Child Past and Future Thinking:
What Children Remember and Imagine, and the Role of Parental Mind-Mindedness and Elaboration

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Abstract

Thinking about memories and possible future events allows us to prepare for the future. Whilst we are beginning to understand how past and future thinking develops in early childhood, little is known about these processes in middle childhood and how parental factors, like mind-mindedness and elaborations, influence them. This study examined the content of past and future thoughts in 11- to 13-year-olds and the role of these parental factors. We collected data from 21 parent-child dyads in three different phases: a) parents completed an online survey involving a measure of mind-mindedness; b) parents and children completed a joint Zoom session measuring parental elaborations; c) children completed an independent Zoom session measuring past and future thoughts. Children generated more relevant details for past thoughts than future thoughts, while the amount of off-topic details was similar between past and future thoughts. This pattern indicates that children are proficient at retrieving relevant information, but they are more proficient at this retrieval when thinking about memories than imagining the future. Children subjectively rated past and future thoughts as similarly important and vivid but reported thinking more frequently about future thoughts than past thoughts. This pattern illustrates that, for children, memories and future events are equally important and visualised equally. However, children imagine the future more often than they reminisce about the past. These findings enhance our understanding of the functioning of past and future thinking in middle childhood. No relationship was found between parents' understanding of their children, parents' elaborations, and children's past and future thoughts. We replicated and extended previous findings with a novel age group, thereby contributing to a lifespan overview of past and future thinking. Our research has practical implications for parents, teachers, and clinicians. A longitudinal design in future research would further assist in understanding past and future thinking across childhood.

Keywords: episodic memory, episodic future thinking, cognition, children, parents, mind-mindedness, elaborations.

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Chapter One: Introduction

To remember who we are, where we are, what we are doing and why, and so much more, we rely on memory. Memory is an essential cognitive process that involves encoding, storing and later retrieving information (Zlotnik & Vansintjan, 2019). Through memory processes, people remember what they have done in the past and use this information to assist them in the present and the future (Brem et al., 2014; Klein et al., 2013). Memory development begins in infancy, improving throughout childhood and adolescence as other physical and cognitive processes improve (Schneider & Ornstein, 2019). Physical and cognitive processes that influence memory development over time include brain development and growth, processing speed, increases in knowledge, and improved strategies for encoding, storing, and retrieving information (Cowan, 2014; Schneider & Ornstein, 2019). External factors also influence memory development over time, including sociocultural processes and interactions with other people (Fivush, 2011; Wang, 2021; Lamb & Lewis, 2011). One question this thesis will explore is the role that parents play in influencing how children think about the past and the future.

Memory is, however, not unitary, with different memory systems processing different types of information in unique ways (Squire, 2009; Nelson & Fivush, 2004). Autobiographical memory is the integration and organisation of personal past experiences into a life narrative (Fivush, 2011; Bauer, 2015). Both episodic details (information about specific past events) and semantic details (general and factual knowledge) are included in autobiographical memory, along with the person's subjective emotions and interpretations that are associated with their experiences (Bauer, 2015; Fivush, 2011; Nelson & Fivush, 2004). A second question this thesis will explore is the content of children's past and future thoughts. Autobiographical memory is significant in shaping a person's sense of self and enhancing a person's psychological well-being (Vanderveren et al., 2017).

Autobiographical Memory Development

Autobiographical memory begins developing in early childhood, from approximately three to five years of age (Berntsen & Rubin, 2012; Fivush, 2011). This development occurs as the child matures cognitively and physically while interacting with others, such as in conversation (Berntsen & Rubin, 2012; Nelson & Fivush, 2004). At this age, children gain a sense of consciousness that they have subjective experiences and a personal history that differs from others (Nelson, 2001). Children also begin to understand at this age that they are a 'continuous' self, whereby they learn that they not only exist in the present but also in the past and will continue to exist in the future (Nelson, 2001). Children, therefore, begin to understand that they have a personal biography at this young age that defines who they are and how they differ from others (Nelson, 2001; Vanderveren et al., 2017). As such, autobiographical memory development is integral to children's identity development (Vanderveren et al., 2017; Fivush, 2011).

Children's autobiographical memory abilities continue to improve over childhood and adolescence. With continued maturation, children become better at encoding their experiences and storing higher-quality, detailed memories (Nelson & Fivush, 2004; Schneider & Ornstein, 2019). Their recollections of the past become more coherent and complete, and they can increasingly recall their personal experiences and the associated emotions and context of these experiences accurately (Berntsen & Rubin, 2012; Nelson & Fivush, 2004). As a result, older children can recall more details when asked an open-ended question and require less probing to retrieve memories than younger children (Hamond & Fivush, 1991; Nelson & Fivush, 2004).

Social processes have a significant influence on the events that children remember (Fivush, 2011; Wang, 2021). Through shared experiences, children learn to define themselves in relation to others. For example, a child with a younger sibling may learn to define

themselves as a caring older sibling based on the experiences that they share with others. The child's close social network significantly influences children's autobiographical memory development (Fivush et al., 2011). This close network includes the child's immediate and extended family, friends, teachers, and peers at school (Fivush et al., 2011). These significant people in the child's life impart information to the child by drawing on their own experiences and autobiographical memories. This shared information shapes the child's identity and continuous self and influences what the child learns is important to remember – thereby influencing the child's autobiographical processes (Fivush et al., 2011). Overall, these social influences and the cognitive developmental changes that occur across childhood assist children's autobiographical memory ability.

With a sufficient autobiographical memory ability, children learn to understand the emotional explanations behind experiences and incorporate these explanations coherently into their narratives (Fivush, 2011). Autobiographical memory helps children with resolution and resilience development regarding these experiences, allowing them to cope with future experiences (Vanderveren et al., 2017). Autobiographical memory is, therefore, helpful in guiding future thoughts and behaviours (Fivush, 2011). Furthermore, we use autobiographical memory to imagine and think into the future (Schacter et al., 2017).

Future Thinking Development

Not only do people develop the ability to remember personal events that occurred in the past, but they also develop the ability to think into the future and 'pre-experience' personal events that are likely to happen (Atance & O'Neill, 2001; Schacter et al., 2017). There are shared cognitive features between the two processes of remembering the past and imagining the future, and some researchers consider episodic memory the basis for constructing and imagining personal future events (Schacter & Addis, 2007; Visu-Petra & Opris, 2019;

Schacter et al., 2017). Therefore, as noted above, we use memory to assist us in thinking into the future. One aspect of the memory system considered to be shared with future thinking is the retrieval processes for autobiographical memories (Berntsen & Rubin, 2012; Schacter et al., 2017; Schacter & Addis, 2007). Schacter and Addis (2007) noted that whilst a memory system itself (used to store information) cannot simulate novel future events, the constructive principles of autobiographical memory are likely used in future thinking. Whereby, in both past and future thoughts, elements of past details are retrieved. In support of this idea, neuroimaging research shows that when people think about the past and the future, similar neural regions are activated (Addis et al., 2007; Okuda et al., 2003; Szpunar et al., 2007; Benoit & Schacter, 2015). However, the future thought system allows for a more flexible retrieval, enabling the recombination and reassembly of details to imagine novel future events (Schacter & Addis, 2007).

Another shared aspect between past and future thinking is that the person must have a 'continuous' sense of self (Nelson, 2001; Berntsen & Rubin, 2012). As noted above, a continuous self allows the person to understand that they exist not only in the present but also in the past and the future (Nelson, 2001). This ability allows the person to 'mentally time travel' to the past and future (Tulving, 1985; Nelson, 2001; Berntsen & Rubin, 2012). Thus, there are clear links between autobiographical memory processes and future thinking. However, there are also processes unique to future thinking, with future thinking considered a more demanding cognitive process, given that people not only retrieve episodic details from their past, but they also have to recombine these details into novel future events that have not occurred before (Gott & Lah, 2014; Schacter & Addis, 2007; Atance & O'Neill, 2001). Overall, there are both similarities and differences between past and future thinking processes.

The development of future thinking begins in early childhood at approximately the same age as autobiographical memory – between three and seven years old (Atance & Meltzoff, 2005; Busby Grant & Suddendorf, 2010; Ferretti et al., 2017). Future thinking abilities increase as children enter adolescence and adulthood (Wang et al., 2014; Gott & Lah, 2014). One study conducted by Gott and Lah (2014) found that adolescents aged between 14 and 16 years old provided more details in remembering past events and generating future events than children aged between 8 and 11 years old. Another study conducted by Ferretti et al. (2017) found that basic future thinking skills developed by seven to eight years old, with continued improvement throughout middle childhood and into adolescence.

Future thinking is a crucial cognitive process for children to develop, as it is needed to plan for potential future scenarios and create future-oriented goals (Schacter, 2012). Future thinking assists children's decision-making skills, allowing them to weigh up potential outcomes and anticipate the risks and benefits of future choices (Schacter, 2012; Bromberg et al., 2017). Future thinking can assist with impulsivity, particularly as children begin adolescence and focus on longer-term goals (Bromberg et al., 2015). In support of this view, adolescents discussing future events with more vivid details showed less impulsiveness during a delayed discounting task (Bromberg et al., 2015). Positive future thinking has further been associated with positive psychological well-being and the development of effective coping strategies (Schacter, 2012; Santos et al., 2022; Taylor et al., 1998).

Similar to autobiographical memory, future thinking development is influenced by external factors, including social norms (Ross & Wang, 2010; Wang, 2016). Furthermore, as the child's close social network influences their autobiographical memories, close others also likely scaffold children's future thoughts through their own perceptions and values and their expectations of the child in the future (Fivush et al., 2011; Soresi et al., 2014). For example,

Soresi et al. (2014) noted that parents play a crucial influence in influencing children's future career thoughts.

Overall, past and future thinking development improves throughout childhood and is influenced by external factors, such as the child's close social network, including parents. Previous research has examined the similarities and differences between past and future thinking processes. Furthermore, research has examined how these processes underlie the specific content generated in past and future thoughts.

The Content of Past and Future Thoughts

The content of past and future thoughts can be broken down into two broad categories (Levine et al., 2002; Willoughby et al., 2012). The first category is episodic details – details the person provides that are relevant to the specific past or future event. The second category is non-episodic details – off-topic information and details the person provides that are irrelevant to the specific event. These categories are a broad catch-all whereby different types of details make up the final episodic and non-episodic categories (Levine et al., 2002). In the episodic category, these types of details are event, place, time, perceptual, and emotion/thought details. In the non-episodic category, these types of details are semantic, repetitions, other, off-topic episodic, and generic routine details (Levine et al., 2002).

Examining and comparing the content of past and future thoughts is crucial for understanding the generative processes involved in past and future (re)construction (Gott & Lah, 2014; Wang et al., 2014; Nyhout & Mahy, 2023). Wang et al. (2014) highlighted the lack of previous research comparing children's past and future thoughts in middle childhood, which hinders our understanding of how episodic thinking functions past early childhood. In their recent review, Nyhout and Mahy (2023) noted that while extensive work with adults had compared past and future thinking, little empirical work had examined this area with

children. The limited existing studies indicate that children in middle childhood generate more episodic details when talking about the past compared to talking about the future (Gott & Lah, 2014; Wang et al., 2014; Ciaramelli et al., 2018; Coughlin et al., 2014). This finding is consistent with adult research (Beni et al., 2013; Zavagnin et al., 2016; Addis et al., 2010). However, child research has not examined the different types of episodic details (only the broad episodic category). In adult research, it has been found that adults generate more event details compared to the other types of episodic details (Cole et al., 2013; Levine et al., 2002; Li-Chay-Chung et al., 2023). Examining the types of episodic details that children generate will enhance our understanding of the specific content children retrieve and (re)construct when they remember the past and imagine the future.

There are conflicting findings regarding non-episodic details. The majority of child research shows that children generate a similar amount of non-episodic details for both past and future thoughts (Wang et al., 2014; Ciaramelli et al., 2018), which aligns with adult findings (Beni et al., 2013; Zavagnin et al., 2016). However, Gott and Lah (2014) found that children generated more non-episodic details when discussing the past compared to the future. The authors only focused on semantic details in their analyses and did not include the other four types of non-episodic details. No other child study has examined and compared the five types of non-episodic details. Li-Chay-Chung et al. (2023), in their pre-printed study, found that older adults generated more details in the generic event subcategory compared to the other non-episodic subcategories, illustrating they thought about generic routines over semantic information or other off-topic information. The authors did not compare detail types between past and future thoughts, but their above finding comparing the types of non-episodic details provides us with some understanding of non-episodic functioning. Similar to the need to examine the different episodic detail types, there is a need to examine the non-

episodic detail types for a deeper understanding of the content that children generate in past and future thoughts.

All research concurs that children generate fewer non-episodic details compared to episodic details generated in both past and future events (Wang et al., 2014; Ciaramelli et al., 2018; Gott & Lah). This finding suggests that children generate more specific than off-topic information. However, replicating these results, particularly for 11-to-13-year olds – an age group missing in prior research – would assist in solidifying these findings. These findings are consistent with findings of young adults aged between 19 and 35 (Levine et al., 2002; Beni et al., 2013; Zavagnin et al., 2016). However, older adults, aged between 61 and 89, tend to generate more non-episodic details compared to these younger aged groups, illustrating age-related cognitive changes in past and future thinking (Levine et al., 2002; Li-Chay-Chung et al., 2023; Beni et al., 2013; Addis et al., 2010; Cole et al., 2013).

To summarise, children generate more episodic content for past thoughts than future thoughts and more episodic content than non-episodic content across past and future thoughts. Most research shows that similar amounts of non-episodic details are generated between past and future thoughts. However, child research has yet to examine the specific types of details children generate in both the episodic and non-episodic categories. Understanding these specific details is essential as it allows us to identify the more subtle differences in children's past and future thinking and sheds light on what specific content children are retrieving from the past to then (re)construct their memories and future thoughts.

When comparing past and future thoughts' episodic and non-episodic content, it is also important to consider children's subjective experiences. Gott and Lah (2014) found that children rated higher strength for past events than future events (i.e., how strong their memory/imagination of the event was), but children rated no significant differences between

past and future thoughts for importance or emotionality. No other child research has examined children's subjective experiences of past and future thoughts. Adult research shows that adults report more vividness for past events than future events (Beni et al., 2013; Brigard et al., 2017; Zavagnin et al., 2016; Li-Chay-Chung, 2023). Li-Chay-Chung (2023) found that older adults rated past events as more emotional compared to future events, and they rated future events as more personally significant compared to past events. Zavagnin et al. (2016) found that past and future events were rated similarly for importance, illustrating a similarity to how children experience past and future events. Understanding these subjective ratings for children is essential as this provides insight into how children perceive and value their memories and future event imaginations.

Furthermore, it is important to place children's past and future content and their subjective experiences within a broader lifespan context to outline the developmental trajectory of past and future thinking. The research on adults discussed above demonstrates this lifespan overview from 19 years to 89 years regarding episodic and non-episodic content and subjective experiences (Beni et al., 2013; Brigard et al., 2017; Zavagnin et al., 2016; Li-Chay-Chung, 2023; Levine et al., 2002). Research on children's past and future thinking adds to the lifespan overview and demonstrates variability between different aged-children, which aligns with the idea that past and future thinking processes develop over time (Nelson & Fivush, 2004; Schneider & Ornstein, 2019; Atance & Meltzoff, 2005; Gott & Lah, 2014). Children in early childhood between the ages of two and four tend to generate more non-episodic details when talking about the past, indicating they do not yet grasp the ability to recall specific episodic events (Bauer, 2007; Nelson & Fivush, 2004; Tulving, 2002).

As noted earlier, there is limited research comparing children's past and future thoughts in middle childhood, which leaves a gap in the lifespan overview (Wang et al., 2014;

Gott & Lah, 2014; Ciaramelli et al., 2018; Coughlin et al., 2014). Studies have primarily focused on children aged seven to ten (Gott & Lah, 2014; Wang et al., 2014). Gott and Lah (2014) found that adolescents (aged 14 to 16) generated more episodic details compared to children in middle childhood (aged eight to ten) in both past and future thoughts, illustrating the developmental progression in past and future thinking across childhood. Ciaramello et al. (2018) examined children with Autism Spectrum Disorder (ASD) to typical developing children aged between seven and 17, finding that children with ASD generated fewer episodic details than typically developing children.

Our research aims to extend the past and future thought research by examining 11 to 13-year-olds. To the best of our knowledge, no prior research has examined our specific age group with exclusively typically developing children. We aim to explore the more subtle differences between past and future thinking by examining the different types of episodic and non-episodic details. We will also examine children's subjective experiences of their past and future thoughts. Doing so will enhance the current understanding of episodic functioning in middle childhood but with a novel age group. By examining 11 to 13-year-olds, we can contribute to the lifespan trajectory of past and future thinking. Alongside this area of research, there is also a need to examine the underlying factors that may impact children's past and future thinking, such as parents and their role in past and future thinking development.

Parent Scaffolding of Past and Future Thinking

Parents play a critical role in children's development from infancy through to adolescence and young adulthood (Lamb & Lewis, 2011; Martizen-Escudero et al., 2020). Through parental socialisation, parents assist children in developing and refining knowledge and skills that they will later need to function effectively in society (Martizen-Escudero et al.,

2020). Parent scaffolding is a specific parental socialisation strategy that parents use to assist children's knowledge and skill development (Wood et al., 1976; Bernier et al., 2010; Neale & Whitebread, 2019). Parent scaffolding occurs when the parent, as the expert, gradually assists the child, as the novice, in building skills and problem-solving (Wood et al., 1976; Hughes & Ensor, 2010; Hammond et al., 2012). Over time, the child internalises the instructions and procedure of the skill and increases their independent ability to use the skill and problem-solve with less parental assistance (Neale & Whitebread, 2019; Vygotsky, 1978). Parent scaffolding is used at all stages of childhood, although the level and form of scaffolding changes as the child ages and increases in their independence (Neale & Whitebread, 2019).

In early childhood, parents use scaffolding to slowly build up and assist the child's basic but necessary skills to function positively in society (Bernier et al., 2010; Vygotsky, 1978). Research has found that effective parent scaffolding in early childhood has been positively associated with children's development, including memory development, along with social competence, academic readiness, and executive functioning skills (Hammond et al., 2012; Bernier et al., 2010; Lengua et al., 2013; Ruberry et al., 2017; Salmon & Reese, 2015; Fivush et al., 2006). Limited research has been conducted on parent scaffolding in later childhood (Ruberry et al., 2017; Colonnesi et al., 2019; Mazachowsky et al., 2021). However, Cooper and Cooper (1992) theorised that parents may reduce their direct scaffolding in later childhood, instead providing children with more abstract scaffolding strategies – to assist and guide children without directly managing their choices or behaviours. Scaffolding in later childhood is, therefore, more contingent on the child's needs and independence, and parents adjust their scaffolding level accordingly (Mermelshtine, 2017). However, parent scaffolding for older children remains critical in influencing children's development (Cooper & Cooper, 1992; Lamb & Lewis, 2011; Longmore et al., 2004; Ritcher et al., 2010). The interactions

between parents and children allow children to practice, rehearse, and refine essential skills, such as autobiographical memory and future thinking skills (Lamb & Lewis, 2011).

To illustrate parent scaffolding, an example of saving money can be used. In early childhood, the parent is likely to offer the child a significant amount of scaffolding regarding saving money. The parent may talk to their child about putting money into a piggy bank so that they can buy a new toy. The parent will slowly introduce the steps of saving money to the child over time and assist the child with each step (giving the child money and putting the money into the piggy bank with the child). As the child ages, the parent will reduce their direct scaffolding, instead providing the child with verbal reminders of why the child should save money (to buy something in the near future) and elaborating to the child the importance of saving money. The parent may reminisce with the child about a previous purchase that the child bought after they had saved their money. As the child ages into adolescence, the parent will likely use more abstract scaffolding because the child will be more independent in remembering how to save money (as they would have internalised this skill from the parent's prior scaffolding). The parent may continue to remind the child why they should save money and is likely to discuss the longer-term and future saving goals with the child. Overall, parental scaffolding for saving money and other life skills assists the child in remembering important events and information, which directs their behaviour in the present and their imagination of the future.

Parents scaffold children's autobiographical memory and future thinking abilities by reminiscing with them about the past and the future (Bird & Reese, 2006; Wang et al., 2014; Salmon & Reese, 2015; Fivush et al., 2006; Cleveland & Reese, 2005; Mazachowsky et al., 2021; Waters et al., 2019). Through parent scaffolding, parents assist children in understanding their experiences, managing their emotional responses to these experiences,

and using these experiences to help them with scenarios they might encounter in the future (Reese et al., 1993; Salmon & Reese, 2015; Wang et al., 2014). Further, through conversations and elaborations, parents scaffold children in organising and structuring autobiographical information and how to emphasise the personal significance of information (Fivush et al., 2006). This scaffolding helps the child's development of memory retrieval strategies, which then assists them in constructing possible future events (Mazachowsky et al., 2021). Mazachowsky et al. (2021) found a significant positive association between frequent parent scaffolding and the child's strategy to remember to do things in the future when controlling for age-related effects.

Parent scaffolding of memory and future thinking can involve visual aids to prompt the child's memory and what they need to do in the future (Mazachowsky et al., 2021). More commonly, however, parent scaffolding involves verbal approaches, including parent-child conversations and parental elaborations (Mazachowsky et al., 2021; Fivush et al., 2006; Bird & Reese, 2006; Salmon & Reese, 2015). Verbal scaffolding begins during infancy, and research has indicated that this approach is essential throughout childhood and adolescence to assist children in constructing coherent, organised memories (Fivush, 2011; Fivush et al., 2011). Children can then effectively recall these memories independently later and use them to direct what they are doing in the present and what they need to do in the future (Peterson & McCabe, 2004; Cleveland & Reese, 2005).

However, not all parents are uniform in their scaffolding ability, with individual factors, such as parental elaboration, influencing parent scaffolding (Cleveland & Reese, 2005; Waters et al., 2019; Fivush, 2011; Salmon & Reese, 2015). These factors have downstream influences on children's autobiographical memory abilities, including influencing how much detail children can recall (Cleveland & Reese, 2005; Waters et al.,

2019; Fivush, 2011; Salmon & Reese, 2015; Leyva et al., 2019). Limited research has been conducted on how individual factors affect children's future thinking ability. However, as future thinking processes share similarities with autobiographical memory processes, individual factors likely impact parental scaffolding of children's future thinking abilities.

Individual Factors Influencing Parental Scaffolding and Child Past and Future Thinking

Parental Elaboration

Parental elaboration can be defined as the level of explanation that parents provide their children in conversation (Leyva et al., 2019; Fivush, 2011). Parents differ in their elaborative abilities, affecting how they structure their conversations with children, thus influencing their verbal scaffolding approach (Fivush, 2011; Salmon & Reese, 2015; Leyva et al., 2019). For instance, highly elaborative parents include more detail in conversations with their children, add new information to the conversation, ask children more open-ended questions, and encourage children to recall additional information (Fivush, 2011; Salmon & Reese, 2015). Conversations between parents and children are longer when parents provide more elaboration. Lower elaborative parents, on the other hand, do not include a high level of information or detail in conversations about the past (Fivush, 2011; Cleveland & Reese, 2005). The parent-child conversations tend to be shorter, with the child participating less in the conversation (Svane et al., 2021; Reese et al., 1993).

Children with highly elaborative parents have been found to recall more autobiographical memories and have more detailed and organised narratives than children with less elaborative parents (Schneider & Ornstein, 2015; Fivush, 2011). Moreover, a longitudinal study conducted by Jack et al. (2009) found that children of more elaborative parents had an earlier age of their first memory as adolescents compared with children of

parents who were lower in elaboration. Overall, higher parental elaboration is positively associated with a child's autobiographical memory. There is, however, a need for research on how elaboration is associated with a child's future thinking.

Parental Mind-mindedness

Parental mind-mindedness can be defined as a parent's ability to understand that their child is an independent person with independent internal states, including thoughts, emotions, and goals (Meins, 2013; McMahon & Bernier, 2017; Aldrich et al., 2021). Parents with higher mind-mindedness are considered to be more attuned to their children's internal states (Meins, 2013; McMahon & Bernier, 2017; Aldrich et al., 2021). They tend to interpret and respond to their children's behaviour based on what they think the child is feeling or thinking (Meins, 2013; McMahon & Bernier, 2017; Aldrich et al., 2021). On the other hand, parents with lower mind-mindedness do not consider children's thoughts and feelings to be independent, and they tend to interpret children's behaviour from their own perspective.

Higher mind-mindedness is associated with positive developmental outcomes in children (Aldrich et al., 2021; Colonnesi et al., 2019; Hobby et al., 2022; McMahon & Bernier, 2017). A meta-analysis by Aldrich et al. (2021) found a significant positive association between higher parental mind-mindedness and children's executive functioning, language, and social skills. A trending positive relationship was found between higher mind-mindedness and general cognitive abilities (e.g., problem-solving and planning). However, research was noted to be limited in this area due to the research only considering cognition as a covariate rather than a primary outcome variable (Aldrich et al., 2021). Other research has found similar positive links between higher mind-mindedness and child development, including in academic achievement, the development of theory of mind in children,

advancements in child language ability, and fewer child behavioural problems (Bernier et al., 2016; Hobby et al., 2022).

Mind-mindedness may influence parent scaffolding. Aldrich et al. (2021) noted that parents with more mind-mindedness are more likely to scaffold and guide their children from a child-appropriate and child-focused viewpoint. Higher mind-minded parents are more able to assist children in learning the connections between their internal states and their behaviours. Mind-mindedness has been researched in parent-child interactions and verbal scaffolding processes (Foley et al., 2022; Hobby et al., 2022). Foley et al. (2022) found that higher mind-mindedness in mothers during pregnancy was associated with parents talking more frequently to their infants at seven months old. Hobby et al. (2022) noted that the verbal scaffolding approaches mothers used were important in assisting children's behaviours and were effective, particularly if the mother had higher mind-mindedness. Thus, it is likely that mind-mindedness does influence parental verbal scaffolding approaches, such as parental elaborations.

Yet research on parental mind-mindedness in parents' interactions with older children is limited, with most current research examining children in early childhood (Hughes et al., 2017). Aldrich et al. (2021) noted that assessing mind-mindedness in parents of older children is essential to understanding older children's developmental outcomes. Some evidence supports this idea; for instance, lower maternal mind-mindedness is associated with more disruptive behaviour in children at age 12 (Hughes et al., 2017). Maternal mind-mindedness also appears to be stable across time with children in early and middle childhood (Illingworth et al., 2016). Further, limited research exists on the associations between parental mind-mindedness and past and future thought development. One study conducted by Bernier et al. (2010) found an association between high parental mind-mindedness when infants were 12

months old and better working memory in infants at 18 months old. However, there is a lack of research on these associations in older children or in autobiographical memory and future thinking.

Gaps in Current Literature

Overall, there are clear gaps in the current literature regarding children's development of past and future thinking. These gaps include limited research comparing past and future thinking at our specific age group of 11-13 years old and limited research examining the more nuanced episodic and non-episodic content (i.e., subcategories) between children's past and future thoughts. There is also a lack of research examining children's subjective ratings of past and future events. Examining these areas will extend our understanding of the generative processes of past and future thinking and contribute to the lifespan overview of past and future thinking. There is a further gap in the literature examining the role of parental mind-mindedness and parental elaborations in scaffolding children's past and future thought development. Examining these individual parental factors will extend our understanding of what factors may contribute to the development of children's past and future thinking.

Current Research

Our aim in the present study is to bridge the gaps in the current literature by quantitatively collecting data from parents and children. The children will independently engage in an adapted child autobiographical Zoom interview where they will talk about two past events and two future events (Gott & Lah, 2014). The parents will engage in an online survey with a "describe your child" task to examine parental mind-mindedness (Meins et al., 1998), and the parents and children will engage in a parent-child reminiscing task where they will talk about two past events and two future events together to examine the parental elaborations (Welch-Ross et al., 1999; Bird & Reese, 2006; Russell et al., 2023).

Our first Research Question (RQ1) is: to what extent does the episodic and non-episodic content of children's past and future thoughts differ? We have three main hypotheses related to this research question. Based on prior literature showing that retrieving and reconstructing past episodic events is an easier cognitive process than constructing future novel episodic events (Gott & Lah, 2014; Schacter & Addis, 2007; Atance & O'Neill, 2001), our first hypothesis is that children will generate more episodic (internal) details for past events compared to future events (H1a). Event details are typically generated more than other subcategory details (Cole et al., 2013; Levine et al., 2002; Gott & Lah, 2014; Schacter & Addis, 2007). As such, our second hypothesis is that, when examining specific types of episodic details, children will generate more event details for past events compared to future events, and children will generate more event details when compared to other types of episodic details (H1b). Finally, based on the necessity of semantic information in past and future thinking (Gott & Lah, 2014), we hypothesise that children will generate more details in the semantic subcategory compared to the other non-episodic subcategories across past and future thinking conditions (H2). We do not hypothesise a difference between past and future conditions, as children and adults tend to generate a similar amount of non-episodic information across temporal directions (Wang et al., 2014).

Our second Research Question (RQ2) is: how do children subjectively experience past and future thoughts? Prior research showed that children rated higher vividness for past events (Gott & Lah, 2014; Li-Chay-Chung, 2023; Zavagnin et al., 2016), while adults rated future events with higher personal significance (Li-Chay-Chung, 2023). As such, we hypothesise that children will rate past events as higher in subjective vividness than future events, whereas children will rate future events as higher in subjective importance and frequency (of thinking of the event) than past events (H3).

Our third Research Question (RQ3) is: what is the association between parental mind-mindedness, parental elaborations, and child past and future thinking? Given that parents who are higher in mind-mindedness are more likely to scaffold children's developmental abilities (Fivush, 2011; Schneider & Ornstein, 2015; Aldrich et al., 2021), we hypothesise that higher parental mind-mindedness will be directly associated with the child generating a higher number of episodic details in past and future events in the adapted child autobiographical zoom interview (H4). Based on the literature showing parental elaborations positively influence children's memory ability (Bird & Reese, 2006; Salmon & Reese, 2015), we also hypothesise that parental elaborations will mediate the association between higher parental mind-mindedness and more detailed child past and future thinking (H5). Therefore, parental elaborations may act as a 'pathway' between the parent's mind-mindedness and the child's memory and future thinking developmental outcomes.

Chapter Two: Method

Participants

Data were collected from 21 parent-child dyads. Participants were recruited through advertising in school newsletters and paper packs sent to schools based in Hamilton. Additionally, participants were recruited through advertising on Facebook and through snowballing. The advertisement remained the same in all sampling methods (see Appendix A). All participants provided informed consent in a manner approved by the University of Waikato Human Research Ethics Committee (approval number HREC2021#71). Ten of the children were female, and 11 were male. Children were aged between 11 and 13 years (M = 11.52, SD = 0.68). All the parents were female. Parents ranged from 28 to 54 years old (M = 39.24, SD = 8.51). All participants spoke fluent English, and the children had no developmental or health issues that would impact their ability to complete the study. Parents were the primary caregivers of the children.

Measures

Parents completed a "describe your child task", the parent-child dyads completed a parent-child reminiscing task, and children completed an adapted child autobiographical Zoom interview. These tasks are each described in more detail below.

Describe Your Child Task

To measure parental mind-mindedness, a "describe your child" task was adapted from Meins et al. (1998). In this task, parents were asked to describe their child in writing for approximately two to three minutes. This task assessed a representational version of mind-mindedness and has been used in previous research with older children (Fishburn et al., 2017; Meins et al., 2014). The task has shown feasibility in an online survey format (Fishburn et al.,

2017; Hill & McMahon, 2016). This measure is, therefore, empirically supported for use in the current study.

Parent-Child Reminiscing Task

To measure parental elaborations, a parent-child reminiscing task was adapted from previous research that assessed parent-child conversations (Welch-Ross et al., 1999; Bird & Reese, 2006; Russell et al., 2023). The task is, therefore, empirically supported to use with parents and children. In this task, parents and children were asked to discuss four events together. These events were: a recent event where the child felt worried or upset about something; a recent event where the child felt happy about something; a specific event coming up in the future which the child was feeling worried or upset about; a specific event coming up in the future which the child was feeling happy about. Following each event, the child was asked to rate how emotional that event made them feel on a seven-point scale, with one being highly negative, four being neutral, and seven being highly positive. A visual scale with faces was created to assist children in rating their emotions for each event (see Appendix B).

Adapted Child Autobiographical Interview (a-CAI)

To measure children's memory and future thinking, we administered the Adapted Child Autobiographical Interview (a-CAI; Gott & Lah, 2014). The a-CAI is a structured autobiographical interview adapted from Willoughby and colleagues' (2012) Children's Autobiographical Interview. In this interview, children were asked to discuss two events that occurred in the past and two that were coming up in the future (see Appendix C for the full a-CAI protocol). Children were given a list of events to help them decide what to discuss (see Appendix D). However, they were told they could also discuss an event that was not on this list. Following a free recall stage, if children did not provide enough detail, the researcher

asked a general probe ("is there anything else you can tell me?"). If children still did not provide enough detail, the research used specific probes to gain more detail (e.g., "when did this event take place?"; "do you remember who was there?"). Following each event recall, children were asked to rate different aspects of the event on a 1 to 7 Likert scale, including emotionality, visual intensity, importance, rehearsal, and strength.

Additional measures

Additional measures were collected as part of a larger study. For the parent participants, these additional measures were the Depression, Anxiety and Stress Scale – 21 items (DASS-21; Lovibond & Lovibond, 1995), and a 'Turning Point' task (McAdams, 2008). For the child participants, these additional measures were the Strengths and Difficulties Questionnaire (Goodman, 1997) and a Verbal Fluency Task (Henry et al., 2015). These measures are irrelevant to the current study and will not be discussed or analysed further.

Procedure

Parents interested in the study were screened for eligibility and emailed a participant information sheet (Appendix E). Two Zoom sessions were scheduled for eligible participants: one for the parent-child conversation and one for the child autobiographical interview. Parents were sent an online Qualtrics Survey to complete prior to the Zoom sessions. There is empirical support for collecting interview data through Zoom, as this data is valid and the platform offers acceptable security features. One such feature is real-time encryption, which ensures the content of participants' interviews is protected throughout the meeting (Semmelmann et al., 2017; Archibald et al., 2019). Archibald et al. (2019) noted that participants in their study generally rated Zoom interviews above other interviewing methods, including face-to-face and telephone methods.

Online survey

On average, the survey took 26 minutes to complete (*SD* = 17.47). Three survey responses were three or more standard deviations higher than the average survey time, so they were excluded from the calculation (these responses were significantly longer in completion time due to the parents completing the survey across two or more separate sittings). The survey included the participant information sheet for parents to re-read and a consent form for parents to sign to provide consent for themselves and their children participating in the study. Parents then provided demographic information about themselves and their children. Following this, parents completed the 'describe your child' task and the DASS-21 and Turning Point measures.

Zoom Session One – Parent and Child Interview

Parents and children engaged in a joint Zoom session with the researcher, in which they completed the Parent-Child Reminiscing Task. This Zoom session took between 5 and 41 minutes to complete, with an average completion time of 13 minutes (*SD* = 8.56). The researcher obtained the parent's and the child's verbal consent at the beginning of this session to record the session. The researcher discussed the study with the participants and invited them to ask any questions. The researcher then gave participants instructions regarding the events they would discuss and asked them to begin discussing the first event (see Appendix F for the full parent-child Zoom procedure). Participants were asked to talk with each other about these events as they usually would at home, for as long as they usually would. The researcher turned off their camera and microphone whilst the parent and child talked to minimise disruption to their conversation. Once the parent and child were finished discussing the event, the researcher asked the child to rate how emotional that event made them feel on a

scale of 1 to 7. The researcher then repeated the instructions for the next event. The order of the events that participants were asked to discuss was counterbalanced to reduce any order effects. Participants were either asked to discuss the memory events first or the future events first. However, the "worried or upset" events were administered before the "happy" events for both the memory and future event discussions so that the session ended on a more neutral event rather than a more distressing event.

Zoom Session Two – Child Interview

In the second Zoom session, children talked with the researcher independently. This Zoom session began immediately following the first Zoom session. Parents were welcome to stay during the session; however, they were asked not to intervene with the child's discussions to ensure the session remained as independent as possible. This Zoom session took between 7 and 31 minutes to complete, with an average completion time of 19 minutes (*SD* = 5.93). The researcher discussed with the child what would occur in the session and gained the child's permission to record the session. The a-CAI was then administered to the child. To reduce order effects, the a-CAI was counterbalanced, with the researcher either administering to participants the memory events or the future events first. Following this, the child completed the additional measures - the Strengths and Difficulties Questionnaire and the verbal fluency task.

Data Processing

The 'describe your child' task was coded using Meins and Fernyhough's (2015) Mind-Mindedness Coding Manual – Version 2.2. Through this coding scheme, each attribute the parent mentioned in their description of their child was classified into one of four categories: mental attributes, behavioural attributes, physical attributes, and general attributes. For a more detailed description of each category and examples, see Table 1. Once classified, the

number of each type of attribute was calculated, and a ratio of mental attributes to total attributes was used for the final mind-mindedness score (e.g., 12 mental attributes and 18 total attributes would have been scored as 12/30). Therefore, a higher percentage of mental attributes, rather than general, physical, or behavioural attributes, equated to a higher mind-mindedness score. See Appendix G for a mind-mindedness coding example.

Table 1

'Describe Your Child' Task Attribute Descriptions and Examples

Attribute Type	Description	Examples
Mental	Any comment that refers to the child's mental life, including their will, mind, interests, imagination, intellect, and memory.	She is bright; she has a mind of her own; he is organised; he has a good sense of humour; she is thoughtful.
Behavioural	Any comment that refers to the child's behaviour, including activities the child is involved in and their interactions with others on a behavioural level.	He likes to play soccer; she likes to watch TV; she is talkative; he is out-going; he is naughty.
Physical	Any physical attributes, including the child's physical appearance, age, or position in the family.	He has brown hair; she has blue eyes; he is my third son; she is thirteen; he is four feet tall.
General	Any other comment related to the child that doesn't fit into the other categories.	He's a lovely little boy; she is an amazing girl.

The parent-child reminiscing task was transcribed verbatim using Otter.ai and manually checked by the researcher. Each event was coded using a frequency-based elaboration coding scheme adapted from Leyva et al. (2019). Through this coding scheme, each parental utterance in the event was coded based on the information the utterance

provided (whether it was an elaboration, repetition, evaluation, or other). See Table 2 for a more detailed description of the utterance codes. Once coded into these categories, the frequency of total elaborations and the frequency of total utterances were calculated. A ratio of total elaborations to total utterances was used for the final elaboration score (e.g., 11 elaborations and 20 total utterances would have been scored as 11/20). Each event was coded and scored separately, and then the two memory events were combined to create an average memory elaboration score and the two future events were combined to create an average future elaboration score. A higher ratio of elaborations compared to total utterances indicated the parent was more elaborative in discussing with their child. See Appendix H for an elaboration coding example.

Table 2

Parent-Child Reminiscing Utterance Types

Utterance type	Description	Examples
Elaboration	Parent providing the child with new information through: a yes/no question, open-ended question, a fill-in the blank question, or a statement.	Did you have fun?; Tell me what you did at school; Her name is aunty…?; We went to the zoo yesterday.
Repetition	Parent repeating the exact or the gist of information that they had already asked/stated to the child in a previous conversation turn.	The parent asked the child "where did you go?" and then asks the child "do you remember where you went?".
Evaluation	Parent evaluates the child's statement by either confirming the child's statement or denying the statement	The child says "we went to the Zoo yesterday" and the parent says "yes, we did go to the zoo yesterday"; The child says "we went to the park yesterday" and the parent says "no, we didn't go to the park yesterday".
Other	All other utterances the parent provides that does not contain any content including: prompting the child to remember; talking about the process of remembering; and off-topic talk.	Do you remember?; Think really hard; Don't touch the Zoom button.

The a-CAI was transcribed verbatim using Otter.ai and manually checked by the researcher. Each event was then coded using the Adapted Autobiographical Interview Scoring Manual (Addis et al., 2008). Through this coding scheme, each event was segmented into individual details – with each detail providing a unique fact, statement, observation, occurrence, or thought about the event. Each detail was then categorised as internal (episodic) or external (non-episodic) to the main event. Following this, each internal detail was

subcategorised into one of five internal subcategories, and each external detail was subcategorised into one of five external subcategories. See Table 3 for a detailed description of the episodic types of details and Table 4 for a detailed description of the non-episodic types of details. Once coded into the categories and subcategories, the total number of internal and external details for each event and the total number of details within each subcategory were calculated. Each of the four autobiographical events was coded and scored separately, then the two memory events were combined to create an average memory score, and the two future events were combined to create an average future score. A higher number of internal details compared to external details indicated that the child generated more episodic information (information specific to the event). See Appendix I for an autobiographical coding example.

Table 3

Adapted Child Autobiographical Interview Episodic Detail Types

Episodic details	Description	Examples
Event details	Details describing the unfolding of the story.	She jumped out of her chair; The sun was coming up; We went to school.
Place details	Information about localisation in space, including details about countries, cities, and buildings.	This happened in Auckland, New Zealand; It was the Post Office on Victoria Street.
Time details	Information about the time of the event, including the year, season, day of the week, and time of day.	It was winter; This event happened on June 10, 2019; It was a Friday.
Perceptual details	Sensory details, including auditory, olfactory, pain, taste, visual, and spatial-temporal details.	There was a loud boom; it smelt like a strawberry sundae; the dress was dark green.
Emotion/thought details	Details regarding the mental state of the participant at the time of the event.	I was sad; I was so excited; I thought to myself this is great.

Table 4

Adapted Child Autobiographical Interview Non-Episodic Detail Types

Non-episodic details	Description	Examples
Semantic details	General facts or knowledge that are general or specific to the person.	The New Zealand flag has four stars; I do not like potatoes; I used to be an astronaut.
Repetitions	A repetition of a prior detail that does not add any new information.	They were excited to see my work… They were thrilled to see my work; We went for a walk to the forest… on my walk, we went to the forest.
Other details	Details that do not fit other categories and are not recollection, including meta-cognitions and inferences.	Let me think about whether this happened; I must have been wearing sunglasses because it was summer.
Off-topic episodic details	Episodic events secondary to the main event	The participant talks about planting their garden, but also talks about adopting a kitten.
Generic events/routines	Events that are repeated or routine.	I go to the supermarket every Saturday; My Mum and I get a coffee from the Café once a week.

Data Analysis

The framework for this study was a within-subjects, correlational design. Data were analysed quantitatively through Jamovi and IBM SPSS software programmes. To answer RQ1 (to what extent does the episodic and non-episodic content of children's past and future thoughts differ?), three Repeated measures Analysis of Variance (ANOVAs) were created. Repeated measures ANOVAs can be used to compare within-subject mean differences across multiple conditions (i.e., measured for past events and measured for future events) and with multiple outcome variables (i.e., autobiographical category and subcategory details; Muhammand, 2023). Thus, the three ANOVAs we created allowed us to compare the mean

differences between children's past and future thoughts for the internal details and external details (ANOVA one) as well as when the content was broken down into the five internal subcategories (ANOVA two) and the five external subcategories (ANOVA three).

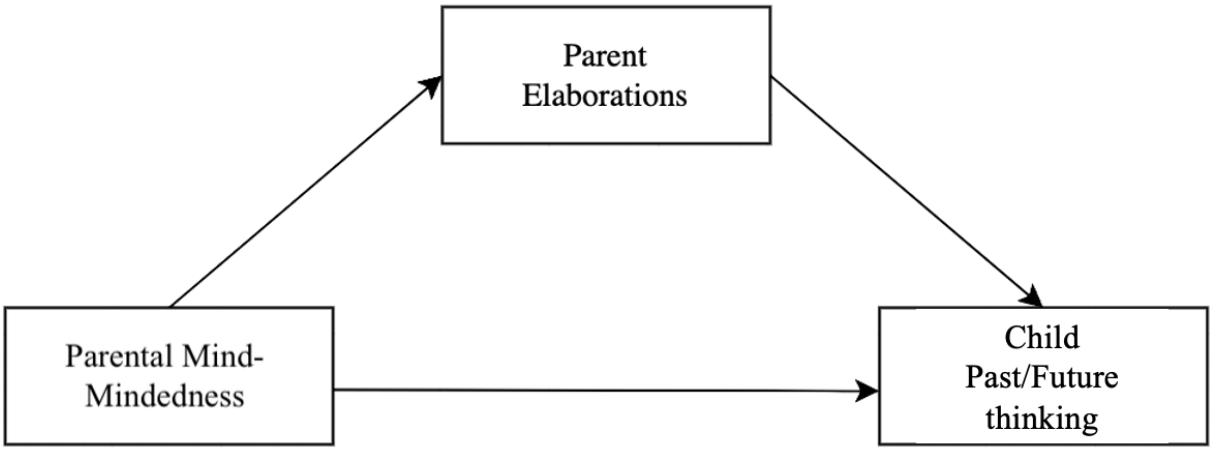
To answer RQ2 (how do children subjectively experience past and future thoughts?), three paired samples t-tests were created. Paired samples t-tests can compare within-subject mean differences across two conditions (past and future) for one outcome variable (a subjective autobiographical rating; Field, 2018). Thus, the three t-tests we created allowed us to compare the mean differences between children's past and future thoughts for each of our subjective ratings – vividness (t-test one), importance (t-test two), and frequency (t-test three).

To answer RQ3 (what is the association between parental mind-mindedness, parental elaborations, and child past and future thinking?), we planned to use a mediation analysis. A mediation analysis would examine whether there was a direct effect of a predictor variable (mind-mindedness) on an outcome variable (children's past and future thoughts) and examine whether a third variable (the mediating variable; parental elaborations) indirectly affected the relationship between mind-mindedness and children's past and future thoughts (Field, 2018). Figure 1 demonstrates a hypothetical model of this mediation. However, prior to a mediation analysis being run, we first ran linear regressions to assess whether there were direct relationships between each of our variables – therefore examining the relationship between two variables at a time (one predictor variable and one dependent variable; Field, 2018; Barron & Kenny, 1986). Altogether, we created six linear regressions examining whether mind-mindedness predicted parental past elaborations (linear regression one) and future elaborations (linear regression two); whether mind-mindedness predicted children's past thoughts (linear regression three) and future thoughts (linear regression four); whether

parental past elaborations predicted children's past thoughts (linear regression five) and future thoughts (linear regression six). Although Figure 1 was created for the mediation analysis, this figure also illustrates these regression pathways. Due to no significant relationships occurring in any of the linear regressions, we did not run the mediation analysis.

Figure 1

Hypothetical Mediation Analysis of Mind-Mindedness, Elaborations, and Child Past and Future Thinking.



Chapter Three: Results

Descriptive Analyses

First, we examined the average results for our three main measures (child past and future event generations; mind-mindedness; parental elaboration). These averages can be seen in Table 5.

Table 5

Descriptive analyses of the three main measures.

Measures	*M*	*SD*
Child event generations		
Overall event generations	27.6	12.4
Future event generations	33.8	21.7
Past event generations	22.1	5.3
Mind-mindedness task		
All comments	15	10.7
Mind-minded comments	5	3.8
Parent-child conversation task		
Overall parent utterances	23	19.4
Overall parent elaborations	15	13.4
Parent memory utterances	23.2	20.4
Parent memory elaborations	14.8	12.6
Parent future utterances	22.8	20.5
Parent future elaborations	15.2	14.9

To summarise these descriptive results, we found that, on average, 33% of parents' comments were mind-minded during the mind-mindedness task. During the parent-child elaboration task, parents elaborated open-endedly with their children around 65% of the time in conversation. Comparing memories and future thoughts, parents elaborated 67% of the time on average in memory conversations with their children and 63% on average in future

conversations with their children. The comparisons between children's past and future event generations are discussed in more detail below as a part of the main analyses.

Comparison of Children's Past and Future Thoughts

The present study's first research question (RQ1) was: to what extent does the episodic and non-episodic content of children's past and future thoughts differ? The second research question (RQ2) was: how do children subjectively experience past and future thoughts? For the first of our main analyses and to answer RQ1 and RQ2, we examined the content of children's past and future thoughts, looking at both the differences in memories and future thought event generations through an objective measure (the Adapted child autobiographical interview – a-CAI), and through children's subjective ratings of past and future events.

Adapted Child Autobiographical Interview (a-CAI)

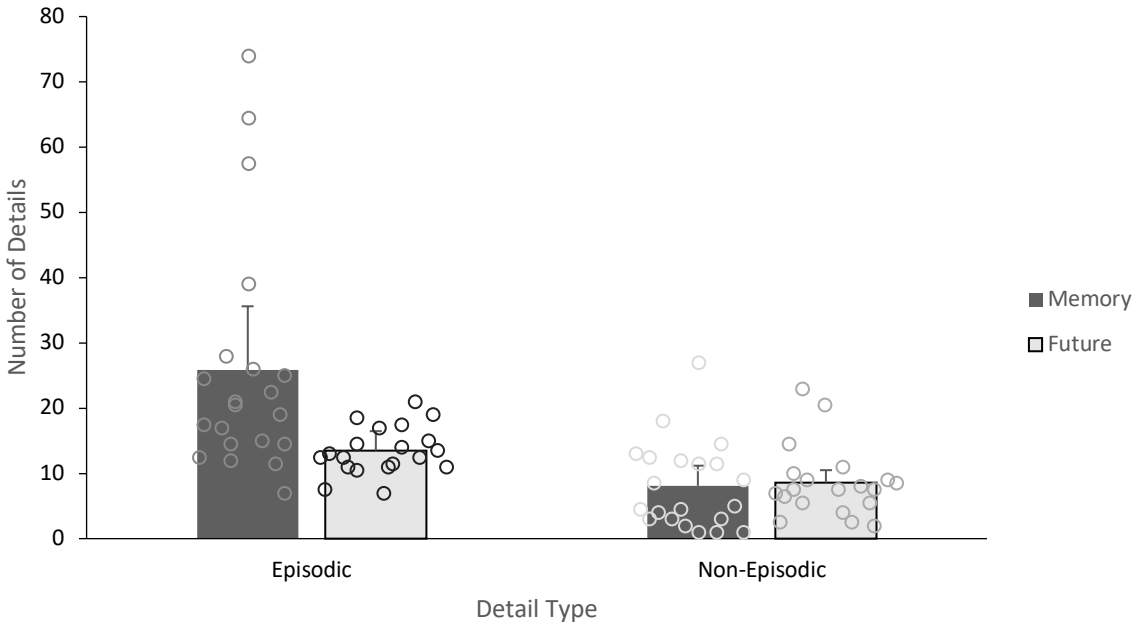
Through the a-CAI, we examined children's past and future event generations. We analysed these event generations using three Repeated measures Analysis of Variance (ANOVAs). One participant was excluded from these analyses due to not participating in three out of four of the a-CAI events. No significant abnormalities in the data distribution were observed through visual inspection of the Q-Q plots and histograms for the data used in the following analyses.

First, we examined whether there were differences between memory and future thought conversations for overall internal and external details (see method, Table 3 and Table 4 for the description of the internal and external details). Two factors were used in this ANOVA, each containing two levels – event type (memory or future thought) and detail type (internal or external). Given that the ANOVA only had two levels, the assumption of

sphericity was met. The mean results of this ANOVA can be seen in Figure 2. A statistically significant main effect of event type was found (F (1, 19) = 9.38, p = .006), with past thought details being greater than future thought details. A statistically significant main effect of detail type was also found (F (1, 19) = 25.12, p < .001), with internal details being greater than the external details. A statistically significant interaction was found between conversation type and detail type (F(1, 19) = 13.37, p = .002). Post-hoc pairwise comparisons with a Bonferroni adjustment indicated that the number of internal details provided in the memory conversations (M = 33.8, SD = 21.7; 95% CI = [18.36, 35.2]) was significantly higher than the number of internal details provided in the future thought conversations (M = 22.1, SD = 5.3; 95% CI = [11.78, 15.2]; p < .011). This finding shows that children recalled more internal details when talking about the past compared to talking about the future and aligns with previous research (Gott & Lah, 2014; Wang et al., 2014). No other post-hoc pairwise comparisons were significant or trending.

Figure 2

ANOVA mean differences for past and future episodic and non-episodic categories



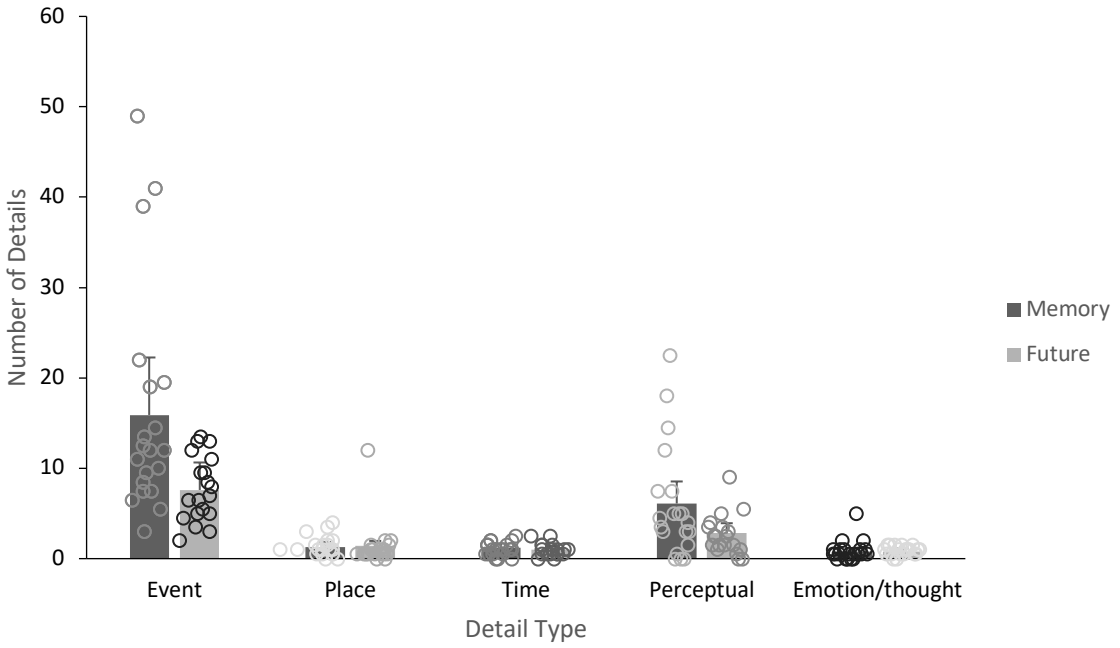
*Scatter points represent individual data

Next, we examined whether there were differences between past and future thoughts for the episodic and non-episodic subcategories. Looking first at the episodic subcategories, we ran a repeated-measures ANOVA with two factors, the first containing two levels and the second containing five levels – conversation type (memory or future thought) and internal subcategory detail type (event, place, time, perception; emotion/thought). Mauchly's test indicated that the assumption of sphericity had not been met, $\chi 2 = 0.01$, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied. A statistically significant main effect of conversation type was found (F (1, 19) = 11.2, $p = .003$), with past thoughts being greater than future thought details. There was also a statistically significant main effect of detail type (F (1, 19) = 39.5, $p < .001$). Post-hoc pairwise comparisons for this main effect illustrated that the number of details in the event subcategory was significantly higher than the number of details in the other four subcategories for both past events (all $p's$ <.001) and future events (all $p's$ <.01). Furthermore, the post-hoc pairwise comparisons for the main effect of detail type found that the number of perceptual subcategory details was greater than the number of time details for both past events ($p = .034$) and future events ($p = .022$). These results can be seen in Figure 3.

A statistically significant interaction was found between the conversation type and episodic subcategory type (F(1.34, 4) = 11.2, $p < .001$). Post-hoc pairwise comparisons with a Bonferroni adjustment indicated that the number of event subcategory details provided in the past thought events ($M = 16.0$, $SD = 12.3$, 95% CI = [10.85, 22.35]) was trending at a higher rate than the event subcategory details provided in the future thought events ($M = 7.6$, $SD = 3.5$, 95% CI = [5.95, 9.25]; $p = .088$). This finding shows that children generated more event subcategory details in the past events compared to the future events. No other post-hoc pairwise comparisons between past and future thoughts were significant or trending. The results of this ANOVA can be seen visually in Figure 3.

Figure 3

ANOVA mean differences for past and future episodic subcategories



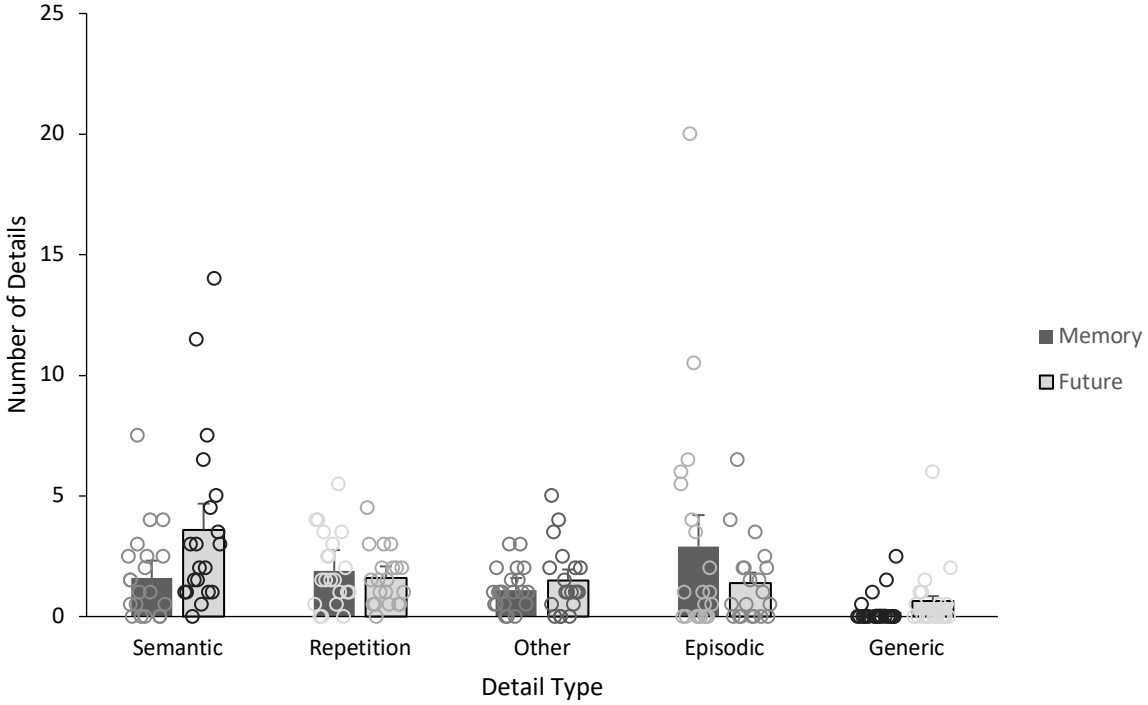
*Scatter points represent individual data

Looking next at the external detail subcategories, a repeated-measures ANOVA with two factors was run, the first factor containing two levels and the second factor containing five levels – conversation type (memory or future thought) and external subcategory detail type (semantic; repetition; other; episodic; generic). Mauchly's test indicated that the assumption of sphericity had not been met, $\chi 2 = 0.18$, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied. A statistically significant main effect of conversation type was found (F (1, 19) = 29.69, p <.001); however, no post-hoc pairwise comparisons were significant. There was also a statistically significant main effect of detail type (F (1, 19) = 9.21, $p < .001$). Post-hoc pairwise comparisons for this main effect illustrated that the number of details in the generic external subcategory was lower than the number of details in the semantic, other, and repetition subcategories (all $p's < .041$).

A statistically significant interaction was found between the conversation type and external subcategory type ($F(2.53, 4) = 27.62$, $p = .019$). However, post-hoc pairwise comparisons with a Bonferroni adjustment indicated no significant or trending differences between memory or future thought conversations regarding the external subcategories. The mean results of this ANOVA can be seen in Figure 4.

Figure 4

ANOVA mean differences for past and future external subcategories



*Scatter points represent individual data

Children's Subjective Ratings of Past and Future Events

We then compared children's subjective ratings of past and future events. We analysed these ratings using three paired samples t-tests. As the participants had to complete the a-CAI events to rate their experience of the events subjectively, the same participant was excluded from these analyses due to not participating in three out of four of the a-CAI events. No

significant abnormalities were observed through visual inspection of the Q-Q plots and histograms for the following data.

First, we compared the children's vividness ratings between past and future events through a paired samples t-test. A Shapiro-Wilk test indicated that our data was normally distributed ($W = 0.94$, $p = .249$). No significant difference was found between children's ratings of vividness for past ($M = 5.17$, $SD = 1.18$) and future thoughts ($M = 4.69$, $SD = 1.03$), $t(19) = 1.52$, $p = .145$; 95% CI = [-0.11, 0.79].

Following this, we compared the children's importance ratings between past and future thoughts using a second paired samples t-test. A Shapiro-Wilk test indicated that our data was normally distributed ($W = 0.94$, $p = .236$). No significant difference was found between children's ratings of importance for past ($M = 5.64$, $SD = 1.42$) and future thoughts ($M = 5.96$, $SD = 0.93$), $t(19) = -1.05$, $p = .306$; 95% CI = [-0.97, 0.32].

Finally, we compared the children's frequency ratings between past and future thoughts using a third paired samples t-test. A Shapiro-Wilk test indicated that our data was normally distributed ($W = 0.97$, $p = .848$). A trending difference was found between children's ratings of frequency for past ($M = 3.48$, $SD = 1.88$) and future thoughts ($M = 4.46$, $SD = 1.48$), $t(19) = -2.08$, $p = .051$; 95% CI = [-0.92, 0.002]. This finding shows that children rated the frequency of thinking about future events higher than the frequency of thinking about past events.

Relationship Between Mind-mindedness, Parental Elaboration, and Child Past and Future Thinking

The third research question (RQ3) was: what is the association between parental mind-mindedness, parental elaborations, and child past and future thinking? To answer RQ3,

we examined the relationships between the three main measures of our study – mind-mindedness, parental elaborations, and children's past and future thoughts. We tested whether there were significant relationships between these three main measures using linear regression models. These linear regression models determined whether the mediation analyses could be carried out. We ran these analyses separately for the study's past and future thought aspects. Altogether, six linear regressions were created – three for past thoughts and three for future thoughts. The Durbin-Watson values were close to two for each regression, indicating no autocorrelation. Therefore, the data points were assumed to be independent. No significant outliers were identified in visual inspection through histograms or Q-Q plots.

To test hypothesis four, that higher parental mind-mindedness will be directly associated with the child generating a higher number of episodic details in past and future events in the adapted child autobiographical zoom interview, we ran two linear regressions with mind-mindedness predicting child past and future thoughts, controlling for parental education, parental socioeconomic status and children's age. One regression was run for the past thoughts and one for the future thoughts. Mind-mindedness was not a significant predictor of child event generation in either linear regression. These results are presented in Table 6.

Table 6

Linear regressions for mind-mindedness and child past and future thoughts, controlling for parental education, parental socioeconomic status, and child age.

	B	***SE B***	***β***	***t***	***p***
Mind-mindedness					
Child past thoughts	0.05	0.15	0.09	0.35	.73
Child future thoughts	0.14	0.17	0.21	0.84	.42

To test the first part of hypothesis five, that higher mind-mindedness will be associated with more detailed parental elaborations, we ran two linear regressions with mind-mindedness predicting parental elaborations, controlling for parental education, parental socioeconomic status and children's age. One regression was run for parental past elaborations, and the other was run for parental future elaborations. Mind-mindedness was not a significant predictor of parental elaborations in either linear regression. These results are presented in Table 7.

Table 7

Linear regressions for the mind-mindedness and elaborations, controlling for parental education, parental socioeconomic status, and child age.

	B	***SE B***	***β***	***t***	***p***
Mind-mindedness					
Parent memory elaborations	0.04	0.13	0.06	0.3	.77
Parent future elaborations	0.01	0.13	-0.02	-0.07	.94

To test the second part of hypothesis five, that more detailed parental elaborations during parent-child conversations would be associated with more detailed child event generation, we ran two linear regressions with parental elaborations predicting event generation, controlling for parental education, parental socioeconomic status and children's age. One regression was run for the past child event generation/parental elaboration, and one for the future event generation/parental elaboration. Parental elaboration was not a significant predictor of child event generation in either linear regression. These results are presented in Table 8.

Table 8

Linear regressions for elaborations and child past and future thoughts, controlling for parental education, parental socioeconomic status, and child age.

	B	***SE B***	***β***	***t***	***p***
Parent memory elaborations					
Child past thoughts	0.37	0.27	0.39	1.39	.18
Parent future elaborations					
Child future thoughts	-0.17	0.33	-0.14	-0.51	.62

Overall, the results of the six linear regressions showed no significant relationships between the three main measures. As a result of this non-significance, mediation analyses were not carried out, and the two hypotheses regarding the relationships between mind-mindedness, parental elaboration, and child past and future thoughts were not confirmed.

Chapter Four: Discussion

Past and future thinking are critical cognitive processes that allow us to reminisce about the past, guide present behaviour and assist in creating future goals. Examining and comparing the content of past and future thoughts for children aged 11 to 13 assists our understanding of how past and future thinking functions at this age and allows for a qualitative comparison to other age groups throughout the lifespan. Examining how parents influence child past and future thinking is essential to identify what key factors may shape children's cognitive development. Thus, examining how the individual factors of parental mind-mindedness and parental elaborations influence parents' ability to scaffold children's past and future thoughts is important. To the best of our knowledge, no research has examined the content of past and future thinking in our age group of 11 to 13 with typically developing children exclusively. Whilst research has examined the association between parental elaborations and child memory, the association between parental elaborations and future thinking has not yet been examined. Mind-mindedness has not been considered as an individual factor that may impact parental elaborations or child past and future thinking.

Based on these gaps in the research, we collected and quantitively analysed data from 21 parent-child dyads to examine child past and future thinking and the relationship between parental mind-mindedness, parental elaboration and child past and future thinking. Here, we discuss the main findings of our analyses, along with the limitations and implications of these findings.

Child Past and Future Thinking

Comparing Episodic and Non-Episodic Content in Children

Our first research question (RQ1) was: to what extent does the episodic and non-episodic content of children's past and future thoughts differ? To examine this question, we statistically compared the amount of episodic and non-episodic details between children's

past and future thoughts. We first found that children provided more episodic details when describing past thoughts compared to when describing future thoughts. This finding supported our first part of our first hypothesis (H1a) and was consistent with prior literature that compared past and future thoughts in adults and children in middle childhood/adolescence (e.g. Gott & Lah, 2014; Wang et al., 2014).

More episodic details may have been generated when children thought about the past compared to the future because retrieving and reconstructing past details is an easier cognitive process than constructing future novel details (Schacter & Addis, 2007; Atance & O'Neill, 2001). When retrieving a past event, more specific details can be drawn as the person can re-experience the previous event. When constructing future details, the person must draw on past events and then re-structure and recombine the details of past events into a novel representation (Schacter & Addis, 2007). A similar concept that could illustrate why children generated more episodic details for past events compared to future events is the idea of abstract thinking. Abstract thinking allows a person to generate thoughts that are not directly connected to their immediate environment (Dumontheil, 2014). Abstract thoughts are, therefore, temporally distant from the person's environment and, as such, abstract thinking relates to a person's past and future thinking abilities (Dumontheil, 2014). The ability to generate past abstract thoughts is easier than the ability to generate future abstract thoughts (Kane et al., 2012; Dumontheil, 2014). With past thoughts, the person simply 'travels' back in time to when the event occurred. When 'travelling' forward in time, the person must first 'travel' back to the past to retrieve specific details of what has occurred and then must 'travel' forward to construct a new event (Kane et al., 2012; Dumontheil, 2014). Therefore, thinking about the future is more abstract than thinking about the past and will likely take more time and cognitive resources. Indeed, Schacter and Addis (2007) noted in their review, "one simply cannot know the future as one knows the past" (pg. 302). Overall, due to the easier

access to specific, past details that have occurred, it is likely that in our study, the children could generate a higher level of episodic details more easily and quickly for past events than they could for future events.

Developmentally, our findings align with adult literature indicating that children aged 11 to 13 show a similar pattern to children of other age groups and to adults when episodically thinking about the past compared to thinking about the future (Beni et al., 2013; Zavagnin et al., 2016; Addis et al., 2010; Gott & Lah, 2014; Coughlin et al., 2014). We have, therefore, contributed to the lifespan understanding of past and future thinking by providing novel empirical evidence that builds upon previous work with an age group that had not been examined. Understanding past and future thinking at the age of 11 to 13 is essential as rapid developmental changes occur at this age, consistent with the onset of puberty (Ciccia et al., 2018). These developmental changes include cognitive changes linked to brain structure changes. For example, frontal lobe volume, which contributes to episodic memory performance, is considered to peak at around age 11 to 12 years (Squire, 1998; Giedd et al., 1999; Ciccia et al., 2018). Our results, therefore, begin to bridge the gap in examining past and future thinking during this critical developmental period. Future research could examine children's episodic content longitudinally to understand how the pattern develops over each developmental period.

Our second and third findings in answering RQ1 were that when examining the episodic types of detail (subcategories), children generated the highest number of details in the event subcategory compared to the other subcategories across the past and future thinking conditions. Children also generated more perceptual details than time details across past and future conditions. Furthermore, when comparing past and future thoughts, children generated significantly more details in the event subcategory for past thinking than future thinking. These findings supported the second part of our first hypothesis (H1b) and align with the

adult literature examining episodic types of detail (Cole et al., 2013; Levine et al., 2002). These findings provide new insight into the content of past and future thoughts for children, as prior literature had not segmented and compared children's past and future thoughts into these specific detail types. Our findings, therefore, assist with a clearer understanding of the specific types of episodic content that children are generating more of, particularly when they think about the past compared to the future – these being event details.

Our finding that children generated more event details across past and future thoughts compared to other types of detail may illustrate that children tend to think about the happenings of an event more than they think about the other types of episodic details. The fuzzy-trace theory hypothesises that we encode the essence of what is happening in an event more than we encode other types of episodic details because the essence is easier to maintain in memory over the long term (García-Bajos et al., 2014; Nyhout & Mahy, 2023; Reyna, 2012). The other episodic details, therefore, become 'fuzzier' over time, such as perceptual and emotional details (Nyhout & Mahy, 2023). When we then retrieve and re-construct past thoughts or construct future thoughts from past details, the essence of what happened in past events is likely to be remembered in more detail than these 'fuzzier' types of episodic content. Thus, when the children in our study were retrieving episodic information, they may have found recalling the event's essence easier than other episodic content. It is also likely that the children generated fewer places and time episodic details because they were told in the autobiographical interview instructions to discuss a specific event and that "the event should be from a specific time and place". This specificity in the instructions also explains why children generated more perceptual details than time details across past and future thoughts.

Regarding why children generated significantly more details in the event subcategory for past thinking compared to future thinking, the theoretical ideas noted previously when discussing the overall episodic category differences between past and future thoughts could

explain the differences that have occurred sub-categorically. In other words, the past event subcategory details were easier for children to construct in comparison to the future event subcategory details because the past details were less temporally abstract and required fewer cognitive resources to retrieve (Kane et al., 2012; Dumontheil, 2014; Schacter & Addis, 2007; Atance & O'Neill, 2001). Overall, the results discussed thus far illustrate that children think in more detail about the past than the future, and children specifically think about the happenings (the event subcategory details) of events more than other episodic subcategory types.

Our fourth finding of RQ1 was that children generated a similar amount of non-episodic content between past and future thoughts. This result contradicted our second hypothesis (H2), as children did not generate more semantic details compared to all the other non-episodic subcategories, and instead, children generated a similar number of details across all non-episodic subcategories for both past and future thoughts, except for generic details which were lower compared to all other subcategories. Whilst we know that the non-episodic subcategories do not overlap with one another in terms of content (Levine et al., 2002; Renoult et al., 2020), this finding illustrates that we use four of the subcategories a similar amount when generating a past or future event. Prior research had only compared past and future thoughts by examining the semantic subcategory or by examining non-episodic information as a catch-all category (Gott & Lah, 2014; Wang et al., 2014; Ciaramelli et al., 2018). Our finding has, therefore, provided novel insight into the other four non-episodic subcategories (repetitions, other details, off-topic episodic details, and generic details). What we found is consistent with prior literature that noted no differences in non-episodic content between past and future thoughts for children or young adults (Wang et al., 2014; Ciaramelli et al., 2018; Addis et al., 2008). Thus, our findings build upon this empirical evidence.

People require access to non-episodic information before they can (re)construct a specific, episodic event (Szpunar, 2010; D'Argebeau & Mathy, 2011). In fact, Conway (1996) noted that sometimes, a specific episodic event is not even accessed when retrieving past details; instead, non-episodic information that provides a basic level of details is retrieved. Non-episodic event retrieval occurs when we are engaged in daily life, as we must retrieve past details to quickly remind ourselves of what we need to achieve in the present and future (Conway, 2005). As an example, if someone was at the supermarket and needed to remember where certain items were, they are likely to remember a general supermarket schema before needing to access specific past details. If the person then needs to think about what they need to do next within the supermarket (in the future), they will have to engage in the same retrieval process by accessing a general supermarket schema before they can construct specific details about the future goal. The similarity in retrieving this general, non-episodic information illustrates that we rely on the same non-episodic content when engaged in past and future thinking (Szpunar, 2010).

Furthermore, when considering the lifespan overview of past and future thinking, this finding concurs with the majority of research conducted on children in middle childhood, adolescence, and young adults, whereby a similar amount of non-episodic information was generated between past and future thoughts (Wang et al., 2014; Ciaramelli et al., 2018; Cole et al., 2013; Levine et al., 2002). This concurrence illustrates consistency throughout these life periods and contributes to the overall developmental picture, which is described below.

Overall, in answering RQ1, we can conclude that children generate more episodic content and, specifically, more episodic event details when describing past thoughts compared to future thoughts. These findings align with the idea that past thoughts are easier to retrieve and reconstruct than future thoughts. We can conclude that non-episodic content is

generated similarly between past and future thoughts. These findings assist us in understanding the functioning of episodic content for 11- to 13-year-olds.

Subjective Comparison of Past and Future Thoughts

Our second research question was: how do children subjectively experience past and future thoughts? To examine this question, we statistically compared children's vividness, importance, and frequency ratings of past and future thoughts. We found no significant differences between past and future thinking for vividness or importance. Children did, however, think more frequently about future events than past events. Our findings partially support our third hypothesis (H3) regarding frequency. For vividness, our finding contradicts prior adult research (Beni et al., 2013; Brigard et al., 2017; Zavagnin et al., 2016; Li-Chay-Chung, 2023). For importance, our finding contradicts some prior adult literature (Li-Chay-Chung, 2023) but is consistent with other adult literature (Zavagnin et al., 2016). Our finding on importance and frequency provides new insight into child literature, as no prior child research has considered these subjective ratings.

The prior studies that found adults rated past events as more vivid than future events noted that this may have been due to future events containing fewer perceptual and event details – both of which are important in enhancing vividness (Beni et al., 2013; Brigard et al., 2017; Zavagnin et al., 2016; Li-Chay-Chung, 2023). In our study, children's similar vividness ratings between past and future events may be related to their perceptual detail retrieval, whereby the children generated a similar number of perceptual details across past and future events. This potential relationship would indicate an overlap between the child's subjective ratings and the objective autobiographical interview scores. However, children's event subcategory detail retrieval differed between the past and the future, which does not align with the vividness ratings being similar based on the above vividness criteria. Instead, it indicates a potential mismatch between the child's subjective ratings and objective

autobiographical interview scores. Future research could explicitly compare the relationship between children's subjective ratings with the objective scores to examine how well they match. Similar research conducted with adults found that older adults' subjective ratings were not closely linked to the number of episodic details that the adults generated (Folville et al., 2020; El Haj & Antoine, 2017).

Regarding importance, some prior adult research found that future events were rated more important compared to past events (Li-Chay-Chung, 2023). These findings were considered to occur due to the link between future events and goals, whereby people tend to place more importance on future goals than past goals, as future goals guide their current behaviour (Lehner & D'Argembeau, 2006). The inconsistency between our findings with these adult findings may illustrate that 11- to 13-year-olds do not perceive future events as more important than past events because they are not yet placing high emphasis on long-term future goals and are not as future-orientated. Indeed, research on adolescents has found that future orientation increases with age (Nurmi, 1991; Steinberg, 2008; Johnson et al., 2016). As our children are pre-adolescents, they may hold a stronger present orientation than future orientation. The idea of a stronger present orientation than past orientation is also likely given that the children rated past and future events similarly in importance.

On the other hand, some adult literature did find a similar result to us, whereby adults indicated a similar level of importance between past and future thinking (Zavagnin et al., 2016). Research examining people's temporal orientation found that people tend to focus on the present more than they think about the past and the future (Beaty et al., 2020). Therefore, this equal importance for the past and future may be a developmental pattern that occurs across the lifespan until older adulthood, where this pattern shifts to the past events being rated as more important (Zavagnin et al., 2016). A longitudinal study examining past and future thinking across the lifespan would assist in understanding the pattern that occurs.

An alternative explanation to be considered, however, is that the type of events that children chose to discuss for the past and the future were equally important events to the child. Thus, the event type influenced the importance rating rather than the child's temporal orientation. Our results show that, on average, importance was rated similarly high between past (M = 5.51) and future (M = 5.96) events – with the highest possible rating being a seven. Given that children tended to discuss events such as birthday parties or Halloween, which occur annually and are probably exciting or more emotionally intense for children, the children are likely to enjoy the events equally regardless of whether these are in the past or the future. To distinguish between the two explanations (temporal orientation versus event type), future research could alter the examples that we provided to children (Appendix D) to include some events that may be lower in emotional intensity (e.g., remembering or imagining going to the park or the library). With more variety in events, the importance ratings could be compared without the equal emotional intensity between events being a potential confounding variable.

Regarding the frequency of events, the finding that children thought more frequently about future events than past events could illustrate that the type of future events children were generating were those they were looking forward to. The higher frequency for future events occurred even though children did not rate these events as more important and even though the children generated fewer episodic details for these events. The children may have anticipated the future events as occurring soon and, therefore, thought about these events more than they thought about the past events that have already occurred. For example, an upcoming birthday is likely to be thought about more often than a previous one, even if the birthdays were equally important because the upcoming one will occur sooner. We do have limited data from the children who voluntarily reported a time period that shows, on average, these children thought about future events that were occurring within the next few months (M

= 2.92; months were coded as a '3'). Therefore, children may have been thinking more frequently about future events as they were occurring relatively soon in the temporal timeline, compared to a year or longer. We also found that children thought into the past at the same temporal distance ($M = 3.42$, $p = .192$) and therefore, children's average thoughts were a few months into both temporal directions. These limited results may support the idea that there is a relationship between how far into the past/future the event is going to occur and how frequently the child thinks about this event. Future research should explicitly examine the significance of this relationship.

Furthermore, there could be an association between the child's emotions about the event and the frequency of thought. As noted above, when retrieving a past event, the emotional details involved tend to diminish compared to event details (Nyhout & Mahy, 2023). Whilst a similar pattern has been found for future events, whereby the person generates less emotional details, the person may still anticipate and think more frequently about events that they feel stronger emotional intensity towards. Future research could examine the relationship between children's frequency of future events and the emotional intensity of these thoughts. This research would deepen the limited understanding of children's phenomenological ratings for future events.

Overall, in answering RQ2, we can conclude that children think more frequently about future events compared to past events, which may be due to the events children generated being events they were looking forward to and may also be because the events were coming up relatively soon – on average, within the next few months. We found that children rated the same level of vividness and the same level of importance between past and future thoughts. Through these findings, we have an understanding of children's phenomenological ratings for past and future events.

Parental Mind-Mindedness, Parental Elaboration, and Child Past and Future Thinking

Our third research question was: what is the association between parental mind-mindedness, parental elaborations, and child past and future thinking? We statistically analysed the relationships between these three main variables to examine this question. Contrary to our hypotheses (H4 and H5), we found no significant relationship between any of the variables. Although mind-mindedness did not predict parental elaborations or child past and future thinking, this finding provides new insight into mind-mindedness as mind-mindedness has not been considered in previous past and future thought literature.

Two possible explanations exist for why parental mind-mindedness may not influence children's past and future thinking. The first explanation is that the parent's mind-mindedness does not contribute to how the parent verbally scaffolds the child; therefore, mind-mindedness is entirely separate from the parent's scaffolding. This explanation would, however, contradict similar theoretical constructs, such as parental attunement, which is linked to mind-mindedness (Planalp et al., 2019) and does impact parent scaffolding (Gattis et al., 2022; Planalp et al., 2019). Parental attunement is the way that the parent is aware of and responds to children's signals (Gattis et al., 2022). Parents with higher mind-mindedness are considered more attuned to their children (Planalp et al., 2019). Therefore, if attunement and mind-mindedness are linked, and attunement and parental scaffolding are linked, then the relationship between mind-mindedness and parental scaffolding may need further exploration, such as with a larger sample of participants than in our current study.

Taking the above explanation into account, the alternative explanation is that by age 11 to 13, children are more independent in their thoughts and actions regardless of how mind-minded the parent is. Developmental research indeed indicates that by age seven, children become more aware of their feelings and that these feelings are distinct from others' feelings (Mah & Ford-Jones, 2012). By ages nine and ten, children show increased independence in

their decision-making and thinking processes, and they demonstrate growing independence from their parents (Malik & Marwaha, 2023). By age 11 to 13, children are likely to be highly independent in their past and future thoughts, and, as such, the mind-mindedness of the parent may not be an influential factor.

There is also a possible methodological limitation that may have impacted the relationship between mind-mindedness and child past and future thinking. This limitation is that the responses to the mind-mindedness question varied considerably in terms of the quality of responses. Whilst we asked participants to describe their child in writing for a period of five minutes, some responses appear to have been written in a much shorter period with limited information provided, which hinders the reliability of the mind-mindedness data that was collected and may have contributed to our null finding. Furthermore, this limitation may demonstrate that collecting mind-mindedness data as a written task is less reliable than other mind-mindedness collection methods, such as verbally asking the parent to describe their child (Meins et al., 1998; Meins & Fernyhough, 2015). Meins & Fernyhough (2015) note in the *Mind-Mindedness Coding Manual* that after asking the parent verbally to describe their child, a follow-up prompt question can be asked if the parent has not already given an extensive answer ("Can you say anything else about him/her?", pg. 15). In future studies, asking the parent to describe their child verbally may assist with the consistency and quality of the responses.

Regarding the relationship of mind-mindedness with child past and future thinking occurring through parental elaborations, our finding of no relationship firstly indicates that mind-mindedness does not impact parental elaborations. This finding is interesting as we assumed that how parents understand their children (mind-mindedness) would impact how the parent converses with their child. Future research could examine what other individual parental factors may influence parental elaborations. Our above potential limitation regarding

the quality of the online mind-mindedness question and responses also needs to be considered regarding how this may have affected the relationship between mind-mindedness and elaborations. Secondly, our finding indicates that parental elaborations did not impact child past and future thinking. This result contradicts prior research that found higher parental elaborations positively impacted child memory development (Fivush, 2011; Schneider & Ornstein, 2015). Similar to mind-mindedness, the child's age may be a confounding variable, whereby they are more independent in their past and future thinking ability regardless of how elaborative their parents are. The broader implication of this finding is that whilst parent scaffolding of children aged between 11 and 13 has been found important in other areas of development (Fivush, 2011; Fivush et al., 2011), parent scaffolding may not be as necessary for past and future thinking at this age. Future research is needed to distinguish whether the lack of association between our variables is due to the child's own independence in thought or due to the variables themselves not being influencing factors. One future avenue would be a longitudinal study examining parent-child dyads from early childhood to adolescence to examine any differences that occur with development.

Overall, in answering RQ3, we can conclude that there is no significant relationship between mind-mindedness, parental elaborations, and child past and future thinking.

Implications

Our findings have provided significant theoretical and practical contributions by answering our three research questions. Firstly, some of our findings have replicated existing literature, such as our finding that children generated more episodic details but a similar amount of non-episodic details in past thoughts compared to future thoughts. These findings have also extended the existing literature on the generation of episodic and non-episodic content, as these are the first findings to have exclusively examined developmentally typical 11- to 13-year-olds and are one of the few studies that have examined future thinking in

children. Therefore, we have contributed to the developmental picture of past and future thinking across the lifespan. To summarise the lifespan developmental picture, children in early childhood struggle to generate episodic content and generate a higher level of non-episodic content as a result (Bauer, 2007; Nelson & Fivush, 2004). By middle childhood, children's episodic content generation is higher than the non-episodic content generation (Wang et al., 2014; Gott & Lah, 2014). Furthermore, by middle childhood, children have been found to generate more episodic content for past thoughts compared to future thoughts (Wang et al., 2014; Gott & Lah, 2014). This middle childhood developmental pattern is what we found in our 11-to-13-year-olds, illustrating a linear trajectory occurs for past and future thinking development throughout this developmental period. This developmental pattern then continues throughout adolescence and young adulthood (Wang et al., 2014; Beni et al., 2013; Zavagnin et al., 2016). In older adulthood, the pattern reverts to a similar trend as early childhood, whereby older adults produce a higher level of non-episodic content, particularly in future thoughts (Levine et al., 2002; Addis et al., 2010; Cole et al., 2013).

Secondly, our findings have provided novel insights into past and future thinking at 11 to 13 years old, including that children generate more episodic event details for past thoughts than future thoughts and when compared to other types of episodic content, such as emotional or perceptual details. These novel insights are essential in informing us about the functioning of episodic thinking and how the functioning differs between the past and the future. Clinicians could practically use these findings when cognitively assessing children between 11 and 13 to compare a child's episodic functioning to the developmental trend we found. Our small sample size does need to be considered as a limitation to the application of our results. However, this developmental trend has also been found at other ages in middle childhood, thus increasing the likelihood of our finding.

Furthermore, we now understand that children of this age are better at reconstructing the past than imagining the future, and this trend is likely to continue throughout their lives. Parents and teachers may benefit from using parenting/teaching strategies that reflect on what the child has done in the past before discussing what that means for the future. This reflective approach should be used because children are likely to remember the past first and then use the specific past details to imagine themselves in the future. For example, when parents are discussing with the child about future subjects the child is going to take at school or future career goals, they should first reminisce with the child about their strengths and specific past experiences to help the child retrieve details they can then use to imagine themselves in the future subjects and career.

Lastly, our research provides a novel theoretical insight into mind-mindedness as this variable has not been examined before at this age group concerning past and future thinking. Even though no association was found between mind-mindedness and past and future thinking, we have opened avenues for future research, including whether children's age is a confounding variable for mind-mindedness. Overall, our findings were theoretically important in replicating and extending prior literature, providing new insights, and creating areas for future research to explore. Our research has practical importance regarding strategies for learning that parents and teachers may apply and a potential assessment strategy that clinicians could utilise.

Limitations

Our research has important limitations that should be considered. We had slow data collection due to three main reasons. Firstly, we found limited success advertising through schools, and successful advertising through Facebook was highly dependent on the timing of the posts, with the most success occurring on Thursday and Friday nights. Accessing Facebook parenting groups proved difficult as many did not allow advertisements. Secondly,

11-to-13-year-olds were a difficult age group to recruit, with many not interested in participating, even if their parents were interested and had agreed to participate. Lastly, there were difficulties for parents who were balancing other commitments (work, study, younger children) to make time to participate in our study, which we acknowledge did require a significant amount of time. Whilst we aimed for approximately 50 parent-child dyads, our final sample size consisted of 21 parent-child dyads. This sample size is generally considered small for a quantitative study (Indrayan & Malhotra, 2018). Therefore, we need to exercise caution when interpreting our results, as we cannot be certain whether our findings are representative of the population or are due to random variation (Hackshaw, 2008). Nevertheless, our findings still provide valuable theoretical and practical implications and have opened avenues for future research.

A second limitation is that we were unable to recruit any fathers as participants. Therefore, our parental mind-mindedness and parental elaboration results are based exclusively on mothers and are more a measure of maternal mind-mindedness and maternal elaborations. As a result, we do not know whether or how fathers influence children's past and future thinking. Previous studies have reported this limitation, with fathers remaining underrepresented in child development research despite their significant role in child development (Gordon, 2016; Davison et al., 2016; Yaremych & Persky, 2023). Future research should recruit fathers as participants to examine their role in children's cognitive developmental outcomes.

A fourth limitation that needs to be considered is our use of Zoom for collecting data. Using Zoom meant a less controlled environment with an increased chance of distractions occurring within the participants' homes. These distractions may have lowered the participants' focus on the study, which may have impacted the quality of their responses. However, the use of Zoom in our study was also a strength as this allowed a more natural

environment for the parents and children to talk together and allowed a higher level of flexibility and convenience when scheduling participants. Archibald et al. (2019) found that participants generally rated Zoom as better than other interview methods, including face-to-face and telephone methods. For the specific measures that we collected through Zoom (parental elaborations and autobiographical details), previous research has shown that data collected through Zoom is similar in richness to data collected in laboratory and face-to-face interviews (Semmelmann et al., 2017). Furthermore, the coding of data collected through Zoom has similar rates to the coding of data collected through face-to-face interviews, indicating that valid data can be collected through Zoom. While Zoom as a data collection method must be considered a limitation, it can also be considered a strength for data collection that is flexible, more natural, and as valid as face-to-face collection methods.

Future Research

One particular avenue that future research could explore is longitudinally examining children's past and future thinking across childhood to compare the episodic and non-episodic content and the subjective ratings across time. This research would assist in determining the developmental pattern of past and future thinking without individual differences between participants being a confounding variable, as it is in cross-sectional research. We assume from prior research and the current study that episodic and non-episodic content follows a linear trajectory across development. However, we cannot be certain of this without longitudinal research. Thus, this would be an important future area to examine.

In summarising some of the other future avenues discussed throughout this chapter, future research could compare children's subjective autobiographical ratings and their objective autobiographical interview scores to understand whether there is a match or mismatch between the thoughts children generate and how they perceive these thoughts. Future research on children's subjective phenomenology could examine the associations

between how frequently children think about an event and how emotionally intense they rate that event. Future research could try to distinguish whether children's subjective importance ratings are influenced by children's temporal orientation (e.g., being present-oriented) or by the type of event the child describes. Regarding the parental influence on past and future thinking, a larger sample size would increase the statistical power and the likelihood that the results represent the wider population. Aside from sample size, future research could examine whether the lack of association between mind-mindedness, parental elaborations, and child past and future thinking is due to the child's age and independence in thought or is due to these variables not being influential. A longitudinal study would benefit this research by reducing the confounding effect of individual differences between the participants. Furthermore, research examining the association between other parental factors and child past and future thinking would assist in understanding the role of parents in this cognitive development.

Conclusion

Past and future thinking are critical cognitive processes that develop across childhood and are influenced by external influences. The current research was the first to examine past and future thinking in typically developing children aged 11 to 13 and to examine the role of two parental factors, mind-mindedness and elaborations, in past and future thought development. Our cross-sectional, quantitative study found that children generated more episodic details for past thoughts than future thoughts and generated a similar amount of non-episodic details between the past and the future. Children reported thinking about future thoughts more frequently than past thoughts. There was no relationship between the two parental factors and child past and future thinking. Theoretically, our results provided novel insight into the episodic and non-episodic content at 11 to 13 years old, including the specific types of content children generated. Practically, our results provide strategies that parents and teachers can apply when teaching children, and our results potentially provide an assessment strategy that clinicians could utilise when examining children's cognitive abilities. Future research that employs a longitudinal design would be beneficial in further examining the development of past and future thinking across childhood.

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Appendix A
Participant Advertisement Sheet

Memory and Wellbeing Study

Are you the parent of an 11-13 year old child? We would love to hear from you!

We are currently recruiting parents and their 11-13 year old children for a study about memory and wellbeing. This will involve an 15 minute online survey (parents only), a 15 minute Zoom call with you and your child together, and a 20 minute Zoom call with your child.

This research will help us understand how parents and children talk together, and how this relates to children's memory and wellbeing.

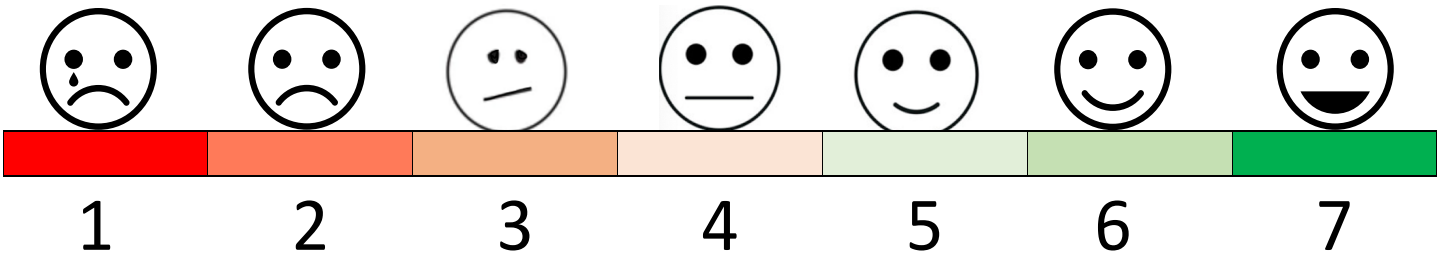
If you are interested in participating in this study, or would like any more information, please contact:

Demi Cuttance-Dunne **waikatoaginglab@gmail.com**

Ethics approval: 2021#71

Appendix B

Visual Face Scale for the Parent-Child Reminiscing Task



Appendix C
Adapted Child Autobiographical Interview Protocol

ADAPTED CHILDREN'S AUTOBIOGRAPHICAL MEMORY INTERVIEW

TEST ORDER:

- General Instructions
- Event 1 Recall (5-minute maximum).
- Event 1 General Probing (5-minute maximum)
- Event 2 Imagination (5-minute maximum)
- Event 2 General Probing (5-minute maximum)
- Event 3 Recall (5-minute maximum).
- Event 3 General Probing (5-minute maximum)
- Event 4 Imagination (5-minute maximum)
- Event 4 General Probing (5-minute maximum)
- Order of Event 3 (past) and Event 4 (future) counter-balanced across participants
- Event 1 Specific Probing
- Event 2 Specific Probing
- Event 3 Specific Probing
- Event 4 Specific Probing

GENERAL INFORMATION

This interview is conducted in 4 Parts:

1) General Instructions (page 2)
2) Recall (page 3)
3) General Probing (page 4)
4) Specific Probing (page 6)

GENERAL INSTRUCTIONS

- Ensure that the recorder is on. Record (i) the child's subject number, (ii) the date and time, and (iii) your name.

I am going to ask you to tell me about two things that have happened to you and two things that are pretty likely be happening to you in the future; we call these things events. I will give you a list of some events that might be of help. You can choose four events from this list *[show child the list – other document].* **I will ask you to describe one event at a time. Then I will ask you some questions about the events. To help me remember what you said, I will be audiotaping your description of the events and your answers to the questions.**

The past events have to be ones where you were personally there and you took part in what happened. Do not pick events that you have heard about from your parents, family, or friends. They must have happened to you. Also, the event should be from a specific time and place. For example, describing a 3-week vacation would not be enough; that is too general. However, something that happened on one day during your vacation would be great. The future events should be similar, something specific, that will be happening to you, and it should be the first time this has happened to you – something new, not

something you do regularly. I would like you to give me as much detail about these events as you can. It is like telling me a story, for example in a book or a TV show. Stories have a beginning, a middle, and an end.
I am not interested in which events you choose, but I am interested in how you tell the event to me. Pick any event that you like from the list *[point to list]***. I want to remind you that I will be asking you to give some details for these events later. So, pick events that you feel comfortable describing to me in detail.**
Do you have any questions?
Repeat the instructions if necessary.

Recall Stage

- Make brief notes about the event on the scoring sheet during recall, to aid in specific questioning later on.

I would now you like you to select one event to tell me about. You may select an event from this list *[point to the list]* **or you may tell me about another event.**

The only acceptable cues during the Recall Stage are:

- **Go ahead**
- **Yes**
- **Non-verbal cues, such as nodding**

Do not influence the recollection. Read the instructions and let the child finish speaking before saying anything. It is possible that the child will not elicit a specific event here. This is okay.

After the child describes the event, **TITLE** the event and tell the child: **"We will call this the _____ event".**

General Probing Stage

Depending on the information elicited in the Recall Stage, select *one* of the following scenarios to guide the General Probe.

Scenarios:

(1) If they did provide sufficient event detail, go to the Recall Stage for the next event *after* asking: **Is there anything else you can tell me?**

(2) If they provide only a terse or vague description *of a specific event*, use the following probes for eliciting more details. These subjects may need encouragement or a cue to give a full account of what happened.

First ask the children:

- **Is there anything else you can tell me?**

If the child is unable to provide any further information, try any of the following probes for one last recall attempt:

- **Tell me more about it.**
- **Tell me more details about -----.**
- **What do you remember about ----?**
- **Is that everything you can say about it? I want to know all the details that pop into your head.**

If the subject reiterates what was said or begins recalling another incident in response to the problem, this may indicate that most of the available information has been produced.

(3) Some subjects may have trouble generating a specific event (e.g. distinguishing specific from general events or generating a single event).

- If a specific event was not provided during the Recall Stage, say:
    - **That's not quite what I was looking for. I need a memory for a single event that happened to you.**
    - **Can you tell me about something that happened to you at a particular time or place?**

If neither probe helps, try giving a personal example (e.g. a birthday party) or ask them look at the list again and select another event. Reiterate that it can be any event, as long as they were personally involved and it is specific in time and place.

- If necessary, verify that the event is specific to a time and a place, rather than a generic description of an event that occurred over several occasions.
    - **Is this something that happened to you more than once?** *If yes*: **Can you time about one time you….?**
- If the subject has difficulty retrieving *one* specific event, it may be necessary to give them the opportunity to select another event. This can be done in two ways – more weight is placed on the former if it is applicable.
    1. If the subject recalls more than one episode during recall that is vague or generic provide guidance by asking them to focus on *one* of those episodes. However, be careful to let the subject select the event rather than asking them leading questions: **You mentioned a number of events** *[list them]***. Now I want you to pick just one of them. Choose the one that you can tell me the most about.**

2. If the subject provides a severely impoverished recollection and you feel that more details could be recalled in another event was selected, say: **Would you like to choose another event?**

General Probing Tips:

During the probing, note information that corresponds to categories on the Specific Probing Sheet, so that these are not repeated during the Specific Probe.

The overall goal is to remind the subject that we are looking for an event that occurred at a specific time and place. Do *not* provide any other guidance such as telling the subject which event to focus on, or asking for details that will be elicited during Specific Probe.

If the subject is unable to provide an event *after 3 attempts at probing*, discontinue the interview and thank them for their participation. However, before discontinuing you should be convinced that the subject really is unable to provide a recollection through General Probing and there is not simply a misunderstanding or uncertainty of what we are looking for. Also, gauge whether they are upset by their inability to recall: it may be that children have a more difficult time with recall. Regardless, do not push them to recall if they are not having an easy time recalling events.

As with Recall, impose a 5-minute time limit after each cue in General Probe.

SPECIFIC PROBING

There are three parts to Specific Probing: (1) Establishing the Event, (2) Specific Probes, and (3) Ratings.

1) **ESTABLISHING THE EVENT:** This first part is probing for event details. The goal is to establish an event that is both scorable and clearly described – in other words to get a clear description of what happened. The amount of probing at this stage will depend upon the detail produced during Recall and General Probe.
   - **If the Event WAS recalled:**
     - If the subject produced a richly detailed episode, *it is not necessary to do this additional probing* – move directly to specific questions. You may still ask if they recall anything else relating to the event (there is a chance they might remember something they did not mention earlier): **Is there anything else you can tell me?**
     - If a clear event was described, but lacking in episodic detail, work with the subject's earlier response to establish the story. Focus the subject based on the content of their earlier response with questions like: **You said _____ happened. What happened next? I want to know as many details as you can remember.**

   Specific questions may be asked based on the content of the response (e.g. **what did she say to you?**), but only ask about aspects that are clearly central to the recollected event based on what the subject said. Try not to be influenced by your own personal judgment about what is important in the event.
   - **If the Event WAS NOT recalled:** If no specific event was recalled, provide them with the list again, as per the General Probe instructions.

2) **SPECIFIC PROBES:** The second part is specific probing using cue questions. Query each major item on the Specific Probing Sheet (pages 8-9) that was not covered in Recall/General Probe. The items can be adjusted based on the event, but try to sample all five senses. Many subjects will come up with sensory information upon query that would not be expected on the basis of the earlier response.

   - For items that have already been covered, ask: **Is there anything else you can tell me about _____ that you haven't told me already?**

Be careful not to lead the subject in querying these items. Some subjects will feel inclined to generate a response simply because you asked. If you sense this is happening, clarify that you do not expect that they will necessarily have a memory for each question, but that you will ask them all just to find out if they do. If you feel the subject has reflexively responded based on the fact you queried, not based upon a real memory, ask them if they really remember it. Similarly, a subject may make a statement that is inferred, rather than a recollection (e.g. it must have been cold because it was December). In this case, ask the subject if they actually recollect this or they are simply assuming without a direct recollection.

- **Are you guessing?**
- **Do you actually remember that happening?**

Because the scoring system for this measure is not concerned with the sequence of probed information within an event, it is not required that the specific probes be administered in a fixed order. In many cases, it can be useful to probe for specific details (time, place) while trying to establish the story as described above.

3) RATINGS: The third part is eliciting ratings of the event. With the exception of the first group of specific probes (place localization) there is also an accompanying or independent subjective rating component. These ratings tap perceptual re-experiencing, emotionality, personal importance "then" and "now", and mental/verbal rehearsal of the episode.

   When you get to the rating section, *show the subject the accompanying rating sheets* to aid them in making their rating. Query the rating as described on the rating sheets and record the response on the Specific Probe Sheet.
   For the first rating, read out the available options on the rating scale. For subsequent ratings simply summarize the rating scale and only read out each available option if necessary. *Do not guide their response* to what you think would be the appropriate rating based on their recollection.

Subject ID: _____ Date: _____ Examiner: _____ Memory #:_____	
RECALL Was the event list used? YES ___ or NO ___	
GENERAL PROBING	
SPECIFIC PROBING **Part 1: Establish the Event** If necessary, work to establish the event *before* proceeding to Part 2.	
Part 2: Specific Probes	
1. When did this event take place?	
Year	
Month/Season	
Date/time of month	
Day of week	
Time of day	
Grade/age	
2. Where did this take place?	
Country	
Region/State/Province	
City	
Street	
Address/Building	
Room/Part of building	
Part of room	
3. Are there any things or objects that stand out when you remember the event?	
4. Do you remember who was there? or Do you remember where they were in/at _____?	
5. Do you remember any colours, smells, or tastes?	
6. Do you remember any physical feelings? For example, if something felt hot/cold/soft?	

7. Do you remember if you were standing/sitting/moving?	
8. How long was this event?	
9. Can you tell me anything about what you were thinking or feeling at the time this happened?	
Part 3: Ratings - *use the rating scale sheets*	
10. How clearly can you see this event when you imagine it (again)?	RATING (1-7):
11. How much did the way you feel change from before to after this event happened? How much do you think the way you feel will change from before to after this event happens?	RATING (1-7):
12. How important is this event to you *now*?	RATING (1-7):
13. How important was this event to you *then*? How important do you think this will be to you when it happens?	RATING (1-7):
14. How many times do you think of this event?	RATING (1-7):
15. How sure are you of what you remembered just now? How sure are you of what you imagined just now?	RATING (1-7):
16. How strong is this memory of the event? How strong do you imagine this event?	RATING (1-7):

Appendix D

List of Event Examples for the Adapted Child Autobiographical Interview

Choose events that happened/could happen to you in a specific time and place.

For example, you could choose…

- Your birthday
- A wedding
- A play, circus, or concert
- A school trip
- Your first/last time riding a bike, or skateboarding, or using rollerblades
- A school party or dance
- A boat ride
- A train ride
- A trip on a plane
- Winning an award or a prize
- Halloween
- Moving to a new home
- Something that happened on vacation
- Your first/last sleepover
- Getting your first/last pet
- A holiday party

Or, you can choose something else (another event not on this list)!

Appendix E
Participant Information Sheet

PARTICIPANT INFORMATION SHEET
MEMORY AND WELLBEING STUDY

PURPOSE OF THE RESEARCH

This is an invitation to participate in the Memory and Wellbeing study conducted by researchers at the University of Waikato (Aotearoa, New Zealand) and Macquarie University (Australia). Research questions include:

1. *How do parents and children talk about the past and the future, and how is this related to children's memory for the past and thinking about the future?*
2. *How is child wellbeing related to memory for the past and thinking about the future?*

WHAT WILL YOU BE ASKED TO DO?

The study involves a parent online survey (approximately 15 minutes) and two online sessions (via Zoom). The first online session is with you and your child together. You will be asked to talk together about four different events (approximately 15 minutes). The second online session is just with your child and they will complete a memory interview and measures of wellbeing and language with a researcher (approximately 20 minutes). You can complete the online survey at a time that is convenient to you, and we will also schedule the online interviews at a time that is convenient for you. Depending on what works best for you and your family, you may choose to schedule the two Zoom interviews one after the other, or on two different days. Your involvement in all aspects of the study is voluntary and you may withdraw your participation at any time.

The specific things you are being asked to consider as part of this study are:

1. **Participate in an online survey (approximately 15 minutes)**

In this survey we will ask some questions about you, your child and your family. For example, the number of children in your family and their ages. We will also ask you to complete a questionnaire that measures different aspects of wellbeing. These questions have been derived from well-developed, established research studies around the world. This survey does include questions about sensitive areas including psychological health. Your responses to these questions are hugely helpful, and provide important insight into your experiences as a parent of your child.

2. **Participate in a Zoom session together with your child (about 15 minutes).**

This will take place online, over Zoom, an online video calling system. With your permission, the session will be recorded. We will ask you and your child to choose together two events from the past

(one where you child felt upset or worried, and one where they felt happy), as well as two events coming up in the future (again, one where your child anticipates feeling upset or worried, and one where they would feel happy). We will ask you to talk together as you usually would, for as long as you usually would. There is no 'right or wrong' way to talk together, and we hope that you will find this chance to talk together interesting and enjoyable.

3. **Your child will take part in a video recorded session with a trained researcher (20 minutes)**

This will occur in your own home, but again we will ask your permission to record this interaction live via a secure Zoom link. We will be asking your child a series of questions about past and future events designed to assess their memory and future thinking. We will then complete a wellbeing measure with your child, and finally a language measure. These measures are what we refer to as 'screening tools'. This means that they allow us to compare children as part of a large group, but we cannot provide any specific information about your child based on their answers to these measures.

POSSIBLE RISKS AND INCONVENIENCES

Your participation will take up to 15 minutes for the online survey, and a further 15 minutes for the first online parent-child session. Your child's additional Zoom session will take about 20 minutes. You may find some of the online survey questions distressing, or your child may find some of the wellbeing measure questions distressing. Not all questions need to be answered. If you do not feel comfortable answering any questions, you may decline to do so. If you or your child become distressed at any stage during or after completing the interview or the survey, please let us know. We would also encourage you to speak to your health care professional or contact one of the counselling services listed below under "Further Information".

You can take your time in considering whether you would like to participate in this aspect of the study and can consult with other members of your family and ask any questions of the researchers before making this decision.

PERMISSION TO CONTACT YOU ABOUT FUTURE RESEARCH

If you choose to participate in this project you can also choose to be contacted about further research conducted by the University of Waikato. This is completely optional. Even if you say yes to this further contact now, you would be free to say no if we did contact you in the future.

STORAGE AND CONFIDENTIALITY OF YOUR INFORMATION

All information collected will be treated completely confidentially and will be used for health research only for the duration of the study. To further ensure security and confidentiality, all information will be stored, analysed and reported with your identifying details removed. You will be identified by a unique participant code rather than your actual name. Nothing that identifies individual participants will be published. You and your child will be visible in the video recordings, but these will be stored and accessed securely only by members of the Memory and Wellbeing study research team.

All data and video recordings will be kept in appropriate and secure facilities at the University of Waikato for a minimum of five years following completion of the study. The Principal Investigator of this study will act as a guardian of the data to ensure all privacy and confidentiality legislation is followed. Only researchers involved in this study, approved by a Human Research Ethics Committee, will have access to the data.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential. In the rare instance that there is a potentially serious concern for your health or safety or the health and safety of someone else, we might need to contact a health provider or other authority. We would always try and talk to you first about this, but in an emergency, might need to contact them directly.

ACCESS TO YOUR INFORMATION AND RESULTS

No individual results will be provided to you. However, the results from you and other participants may provide valuable information on the health of the community and advance scientific discoveries. We will produce a brief summary of findings, which we will send to you.

PUBLICATION OF RESULTS

Findings from the study may be published in research reports, journal articles and at conferences. Confidentiality is assured and you and your family will not be identified in any reports or presentations connected with the study. Reports outlining the group findings will be made available to participants. These will be based on data reflecting the overall study population and will not contain information about individuals.

WITHDRAWAL FROM THE STUDY

Your involvement in the study is voluntary and you may withdraw your participation at any time up until three weeks after the end of your participation, or decline to answer any questions. If you withdraw from this study, your data will be destroyed. Choosing not to participate in the study will not affect your relationship with the University of Waikato, or your current or future health provision.

FUNDING AND BENEFITS OF THE STUDY

The research is aimed at improving future health and well-being of families and is not designed to benefit the individual in the short-term. However, the study may provide important information concerning well-being, and how parents can have positive interactions with their children. Participants and the wider community may benefit directly from improved health guidelines and policy resulting from scientific discoveries made by this study. This study is funded by the University of Waikato.

ETHICS REVIEW AND COMPLAINTS

This research project has been approved by the Human Research Ethics Committee (Health) of the University of Waikato under HREC(Health)2021#71. Any questions about the ethical conduct of this research can be addressed to the Ethics Committee on humanethics@waikato.ac.nz, University of Waikato, Te Whare Wananga o Waikato, Private Bag 3105, Hamilton 3240.

Our Team

Our research team is made up of the following researchers from the University of Waikato and Macquarie University:

- Dr Amy Bird, Clinical Psychologist, University of Auckland Senior Lecturer
- Dr Aleea Devitt, University of Waikato Lecturer
- Associate Professor Penny Van Bergen, Macquarie University, New South Wales, Australia
- Demi Cuttance-Dunne, Bachelor of Honours in Psychology, Research Assistant, Masters Student

Further information

Further details of the study can be obtained from Dr Aleea Devitt, +647 837 9220 or email: aleea.devitt@waikato.ac.nz

If you have any concerns about your child or would like support for yourself or your child at any time, please talk to your GP or contact one of the following services

Parenting Helpline: 0800 568 856
Lifeline: 0800 543 354
Depression and Anxiety Helpline: 0800 111 757
Youthline 0800 37 66 33 or free text 234
What's Up? 0800 942 8787

Thank you for taking the time to consider this study. If you wish to take part, please read and complete the consent form.

Appendix F
Parent-Child Reminiscing Task (Elaboration) Protocol

Event one:
I will now ask you both to discuss a recent event when the child felt worried or upset about something. I ask for you to talk about this event as you usually would at home, for as long as you usually would. I will mute myself and turn off my camera to not disturb your conversation.

Following event, ask the child how emotional did you feel during that event on a scale from 1 to 7. 1 being negative emotions, 4 being neutral, and 7 being positive emotions.

Event two:
I will now ask you both to discuss a recent event when the child felt happy about something. Again, I ask you to talk about this as you usually would at home, for as long as you usually would.

Following event, ask the child how emotional did you feel during that event on a scale from 1 to 7..

Event three:
Now discuss a specific event coming up the future which the child is feeling worried or upset about.

Following event, ask the child how emotional do you think you will feel during that event on a scale of 1 to 7.

Event four:
Now discuss a specific event coming up in the future which the child is feeling happy about.

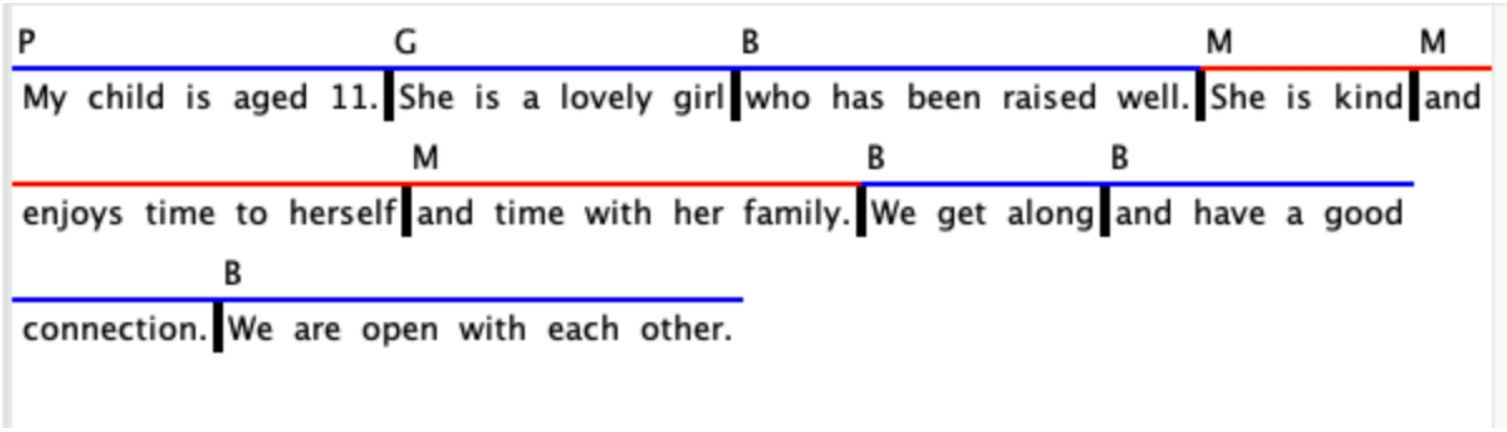
Following event, ask the child how emotional do you think you will feel during that event on a scale of 1 to 7.

Appendix G
Mind-Mindedness Coding Example

The following coding example has been adapted for anonymity.

The codes in the example are: M (Mental); P (Physical); B (Behavioural); G (General). See Table 1 for a description of each code.

This participant scored 3/9 for mind-related comments: all comments.



Appendix H
Elaboration Coding Example

The following coding example has been adapted for anonymity.

The elaboration codes in the example are: YN-EL (Yes-No Elaboration); S-EL (Statement Elaboration); MQ-EL (Memory Elaboration).

The other codes are: Eval-C (Confirmation); YN-REP (Yes-No Repetition).

See Table 2 for a description of each code.

The uncoded responses are the child's responses.

This participant scored 11/13 for total elaborations: total utterances.

YN-EL
Mm. Getting that top?

Yeah.

S-EL | S-EL | S-EL | S-EL
[Child] has been wanting this certain top for ages. | She'd tell me all the time that she'd want that top | and me and my friend were out shopping | and we saw the top

S-EL | S-EL | S-EL | MQ-EL
and said oh, the girls want these. | So I bought one and then my friend bought one | and then we showed her | and she got so excited. | Do you want to explain why you were excited?

Because I saw them on tiktok. Nah and because they look nice and are comfortable.

MQ-EL
How excited were you?

Very.

YN-EL
Did you know I was going to get them for you?

No. I thought you, I had a suspicion that you would but.

YNREP
Did you think I was going to.

Yeah.

EvalC
Yes.

Appendix I
Autobiographical Coding Example

The following coding example has been adapted for anonymity.

The episodic subcategory codes in the example are: Event; Time; Place; Em/Th (Emotion/Thought). The external subcategory codes in this example are: Sem (Semantic); Other; Rep (Repetition); Gen (Generic).

See Table 3 for a description of each code.

This participant scored 14 episodic details and 11 non-episodic details. Regarding the episodic subcategories, they scored: 8 event; 2 time; 2 place; 2 emotion/thought. Regarding the non-episodic subcategories, they scored: 5 semantic; 1 other; 3 repetition; 2 generic.