, was there a time that you felt really sad? C: 没有 No R: 好难过的时候，想一想，然后告诉姐姐，好不好呀？ Like really sad. Can you have a think and tell JieJie? What do you think? C: 没有 No R: 那有没有什么事情，你记得的，让你觉得很难过？ Then was there anything that you remember, made you felt sad? C: 没有 No					0
幸运 (Lucky)	R: 好的，那么下一个，那你有没有一件事情，让你觉得自己好幸运，好好运啊？ Okay, then next one. Was there a time that you felt really lucky, lucky? C: 没有 No R: 这个也没有吗？要不要我们再想一想？ Also a *No* for this one? How about let's have a think about it? C: 没有 No					0
害怕 (Scared)	R: 好的，下一个，那你想一想，有没有一个时候，是你觉得很害怕的呀？ Okay, next one. Then can you think of time, a time, that you felt really scared? C: 没有 No R: 那没有什么事情你是觉得害怕的吗？ Then, was there anything that you are scared of? C: 没有 No R: 没有啊，那行，我们下一个，好不好？					0

	No. Okay. How about we move to the next one?					
坚强 (Strong)	R: 那你能不能一个时候，你觉得自己很坚强，好勇敢的时候啊？ Then can you think of a time that you felt really strong and brave? C: 有 Yes R: 有啊，那你想一想，是什么情况下我们就觉得很坚强，勇敢呢？ Yes. Then have a think, under what situation, you felt really strong and brave? C: 嗯 Em R: 是什么事情啊？ What was it? C: 我不想说 I don't want to say					0
厌烦 (Tired)	R: 好吧，那我们想一想，有没有一个时候就觉得好烦或者好讨厌啊？ That's okay. How about, let's think of a time that you felt really tired, or annoyed? C: 有 Yes R: 有啊，跟姐姐讲一下，好不好呀? Yes. Can you tell me about it? C: 我不喜欢很吵 I don't like too noisy, R: 是说如果很吵的时候，你就觉得很烦，是不是啊？ Are you saying if it is too noisy, you feel annoyed, right? C: (no response)				0	
聪明 (Smart)	R: 那好的，你看最后两个了，好不好？ Alright. Last two questions, what do you think? C: (no response) R: 那有没有一个时候你就觉得自己好聪明，好厉害的啊？ So, was there a time that you felt you were so smart? C: 没有 No R: 没有吗？那你想一想，有没有什么事情让你觉得自己很聪明呀？ Nope? How about, was there anything that made you feel smart? C: 嗯 Em R: 也没有吗？那最后一个了，好不好？ Also no? Then last question, what you think?					0
饥饿 (Hungry)	R: 那你想一想，有没有一个时候你觉得特别特别饿的啊？ Then, can you have a think…was there a time that you felt very, very hungry? C: 没有 No R: 那有没有哪一次你觉得特别饿？					0

	Then, can you think of a particular time that you felt hungry? C: (no response) R: 没有吗？ Nope? C: (no response) R: 那好，我们就问完啦。 Okay. Then we finished all our questions.					

Note. Ca= Cantonese. AMT-PV= Autobiographical Memory Test-Preschool Version. R= researcher, C= child. RC= repeated categorical; EP= extended periods; NM= non-memories; O= omission.

The AMT-PV was orally presented by bilingual researchers in either Mandarin or Cantonese depending on the dyads' self-reported predominant language used at home. In total, researchers administered 24 AMT-PV tests in Cantonese, 25 in Mandarin, and 4 in both languages. The results of the one-way analysis of covariance (ANCOVA), controlling for child age, gender, linguistic skill, and maternal education showed that there was no difference in child memory specificity between children reported memories in Cantonese and children reported in Mandarin, F (1, 43)= 1.20, p= .28.

Example of Mother-Child Conversation about Past Emotional Events

Happy Event

Mom: We are going to talk about times that we found different. The first thing we are going to talk about is a time that we felt happy, and I thought there was a time that we felt happy when in Singapore, do you remember we went to the water park?

Child: Yes

Mom: Do you remember we were going to water park, we got into that river, and we were on tubes, but then you were so excited, because you can stand up in the water, and then you just went around the whole park in the water with us, and you were just swimming the whole way, and if you need a tube, you can just stand up, because we were just floating behind you, do you remember that?

Child: No

Mom: What do you remember?

Child: I remember the world park, the small world park, the …(*inaudible*)…running into wasters with me, and…

Mom: and you felt happy, so you don't remember when we went to the big water park? And [*person's name*], [*person's name*] and I were in a lilo, and the water would wash pass.

Child: Oh, yeh, yeh

Mom: Yeh, yeh, you remember now?

Child: There was dipnet

Mom: Yeh, there was dipnet, so you can stand up

Child: Oh yeh

Mom: and that made you feel happy, didn't it?

Child: Oh yeh

Mom: That's awesome.

Scared Event

Mom: Would you like to do the next one now, [*child's name*]?

Child: Yehhh…

Mom: Come back, [*child's name*]. We have not finished yet. So I wanna think about a time, do you remember a time you were a bit scared? I remember when we had to go get

these needle done at…You know we needed to get the blood out of your arm at that time, and even though we made unicorn ice cream, it was a bit scary, wasn't it?

Child: Uh-huh

Mom: Do you remember that? What do you remember?

Child: Em…I remember that too

Mom: Do you remember that lady pushed against you? How did that make you feel?

Child: Sad and scared

Mom: Yeh, it was a bit scary, wasn't it?

Child: Em

Mom: But what did we do after that?

Child: Eat ice cream

Mom: Yeh. And we saw xxx too.

Child: He was getting his blood taken

Mom: Yeh, he was getting his blunt taken.

Sad Event

Mom: Okay, I wanna talk about another time when you feeling a bit sad.

Child: Uh-huh

Mom: Do you remember when you started to going to child's care? Particular at the airport. And do you remember you use to be a bit sad and you would cry before me leave?

Child: Yeh

Mom: [*person's name*], the teacher, do you remember teacher [*person's name*]?

Child: Oh yeh, [*person's name*]

Mom: You remember you got a little bit sick once, and then you became very good friends with her? But do you remember being sad, when I use to leave you there, when used to go to work?

Child: Yeh

Mom: What do you remember?

Child: I remember the…(*inaudible*)

Mom: Oh yeh

Child: And there was [*kid's name*]

Mom: Everyone else was there at childcare.

Child: It was at airport

Mom: Do you remember any bunnies?

Child: Bunnies?

Mom: Wasn't bunnies there?

Child: no, there were corns outside

Mom: oh there was corns outside

Child: and we used to hop on them, like you don't step on them, you need to hop hop hop, rooster…hop hop hop rooster

Mom: so once you were (chunked in), you weren't really that sad anymore, were you? You were just sad when mommy left. And when I come pick you up, sometimes, you a little bit sad too.

Child: Coz, I wanna stay there.

Mom: Ah, okay.

Mad Event

Mom: What about a time when you were mad? Can you remember a time when you were mad?

Child: Nothing, I don't remember something, okay?

Mom: ohhh, okay. So you want me remember first?

Child: Yeh

Mom: Well, I think I remember you being really mad, at [*kid's name*].

Child: Oh yeh yeh yeh

Mom: Yeh?

Child: Yeh

Mom: What you were mad about [*kid's name*] for?

Child: Toys he breaks

Mom: What toy did he break?

Child: Don't remember

Mom: Oh, did he break your lifesaver?

Child: My lifesaver? What lifesaver?

Mom: You know the big thick lights up sword.

Child: Oh yeh, he did. I got really angry. Can I spin on this (*referring to the chair in the lab*)?

Mom: (*laugh)* yes, you can spin on this.

Child: Am I allowed?

Mom: yes, you are allowed. So, you got mad at joe, he broke your sword?

Child: Yeh, that's my lifesaver, my gold sword.

Mom: But do you remember? Do you remember what room you were in?

Child: No

Mom: Do you remember in the laundry room?

Child: No

Mom: Was it in the laundry or was it in the hallway?

Child: Hallway, and we actually in the kitchen. Wait, no…it was definitely in the laundry.

Mom: (*laugh*) thank you. Yeh, and [*kid's name*] was hitting everything with lifesaver, and the little top of the lifesaver came off.

Child: Yeh

Mom: Do you remember?

Child: And it was in the cupboard all the time

Mom: but how did it make you feel when you got mad?

Child: Err….

Mom: Okay, let [*researcher's name*] know we finished.

CHAPTER 7: Study 4

Investigating Maternal Emotional Reminiscing, Child Autobiographical Memory, and Socioemotional Functioning in Pre-schoolers: A Cross-Cultural Examination

(Paper 4)

7.1 Declaration for Chapter 7

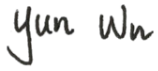
Declaration of the Candidate: In the case of Chapter Seven, the nature and extent of my contribution to the work was the following:

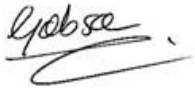
Nature of Contribution	Extent of Contribution
Conceptualisation, literature review, data coding, analysis, and manuscript write-up	75%

The following co-authors contributed to the work:

Name	Nature of Contribution
Laura Jobson	*Discussion of ideas expressed in the manuscript, data analysis, and critical review of manuscript*
Zijing He	*Measures preparation, data collection, and review of manuscript*

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate and co-authors' contributions to this work.

Candidate's Signature: 

Main Supervisor's Signature: 

7.2 Abstract

This study aimed to explore the mediating effect of child autobiographical memory (elaboration and specificity) on the relationships between the maternal support during emotional reminiscing and child socioemotional functioning (prosocial and disruptive behaviours), and whether cultural context moderated these effects. The moderated mediation model was tested using data from a cross-cultural sample of 40 Australian and 54 Chinese mother-child dyads who completed measures of child memory specificity, strengths and difficulties, and a mother-child emotional reminiscing task which assessed child memory elaboration and maternal supportive reminiscing style. As predicted, there was an indirect effect of maternal supportive reminiscing via child memory elaboration on children's prosocial behaviours in both cultural contexts. Cultural context did not moderate this indirect effect of maternal supportive reminiscing on child prosocial behaviours. There was no evidence to suggest child memory specificity significantly related to maternal supportive reminiscing and child disruptive (or prosocial) behaviours in either cultural context. These findings affirm the universal benefit of mothers' supportive guidance during emotional reminiscing on young children's memory elaboration and positive socioemotional functioning across cultural contexts.

Keywords: emotional reminiscing, maternal supportive reminiscing, child memory elaboration, memory specificity, child socioemotional functioning

7.3 Introduction

The acquisition of socioemotional skills in early childhood provides an important foundation for children's future academic competence and psychological wellbeing (Campbell et al., 2016; Madigan et al., 2018). Children who are able to build and maintain positive interpersonal relationships, control attention, and inhibit inappropriate behaviours when learning and interacting with others are more likely to achieve better educational outcomes (Leyva, Berrocal, & Nolivos, 2014). For this reason, researchers, practitioners, and policy makers are placing increasing emphasis on promoting positive socioemotional development in preschool years (Halle & Darling-Churchill, 2016; Salmon & Reese, 2016). Given the parent-child interaction is the first socializing relationship encountered by most children, parental reactions to child emotion, parental emotional expressiveness, and discussion of emotions have been acknowledged as three key processes for young children's construction of socioemotional understanding and prosocial behaviour (Eisenberg, Cumberland, & Spinrad, 1998; Johnson, Hawes, Eisenberg, Kohlhoff, & Dudeney, 2017). In particular, parent-child discussion (specifically mother-child discussion) of past emotional experiences has been theorized as a powerful context that promotes young children's social competence and emotional development (for reviews, see Fivush, Haden, & Reese, 2006; Salmon & Reese, 2016; Wareham & Salmon, 2006).

Mother-child discussion about past emotional events (i.e., emotional reminiscing) differs considerably from the mother-child discussion about emotions that occur during an event (Fivush, Berlin, McDermott Sales, Mennuti-Washburn, & Cassidy, 2003). Specifically, in the situation in which children are experiencing strong emotions (e.g., anger), a mother's primary consideration is often to manage her child's emotion, rather than promote and socialize emotional understanding (Laible, 2011). Children also tend to be preoccupied with experiencing the emotion and are thus less responsive to mothers' reasoning (Laible,

Thompson, & Froimson, 2014). In contrast, when reminiscing about children's past emotional experiences, mothers are often motivated to foster children's positive sense of self and emotionality (Kulkofsky & Koh, 2009). Children are also less likely to be negatively aroused (Van Bergen, Salmon, & Dadds, 2018). Hence, the conversations about emotional events in the context of reminiscing create a favourable environment for mother-child dyads to re-evaluate past experiences, clarify emotional causes, and explore candidate resolutions to problems in a reflective and explanatory manner (Laible, 2011; Van Bergen et al., 2018). Thus, mother-child reminiscing about past emotional experiences is predicted to translate into children's socioemotional skills (Johnson et al., 2017).

Despite rich theoretical perspectives, existing literature on mother-child reminiscing has primarily focused on its influence on children's cognitive functioning, including literacy, language, theory of mind, and autobiographical memory (e.g., Fivush, 2011; Larkina & Bauer, 2010; Reese & Cleveland, 2006; Sparks & Reese, 2012). Relatively fewer studies have investigated the associations between maternal emotional reminiscing and children's socioemotional functioning (Leyva et al., 2014). Among them, most studies have focused on children's emotional competence (e.g., Doan & Wang, 2010; Laible, Murphy, & Augustine, 2013a; Wang, 2001; Wang & Fivush, 2005). Little is known about the associations between mother-child emotional reminiscing and other aspects of child socioemotional functioning (e.g., social competence and problem behaviours). In the preschool years children start to engage in wider social networks and greater academic activities, thereby, fostering children's social competence and abilities to regulate behaviour which can have profound influences on children's psychological adjustment and later development (Leyva & Nolivos, 2015; Song & Wang, 2013).

Albeit relatively scant research, the enduring individual differences in how mothers reminisce about emotional events with their children has been well-documented (Fivush,

2007). Research has shown that mothers with high-quality reminiscing style tend to have preschool-aged children that display greater social competency and fewer problem behaviours (e.g., Garner, Dunsmore, & Southam-Gerrow, 2008; Leyva et al., 2014; Song & Wang, 2013; Speidel, Valentino, McDonnell, Cummings, & Fondren, 2019). Mothers' high-quality reminiscing style is often conceptualized in terms of how elaborative and emotionally supportive the mother is during reminiscing (Garner et al., 2008; Van Bergen et al., 2018). Such an elaborative and supportive reminiscing style reflects mothers' sensitive guidance during reminiscing and is often indexed by how supportive mothers are when providing scaffolded conversational structure, encouragement to child contribution, resolutions to negative emotions, and appropriate warmth (Speidel et al., 2019; Valentino, McDonnell, Comas, & Nuttall, 2018). However, empirical research exploring the mechanisms underpinning the relationships between maternal support during reminiscing and child socioemotional functioning remains limited.

One possible mechanism by which mother-child reminiscing about past emotional experiences influences young children's socioemotional skills is through children's developing autobiographical memory (Valentino et al., 2018). Autobiographical memory is an individual's recollection of personally experienced events and is closely related to one's self-identity, social problem-solving, and future planning (Q. Wang & Conway, 2004). Given the importance of autobiographical memory to central human functioning, considerable research has focused on the emergence of child autobiographical memory (Bauer & Fivush, 2010); in particular, memory elaboration and specificity. Memory elaboration refers to children's ability to provide unique memory contribution about the event under discussion and is often assessed in the scaffolded reminiscing task (Nelson & Fivush, 2004). Memory specificity, on the other hand, refers to children's ability to independently retrieve specific memories of personal events that happened on a particular day and is often assessed using a

cued memory retrieval task (Nuttall, Valentino, Comas, McNeill, & Stey, 2014). There is now robust evidence that mothers who provide more supportive guidance during reminiscing have children with better autobiographical memory performance in preschool years (for a review, see Fivush, 2011; Jobson, Burford, Burns, Baldry, & Wu, 2018; McDonnell, Valentino, Comas, & Nuttall, 2016).

Recently, researchers have started to examine the consequences of autobiographical memory in early childhood, especially in relation to child socioemotional functioning (e.g., Laible, Murphy, & Augustine, 2013b; Song & Wang, 2013; Valentino, McDonnell, Comas, & Nuttall, 2018; Wang, Hou, Koh, Song, & Yang, 2018). For example, by examining mother-child reminiscing about preschool-aged children's experiences with peers, Song and Wang (2013) found that children who were able to recall more details about past peer experiences (i.e., specific memories) in reminiscing scored higher on social competence. Similarly, Laible et al. (2013b) found that young children's memory contribution to reminiscing predicted their subsequent emotional and moral understanding. Song and Wang suggested that with maternal assistance in scaffolded reminiscing, children who recall more details about past emotional experiences form richer schema that contain information regarding socially competent responses that can be applied in similar future situations. Additionally, autobiographical memory reflects one's wellbeing and meaning making of life (Lekes, Guilbault, Philippe, & Houle, 2014). Thus, children's memory contribution during reminiscing not only signifies willingness to openly discuss negative emotional experiences, but also provides a rich source of information to guide mothers when managing children's inappropriate behaviours and encouraging prosocial behaviours (Grusec & Davidov, 2014; Laible et al., 2013b). Moreover, the findings of these studies support the notion that the quality of early mother-child reminiscing predicts children's socioemotional skills. Hence, we propose that children's developing autobiographical memory (i.e., memory elaboration

and specificity), is likely to mediate the relationship between maternal emotional reminiscing and child socioemotional functioning.

To date, no study has explored the mediating role of child autobiographical memory abilities on the relationship between maternal reminiscing and children's socioemotional functioning. A recent study (Valentino et al., 2018) has explored the associations among variables including maternal reminiscing quality (i.e., supportive reminiscing style), child autobiographical memory (i.e., memory elaboration and specificity), and child adjustment problems (i.e., attention problems, aggressive behaviours, emotionally reactive, somatic complaints, withdrawn, and anxious/depressed). Valentino and colleagues found that maternal supportive reminiscing style significantly predicted child memory specificity, while child memory specificity (but not memory elaboration) significantly predicted children's total adjustment problems. Additionally, the results of the path analysis seems indicate a possible indirect effect of maternal supportive reminiscing via child memory specificity on child adjustment problems. Given this is the only study that has explored these associations, and it focused on problematic behaviours, further research is needed. For instance, it has been theoretically proposed that having detailed and specific autobiographical memories is beneficial for an individuals' adaptive functioning (Fivush, 2011). However, Wang and colleagues (2018) found that children's memory specificity was not significantly positively associated with their prosocial and desirable behaviours. This aligns with adolescent and adult research which has found that reduced memory specificity is an unique marker for negative psychological functioning (Hitchcock, Werner-Seidler, Blackwell, & Dalgleish, 2017; Williams et al., 2007). It is possible then that different aspects of child autobiographical memory predicts different aspects of child socioemotional functioning, with memory specificity uniquely predicting child's problem behaviours and memory elaboration predicting child prosocial behaviours.

Notably, the empirical investigation of emotional reminiscing, child autobiographical memory and socioemotional development has primarily focused on Western industrialized societies and conducted in European-descent participants from USA (Cui et al., 2018; Laible et al., 2013b; Song & Wang, 2013; Valentino et al., 2018). While the associations between maternal reminiscing style and child memory elaboration have been documented in both Western and East Asian cultural contexts (Wu & Jobson, 2019), there is considerable variation in how emotional reminiscing and autobiographical memory are valued across cultures (see Nelson, 2003; Raval & Walker, 2019; Q. Wang, 2016). Globally mothers aim to assist their children to become well-adjusted and competent members of their particular social-cultural environment (Cui et al., 2018). However, what is considered as socially and emotionally competent varies across cultures and in turn shapes the way in which mothers involve their children in reminiscing about emotional events (Chan, 2011; Leyva & Nolivos, 2015). For instance, in contemporary Western cultures (e.g., USA), where autonomy and personal uniqueness are valued, discussing emotion is often regarded as a source of self-authenticity, a direct expression of individuality, and a strategy to ensure one's needs are met (McCord & Raval, 2016; Q. Wang & Fivush, 2005). Thus, mothers from these cultures use emotional reminiscing to foster their children's emotional abilities and self-growth (Q. Wang, 2001). Children are expected and encouraged to talk about their emotional experiences with their mothers from a very young age (Leyva & Nolivos, 2015). Thus, in Western cultures the retrieval of specific memories is valued (Wang, 2006).

By contrast, in East Asian cultures (e.g., China), where social harmony and group interests are generally valued, explicit talk about emotion could be considered as disruptive to interpersonal relationship and is only encouraged when it serves the purpose of maintaining relationships (McCord & Raval, 2016; Q. Wang, 2001). Mothers from these cultures take emotional reminiscing as a regulative function in cultivating inhibition of impulses and

restraint of strong socially-disengaging emotional states (e.g., anger) (Doan & Wang, 2010; Louie, Wang, Fung, & Lau, 2014). Children are expected to learn mostly through observation and careful listening (Leyva & Nolivos, 2015). Accordingly, cultural beliefs in memory functions have direct influences on children's autobiographical memory development (Q. Wang, 2016). Detailed remembering of one's personal past is not necessarily the norm across all cultures (Ross & Wang, 2010). Consistent with the East Asian cultural emphasis on group harmony and social relatedness, detailed remembering of one's past is often deemed superfluous for identity construction (Q. Wang, Koh, Song, & Hou, 2015). Having detailed and specific personal memoires may signal an excessive focus on self (which is incongruent with cultural norms), and thus may not be beneficial to individuals' psychological functioning (Q. Wang et al., 2018). Thus, those from East Asian cultures provide less specific memories than those from Western cultures (Wang, 2006). In order to align with cultural norms and assumptions, mothers from different cultural contexts vary in the frequency of engaging children in memory conversations about emotional experiences and the expectations of child memory contribution during reminiscing (Q. Wang, 2016). Therefore, it is important to take cultural contexts into consideration when investigating how mothers' emotional reminiscing assists in achieving the universal child-rearing goal of raising well-adjusted children (Cui et al., 2018).

7.3.1 The present study

This study first aimed to investigate the relationships between maternal emotional reminiscing, and pre-schoolers' autobiographical memory and socioemotional functioning. In particular, our primary interest was to explore how maternal support during emotional reminiscing and child autobiographical remembering (i.e., elaboration and specificity) were related to different aspects of child socioemotional functioning. Past research has shown that the presence of social and emotional competencies does not preclude the presence of

behavioural problems in young children (Halle & Darling-Churchill, 2016). Thus, we have included two particular domains of child socioemotional functioning: prosocial and disruptive behaviours. Second, we aimed to explore whether maternal supportive reminiscing influenced child socioemotional functioning through children's autobiographical memories (see Figure 7.1). Given the apparent importance of cultural context on child development (Greenfield, Keller, Fuligni, & Maynard, 2003), we also examined whether the indirect effect of maternal emotional reminiscing on child socioemotional functioning would be moderated by cultural context. To investigate these aims, we selected samples from two cultural contexts: China (an East Asian collectivistic context favouring emotional restraint) and Australia (a Western individualistic context favouring open expression) (Louie et al., 2014).

Although somewhat exploratory in nature, we generated several hypotheses based on existing literature outlined above. First, we hypothesized that maternal support during reminiscing of past emotional experiences would be associated with greater child prosocial behaviours and fewer disruptive behaviours in both cultural contexts, but with the strength of the associations being attenuated in the Chinese context. Second, as the associations between maternal reminiscing and child memory development has been documented in both cultural contexts, we predicted that mothers' supportive reminiscing style would be positively associated with children providing more elaborate and specific memories in both cultural contexts. Third, we predicted that children's memory elaboration would be positively associated with their prosocial behaviours. Given the lack of existing cross-cultural research examining this relationship, culture-specific predictions could not be derived and thus, our cultural analysis for this association was exploratory. Fourth, based on the notion that specific autobiographical memory is not necessarily the norm in all cultures, we predicted that child memory specificity would only be negatively associated with disruptive behaviours in the Australian context.

Finally, in terms of the moderated-mediation models, we hypothesized that children's autobiographical memory elaboration (but not memory specificity) would mediate the relationship between mothers' supportive reminiscing style and children's prosocial behaviours. We predicted that children's memory specificity (but not memory elaboration) would mediate the relationship between maternal supportive reminiscing style and children's disruptive behaviours. In addition, cultural context would moderate the indirect association between maternal support during emotional reminiscing and child socioemotional functioning. Specifically, the indirect association between maternal supportive reminiscing and child socioemotional functioning would be stronger among Australian dyads than Chinese dyads.

7.4 Methods

7.4.1 Participants

The data for this study was a subset of data collected for the larger cross-cultural research project (Study 3) examining children's developing autobiographical memory. Ninety-four mothers and their preschool-aged children participated in this study, including 40 European-descent mother-child dyads from Melbourne, Australia and 54 Han Chinese dyads from Guangzhou, China. Participants were recruited from the general community using flyers, social media adverts and contacts with local pre-schools. As shown in Table 7.1, mothers from both samples were well-educated, with over 80% of mothers reporting having at least an undergraduate degree. In both samples, the majority of mothers reported being employed/self-employed and the primary caregiver of their child. Australian mothers were significantly older than Chinese mothers. There was no significant difference between the Chinese and Australian children's mean age, language ability and gender distribution. The majority of Australian mothers reported having more than one child at home, whereas more than three-quarters of Chinese mothers reported the child was an only-child.

7.4.2 Materials

7.4.2.1 Autobiographical memory test-preschool version (AMT-PV)

The AMT-PV (Nuttall et al., 2014) is an adaptation of the original AMT (Williams & Broadbent, 1986) designed for preschool-aged children. It consists of 10 cue words that are presented orally and visually in a fixed order: happy, mad, surprised, sad, lucky, scared, strong, tired, smart, and hungry. Children were asked to generate a memory in response to each cue word (e.g., "*Think of one time that you felt… and tell me about it*") and were prompted when necessary (i.e., "*Can you tell me just one time when you felt that way*?"). Researchers were refrained from giving additional instructions or explanations of the cue words. Children were given one minute to generate a memory for each cue word. If no response was provided, the researcher progressed to the next cue word. Children's responses were audio-taped and subsequently transcribed verbatim for coding. Coding was conducted by trained researchers (with bi-lingual researchers coded the Chinese data) who were blind to study aims and hypotheses. Children's first memory responses to each cue word was coded for memory specificity (Williams et al., 1996). A memory was coded as specific if it was of an event that lasted less than a day (e.g., "the day I went to Disney with mommy and daddy"). After rating each memory response, the frequency for the number of specific memory responses was calculated. The Chinese version of the AMT-PV was translated and back-translated by the researchers involved in current study, BLINDED and BLINDED. Twenty-five percent of the transcripts were coded by two independent coders (inter-rater reliabilities for Chinese coding k= .71 and Australian coding k= .86).

7.4.2.2 Strength and difficulties questionnaire (SDQ)

The SDQ (R. Goodman, 1997) is a 25-item screening tool that examines children's psychological and psychosocial development (DeVries, Gebhardt, & Voß, 2017). The parental version of the SDQ requires mothers to assess their children in five dimensions of

psychological adjustment (i.e., conduct problems, hyperactivity, emotional symptoms, peer problems, prosocial behaviours) over the last six months. Each of the five subscales comprises five items which are rated on 3-point Likert scales (0= *not true* to 2= *certainly true*). As the participants in the current study were from low-risk community samples and the children were quite young, instead of focusing on each subscale, the SDQ total difficulties score was used to assess children's potential developmental problems (Goodman et al., 2010). The SDQ total difficulties score, which is the sum of all subscales except for the prosocial scale, can range from 0 to 40, with higher value indicating more emotional and behavioural difficulties. Cronbach's coefficient alpha for the total difficulty score was .72 and .66 in the Australian and Chinese sample, respectively. The internal consistency coefficients for the prosocial scale were .63 for the Australian sample and .68 for the Chinese sample.

7.4.2.3 Mother-child reminiscing task

Following the procedure outlined by the Autobiographical Emotional Events Dialogue (AEED; Koren-Karie, Oppenheim, & Getzler-Yosef, 2008), each mother-dyad reminisced about four past events: happy, sad, mad and scared. Given mother-child reminiscing of past negative emotional experiences is particularly predictive of child wellbeing, most events discussed in the reminiscing task were focused around negative emotions (Laible, 2011; Sales & Fivush, 2005). Prior to the reminiscing task, mothers were asked to think of a few events in which the child experienced the emotions and that were experienced by the mother and child together recently. Mothers were encouraged to select events that were distinctive and with one-time occurrence. Then the mother and child were asked to discuss these events as naturally as possible for as long as they wished in a quiet room. All dyads discussed the happy event first, and then the three other events in the sequence they preferred. The entire conversations were audio-taped and subsequently transcribed verbatim for rating and coding.

Following the approach of Speidel and colleagues (2019), mothers' supportive guidance during reminiscing was rated using the coding scheme provided by the AEED manual. The AEED contains a series of 9-point Likert scales which assess the quality of maternal behaviour during reminiscing. Mothers were rated on their f*ocus on the task*, *acceptance and tolerance*, *involvement and reciprocity*, *resolution of negative feeling*, *elaboration and structuring*, *adequacy*, and *coherence*. The seven AEED categories were averaged to generate a composite score for maternal supportive reminiscing style (see Study 3, for operational methods). To assess child memory elaboration, we coded children's utterances that provided new information about the past events being discussed (Haden, 1998). In addition, *child's mean length of utterance in words* (MLU-word; Brown, 1973) was calculated to examine child's linguistic skills at the time of the study.

All coding was conducted by trained bi-lingual independent researchers who were blind to study aims and hypotheses. Following the instruction provided by AEED manual, interrater agreement was calculated based on 25% of the transcripts being coded by two independent coders. High agreements were obtained in both the Australian sample (all subscales >.75) and the Chinese sample (all subscales > .73). For child memory elaboration and language, inter-rater reliabilities were assessed and intraclass correlation coefficients exceeded .80 for both the Australian and Chinese samples.

7.4.3 Procedures

Ethical approval was obtained from BLINDED. Following informed consent and assent, the mother-child dyad participated in a one-hour joint testing session. Mothers completed a questionnaire booklet containing the SDQ and demographic questions. Whilst the mothers were completing the questionnaire, the researchers administered the AMT-PV to the child. During this time, the mother and child were both in the same room. Next, the

mother and child completed the emotional reminiscing task, without the researchers present. Each dyad received $15 cash payment (¥100 for Chinese sample) and a small toy gift.

7.4.4 Data analysis plan

Data analyses were conducted using SPSS statistics version 25. Skewness and kurtosis were examined for all variables and the data was inspected for potential outliers using boxplots and histograms. Extreme cases that exceeded *z* score of 3 were winsorized to the next highest/lowest scores that was not considered as an outlier (Field, 2018). In several instances, the variables were not normally distributed, transformations were applied. However, transformations did not alter the skewness of these variables. Therefore, the bootstrapping method (with 5000 resamples), a robust non-parametric method for dealing with violations of assumptions, was applied in the subsequent analyses (Field, 2018).

We conducted a series of analysis of variances (ANOVAs) to examine the influence of demographic differences and child gender on the primary study variables. The results indicated that there was no significant effect of demographic/gender differences or "demographic/gender x culture" interactions on the study variables. As child language ability and child age was positively associated with several main study variables (i.e., maternal reminiscing, child elaboration and specificity), these two variables were entered as covariates in the analyses. Hence, partial correlations were performed to test the relationships among study variables. The moderated-mediation analyses were conducted using PROCESS macro (Model 8) for SPSS, with bias-corrected 95% confidence interval calculated with 5000 bootstrapping re-samples (Hayes, 2018). Specifically, we first investigated whether child memory (elaboration and specificity) mediated the relationship between maternal supportive reminiscing and child prosocial behaviours and whether cultural contexts moderated these relationships. We then investigated the effect of same moderated-mediation model in

predicting child disruptive behaviours. Statistical significance (α=.05) was indicated by the 95% confidence intervals not crossing zero.

7.5 Results

7.5.1 Group characteristics

As shown in Table 7.2, Australian mothers provided significantly greater affective support when reminiscing about past emotional experiences with their children. Australian children provided significantly greater memory elaboration than their Chinese counterparts. However, there was no significant group difference in children's memory specificity. Overall, mothers from both groups scored their children high on prosocial behaviour and low on disruptive behaviours, with Australian mothers rating their children significantly higher on prosocial behaviours and lower on disruptive behaviours than Chinese mothers.

7.5.2 Main analyses

Table 7.3 presents the partial correlations among the main study variables. Contrary to the *Hypothesis 1*, maternal supportive reminiscing was not directly associated with children's prosocial or disruptive behaviours in either cultural context. There was partial support for *Hypothesis 2*. Maternal supportive reminiscing was significantly positively associated with children's memory elaboration in both cultural groups. However, contrary to that predicted, there were no significant relationship between maternal supportive reminiscing and child memory specificity in either cultural group. In support of *Hypothesis 3*, in both Australian and Chinese samples, child memory elaboration was positively correlated with children's prosocial behaviours. Nonetheless, this association did not reach statistical significance in the Australian sample. Contrary to *Hypothesis 4*, children's memory specificity was not significantly related child disruptive behaviours in either cultural context. Finally, child elaboration was also not related to disruptive behaviours.

The main results of the moderated mediation analyses are shown in Table 7.4. In the moderated-mediation models, after controlling for child age and language, maternal support during reminiscing significantly predicted children's memory elaboration (β = .84, p<.01), but not memory specificity (β = .09, p=.78). As can be seen in Table 7.4, only child memory elaboration emerged as a significant predictor for child prosocial behaviours. Contrary to our prediction, there was no evidence of an indirect effect of child's memory specificity on the relationship between maternal supportive reminiscing and child disruptive (or prosocial) behaviour. However, as shown in Table 7.4, for both cultural groups, there was a significant indirect effect of maternal supportive reminiscing style via child memory elaboration on the children's prosocial behaviours. There was no evidence to indicate that child elaboration mediated the relationship between maternal supportive reminiscing and children's disruptive behaviours. Finally, though there was a significant interaction of cultural context and maternal support during reminiscing in predicting children's prosocial behaviour, the index of moderated mediation showed that cultural context did not moderate the indirect effect of maternal supportive reminiscing on child prosocial behaviours. Cultural context did not moderate any of the indirect effects of supportive reminiscing on child socioemotional functioning.

7.6 Discussion

This study aimed to examine how maternal support during emotional reminiscing and child autobiographical memory (elaboration and specificity) were related to child's socioemotional functioning in two cultural contexts: China and Australia. Our results indicated that mothers' supportive reminiscing about past emotional experiences was not directly associated with children's prosocial or disruptive behaviours in either cultural contexts, with negligible to small effect sizes observed. In addition, maternal supportive reminiscing was not associated with child memory specificity but was significantly positively

associated with child memory elaboration in both cultural contexts. Child memory elaboration was positively associated with maternal report of child prosocial behaviours in both cultural contexts, with small to moderate effect sizes observed (except the correlation did not reach statistical significance in the Australian context). However, child memory specificity was neither correlated with child prosocial or disruptive behaviours in both cultural groups. Finally, we found that in both cultural contexts child memory elaboration mediated the relationship between maternal supportive reminiscing and child prosocial behaviour.

In our moderated mediation models, we observed that mothers' supportive reminiscing about past emotional experiences significantly predicted children's memory elaboration. This finding supports previous theoretical accounts and empirical evidence suggesting maternal reminiscing style is associated with children's autobiographical memory elaboration (see Fivush, 2011; Wu & Jobson, 2019). Moreover, as hypothesized, children's elaboration was uniquely associated with children's prosocial behaviours. Importantly, there was a significant indirect effect of maternal supportive guidance during reminiscing through child memory elaboration on child prosocial behaviours. This is consistent with recent findings that children's active contribution in emotional reminiscing is important for fostering children's socioemotional skills (Laible et al., 2013a; Song & Wang, 2013). Shared reminiscing of past emotional experiences with mothers provides a resourceful forum for children to understand emotions and relevant social cues. This in turn, allows children to learn the differences between their own and others' perspectives, develop schema that contains information of socially competent responses which can be applied in future situations, and practice emotional and social problem-solving strategies that are generated from mothers' advice during reminiscing (Song & Wang, 2013). Consequently, allowing children to engage in prosocial behaviours.

Despite our predictions, we did not find any significant associations between maternal supportive reminiscing, child memory specificity and child socioemotional functioning in either cultural context. Further, contrary to our prediction, children's memory specificity did not mediate the relationship between maternal supportive reminiscing and children's disruptive behaviours. This is in contrast to Valentino and colleagues (2018) who found that maternal supportive reminiscing positively predicted child memory specificity and child memory specificity uniquely predicted children's disruptive behaviours. This difference in findings could reflect Valentino and colleagues' study being conducted with children from families with high socioeconomic risk (i.e., a population with increased risk for negative behavioural and physical health outcomes). In contrast, our study employed community samples in which there was a low frequency of reported disruptive behaviours. Additionally, our child sample tended to be younger (M= 4.37 years), while Valentino and colleagues' sample had an average age of 5.55 years. Past research has found that children's memory specificity is often not stabilized until 4 and half years of age (Nieto, Ros, Mateo, Ricarte, & Latorre, 2017). Therefore, it is possible, that children in the current study have not yet been socialized to the value of recalling specific autobiographical memories and their use for psychological adjustment.

Finally, we did not find any significant moderation effect of cultural context on the indirect effect of maternal supportive reminiscing on child socioemotional functioning. These findings may seem counterintuitive, but such results may exemplify that the investigation of cultural influences requires appreciation of more micro views of parental beliefs about emotions and the potential social dynamic factors underpinning cultural variations (Cole & Tan, 2014; Denham et al., 2011). For example, with the influence of rapid economic development and globalizations, research of urban families in China have demonstrated a visible social transformation under the Western influences, with young Chinese people being

more responsive to individualistic values (Y. Wang, 2006). Therefore, investigation of cross-cultural influences that index culture by nation may be imprecise, mothers from different cultural contexts may be both different and similar in their beliefs about child rearing goals and emotion socialization (Denham et al., 2011).

There are several limitations associated with the study. First, while the SDQ is the most widely used measure (i.e., available in over 40 different languages) of a child's strengths and difficulties in cross-cultural research (Hall et al., 2019), in the current study the internal reliabilities for its subscales were not ideal in both cultural contexts. In addition, previous research examining the psychometric properties of SDQ in China, has found that Chinese parents interpret the questions relating to children's conduct and peer problems somewhat differently to their UK counterparts (Du, Kou, & Coghill, 2008). Similar to past research (Du et al., 2008), our study also found Chinese mothers scored their children consistently higher on disruptive behaviours (i.e., peer problems and hyperactivity) than Australian mothers. It is unclear whether the significant cultural group differences observed in the current study reflect actual between-group differences in prevalence or are the result of cultural differences in expectations of 'competent behaviours' (Halle & Darling-Churchill, 2016). Thus, the results need to be interpreted with caution and future research could use more internationally valid and reliable measures which are sensitive to differences in social behavioural norms (Campbell et al., 2016).

Second, although bootstrapping has been proposed as a robust method for small samples with outliers (Hayes, 2018), our modest sample sizes may have limited the power in testing the true mediation effect of child memory performance on the relationship between maternal supportive reminiscing and child socioemotional functioning (Schoemann, Boulton, & Short, 2017). In addition, our cross-sectional design limits the causal inferences that can be drawn. Thus, further longitudinal investigations are needed. Finally, research has shown that

subtle differences between social classes or subcultures within the same society may affect parental socialization goals and beliefs in praising and displaying emotions (Denham et al., 2011). Given all of the included mother-child dyads were well-educated and from urban cities, our results may not be generalizable to the larger population with a more diverse demographic profile.

Despite these limitations, this study supports the recent conceptualization of child memory elaboration as a potential mediator underpinning the relationship between maternal support during emotional reminiscing and children's prosocial behaviours. The current findings also further affirm the benefit of maternal supportive reminiscing on young children's autobiographical memory (i.e., elaboration) and positive socioemotional functioning across cultures. The role of child memory specificity in child socioemotional functioning was less clear, and thus, more research is needed.

7.7 Reference

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Table 7.1

Mother and child sample characteristics by cultural group

Characteristics	Australian Group (n= 40)		Chinese Group (n= 54)		*Group Difference*
	M	*SD*	*M*	*SD*	
Mother Age (years)	38.83	4.33	33.04	3.45	t= 7.21**
Child Age (months)	54.39	14.04	50.46	13.00	t= 1.40
Child MLU-w	4.92	.77	4.61	.92	t=1.71
	n	*%*	*n*	*%*	
Child Gender					χ^2= 2.42
Girl	25	62.5	25	46.3	
Boy	15	37.5	29	53.7	
Attending Preschool					χ^2= 1.84
Yes	36	90.0	43	79.6	
No	4	10.0	11	20.4	
Only-Child					χ^2= 27.54**
Yes	7	17.5	39	72.2	
No	33	82.5	15	27.8	
Maternal Education					χ^2= 19.44**
Postgraduate	26	65.0	11	20.4	
Undergraduate and below	10	25.0	34	63.0	
Diploma and Other	4	10.0	9	16.7	
Employment Status					χ^2= .85
Employed/Self-employed	32	80.0	47	87.0	
Part-time employed/ Full-time mom	8	20.0	7	13.0	
Primary Caregiver					χ^2= .11
Mother	39	97.5	52	96.3	
Father	1	2.5	2	3.7	

Note. Child MLU-w= Mean Utterance of Length-words. ** p< .01

Table 7.2

Means and standard deviations of primary study variables

Variable	Australia				China				Culture Group Difference	
	n	Mean	*SD*	Range	*n*	Mean	*SD*	Range	*F*	η^2
Child Memory Specificity	40	3.93	2.63	0-10	52	3.77	2.60	0-10	.14	.002
Child Memory Elaboration	39	4.23	2.76	0-11.25	53	2.60	2.15	0-9.25	13.49***	.13
Maternal Supportive Reminiscing	39	6.93	1.30	3.43-8.71	53	5.48	1.72	1.57-8.43	19.22***	.20
Focus on Task		7.13	1.85	1-9		5.40	2.05	1-9	16.67***	.16
Acceptance/Tolerance		7.64	1.16	5-9		5.77	2.09	1-9	25.13***	.22
Involvement/Reciprocity		7.31	1.67	3-9		5.41	2.01	1-9	23.68***	.21
Structuring and Elaboration		6.72	1.64	2-9		5.74	1.88	2-9	7.43**	.08
Negative Feeling Resolution		6.38	1.55	1-9		5.15	1.54	2-8	12.02**	.12
Overall Adequacy		7.03	1.68	2-9		5.75	2.12	1-9	9.98**	.10
Overall Coherence		6.41	1.67	2-9		5.17	1.87	1-8	10.29**	.11
Child Prosocial Behaviour	40	7.68	1.85	3-10	54	6.44	1.85	2-10	8.89**	.09
Child Disruptive Behaviour	40	8.58	4.84	0-20	54	11.56	4.59	3-26	8.71**	.09
Hyperactivity		3.47	3.03	0-10		4.63	2.43	0-9	4.20*	.04
Conduct Problem		2.13	1.67	0-7		2.13	1.37	0-6	.00	.00
Emotional Problem		1.82	1.85	0-7		2.35	191	0-8	1.79	.02
Peer Problem		1.15	1.35	0-5		2.44	1.45	0-6	19.42***	.17

Note. Bootstrapping with 5000 resamples were applied. * $p<.05$, ** $p<.01$, *** $p<.001$.

Table 7.3

Partial correlations among primary study variables controlling for child age and language

	1	2	3	4	5
Australia					
8. Maternal Supportive Reminiscing	-				
9. Child Memory Specificity	-.002	-			
10. Child Memory Elaboration	.36*	.05	-		
11. Child Prosocial Behaviour	-.13	-.23	.20	-	
12. Child Disruptive Behaviour	.002	.08	.06	-.47**	-
China					
8. Maternal Supportive Reminiscing	-				
9. Child Memory Specificity	-.06	-			
10. Child Memory Elaboration	.56**	-.07	-		
11. Child Prosocial Behaviour	.05	-.14	.32*	-	
12. Child Disruptive Behaviour	-.02	-.06	-.13	-.16	-

Note. Bootstrapping with 5000 resampling were applied. * $p<.05$, ** $p<.01$

Table 7.4

Results of the moderated mediation analyses for child prosocial and disruptive behaviour

Prosocial Behaviour				BCa 95% CI	
	B	*SE*	*t*	*Lower*	*Upper*
Predictors					
MSR	-.65	.25	-2.62*	-1.14	-.16
Culture	-4.74	1.79	-2.65*	-8.29	-1.19
Child Memory Elaboration	.26	.10	2.57*	.06	.48
Child Memory Specificity	-.15	.08	-1.88+	-.31	-.01
MSR x Culture Context	.58	.27	216*	.05	1.11
Conditional direct effect of MSR on Prosocial					
Australian Context	-.65	.25	-2.62*	-1.14	-1.56
Chinese Context	-.07	.16	-.43	-.39	.25
Conditional indirect effect of MSR on Prosocial (Elaboration) [a]					
Australian Context	.22	.12	-	.03	.51
Chinese Context	.16	.07	-	.04	.31
Conditional indirect effect of MSR on Prosocial (Specificity) [b]					
Australian Context	-.01	.05	-	-.12	.08
Chinese Context	.02	.04	-	-.06	.10
Disruptive Behaviour				BCa 95% CI	
	B	*SE*	*t*	*Lower*	*Upper*
Predictors					
MSR	.29	.66	.44	-1.02	1.61
Culture	5.27	4.78	1.10	-4.25	14.78
Child Memory Elaboration	-.17	.28	-.62	-.72	.38
Child Memory Specificity	.11	.22	.50	-.33	.55
MSR x Culture	-.33	.72	-.47	-1.76	1.09
Conditional direct effect of MSR on Disruptive					
Australian Context	.29	.66	.44	-1.02	1.61
Chinese Context	-.04	.43	-.10	-.89	.81
Conditional indirect effect of MSR on Disruptive (Elaboration) [c]					
Australian Context	-.08	.28	-	-.70	.44
Chinese Context	-.06	.18	-	-.44	.29
Conditional indirect effect of MSR on Disruptive (Specificity) [d]					
Australian Context	.004	.06	-	-.11	.17
Chinese Context	-.004	.05	-	-.14	.08

Note. Controlling for child age and language abilities. MSR = Maternal supportive guidance during emotional reminiscing. +p<.10, *p<.05.

[a] Index of moderated mediation: Index = -.06, *SE*= .10, 95%CI [-.28, .12].

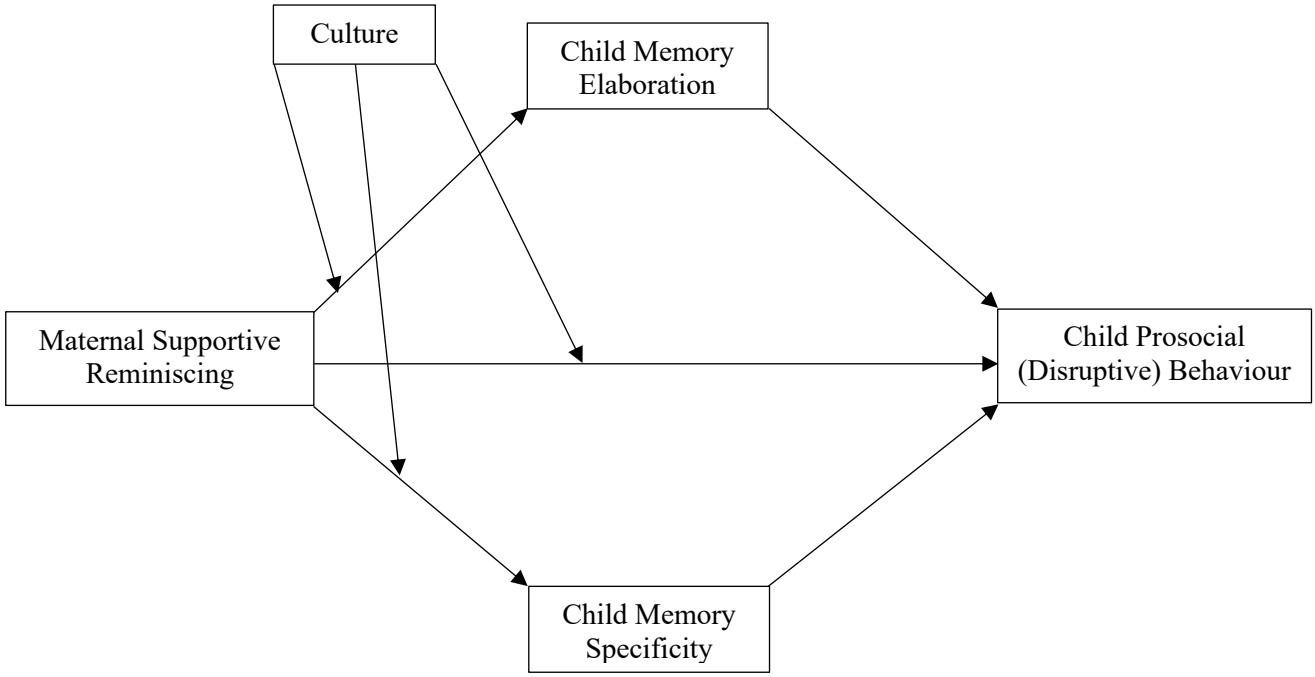
[b] Index of moderated mediation: Index = .03, *SE*= .06, 95%CI [-.08, .16].

[c] Index of moderated mediation: Index = .02, *SE*= .14, 95%CI [-.22, .36].

[d] Index of moderated mediation: Index = -.01, *SE*= .09, 95%CI [-.24, .13].

Figure 7.1

The Moderated Mediation Model of Two Aspects of Child Autobiographical Memory on the Relationship Between Maternal Supportive Reminiscing and Child Socioemotional Functioning (i.e., Prosocial and Disruptive Behaviours).



CHAPTER 8: General Discussion

8.1 Overall Aims

Rich theoretical perspectives have highlighted the critical role of maternal reminiscing in shaping young children's autobiographical memory. These theoretical accounts specifically suggest that enduring individual differences in mothers' reminiscing styles lead to individual differences in children's autobiographical memory ability. Yet, to date, these conclusions have been derived from investigations that have focused on the associations between maternal elaborative reminiscing and child memory elaboration. Though other aspects of the maternal reminiscing style (i.e., supportive reminiscing) and facets of child autobiographical memory ability (i.e., memory specificity) have recently attracted researchers' attention, this research is in its infancy. In particular, empirical evidence examining maternal reminiscing and child memory specificity has mostly centred on at-risk children in the United States. Therefore, it is unclear whether these findings can be generalised to the broader community population and in other cultural contexts. Furthermore, while the importance of early autobiographical memory in child development outcomes has been stressed in literature, empirical research investigating the relationships between child autobiographical memory and socioemotional functioning still remains limited.

Therefore, this study aimed to extend the current knowledge of the associations between maternal reminiscing styles (elaborative and supportive) and child autobiographical memory (elaboration and specificity) and the implications for child adjustment in two distinct cultural contexts: Australia and China. To address this aim, the thesis conducted a meta-analytic review and a series of empirical studies. First, a systematic review of past literature (Study 1) was conducted to explore how maternal elaborative reminiscing and child memory elaboration have been previously investigated. In addition, Study 1 utilised a meta-analytic approach to examine whether a consistent relationship between the two aforementioned variables could be established and how social-cultural factors might influence this

relationship. Second, a pilot study (Study 2) was conducted in an Australian community sample to investigate whether the relationships between maternal reminiscing styles and child memory specificity could be observed in typically developing children. Study 2 also explored whether the memory specificity of preschool-aged children mirrored that of their mothers. Finally, two cross-cultural studies, using participant samples from China and Australia (representing a relatedness-oriented and an autonomy-oriented cultural context respectively), were conducted to address the primary research aims of this thesis. The first of these cross-cultural studies, namely Study 3, specifically examined cultural variations in maternal reminiscing styles and mother-child autobiographical memory features between these two cultural contexts. In addition, Study 3 explored the similarities and differences in the relationships between maternal reminiscing styles and mother-child memory features across cultures. The second cross-cultural study, namely Study 4, examined how maternal support during emotional reminiscing and child autobiographical memory abilities were related to different aspects of child socioemotional functioning (i.e., prosocial and disruptive behaviours).

8.2 Overview of Findings

By conducting a systematic review and meta-analyses, Study 1first identified several maternal reminiscing elements that often constitute an elaborative reminiscing style. In particular, Study 1 highlighted that maternal *open-ended questions* and *positive evaluation* are two critical aspects of an elaborative reminiscing style that closely relate to child memory elaboration. Furthermore, Study 1 found considerable variations in how an elaborative reminiscing style was examined in past literature. Nonetheless, the relationship between maternal elaborative reminiscing and child memory elaboration did not differ significantly between the three predominant calculation methods (i.e., total elaboration, elaboration-ratio, classification analyses). Overall, Study 1 provided strong evidence indicating that mothers'

highly elaborative reminiscing style was associated with children's ability to provide greater detailed personal memory (i.e., elaboration), both concurrently and longitudinally. Such a positive association between those two aspects was also observed in cross-sectional studies conducted in financially disadvantaged dyads and across cultural contexts.

Using a community sample of Australian preschool-aged children and their mothers, Study 2 found moderate positive associations between aspects of maternal supportive reminiscing (i.e., focus on a child's emotional experiences and the structuring and elaboration provided to assist his or her provision of narratives) and child memory specificity. However, in contrast to the strong association between maternal elaborative reminiscing and child elaboration found in Study 1, Study 2 revealed that this reminiscing style was not significantly associated with child memory specificity. In addition, Study 2 found that maternal supportive reminiscing was positively associated with mothers' memory specificity, with a moderate to large effect size observed. Finally, Study 2 found that while child memory specificity was not directly associated with maternal memory specificity, an indirect pathway existed between maternal memory specificity and child memory specificity through mothers' supportive guidance during reminiscing.

Study 3 used a cross-cultural investigation of mother-child reminiscing and dyads' autobiographical memory features, and it found that Australian mothers tended to adopt a more elaborative and supportive reminiscing style than Chinese mothers when discussing past emotional events with their preschool-aged children. Similarly, Australian children provided significantly greater memory elaboration than Chinese children during reminiscing. Nonetheless, while Australian mothers recalled significantly more specific memories than Chinese mothers, children from these two cultural contexts did not differ significantly in their memory specificity. Furthermore, Study 3 found that maternal elaborative and supportive reminiscing styles were significantly associated with child memory elaboration in both

cultural groups. However, maternal reminiscing (both elaborative and supportive reminiscing) was not associated with child memory specificity in either cultural group. The exploratory analyses demonstrated that there was a significant interaction effect between maternal elaborative and supportive reminiscing in predicting child memory specificity. Finally, Study 3 found that while cultural context and maternal reminiscing styles contributed to young children's memory elaboration, they did not uniquely contribute to child memory specificity. These findings highlight that the processes of maternal reminiscing's contribution to child memory elaboration and child memory specificity may differ.

Study 4 examined the relationships between maternal supportive guidance during emotional reminiscing, child autobiographical memory (elaboration and specificity), and child socioemotional functioning (prosocial and disruptive behaviours). Study 4 specifically found that in both cultural contexts, maternal support during discussions of past emotional experiences was not directly associated with child prosocial or disruptive behaviours. In addition, children's memory specificity was not related to their prosocial or disruptive behaviours. However, positive associations (with small to moderate effect sizes) were observed between child memory elaboration and child prosocial behaviours in both cultural contexts. Moreover, the results of Study 4 demonstrated that in both cultural contexts, child memory elaboration mediated the relationship between maternal supportive reminiscing and child prosocial behaviour.

The following sections integrate the findings from these studies and discuss their theoretical and practical implications. Thereafter, the strengths and limitations of the current research are considered. The final section outlines future research directions and draws final conclusions.

8.3 Cultural Differences in Dyads' Reminiscing and Memory Features

As outlined throughout the thesis, two decades of research has constantly found profound cultural differences in maternal reminiscing styles (particularly the maternal elaborative reminiscing style). It is well-recognised that mothers from autonomy-oriented cultures are more elaborative and encouraging of their children's participation during reminiscing than those from relatedness-oriented cultures (Wang, 2007; Wang & Fivush, 2005). Consistent with this research, the current research (Study 3) found that Australian mothers were significantly more elaborative (i.e., produced more *wh*-questions, yes/no questions, and confirmations) during reminiscing than Chinese mothers. In addition, Australian mothers were rated as significantly more supportive (i.e., recognising, validating, and encouraging children's contribution to the conversations, and providing positive resolutions to negative feelings) during reminiscing than Chinese mothers. These findings support past research suggesting that mothers from autonomy-oriented cultures tend to afford their children greater autonomy during mother-child interactions and adopt a more 'reassuring' approach when resolving their children's negative feelings during joint reminiscing than mothers from relational-oriented cultures (Sun & Rao, 2017; Wang & Fivush, 2005).

Such systematic cultural differences in maternal reminiscing styles may reflect the different cultural emphases on the detailed remembering of one's personal past (Wang et al., 2018). In contemporary autonomous cultures, autobiographical memory is seen as particularly important in meeting the cultural expectation of having individuality and a personal history (Nelson, 2003). Children as young as those in their preschool years are expected to have individually composed personal stories that can be shared with others (Nelson, 2003). Hence, mothers from autonomous cultures tend to be more child-centred during reminiscing by placing greater focus on the child's expression of thoughts and feelings

and fostering individual opinion formation than mothers from relational cultures (Schröder et al., 2012).

The significant differences in maternal reminiscing styles between two cultural groups may also reflect cultural differences in the value of the expression of emotions. In the joint reminiscing task, mothers were required to discuss four past emotional events in which the child's emotion was centred. In autonomous cultures, discussing emotions is often regarded as a source of self-authenticity, a direct expression of individuality, and a strategy to ensure that one's needs are met. In contrast, in relational cultures, explicit talk about emotions is often considered to be disruptive to interpersonal relationships and is rather only encouraged when it serves the purpose of maintaining relationships (McCord & Raval, 2016). Hence, mothers from autonomous cultures tend to use emotional reminiscing to encourage their children's emotional abilities and self-growth, whereas mothers from relational cultures tend to use such reminiscing to cultivate children's impulse inhibition and restraint of socially disengaging emotional states (Doan & Wang, 2010). With this intention, children from autonomous cultures are expected and encouraged to talk more about their emotional experiences during reminiscing, whereas those from relational cultures are expected to learn mostly through careful listening (Leyva & Nolivos, 2015). Indeed, consistent with past research, the current study also found that Australian children provided significantly more memory elaboration during reminiscing than Chinese children.

In terms of memory specificity, the current study found that Australian mothers provided significantly more specific memories about past personal events than Chinese mothers. This aligns with past research demonstrating that individuals from autonomous cultures tend to report greater memory specificity than individuals from relational cultures when recalling personal events (e.g., Jobson & Cheraghi, 2016; Wang et al., 2018). However, no cultural difference was observed in memory specificity between Australian and Chinese

children. Given that the current study is the first to investigate cross-cultural differences in preschool-aged children's autobiographical memory specificity using the cue-word paradigm, it is unclear whether such a finding reflects a cultural similarity in child memory specificity in the preschool period or whether it is a result of other factors. For example, it is possible that the non-significant cultural difference may be the consequence of inclusion of a bilingual participant sample for the Chinese cultural group. There is evidence suggesting that being raised in a bilingual environment (i.e., exposed to a greater variety of speech patterns and memory retrieval cues, and more opportunities to practice making associations between past events) is beneficial to children's cognitive development (Bialystok, Craik, & Luk, 2012; Brito, Grenell, & Barr, 2014). It is thus possible that the bilingual children in the Chinese group may have enhanced development of autobiographical memory specificity than mono-lingual children. Further research is needed to arrive at a firm conclusion.

8.4 Maternal Reminiscing, Autobiographical Memory, and Socioemotional Functioning

In general, cultural variations were observed in maternal reminiscing styles and dyads' autobiographical memory features in the current research. However, such cultural differences do not automatically imply significant differences in the relationships between maternal reminiscing styles and child autobiographical memory abilities, and their implications for child socioemotional functioning.

8.4.1 Pan-Cultural Evidence of Maternal Reminiscing on Child Memory Elaboration

Indeed, despite the cultural variations observed in maternal reminiscing styles, the current study found that, pan-culturally, significant associations existed between maternal reminiscing styles and child memory elaboration (as evident in Studies 1 and 3). By categorising past studies into subgroups of '*autonomy-oriented*', '*relatedness-oriented*', and '*autonomy-relatedness oriented*' cultural contexts, Study 1 first demonstrated that a maternal elaborative reminiscing style was positively related to child memory elaboration across

cultures. In particular, there was strong evidence suggesting that mothers' elaborativeness and positive evaluation were closely associated with children's memory elaboration in both autonomy-oriented and relatedness-oriented cultural contexts. In addition, no significant evidence was found that cultural context moderated these relationships. Study 3 further provided evidence that maternal elaborative and supportive reminiscing uniquely predicted child memory elaboration even after controlling for a child's age, gender, language, and cultural context. Akin to the findings of Study 1, cultural context did not moderate the relationships between maternal reminiscing and child elaboration. This finding aligns with previous research suggesting a universal contribution of maternal elaborative reminiscing in eliciting child memory elaboration (Schröder et al., 2012; Wang, 2007), and it lends support to Nelson and Fivush (2004) social-cultural developmental theory, which views maternal reminiscing as a critical universal factor for facilitating young children's autobiographical memory development.

8.4.2 Exploring Child Autobiographical Memory Specificity Across Cultures

In contrast to the aforementioned findings, the conclusions that can be drawn in relation to child autobiographical memory specificity investigations are less clear. Studies 2 and 3 revealed mixed findings regarding the associations between maternal reminiscing and child memory specificity. Consistent with past studies (e.g., Valentino et al., 2014, McDonnell et al., 2016), Study 2 found a positive association between maternal supportive reminiscing (but not elaborative reminiscing) and child memory specificity in a sample of Australian mother-child dyads. This supports recent theoretical accounts that the extent to which details of memories are rehearsed and elaborated (i.e., elaborative reminiscing) is not related to children's ability to independently retrieve specific memories (Valentino et al., 2014). Instead, their memory specificity is developed through mothers' sensitive guidance to

facilitate children in making sense of past experiences and to encourage appropriate engagement with affective-laden memories (Larkina & Bauer, 2010; Valentino et al., 2014).

However, Study 3 provided no support for significant relationships between maternal supportive reminiscing (or elaborative reminiscing) and child memory specificity in both cultural contexts. It is not clear whether the non-significant associations observed in Study 3 are the result of that study employing a slightly younger child sample in both cultural contexts, compared to the child sample included in Study 2 and past empirical studies. When examining the factors that predicted child memory specificity, only child age and linguistic skill emerged as significant predictors; neither cultural context nor maternal reminiscing significantly predicted child memory specificity. It has been suggested that children's ability to recall specific memories may not be stabilised until the age of 4.5 years (Nieto, Ros, Mateo, Ricarte, & Latorre, 2017). As the mean age of the children who participated in Study 3 was 4, it is possible that the concept of specific memories has not been readily internalised by some children in early preschool years. The finding that only child age and linguistic skill significantly predicted child memory specificity is in line with extant research evidence suggesting children's ability to recall their past is dependent on their verbal ability at young ages (Farrant & Reese, 2000; McDonnell et al., 2016; Reese et al., 2018). Nonetheless, it is worth noting that Study 3 observed a significant interaction effect of maternal elaborative and supportive reminiscing in predicting children's memory specificity. Such finding provided cross-cultural evidence to support recent research (i.e., Lawson et al., 2018; McDonnell et al., 2016) that suggested maternal elaborative reminiscing can significantly predict child memory specificity under conditions of high maternal support during reminiscing. Given research investigating these associations are still relatively nascent, further research is required to draw a firm conclusion regarding how maternal reminiscing styles contribute to child memory specificity.

8.4.2.1 The Relation of Maternal Memory Specificity to Child Memory Specificity

When exploring the possible relation between maternal memory specificity and child memory specificity, neither Study 2 nor Study 3 found that children's memory specificity in preschool years was associated with maternal memory specificity. However, mixed results were reported for the associations between maternal memory specificity and maternal reminiscing styles. In particular, Study 2 found a significant positive association between mothers' memory specificity and maternal supportive reminiscing style (i.e., maintaining focus on a child's emotional experience, keeping him or her engaged in conversation, structuring the conversation, and gaining closure on negative feelings). Furthermore, Study 2 demonstrated an indirect effect of maternal specificity via maternal supportive reminiscing on child memory specificity. This finding provided the first evidence that maternal support and sensitive guidance in reminiscing may be one mechanism by which maternal memory specificity influences child memory specificity. Nonetheless, such findings were not replicated in Study 3. The results of Study 3 that maternal memory specificity was not associated with any of the maternal reminiscing style variables or child memory variables in either cultural context (when mediation analyses were conducted, no evidence was found to support the findings of Study 2). Thus, no clear conclusion currently exists regarding the associations between maternal memory specificity and children's memory specificity.

8.4.3 Consequences of Emotional Reminiscing and Child Autobiographical Memory

Mother-child discussion about emotions has long been theorised as a powerful context facilitating children's socioemotional development (Eisenberg et al., 1998). However, researchers have only recently begun to examine the influence of mother-child discussion about past emotional events (i.e., emotional reminiscing) on children's socioemotional functioning (Fivush et al., 2006; Salmon & Reese, 2016). In support of this theoretical perspective, Study 4 found a significant indirect effect of maternal supportive reminiscing

about past emotional events on children's prosocial behaviour via their memory elaboration; cultural context did not moderate this indirect effect. Such a finding also provides support to recent research suggesting that children's active memory contribution in emotional reminiscing is important for fostering their socioemotional understanding (Laible, Murphy, & Augustine, 2013a; Song & Wang, 2013). Researchers have proposed that reminiscing about past emotional events creates an optimal environment for children to reflect and re-evaluate their past experiences (Laible, 2011). Moreover, mothers who are able to reminisce in a sensitive and supportive manner during emotional reminiscing provide a resourceful forum for children to understand emotional and social cues (Van Bergen et al., 2018). Meanwhile, children's memory responses during reminiscing provide mothers with information regarding whether there is a need to manage their children's inappropriate behaviours and encourage prosocial behaviours (Grusec & Davidov, 2014; Laible et al., 2013b). Therefore, by engaging in joint reminiscing about past emotional experiences, alongside sufficient maternal support, children are gradually equipped with the knowledge about important social skills that can be applied in various situations (e.g., clarification of emotional causes, possible solutions to similar problems) (Laible, 2011).

However, Study 4 did not find any significant associations between the maternal supportive reminiscing, child memory specificity, and child socioemotional functioning (prosocial and disruptive behaviours) in either cultural context. This finding is inconsistent with Valentino et al.'s (2018) study, which provided preliminary evidence that child memory specificity uniquely predicted children's disruptive (i.e., externalising and internalising) behaviours. In addition, contrary to our hypothesis, the current study did not find an indirect effect of maternal supportive reminiscing on child disruptive behaviours via child memory specificity. The non-significant findings in Study 4 may again reflect the current investigation being conducted in young children (*M* age = 4.37 years) from community samples in which

there was low frequency of reported disruptive behaviours, compared with Valentino et al.'s study, which employed a sample of slightly older pre-schoolers (*M* age = 5.65 years) from economically disadvantaged families—a population that has been recognised as being at increased risk of negative behavioural outcomes (Van Bergen et al., 2018). It is also possible that children in Study 4 had not yet been socialised to the value of autobiographical memory specificity and its use for psychological adjustment.

8.5 Theoretical Implications

Overall, the findings of the current study lend support to both Nelson and Fivush's (2004) social-cultural developmental theory and Valentino's (2011) developmental model of memory specificity, both of which posit that mother-child reminiscing plays a critical role in shaping child autobiographical memory. Specifically, the findings from Study 2 and 3 demonstrated a unique and consistent relationship between maternal reminiscing styles and young children's memory elaboration across cultural contexts. Though the conclusion that could be made about how mothers' reminiscing styles contribute to child memory specificity is less clear, Study 2 and 3 provided evidence supporting the notion that mother-child reminiscing can also facilitate children's developing memory specificity. In Valentino's model, elaborative and emotionally rich maternal reminiscing is proposed to help children understand the personal meaning of past events and to integrate these past events into a coherent autobiography, which is critical in children's later memory retrieval. However, empirical evidence has tended to show a lack of association between mothers' elaborative reminiscing style and children's ability to retrieve specific memories, suggesting that it is not the extent to which details of memories are repeated, rehearsed, or elaborated that are related to child memory specificity (e.g., Valentino et al., 2014). The current thesis provided evidence that mothers' elaborative reminiscing can significantly predict children's memory specificity when mothers are high in supportive reminiscing (i.e., assisting children in making

sense of their past experiences in a sensitive, supportive, and coherent way) (McDonnell, Valentino, Comas, & Nuttall, 2016).

There was also support for theoretical models positing sociocultural influences on the development of child autobiographical memory (e.g., Conway & Jobson, 2012; Fivush, 2011; Nelson & Fivush, 2004; Valentino, 2011; Wang & Conway, 2004). This research (Study 3) supported the notion that mothers' culturally shaped beliefs influence their reminiscing styles, which in turn influence the formation of children's autobiographical memory (Wang & Fivush, 2005). In addition, even though there was no evidence suggesting that children's memory specificity differed across cultures, a significant cultural difference was observed in mothers' memory specificity. Such a finding may exemplify how culture influences an individual's autobiographical remembering. It is possible that individuals' memory specificity does not differ in the early preschool period, but that they gradually learn the culture-specific values of autobiographical remembering as they group up and eventually translate these values into their own memory operations (Wang, 2016). Despite the significant cultural variations in reminiscing and memory features, the current research did not find a moderating effect of cultural context on the associations between maternal reminiscing and child autobiographical memory abilities. This finding supports the cross-cultural utility of Nelson and Fivush's (2004) social-cultural developmental theory and Valentino's (2011) developmental model of memory specificity, namely that pan-culturally, maternal reminiscing styles plays an important role in child memory development.

Furthermore, the findings from Studies 1 and 3 suggest a need to reconsider the existing definition of elaboration. Maternal elaboration has been defined as mothers' utterances that either introduce a topic for discussion, provide new information, or move the conversation to a different aspect of an event, and it is often reflected in three main forms: *wh*-questions, yes/no questions, and elaborative statements (Reese et al., 1993). Nonetheless,

the results of the meta-analyses indicated that yes/no elaborative questions and elaborative statements were not significantly related to child memory elaboration. Such a finding suggests that these elements may not always be effective in encouraging and eliciting children's memory response. For instance, the frequency of maternal yes/no questions and elaborative statements may reflect that the mother is actually driving the reminiscing instead of offering opportunities for the child to contribute. This finding is further supported in Study 3, which found that when using factor analysis to create a maternal elaborative reminiscing variable, only *wh*-questions, elaborative statements, and confirmations loaded onto a single factor; yes/no questions did not load onto the same factor. This finding aligns with previous literature suggesting that yes/no questions may be associated with low elaborative reminiscing (Fivush, 2011).

Study 1 also notably revealed a non-significant but positive relationship between maternal repetition and child memory elaboration. Maternal repetition has been defined as mothers repetition of either the exact content (or gist) of their own previous utterances or their children's utterance; and it is often conceptualised as an indication of a low elaborative reminiscing style (Reese et al., 1993). However, its positive relation to child memory elaboration suggests that maternal repetition may not necessarily have a negative influence on that type of elaboration. Researchers have suggested that mothers may use repetition of child utterances as a strategy to encourage their children to join the conversation, especially when children are early in the language development phase (Zevenbergen, Holmes, Haman, Whiteford, & Thielges, 2016). Therefore, there is a need for research to continue the investigation of understanding and recognising the reminiscing elements that constitute an elaborative reminiscing style—in particular, differentiating the elements that facilitate or impede mother-child reminiscing within each reminiscing utterance.

8.6 Practical Implications

The current study has several possible practical implications. A critique of the current reminiscing literature is that it is largely based on studies conducted with dyads from well-educated and middle-class families (Fivush, 2011). By integrating past empirical findings, Study 1 provided evidence that maternal elaborative reminiscing is equally beneficial to child memory elaboration in families with high socioeconomic risks. This is a potentially important finding, given that accumulating evidence suggests that children from low-income families are at risk of delayed autobiographical memory development and are more likely to have associated behavioural problems (e.g., antisocial behaviours) (Odgers et al., 2012; Van Bergen et al., 2018). It is possible that within financially disadvantaged families, where less support and fewer resources are available for child development, children's socioemotional skills and memory development may be even more dependent on maternal support during reminiscing.

Despite the cultural variations observed in child memory elaboration and maternal reports of child prosocial behaviours, Study 4 notably found that child memory elaboration was uniquely associated with child prosocial behaviours in both cultural contexts. It is important to note that in both cultural contexts, the findings of Study 4 support the recent theorisation of child memory elaboration as a potential mediator underpinning the relationship between maternal support in emotional reminiscing and child prosocial behaviours (Laible et al., 2013a; Song & Wang, 2013). This finding highlights the importance of fostering children's memory elaboration during mother-child discussions about past emotional experiences to facilitate children's positive socioemotional functioning. Intervention research has found that mothers can be trained to be more elaborative (i.e., use more open-ended questions and confirmations) in their reminiscing, and in turn, children of trained mothers tended to demonstrate improved memory elaboration (Reese & Newcombe,

2007; Taumoepeau & Reese, 2013; Wareham & Salmon, 2006). Therefore, training mothers to adopt a more elaborative and supportive reminiscing style may serve as a protective factor against children's development of behavioural problems, and it may have applicability in cross-cultural contexts.

Furthermore, Study 2 provided preliminary evidence of an indirect effect of maternal memory specificity on the relationship between maternal supportive reminiscing styles and child memory specificity. This is a potentially important finding that may aid in the development of intervention programmes targeting mothers who are at risk of having reduced memory specificity (e.g., mothers with depression or post-traumatic distress disorder). A caregiver's mental health outcomes (e.g., depression) are often seen as a risk factor for maltreatment and poor psychological adjustment in children, as the disruptions in emotion regulation and emotion expression associated with these disorders can impair one's ability to parent a child (Claude, Omar, & Danielle, 2013; Feng, Shaw, Skuban, & Lane, 2007; Fujiwaraa, Kasaharab, Tsujiic, & Okuyama, 2014). Mothers experiencing psychological distress are also less likely to communicate and interact with their children in a way that meets their developmental needs; be sensitive to children's signals; and respond in order to comfort and understand when children are distressed (Salmon & Reese, 2015). A recent study conducted by Woody et al. (2015) examined the memory specificity in the never-depressed children of mothers with major depressive disorder (MDD) versus mothers without a history of MDD. This study found that children of depressed mothers, compared to those of non-depressed mothers, recalled fewer specific memories in response to negative cue words. Hence, if mothers' memory specificity is reflected in their emotional reminiscing styles, then training them to be more supportive in past emotional event discussion may prevent children from developing reduced memory specificity, which is negative for psychological functioning. There is emerging evidence indicating that memory specificity can be trained in

adolescents and adults (e.g., Neshat-Doost et al., 2013), and memory specificity training for mothers and potentially younger children may thus be beneficial. However, given the contrary results obtained in Study 2 and Study 3, questions remain about whether maternal memory specificity influences maternal reminiscing styles and child autobiographical memory development. Further research is required to explicitly address this question.

8.7 Strength and Limitations

This thesis contains the first research to systematically investigate the variations in and relationships between maternal emotional reminiscing styles (i.e., elaborative and supportive) and mother-child autobiographical memory features (i.e., elaboration and specificity), as well as their implications for child socioemotional functioning (i.e., prosocial and disruptive behaviours), in a cross-cultural context. In particular, the current research was the first cross-cultural examination of young children's memory specificity using the classic cued memory retrieval task, thereby extending cross-cultural understanding of child autobiographical memory development. These findings provide normative data of memory specificity in typically developing children during preschool years and evidence regarding the relationships between maternal reminiscing styles and young children's memory specificity in participants outside the United States. The findings further support the cross-cultural applicability of Nelson and Fivush's (2004) social-cultural developmental theory and Valentino's (2011) developmental model of memory specificity. Finally, the inclusion of a bilingual (in Mandarin and Cantonese) Chinese child sample enables the current research to generalise to other relatedness-oriented cultural contexts (e.g., Singapore and Malaysia) where bilingualism and multilingualism are especially common (Goh, 2017; Ozóg, 1993).

However, several limitations are worth considering. First, the findings of the current research (Studies 2, 3, and 4) were based on cross-sectional observations. Though the correlational cross-sectional design and the use of moderation and mediation analyses were

helpful in understanding the complex relationships between the primary study variables, causal interpretations cannot be drawn. Second, even though the sample sizes in Studies 2, 3, and 4 were comparable to past research that has examined similar research questions, the modest sample sizes may have limited the statistical power in testing the true effect of the moderation or mediation models investigated in the current research. In addition, the unequal sample sizes for each demographic subgroup (e.g., family raising model) limited our ability to examine the influence of these factors on the study variables.

Third, while an attempt was made to increase cultural generalisability, the generalisability of the current findings is still subject to certain limitations. For instance, in both cultural contexts, the participant samples were limited to well-educated mothers, with the majority of mothers holding at least an undergraduate degree. Research has demonstrated that mothers' education level has a significant effect on child memory elaboration, with less-educated mother-child dyads being less elaborative and evaluative than well-educated mother-child dyads during reminiscing (Reese & Newcombe, 2007). Hence, the findings might not generalise to populations with lower levels of education. In addition, the samples included in the current research were limited to urban samples of a major city (i.e., Guangzhou and Melbourne) in each cultural group. Research has found that the subtle differences between social classes or subcultures within the same society may affect parental socialisation goals and beliefs in child-rearing (Denham et al., 2011). Our results may therefore not be generalisable to the larger population with a more diverse demographic profile.

Finally, the most important limitation relates to the reliability and validity of some of the measures included in the current study. For instance, given that this is the first study examining preschool-aged children's memory specificity using the AMT-PV in China, the psychometric properties of the Chinese version of the AMT-PV have not yet been tested. In

addition, research has revealed that the scores on AMT can be susceptible to procedural differences and different selection of cue words (Griffith et al., 2012). Though attempts have been made to minimize the procedural influences (e.g., using minimal instruction for non-clinical samples, audio-taping the AMT-PV conversations to prevent experimenter bias), the current thesis did not control the selection of cue words for the AMT and AMT-PV. Researchers suggested that failures in specific retrieval can also vary with the degree to which respondents relate to cue presentations important to self-regulation (Griffith et al., 2012). Given such idiosyncratic meanings of the cues can vary for participants from different cultural context and potentially across developmental stages, it is important for cross-cultural developmental studies to ensure the selection of cue words are self-relevant for participants under investigation. Furthermore, despite the SDQ has been the most widely used measure of a child's strengths and difficulties in cross-cultural research (Hall et al., 2019), Study 4 demonstrated that the internal reliabilities for the SDQ subscales were not ideal in both cultural contexts. Research has found that Chinese parents tend to interpret the SDQ questions relating to children's conduct and peer problems somewhat differently to parents from the UK (i.e., Du, Kou, & Coghill, 2008). Consistent with Du et al.'s (2008) study, Study 4 also found that Chinese mothers scored their children consistently higher on disruptive behaviours than Australian mothers. It is thus unclear whether the differences observed between two cultural contexts reflect the actual between-group differences in prevalence or if they are the result of cultural differences in expectations of 'competent behaviours' (Halle & Darling-Churchill, 2016).

8.8 Future Research Direction

Future research would benefit from addressing these methodological limitations. First, longitudinal design research is required to understand the effect of maternal reminiscing on child autobiographical memory development. Second, further work with a larger sample size

and inclusion of participants from diverse demographic backgrounds would enable a more comprehensive examination of the theoretical models. Third, future cross-cultural research would benefit from the use of internationally valid and reliable instruments that are sensitive to differences in social behavioural norms. In particular, an essential next step for future research with a focus on children's memory specificity in China is to confirm the reliability and validity of the Chinese version of AMT-PV. In the current thesis, the translated cue word '坚强' (*strong*) in the Chinese version of AMT-PV was deemed hard to understand for children who just reached three years old. It is possible, a cue word that is considered age-appropriate in one language may not be equally age-appropriate in another language with its direct translation. In addition, as the AMT-PV is newly developed, and with its psychometric properties being mainly reported for children between 4 to 6 years old (Nuttall et al., 2014), it is less clear about its appropriateness of assessing 3-year-olds' capacity to retrieve specific memories. In a recent study (i.e., Nieto et al., 2017) that similarly administered a preschool version of AMT in Spanish children, the researchers found that the AMT is mostly appropriate for pre-schoolers from the age of 4.5 years. Nieto and colleagues suggested that the AMT task is more difficult and less informative for younger pre-schoolers. Thus, for future research aiming to understand child memory specificity in different cultural contexts, it is important to develop AMT versions (with developmentally appropriate and culturally relevant cue words) adapted to preschool populations in the particular countries under investigation (Nieto et al., 2017).

Moreover, as the current research is the first to systematically investigate maternal emotional reminiscing styles, child autobiographical memory, and child socioemotional functioning in a cross-cultural context, several directions exist for future research. First, despite substantial progress in the understanding of child autobiographical memory development over several decades, current knowledge of young children's memory

specificity formation is still limited. Following past studies, when examining mother-child memory specificity, the current research also focused on whether their memory responses were specific when asked to recall a past event independently. Little is known about how the characteristics of these specific memory responses would be associated with the main study variables in current research. For example, as mentioned earlier in the thesis, a specific memory response can consist of details from very little information to plentiful details. A recent study (i.e., Kyung, Yanes-Lukin, & Roberts, 2016) has revealed that while specific memories predicted adults' fewer depressive symptoms, better executive control, lower emotional avoidance and reactivity; the amount of details within specific memories predicted adults' greater depressive symptoms, subjective stress, emotion reactivity and rumination. Future research could examine how preschool-aged children's specific memories and the level of details within their specific memories are associated with their socioemotional functioning. Further, research so far (including the current thesis) has mainly focused on preschool-aged children's specific memories. Future research could examine whether children's non-specific memory responses (e.g., extended, categorical, semantic) would significantly predict certain aspects of child socioemotional functioning in preschool years.

In addition, the current research only tested aspects of Valentino's (2011) model (i.e., at the macro and micro levels). Given that this model is still relatively new, further research is required to validate the applicability of the developmental psychopathology model in predicting child memory specificity across various sociocultural contexts. Specifically, greater attention is still needed in cross-cultural research examining the specific links between mother-child reminiscing and child memory specificity. Furthermore, one could examine the ways in which the risk and protective factors (at multiple levels of the model) interact to best predict child memory specificity in order to understand the complex mechanisms underpinning its developmental process.

Another possible area for future research is investigating the influence of maternal memory specificity on maternal reminiscing styles, as well as its subsequent consequences on children's autobiographical memory and associated psychological adjustment (Wareham & Salmon, 2006). The current research presented some evidence that maternal supportive and sensitive guidance during emotional reminiscing may be one mechanism by which maternal memory specificity influences child memory specificity (Study 2) and that maternal elaborative and supportive reminiscing may interact to influence child memory specificity (Study 3). However, much more research in this area is needed, especially given the well-established relationship between reduced memory specificity and emotional disorders (Sumner et al., 2010). For instance, further research could explore how maternal depression and maternal memory specificity may interact to influence child memory and adjustment development. In addition, it is important to continually expand the current understanding of how different aspects of child autobiographical memories contribute to different aspects of children's socioemotional development. If a consistent relationship between maternal memory specificity, mothers' reminiscing styles, child autobiographical memory, and socioemotional functioning could be established, then such a finding may assist in the development of intervention programmes.

Finally, in the future, it is also important to explore the possible influences of other family members (e.g., fathers, grandparents, and siblings) on young children's autobiographical memory development. The current research only included mothers, assuming that they were the primary caregivers. However, the family structure variations observed both within and across cultural contexts indicate the presence of other important primary caregivers. Though there is some research evidence suggesting differences in how mothers and fathers reminisce with their children (Bost, Choi, & Wong, 2010; Buckner & Fivush, 2000), empirical investigations regarding the way in which father-child reminiscing

contributes to child autobiographical memory development is limited. In addition, given the growing tendency of co-residence of grandparents and grandchildren in contemporary societies (K. Brown et al., 2017; Chen, Liu, & Mair, 2011), it would be beneficial to explore how intergenerational reminiscing might influence young children's autobiographical memory development. Furthermore, even though sibling-child interaction might not be as influential as parent-child interaction on child development, sibling relationships are often the first peer experiences that most children encounter (Healy, 2018), and these relationships might thus play a role in the complex development pathways of child memory and psychological development.

8.9 Conclusion

Overall, the present four studies provided a detailed view of the cultural similarities and differences in maternal reminiscing styles, mother-child autobiographical memory features, and child socioemotional functions between two distinct cultural contexts: China and Australia. The current research tested the cross-cultural applicability of Nelson and Fivush's (2004) social-cultural developmental theory and Valentino's (2011) developmental model of memory specificity. Despite the cultural variations observed between the Australian and Chinese mother-child dyads' reminiscing and remembering of past emotional experiences, the current research provided strong evidence that pan-culturally, maternal support during reminiscing is positively associated with child memory elaboration and children's prosocial behaviours. Though the conclusions that can be drawn in relation to the associations between maternal reminiscing styles and child memory specificity are less clear, there was some support for the theoretical notion of a critical role of maternal reminiscing styles in child memory specificity. The current research suggests that different pathways may exist in how maternal reminiscing styles contributes to different aspects of child autobiographical memory (i.e., elaboration and specificity), with a possible role of maternal

memory specificity in child autobiographical memory specificity. In addition, different aspects of child autobiographical memory may be associated with different aspects of child socioemotional functioning.

CHAPTER 9: References

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