Parent Child Reminiscing and Developmental Outcomes for Children with Autism Spectrum Disorder (ASD)

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ABSTRACT

Conversations between parents and their children about past events (known as reminiscing) have been shown to promote child language development, socioemotional/behavioural functioning, and self-esteem (Farrant & Reese, 2000; Koh & Wang, 2021; Reese et al., 2007; Swetlitz et al., 2021). These developmental outcomes are often compromised for children with Autism Spectrum Disorders (ASD), yet only two published studies have examined parent-child reminiscing for children with autism (Faust, 2009; McDonnell et al., 2021). The aim of the current study was to examine differences in parent-child reminiscing for children with autism, compared with typically developing children, and the relationship with child self-esteem, socioemotional and behavioural functioning.

Participants were 164 children and their mothers (78 children with autism and a matched sample of 86 typically developing children) enrolled in the *Growing Up in New Zealand* study. The sample was matched based on gender and age, with no statistically significant differences in further sociodemographic variables found. Parents completed the Strengths and Difficulties Questionnaire (SDQ) as a measure of children's socioemotional and behavioural functioning (Goodman, 1997). Children completed the global self-worth scale (GSW) in the Self-Perception Profile for Children (SPPC) as a measure of self-esteem (Harter, 1982). Parents and their children were also asked to engage in a reminiscing task. They were able to pick one of three events to discuss together, either: (1) a recent time their child had a disagreement with another child, (2) a time that their child didn't do as well as they wanted to e.g., in a test or a sports game, or (3) a time that they hurt themselves a little bit e.g., from falling off their bike. Interviews were transcribed and coded for parental elaboration and resolution quality (for parent and child). Transcripts were also analysed via Linguistic Enquiry Word Count (LIWC) to record emotion and internal state and pronoun word counts.

The current study found that after controlling for child language parents of children with autism were less elaborative compared to parents of typically developing children, which is consistent with prior research (Faust, 2009: McDonnell et al., 2021). Dyads where the child was typically developing

were also higher in emotion resolution quality compared to dyads where the child had autism. Our analyses found no significant differences for emotion, internal state word or pronoun use for children with autism compared with typically developing children. Overall, it appeared that child developmental status did not moderate any relationship between reminiscing and child self-esteem, internalising or externalising symptoms, or prosocial behaviour. However, parents of children with autism were moderately more likely to be elaborative when reminiscing if they rated their child as less prosocial.

The current study has extended a small body of evidence suggesting that there are differences in parent-child reminiscing conversations for children with autism, compared to typically developing children. Future research is needed into this area to further examine these differences in depth, and potential associations with a range of child developmental outcomes across time.

1. LITERATURE REVIEW

1.1 Autism Spectrum Disorder/Tākiwātanga

Takiwātanga, which is the Te Reo Māori term for Autism Spectrum Disorder (ASD), was derived from the words "tōku/tōna anō takiwa," which means in his/her own time and space (Bowden et al., 2020). While individuals with autism do things in their own space and time, they can also face difficulties in two main areas: (1) social communication/interaction and (2) restrictive, repetitive patterns of behaviour, interests and activities (RRB's) (American Psychological Association, 2013). The difficulties with socialising include, but are not limited to, difficulty with initiating and participating in social interactions, and challenges with deciphering the non-verbal behaviours that are often part of social interactions. As a result, developing, maintaining, and understanding social relationships can be hard for people with autism. The second symptom group, RRB's, can manifest as highly fixated interests and/or stereotyped/repetitive motor movements use of objects or speech. Individuals who have RRB symptoms can also have an insistence on consistency, routine, or ritualised patterns of behaviour.

ASD also has three severity levels that are indicative of how much support the person with autism would require: level 1 = *requiring support*, level 2 = *requiring substantial support* and level 3 = *requiring very substantial support* (American Psychological Association, 2013). ASD is a spectrum disorder, and the severity and manifestation of ASD and these difficulties therefore vary between individuals.

ASD is often viewed through a deficit lens, with differences across multiple domains of life i.e., social, academic, and occupational, seen as disadvantages. However, recent person-centred movements driven by the ASD community emphasise ASD as part of a neurodiverse spectrum, emphasising that everyone exists in their own place in the large spectrum and has their own strengths and weaknesses (Jaarsma & Welin, 2012). Many people are likely to therefore be connected to someone with autism through either personal or vicarious experiences, hence discussion of ASD can

be a personal and potentially emotive topic. There are a wide range of terms used to describe people with autism ranging from hyper-clinical to colloquial. A study conducted with people who had autism, their families, friends and health care professionals who work with people with autism found that most people preferred to use terms such as “autism” and “on the autism spectrum” more than “autism spectrum disorder” when describing people with autism (Kenny et al., 2016). Regarding labels, the label “autistic” was highly endorsed by adults on the autism spectrum as well as their family and friends, as this label acknowledges that ASD is part of the individual and influences every part of their being. Health care professionals showed a stronger preference for “person with autism” (Kenny et al., 2016). Because the author is not an individual with ASD/Tākiwātanga, the label “person/child with autism” will be used herein. When referring to the diagnosis, the term ASD will be used, as this is what is used in existing literature.

While prevalence rates vary, international data suggests that ASD rates are increasing. This is most likely due to the improved screening/diagnostic process, as well as diagnostic changes, specifically the merging of Asperger Syndrome and ASD (Bowden et al., 2020). The most recent New Zealand Health Survey suggests that the prevalence of ASD among children aged 2 to 14 years old could be as high as 1.6% (Bowden et al., 2020). A New Zealand wide study showed that although parents noticed symptoms or concerns in children as young as three years of age, the average age of official diagnosis was 6.6 years old (Eggleston et al., 2019). Out of the 516 children who were diagnosed with ASD, only 54% of them were assessed by a multidisciplinary team. The average time that children spent on the waitlist for assessment is 5.3 months (Eggleston et al., 2019).

Parenting a child with autism brings both positive and negative experiences (Estes et al., 2019). After the formal diagnosis in particular, many parents experience uncertainty or distress. While some parents may struggle to accept their child’s diagnosis, others might experience understanding and associated relief about their child’s experience (Corcoran et al., 2015; Fernańdez-Alcántara et al., 2016). Parents also tend to develop a strong relationship with their child and a deep appreciation for

milestones achieved, which may seem inconsequential to a parent of a typically developing child, for example, returning a blown kiss (Corcoran et al., 2015; Waizbard-Bartov et al., 2019)

1.1.1 ASD and Language Development

Language is integral to all aspects of development as it allows children to communicate their needs and wants, and to understand relationships, expectations, and guidelines (Denham et al. 2003). By being able to talk about and understand their feelings (both negative and positive), children are better able to cope with difficult emotions, understand others and in turn, build relationships (Nelson, 2007; Roben et al., 2013; Salmon et al., 2016). Children with autism can have language difficulties that can range from being completely non-verbal, to having idiosyncratic language, including echolalia and differences in tone (Mody & Belliveau, 2013). Language is one of the many cognitive processes thought to be at least partially constructed through social interactions, a process termed social constructivism (Palincsar, 1998; Vygotsky & Cole, 1978). This process of language acquisition through social interaction is more challenging for children with autism because the accompanying social difficulties could result in fewer learning opportunities, compared with typically developing children. Approximately 50% of children with autism will reach the age of three years old without having the necessary, and developmentally appropriate language skills (Tager-Flusberg & Kasari, 2013). From a social constructivist perspective, the impacts on communication, and subsequent reduced opportunities to practice could be a possible reason why children with autism who have more severe social difficulties tend to also have significantly lower language abilities than children with severe RRB symptoms (Kim et al., 2020) Children whose language abilities are not at the same level as their peers may face difficulties in school as it can be hard to comprehend and communicate the concepts being taught (Golinkoff et al., 2019). Children with language difficulties may also find it harder to make friends, play with others and deal with interpersonal conflicts because they find it difficult to verbally express how they feel. This difficulty in conflict management could be why some

children with language difficulties prefer to engage in quiet or solo activities with fewer oral language demands (for example, drawing, riding a bike) (Owen et al., 2004).

These language difficulties, together with difficulties initiating and maintaining joint attention, may make it more challenging for parents of children with autism to create and utilise language-related learning opportunities. (Edmunds et al., 2019; Heidlage et al., 2020). They can also make it harder for parents to verbally respond to their child, through affirmations, imitations, descriptions of their child's actions, questions and/or demonstrations (McDuffie & Yoder, 2010). This parental verbal responsiveness (PVR) encompasses not only parents' responses to their child's behaviour, but also the type of behaviour the parent is responding to. For example, a parent might respond to their child's attempts to communicate; or might make comments based on what their child's attention is focused on (McDuffie & Yoder, 2010). Meta analyses have shown that PVR is positively associated with a child's verbal communication, regardless of diagnostic status (Edmunds et al., 2019). In terms of children with autism, parents who are more verbally responsive to what their child's attention is focused on, and an activity of their interest, are more likely to have children who have consistently higher gains in language abilities longitudinally (Siller & Sigman, 2002). Language interventions specifically for children with autism have been shown to improve language use, but especially interventions where parents play an active role as both parent and child are being helped (Hampton & Kaiser, 2016). These parent-orientated interventions can be particularly effective because they help PVR and the child's language use (Hampton & Kaiser, 2016). Although enhancing PVR is thought to be helpful for typically developing children, it is less clear whether this is the case for children with autism.

1.1.2 ASD, Socioemotional Understanding and Theory of Mind

Emotion understanding is a complex, multisensory process that requires one to interpret verbal and physical gestures (Kuusikko et al., 2009). This interpretation allows people to understand emotions (their own, and others') and understand potential influences on emotions, such as external causes, past

memories, or beliefs (Pons et al., 2004). Emotion understanding also involves understanding that emotions can often be mixed, and in some cases, hidden from the rest of the world (Pons et al., 2004). Children typically develop these emotion understanding skills through a combination of biological predispositions (e.g., temperament) and environmental influences such as social interactions (Raikes & Thompson, 2006; Wang & Saudino, 2013). With these skills, children can learn how to identify and predict their emotions, and the emotions of others. Introspection is a key factor that aids in emotion understanding as it helps one to empathise with and understand how others might feel. However, children with autism often struggle to identify and talk about their own emotions and internal states, and to understand others' inner worlds (Baixauli et al., 2016). The latter can be thought of as 'theory of mind', and can aid in navigating social interactions and avoiding social conflict by considering others' emotional and mental states when engaging in moral reasoning and decision making (Lane et al., 2010). Research has shown that individuals with autism often have varying degrees of difficulty with theory of mind (Jones et al., 2018). Moreover, individuals with autism are not always aware of their difficulties with theory of mind, so it is harder to adjust their behaviours and communication styles to specific contexts and interactions. In addition to this, individuals with autism can also struggle with distinguishing between their own and others' preferences/emotions (Elmose, 2016). Theory of mind difficulties can also reflect in how children with autism speak, as children with autism might not take the listener's perspective into account. For example, a child with autism might use more ambiguous pronouns when speaking that make it harder to understand the subject of the sentence as there are two pronouns and two possible subjects. For example, when *she* dropped her ice on the phone, *it* broke (Baixauli et al., 2016). This difficulty in distinguishing others' emotions stems from a struggle with recognising social cues from others' facial expressions, body language and the stylistic factors involved with their speech (Kuusikko et al., 2009). Children with autism can struggle to recognise emotions based on facial expressions, especially when looking into the eyes alone, and are more likely to interpret ambiguous facial expressions as negative (Kuusikko et al., 2009). This indicates that for

children with autism, more obvious and exaggerated facial expressions could be helpful in the correct identification of emotional states, and a reduced risk of incorrectly interpreting a social interaction as negative and/or threatening.

Difficulties for children with autism are not only present in identifying and comprehending emotions, but also in emotion regulation. Children with autism have been known to show less persistence and use more negative vocalisations and coping strategies (such as venting and avoidance) in situations that can provoke frustration and fear (Goldsmith & Rothbart, 1999; Smiley & Dweck, 1994; Zantinge et al., 2017). They are also more likely to rely on the people around them to help regulate their emotions e.g. parents, teachers (Cibralic et al., 2019). The difficulties observed in regulating emotions by children with autism may partially be confounded by high comorbidity between ASD and mental health disorders such as anxiety (Vasa et al., 2020; Wijnhoven et al., 2019).

Although outside of the scope of this thesis, difficulties in emotion identification, perception and recognition could also be due to underlying neuropsychological differences including attention and processing speed biases (e.g., to eyes and faces) (Dawson et al., 2005). Structural differences could also play a role in this difficulty, and result in difficulties in recognising, identifying, and attaching salience to faces (Bauman & Kemper, 2005; Kemper & Bauman, 1998; Schultz, 2005; Schultz et al., 2000).

1.1.3 ASD and Self-Esteem

During early life, children develop a concept of 'who I am.' There are many ways of measuring the self, one being global self-worth, or self-esteem. Self-esteem describes an individual's valanced or evaluative view of the self and is influenced by social and cognitive processes (Blascovich et al., 1991). Most recent studies have found that children and adolescents with autism have lower self-esteem than typically developing children and adolescents (Cooper et al., 2017; McCauley et al., 2019; McChesney & Toseeb, 2018). The social and language difficulties outlined above may go some way to explaining this. From a theoretical standpoint, children with autism could have a different conceptualisation of

self-esteem compared to typically developing children, due to their difficulties with social (theory of mind, navigating relationships) and cognitive (autobiographical memory) processes that may influence their self-esteem (Lane et al., 2010; McCauley et al., 2019; Owen et al., 2004). These difficulties may not only limit their understanding of themselves, but also mean that traditional measures of self-esteem might not be meaningful to children with autism as they would conceptualise themselves differently (McCauley et al., 2019). Although questions surrounding the conceptualisation of self-esteem by children with autism remain unanswered by literature, McCauley et al. (2019) found that youth with autism had self-esteem ratings that were internally consistent within and across two different measures of global self-esteem. They also found that among the youth with autism in their sample, those who had a higher theory of mind score had a lower self-esteem score. This suggests that higher social understanding does play a role in self-esteem, but among children with autism it might highlight their difficulties in building relationships and the negative opinions that others may have towards them, ultimately leading to a more negative self-view (McCauley et al., 2019). Children with autism who have been diagnosed with mood disorders such as depression and/or anxiety have lower social functioning than typically developing children (Duan et al., 2020; McCauley et al., 2019; Pouw et al., 2013). Feelings of social rejection and social withdrawal that could rise from victimisation or mood disorder symptoms could result in a lack of "emotion practice", which includes practicing understanding and recognising others' emotions. Therefore, children with autism could be more likely to base their interpretations of others' emotions on their own imagination and self-esteem, or lack thereof (Kuusikko et al., 2009).

1.1.4 ASD and Autobiographical Memory

Autobiographical memory encompasses all memories relating to the self (Brewer, 1986). It gives children the ability to define themselves in relation to others and the past (Bruck et al., 2007; Tulving, 2002). Autobiographical memory also allows children to use memories to guide present and future behaviour, therefore promoting self-understanding and reflection (Fivush, 2011).

Autobiographical memory theories suggest that one needs self-concept, theory of mind, social skills, and the ability to use a narrative structure to develop autobiographical memories (Goddard et al., 2014). These are four key components of social interaction that children with autism struggle with (Goddard et al., 2014). Differences in autobiographical memory for children with autism have been noticed as early as the preschool period (McDonnell et al., 2021). Accessing these autobiographical memories seem to be more difficult for children with autism and they need often need more prompting (Goddard et al., 2014; Robinson et al., 2017). When they do talk about memories, children with autism are more likely to make fewer references to the actual memory, and less likely to recall semantic and episodic memories when prompted by a particular lifetime period (Goddard et al., 2014). They can struggle to report specific memories when asked, so they tend to either not offer a memory, or give a general memory instead (Goddard et al., 2014). When questioned about their memories (either far or recent past), children with autism tend to report less details and also have less accurate responses when questioned about these events, regardless of the nature of the question (open ended or specific) (Bruck et al., 2007). However, it is interesting to note that children with autism are not more likely to falsely report memories (Bruck et al., 2007).

1.2. Reminiscing and Typically Developing Populations

A wealth of research conducted with typically developing populations suggests that parent-child conversations about past events – known as reminiscing – may have salience for children's cognitive, social, and emotional development. Through reminiscing, children are participating in conversations that help them understand their own and others' emotions, behaviours, and social environments (Salmon et al., 2016). Individual differences in parent reminiscing have typically focused on either the style or content of conversations. A parent's elaborative style refers to the use of open-ended questions, which encourage an answer broader than a simple "yes" or "no" and challenge the child to think critically about the event, and confirmations of the child's contributions (Fivush et al., 2006). A more

elaborative (compared with repetitive) style in parents has been associated with child language, autobiographical memory and self-esteem (Waters et al., 2019) Examination of the specific content of reminiscing conversations has typically focused on the internal state or evaluative content of conversations, for example, emotion (e.g., 'You were *sad*') or cognition (e.g., 'You *knew* something wasn't right') words, emotion explanations or resolutions (Wu & Jobson, 2019) High quality parent-child reminiscing can support children to develop a deeper understanding of who they are, including preferences, abilities, values and interests (Bird & Reese, 2006; Wareham & Salmon, 2006) Parent-child reminiscing also allows parents to model skills such as coping mechanisms, emotion understanding and emotion regulation (Fivush & Nelson, 2006; Salmon et al., 2016; Valentino et al., 2015).

Reminiscing is a socially constructed interaction; therefore, one would expect that social factors such as interpersonal relationships, culture and gender might influence how parents and their children reminisce with each other. Exposure to negative life events such as trauma, poverty, domestic violence, and substance abuse can result in lower maternal elaboration and use of emotion words (Leyva et al., 2021; Raikes & Thompson, 2008; Valentino et al., 2015). Cultural values can also influence how parents reminisce with their children. For example, Māori mothers who report stronger affiliations with their culture tend to be more elaborative and repetitive when reminiscing about culturally relevant events (Reese & Neha, 2014). This shows how the cultural significance of oral history (teaching, sharing of whakapapa) in Māoridom can be associated with reminiscing style. The same associations between cultural values and reminiscing have been observed with Pasifika and Chinese immigrant dyads (Koh & Wang, 2021; Reese et al., 2014). Socioeconomic factors i.e. education and income, can also influence the quality of some parent-child reminiscing conversations and the discourse used (Raikes & Thompson, 2008). Early research did indicate that mothers were more elaborative with their daughters rather than their sons, however, findings amongst current studies are more inconsistent (Waters et al., 2019). This could be due to a cultural shift away from stereotypical gender roles.

1.2.1 Reminiscing and Language Development

The relationship between parent-child reminiscing and child language may be bidirectional. On the one hand, children with developed language skills may enable richer parent-child reminiscing, allowing for discussion, comparison, and negotiation of a range of perspectives on the past event (Fivush & Nelson, 2006). On the other, it has been shown that the quality and quantity of parental language used in parent-child conversations are linked to a child's language use and acquisition (Golinkoff et al., 2019). Farrant and Reese (2000) found a bidirectional relationship across time between parent reminiscing style and child language development. Mothers who encouraged and facilitated more opportunities for their children to participate had children who were more likely to participate in the reminiscing conversation. At the same time, the child's participation also shaped the way in which their mother facilitated the conversation (Farrant & Reese, 2000). Therefore, the level of language in conversations plays an important role in a child's language development, and parent-child interactions such as reminiscing can help to facilitate this (Salmon et al., 2016). The valuable language skills obtained from reminiscing can help children to understand their selves, their sense of time and also how to articulate events in different periods of time (past, present and future) and their meaning via the use of personal pronouns (Bird & Reese, 2006; Fivush & Nelson, 2006). Past tense language can help children to compare their recounts with their parents and also help them to separate their own experiences from the experiences of others. Through language, parents can scaffold their child's understanding of how to interpret, cope with and verbalise ideas surrounding emotions of any valence (Waters et al., 2019). This scaffolding then allows children to develop the vocabulary needed to clearly express their likes, dislikes, and desires. As well as increasing phonological awareness, high quality reminiscing also requires children to develop sophisticated language and sentence structures (Leyva et al., 2012). This complexity will allow children to not only think about, but also put their past experiences into words.

1.2.2 Reminiscing and Self-Esteem

Talking about past events helps children to make sense of their experiences and understand why they are important. By talking about their likes, dislikes and what is important to them, children can connect a series of past experiences into a coherent story about their life, and ultimately 'who I am' (Bird & Reese, 2006). Reese et al. (2007) found that parents who explained and confirmed past positive emotions, and explained past negative emotions, had children with higher self-esteem. They suggested that parents modelling positive and open evaluation may help children to generalise this form of evaluation to themselves, helping them to develop an integrated view of the self (Reese et al., 2007). Maternal emotion talk, collaborative expression and explanation of emotions during reminiscing have been linked to self-esteem in a handful of other studies (Bohanek et al., 2008; Marin et al., 2008). Some research has found no associations between parent-child reminiscing and self-esteem, but instead found that supportive parenting was positively associated with children's self-esteem (Harris et al., 2017). Generally speaking, parent-child reminiscing that is rich in emotion resolution and explanation is found to be positively associated with a child's self-esteem. However, what we do not know is how emotion reminiscing is associated with children with autism and their self-esteem.

1.2.3 Reminiscing and Behavioural Functioning

Reminiscing about past emotional events within a supportive relationship may help a child to successfully navigate their world by allowing them to understand how others feel and how to respond appropriately. This in turn, may aid their wellbeing. While there are many differing definitions of child wellbeing, common themes across literature cite the following as key factors in the concept of child wellbeing: access to resources (health care, education), social support (from family and others), emotional wellbeing (self-acceptance/esteem) and social wellbeing (friends, play) (Cho & Yu, 2020; Moore & Lynch, 2018; Sixsmith et al., 2007).

Regardless of how wellbeing is conceptualised, internalising and externalising problems can negatively impact a child's wellbeing. Both types of behavioural problems can also be a measure of

how well a child can regulate their emotions. Internalising problems include emotional problems (such as depression and anxiety) and peer problems (such as feelings of rejection and social withdrawal) (Liu et al., 2011). Externalising problems are displayed outwardly towards other people and/or the environment (Liu, 2004). Externalising problems can either involve hyperactivity (difficulties with maintaining attention and controlling impulses) or conduct (including aggression and delinquency). Both internalising and externalising problems can either exist on their own or be comorbid. Children with autism tend to have more difficulties with peer relationships and prosocial behaviours (Salayev & Sanne, 2017) They also tend to report more internalising and externalising problems when compared to typically developing children (Salayev et al. 2017).

Reminiscing has been found to be associated with internalising and externalising problems for children. Mothers who have previously had depression symptoms are more likely to be less elaborative when reminiscing, which has then been associated with later externalising problems for their children (Swetlitz et al., 2021). Maternal elaboration, explanation, and confirmation of negative emotions during reminiscing have been associated with reduced likelihood of child internalizing and externalizing problems (Koh et al. 2021).

Reminiscing about past events may create distance between the child and the emotions associated with that event, therefore allowing for conversations that are not as emotionally charged (Fivush et al., 2003). Talking about events after they have occurred may enable a more reflective approach and create a sense of ownership or autonomy. As with language and self-esteem, no existing research has examined associations of reminiscing with internalising and externalising difficulties among children with autism. It remains to be seen whether the potential benefits of high-quality reminiscing experienced by typically developing children are the same for children with autism.

1.2.4 Reminiscing and Children with Autism: Current State of Knowledge.

There are only two existing reminiscing studies that involve parents and their children with autism. The first study, conducted by Faust (2009) used a small, matched sample (on verbal and mental

age) of 12 children with autism and 12 typically developing children. Dyads were asked to speak about four emotional past events (a time the child felt happy, sad, angry and scared) (Faust, 2009). Contrary to hypotheses, there were no differences in reminiscing styles or amount of emotion talk for either parents or children. However, it was found that parents of children with autism were more elaborative when their child showed more interest in the conversation. Additionally, parents who used more emotion talk were more likely to have children who did the same, regardless of diagnostic status (Faust, 2009). This suggests that as with typically developing children, children with autism may also develop a socially constructed reminiscing style.

McDonnell et al. (2021) conducted a similar study but also examined associations of reminiscing style with an independent measure of children's autobiographical memory. The study had a matched sample size (matched on age, sex, and expressive language) of 38 preschool aged children, 17 of them with autism and 21 typically developing. Results indicated that children with autism did not have any notable difficulties with their autobiographical memory compared to their typically developing counterparts, as their responses during reminiscing were just as long, emotionally appropriate, and detailed (McDonnell et al., 2021). One key difference was that the children with autism recalled fewer specific memories regardless of whether they had received prompting from their parents. Having a better understanding of theory of mind, a positive self-concept consistency and stronger executive functions were also positive predictors of autobiographical memory specificity across both children with autism and typically developing children. In terms of reminiscing style, the mothers of children with autism used more off-topic comments and closed ended questions (McDonnell et al. 2021). These closed-ended questions also negatively predicted autobiographical memory specificity for the children with autism, and a more elaborative approach positively predicted autobiographical memory specificity for both groups of children (McDonnell et al. 2021). Faust (2009) and McDonnell et al. (2021) have shown that there are differences in how children with autism reminisce with their parents compared to typically developing children and their parents. What remains unclear is: (a) whether

these differences are found with a larger and more diverse sample of ASD children; and (b) whether these differences are associated with the emotional, social, behavioural, and cognitive outcomes for children with autism (beyond autobiographical memory).

1.3 Current Study

This study was conducted using data from the *Growing Up in New Zealand* study. *Growing Up* is a longitudinal, contemporary population cohort study designed to track the lives of children growing up in 21st century New Zealand, and the factors that impact their health and wellbeing. This study offers an ideal sample to answer our research questions as it is socio-economically and ethnically diverse. To answer our research question, we will be using a matched sample of typically developing children and children with autism from the 8-year data collection wave. Similar to Faust (2009), we will control for child language to reduce language differences between the two groups.

1.3.1 Aim and Hypotheses

The current study has two primary aims:

(1) To examine whether differences exist in parent-child reminiscing for children with autism compared with typically developing children. We will attempt to extend Faust (2009) and McDonnell et al. (2021) by examining parent elaborative style. We will also be building upon these findings by examining the quality of resolution of emotion within reminiscing conversations by both parent and child, as well as specific references to emotional and cognitive internal state language, as well as temporal use and pronoun use, of both parent and child using the Linguistic Enquiry Word Count (LIWC) software.

   a. Based on existing research (McDonnell et al., 2021), it is predicted that parents of typically developing children will engage in more elaborative conversations than parents of children with autism. Given a lack of research examining differences in emotion or pronoun content, no a priori predictions are made here.

(2) To examine whether differences in reminiscing style or content are associated with developmental outcomes relevant to children with autism: self-esteem and internalising and externalising difficulties. Overall, it is predicted that findings from typically developing populations (e.g., Waters et al., 2019; Bird & Reese, 2006; Welch-Ross et al., 1999) will be replicated with children with autism.

   a. It is predicted that more elaborative reminiscing will be associated with higher receptive language scores for children with autism at age 8 years, after controlling for language ability at age 4 ½ years.
   b. It is predicted that greater parent and child reference to emotion, but not cognitive, terms will be associated with greater self-concept coherence for children with autism.

2. METHOD

2.1 Design and Ethics

All participants were recruited from the *Growing Up in New Zealand* cohort. Surveys and recordings were collected by *Growing Up*, and the current project is an archival analysis of this data, including additional targeted transcription and coding.

Women who had a due date between 25th April 2009 and 25th March 2010 and living in the District Health Boards (DHBs) of Auckland, Counties Manukau and Waikato were able to take part. 6822 pregnant women in total were recruited. Recruitment methods included referral by health professionals, visits to antenatal classes and clinic rooms, community events and media publicity. Detailed descriptions of the cohort study design and sample recruitment have been published previously (Morton et al., 2013; Morton et al., 2015)

2.2. Ethical Approval and Consent

Ethical approval for the *Growing Up* study was granted by Health and Disability Ethics Committee (Northern). Further ethical approval for the use of data for this project was granted by the Human Research Ethics Committee of the University of Waikato (2021#18).

The families in the study have been participating in approximately five annual data collection waves, with additional consent sought at each point of contact. Parents provided written consent and children provided verbal assent as part of the *Growing Up* 8-year data collection process. Recording of the parent-child conversation required additional consent in addition to the participation consent. Incentives were not given, but children were given a small stationery gift for taking part in the data collection wave.

2.3 Participants

The ASD sample consisted of all children identified by their parent as having ASD, for whom a parent-child reminiscing conversation recording was available (n= 85). We used case control matching to create a matched, same-size sample of typically developing children selected from all typically developing children in the 8-year cohort (n = 86). The children were matched based on age and gender. There were no other statistically significant differences between the two groups for sociodemographic variables such as maternal education, area deprivation and ethnicity, as seen in Table 2**.** The children in our sample ranged from 7.9 – 9.75 years of age.

2.4 Measures

2.4.1 Child

Of all the information collected in the questionnaires, the following key measures were included in our study:

2.4.1.1 Language Development

An adapted version of the Peabody Picture Vocabulary Test Version Three (a-PPVT) was used to measure children's receptive language ability (Dunn et al., 1997; Rothman, 2005). The a-PPVT questions contain three sets: Core, Basal and Ceiling, with 20 items in the Core set, and 10 items in the Basal and Ceiling sets. The total score was calculated by adding the number of correctly identified pictures across sets. For all questions, interviewers read a word, and the child had to pick a picture (from four numbered options) that best illustrated the meaning of the spoken word e.g., "*crawling*" or *"walking*." This adapted version of the a-PPVT was developed based on prior work by the *Longitudinal Study of Australian Children (LSAC)* (Taylor et al., 2013).

2.4.1.2 Self Esteem

We measured self-esteem using the global self-worth (GSW) subscale of the Self-Perception Profile for Children (SPPC) (Harter, 1982). This subscale includes six items pertaining to the child's overall self-worth (e.g., if they are happy with the way they are, how they feel about how they act and if they think that they are a good person). The two anchors for each item are first presented. For example, *"Some kids are not very happy with the way they do a lot of things BUT Other kids think the way they do things is fine."* Children were asked to say which of the two statements was most true for them, and then whether that statement was 'really true for me' or 'sort of true for me', resulting in an overall 4-point Likert scale for each item. In line with the recommended scoring from the manual, the mean of the self-worth items was calculated, with higher scores indicating higher global self-worth (Harter, 2012).

2.4.1.3 Socioemotional and Behavioural Functioning

The parent report form of the Strengths and Difficulties Questionnaire, (SDQ) was used to assess children's socio-emotional and behavioural functioning over the past six months (Goodman, 1997). The SDQ's five subscales measure hyperactivity, emotional problems, conduct problems, peer problems and prosocial behaviours, with each subscale consisting of five items. Parents rated their

agreement using a 3-point Likert scale ranging from 0 = *not true* to 2 = *certainly true.* The conduct problems and hyperactivity subscales were combined to give an externalising score, and the emotional and peer problems scores were combined to give an internalising score. The current study only utilised the prosocial, internalising, and externalising scores. *Growing Up* has published studies detailing the validation of the SDQ measure used in the *Growing Up* data collection waves (D'Souza et al., 2017; Thompson et al., 2021). A copy of the SDQ used in our study can be found in Appendix A. Due to copyright reasons, the SDQ is the only measure that will be included in the Appendix.

2.4.1.4 Reminiscing Conversation

Parents and their children could choose to talk about one of three topics: (1) a recent time their child had a disagreement with another child; (2) a time that their child didn't do as well as they wanted to (e.g., in a test or a sports game); or (3) a time that they hurt themselves a little bit (e.g., falling off a bike).

2.4.1.5 Coding

All reminiscing conversations were transcribed verbatim from the audio recordings. A large number of transcripts (n = 1,442) were transcribed before this project started and the remaining 85 (for the selected ASD children and matched sample) were transcribed before coding and data analysis. All identifying information (e.g., names and genders) was removed from the transcripts. The transcripts were coded in three passes (see Table 1). To be eligible for analysis, all transcripts had to be related to the event that the dyad chose to talk about, and both parties (parent and child) had to verbally participate. We did not code off-topic talk and talk during the selection process. Finally, transcripts were formatted to fit the LIWC requirements prior to data analysis. LIWC requirements included the removal of contractions, colloquial language, and replacement of general utterances with words in the LIWC dictionary e.g., changing "*err"* to "*um"*. To identify separate parent and child conversation variables for LIWC, transcripts had to be split (with all dialogue from the mother in one document and all dialogue from the child in another document) and processed separately.

Table 1

Narrative Coding passes used in the current study.

Coding Pass	Description of Process
First Pass: Elaborative Coding	We used the Elaborative Reminiscing Scale Coding Scheme, adapted from an existing scheme (Leyva et al., 2020). This scheme was used to make a global judgement on parent elaboration. Each transcript could have been given one of five possible codes ranging from 1 (indicative of the parent not following up on the child's contributions or encouraging them to elaborate on their statements) to 5 (parent encourages the child to elaborate on the event while also taking part in providing elaborative statements, therefore helping to build the story). We used the two-way random-effect model based on single measures and absolute agreement to calculate inter-rated reliability on a sample of 110 (Syed & Nelson, 2015). The ICC value was 0.757, indicating good reliability (Koo & Li, 2016).
Second Pass: Emotion Resolution	An adapted version of the Autobiographical Emotion Events Dialogues: Coding Manual was used (Koren-Karie et al., 2003). The original manual has 14 scales with half focusing on mother and half focusing on the child. However, here only the resolution/closure of negative feelings scale was used. This resolution/closure scale examines how mothers and children end conversations about negative experiences and the emotions involved in these experiences. Scores were measured on a 9-point Likert scale. Two separate scores were given: one for the mother and one for the child. Scores on the lower end of the scale indicated that

	mothers and their child ended on a negative note, with potential for increasing negative emotionality towards the end. Higher scores indicated that the mother and child ended the story with a positive resolution. This could look like mothers trying to reframe the story and create a 'happy ending' or ending the story emphasising the child's resilience and ability to cope with the negative experience.
LIWC: Internal State and Emotion Words	We used the Linguistic Inquiry and Word Count (LIWC) software for the third pass (Pennebaker et al., 2001). LIWC counts words in text files and the transcripts of conversations are entered into the software. Each word is counted, compared with the dictionary file and put into one of the pre-set categories (Pennebaker et al., 2015). Pre-set categories are split into further sub-categories e.g., the main category, affect, can be split into positive and negative affect. We chose to use the overarching categories to avoid risk of Type II error for majority of our analyses. However, there were instances where we decided that a sub-category would best help us investigate our developmental outcome of interest. In addition to total word count, we selected the following categories to help us address our key developmental outcomes that linked best to internal state and emotion words: (1) Socioemotional functioning: affect, positive and negative affect, social (including family, friends, female, male). (2) Self-esteem: personal pronouns (including I, we, you, she/he, they) and cognitive processes (including insight, causal, discrepancies, tentative, certainty, differentiation)

2.4.2 Potential Covariates from Maternal Data

As part of the 8-year data collection wave, the mothers of the children in the *Growing Up* cohort completed an electronic questionnaire. This questionnaire included questions surrounding the child's household and living environment, and their own household socioeconomic status, employment, sources of formal and informal support, maternal health/wellbeing (including depression), inter-parental relationship and information about their wider environments (including their families and households). We utilised mothers age (in years), area deprivation, maternal highest education, and maternal self-prioritised ethnicity, as well as the following measure of maternal depression symptoms:

2.4.2.1 Depression Symptoms

We used the Patient Health Questionnaire (PHQ9) to measure severity and intensity of depression symptoms (Spitzer et al., 2006). The PHQ9 has nine items that have been designed to screen for depressive symptoms experienced over the past two weeks. The mothers were asked to rate how often they had been bothered by the problems described in the individual items (*e.g., "little interest or pleasure in doing things"* or "*feeling tired or having little energy"*) on a 4-point Likert scale ranging from 0 = *not at all* to 3 = *nearly every day*. Possible scores range from 0 – 21, with higher scores indicative of severe depression symptoms. Scores from 0-5 are classed as mild, with 10 = moderate, 15 = moderately severe and 20 = severe depression. It was recommended that if a person scored over 10, they should be contacted for further assessment.

2.5. Procedure

The 8-year data collection wave was the first wave in which children in the study completed their own separate questionnaire, which was administered by interviewers. The children also completed a face-to-face interview in their own homes, conducted by a trained interviewer. Questions covered areas such as their views of themselves, their identity and wellbeing. As well as these questions, children also completed activities which tested their language proficiency, cognitive

development, and psychosocial development. A child-proxy questionnaire was also completed for the child, on behalf of their mother asking for details about their child's food behaviours, sleeping habits, cultural engagement, and behaviour/social skills.

For the reminiscing task, mothers and their children were asked to sit together comfortably and to talk together how they normally would and for as long as they usually would. These conversations were to be around the three provided conversation topics, with picture prompts used. Researchers also completed some in vivo ratings, but these were not utilised in the current analyses.

3. RESULTS

We first reviewed all transcripts and excluded a total of 6 dyads from the study, as they did not meet our inclusion criteria. The remaining 164 dyads (78 children with autism and 86 typically developing) were eligible to be in our final dataset. It is important to note that not all dyads completed all parts of the questionnaire due to various reasons.

Table 2

Descriptive statistics and preliminary analyses for socio-demographic, reminiscing and child language, self-esteem, child wellbeing and socio-emotional variables, for typically developing and children with autism.

Variables	Independent sample t-tests					
	Typically Developing		ASD		Independent sample t-tests	
	M	*SD*	*M*	*SD*	*t*	*p*
Maternal age	39.56	5.883	39.6	4.815	-.041	.967
Area deprivation	4.71	2.739	5.24	3.011	-1.168	.245
Maternal depression symptoms	3.71	3.111	4.86	4.576	-1.852	.066
SDQ prosocial	13.06	1.804	11.53	2.345	-4.714	<.001
SDQ internalising	11.93	2.468	15.22	3.017	5.715	<.001
SDQ externalising	11.14	2.522	13.30	2.866	3.741	<.001
GSW	9.53	3.328	9.75	3.055	.411	.681
Variables	Chi square					
	n	*%*	*n*	*%*	X^2	*p*
Maternal ethnicity (SelfproethAM5g)					12.513	.014
NZ European	65	75.6	59	75.6		
Maori	5	5.8	11	14.1		
Pacific	5	5.8	5	6.4		
Asian	11	12.8	1	1.3		
MELAA and other	0	0	2	2.6		
Maternal education (EDALL3g)					2.963	.227
High school	19	22.1	25	33.8		
Diploma or trade	22	25.6	14	18.9		
University	45	52.3	35	47.3		
Child gender (GENDER_PDL)					.095	.758
Boy	70	81.4	62	79.5		
Girl	16	18.6	16	20.5		
Event type discussed					2.890	.236
Social disagreement	13	15.3	17	21.8		
Disappointment	20	23.5	11	14.1		

Injury	52	61.2	50	64.1		
Event discussed					.181	.670
Unshared	49	57.0	47	60.3		
Shared	37	43.0	31	39.7		

Note. Percentages are column percentages.

3.1 Descriptive and Preliminary Analyses

A combination of independent sample T-tests and Chi Square goodness of fit analyses were used to calculate differences in key variables across the ASD and typically developing samples. As Table 2 shows, there were no significant differences between most of the demographic variables except for one. The proportion of NZ European, Māori, Pacific, Asian and MELAA in our sample was not equal between mothers of children with autism and mothers of typically developing children $X^2(4, 164) = 12.513$, $p = .014$. Because of this, we controlled for maternal ethnicity in our main data analyses. There was a higher proportion of males in both groups which is expected, seeing as ASD is more common among boys than girls.

Chi square analyses identified no significant difference in the frequency of the type of event discussed when comparing dyads where the child had a diagnosis of ASD to dyads where the child was typically developing. Independent t-tests showed the same conclusion for whether the event was shared between parent and child, or unshared (see Table 2).

There were significant differences in SDQ scores for dyads where the child had a diagnosis of ASD and dyads where the child was typically developing. For the prosocial subscale of the SDQ, children in our sample with autism had significantly lower scores ($M = 11.53$, $SD = 2.345$) compared to the typically developing children in our sample ($M = 13.06$, $SD = 1.804$), $t(162) = -4.714$, $p < .001$, $d = -.737$. Children with autism also had significantly higher internalising scores ($M = 15.22$, $SD = 3.017$) than typically developing children ($M = 11.93$, $SD = 2.468$), $t(110) = 5.715$, $p < .001$, $d = .796$. Finally, children with autism had significantly higher externalizing scores ($M = 13.30$, $SD = 2.866$)

than typically developing children (M = 11.14, SD = 2.522), $t(110) = 3.741$, $p < .001$, $d = .826$ = large effect size. Levene's test indicated unequal variances (F = -1.233, p = .269), so degrees of freedom were adjusted from 162 to 144. Therefore, the mothers of children with autism were more likely to identify that their child displayed more hyperactivity/inattention and conduct problems.

3.2 Research Question 1: Differences in reminiscing conversation between dyads where the child has an ASD diagnosis and dyads where the child is typically developing.

Table 3

Multivariate analysis of variance (MANCOVA) controlling for child language and maternal ethnicity comparing dyads where the child is typically developing and dyads where the child has autism.

Variables	MANCOVA					
	Typically Developing		ASD		Between Subjects Effects	
	M	*SD*	*M*	*SD*	*F*	*p*
Parent						
Parental elaboration	3.26	.90	2.52	1.06	19.39	<.0001
Resolution quality (1-9)	6.63	1.14	5.71	1.24	20.91	<.0001
Words Per Sentence	7.68	2.78	6.79	1.77	4.326	.039
Personal Pronouns	14.29	3.57	14.14	3.44	.055	.815
I	1.48	1.34	1.33	1.43	.314	.576
Affect	6.19	2.87	6.65	2.91	.675	.413
Positive emotions	4.02	2.36	4.53	3.01	1.027	.313
Negative emotions	2.15	1.61	2.08	1.43	.085	.771
Social	17.29	4.35	17.19	4.33	.025	.876
Cognitive processes	11.60	4.09	11.22	4.58	.367	.546
Child						
Resolution Quality	6.07	1.36	5.07	1.36	18.89	<.0001
Words Per Sentence	5.98	3.59	6.83	3.74	2.744	.100
Personal Pronouns	13.43	3.95	13.09	4.74	.217	.642
I	9.48	3.34	9.61	4.56	.036	.849
Affect	4.41	3.52	4.31	3.46	.029	.865
Positive emotions	2.33	2.59	2.13	2.05	.335	.564
Negative emotions	2.05	2.58	2.17	2.93	.093	.761
Social	7.87	5.49	7.34	5.43	.272	.603
Cognitive processes	9.46	5.13	9.45	5.83	.001	.970

To answer this research question, a multivariate analysis of variance (MANCOVA) controlling for child language and maternal ethnicity was conducted (see Table 3). Parent and child reminiscing variables were included, comparing dyads where the child had a diagnosis of ASD with dyads where the child was typically developing. The MANCOVA found an overall significant difference between the two groups (Wilks' Lambda $F = 1.94$, $p = 0.017$).

As shown in Table 3, the MANCOVA identified a significant difference in parental elaboration ($F = 19.39$, $p < .0001$), with parents of typically developing children demonstrating higher elaboration ($M = 3.26$) compared with parents of children with autism ($M = 2.52$). This shows that in our sample, the parents of typically developing children were on average more elaborative during reminiscing compared to the parents of children with autism.

Parent emotion resolution was significantly lower for parents of children with autism ($M = 6.63$, $SD = 1.14$), compared to parents of typically developing children ($M = 5.71$, $SD = 1.24$) ($F = 20.91$, $p = < .0001$). Similarly, children with autism had significantly lower emotion resolution scores ($M = 6.07$, $SD = 1.36$), compared to typically developing children ($M = 5.07$, $SD = 1.36$) ($F = 18.89$, $p = < .0001$).

The MANCOVA did not identify significant differences across any of the LIWC reminiscing variables.

3.3. Research Question 2: Reminiscing and developmental outcome associations for children with autism and typically developing children.

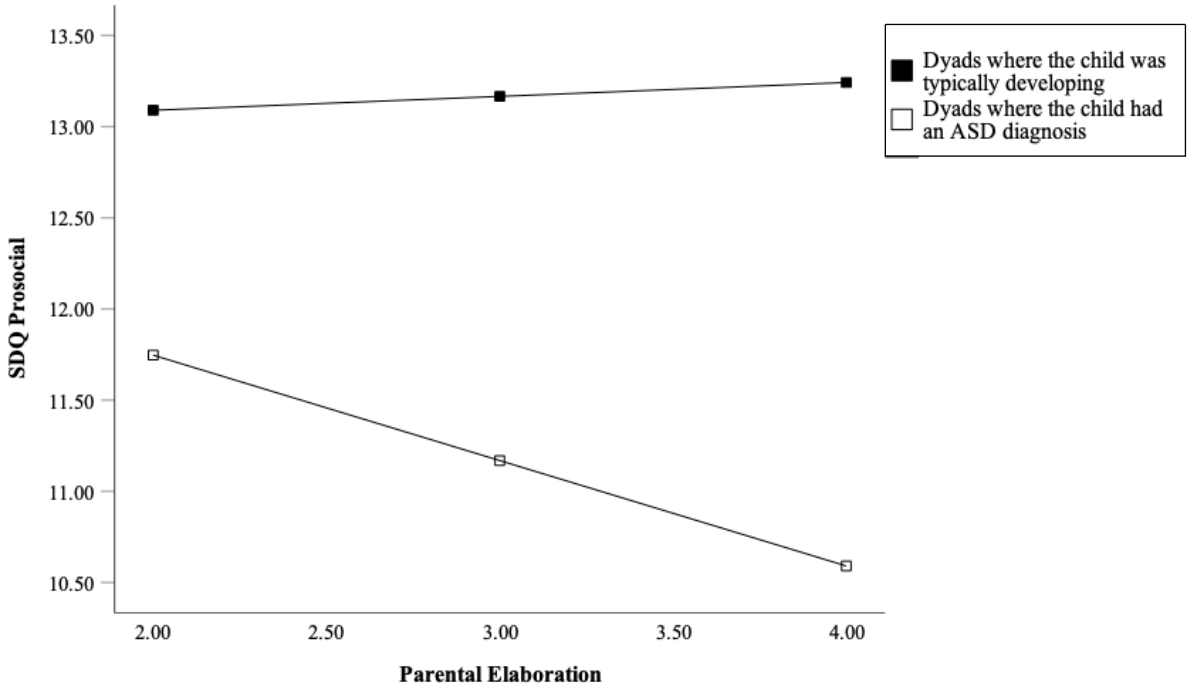
Table 4

Test of unconditional interaction: is the relationship between parent reminiscing and child behaviour and self-esteem moderated by child developmental status (ASD or typically developing) moderated by behavioural outcomes and self-esteem?

	Parent elaboration			*Parent resolution*			*Child resolution*		
	R^2 change	*F*	*p*	*R^2 change*	*F*	*p*	*R^2 change*	*F*	*p*
SDQ internalising	.0071	.94	.33	0.0015	0.19	0.66	.0042	.55	.46
SDQ externalising	.0021	.25	.62	0.0013	0.15	0.70	.0053	.62	.43
SDQ prosocial	.0207	3.50	.06	0.0001	0.01	0.92	.0054	.88	.35
GSW	.0068	.96	.33	.0004	.06	.81	.0005	.07	.80

Figure 1

Moderation plot demonstrating interaction between SDQ prosocial subscale and parental elaboration for dyads where child has an ASD diagnosis.



A set of regression models were tested using Hayes' Process macro, controlling for covariates (maternal ethnicity and child language) (Hayes, 2018). In each model a reminiscing variable was entered as the independent variable (parent elaboration, parent resolution or child resolution), a child developmental outcome as the dependent variable (SDQ internalising, SDQ externalising, SDQ prosocial or GSW), with child developmental status (ASD or typically developing) as the moderator. There was no evidence for a significant unconditional interaction effect (see Table 4). Therefore, child developmental status did not moderate any relationship between reminiscing and child self-esteem, internalising or externalising symptoms, or prosocial behaviour. However, it is interesting to note that one model showed a moderately significant interaction effect: the relationship between parent elaboration and child prosocial behaviour (F = 3.50, p = 0.06). For children with autism, greater

parental elaboration was associated with poorer prosocial behaviour (z = -0.58, p = 0.02, 95% CI -1.07, -0.08), whereas no relationship was observed for typically developing children (z = 0.08, p = 0.76, 95% CI -0.41, 0.56). Therefore, indicating that among the dyads where the child had a diagnosis of ASD, parents were marginally more likely to be elaborative when reminiscing if they reported their child having poorer prosocial behaviour, compared to the rest of the sample (see Figure 1).

4. DISCUSSION

The current study examined differences in parent-child reminiscing for children with autism, compared with typically developing children, and the relationship with child developmental outcomes. We extended prior research on reminiscing with samples with autism by considering multiple aspects of both parent and child reminiscing style and content; specifically, elaboration, emotion resolution and emotion/internal state word content. With our larger sample, we found that – consistent with prior research (Faust, 2009; McDonnell et al., 2021) - parents of children with autism were less elaborative compared to parents of typically developing children. Moreover, in our sample, emotion resolutions for typically developing children were higher quality compared with emotion resolutions for children with autism. Our analyses found no significant differences for emotion, internal state word or pronoun use for children with autism compared with typically developing children. The second aim of this study was to examine whether a relationship between reminiscing and child socio-emotional and behavioural functioning was moderated by child developmental status (autism compared with typically developing). Overall, it appeared that child developmental status did not moderate any relationship between reminiscing and child self-esteem, internalising or externalising symptoms, or prosocial behaviour.

4.1. Research Question 1: Differences in parent-child reminiscing for children with autism, compared with typically developing children.

Our analyses found support for some differences in parent-child reminiscing between dyads where the child had autism and dyads where the child was typically developing. We found that parents of children with autism were significantly less elaborative than parents of typically developing children, after controlling for child language. These findings are in line with those of McDonnell et al. (2021), who also found that mothers of children with autism were less elaborative when reminiscing with their children. While Faust (2009) found no difference in parental elaboration between children with autism and typically developing children, they did find that parent elaboration was positively associated with child interest. In our study, we noted that some children with autism went off topic for long periods. When this happened, parents tended to stop asking open-ended questions and instead responded with simple answers, and/or asked closed-ended questions. Therefore, it may be that adopting a less elaborative style when talking with children with autism can be adaptive strategy for bringing them back on topic. It may be helpful for further research to examine reminiscing conversations for children with autism using a 'line-by-line' coding approach to consider child moves off topic, parent responses, and the impact on subsequent child conversation. The following excerpts demonstrate this parent shifting her style to her child's off-topic talk, attempting to connect the child's preferred topic of conversation, with the reminiscing task. This parent also weaves emotion content into 'off-topic' talk, suggesting that flexibility and adaptability may be especially important for parents reminiscing with children with autism.

Mother: And you felt sad? What happened? Do you remember what happened?... You were sitting down at the table, and then the chair slipped, didn't it? Did the chair slip?

Child: Where's the car?

Mother: No this is a different picture this, in this picture this is a time when this boy was hurt, it looked like he fell off his bike. But we're talking about [Child's name] time he was hurt. Do you remember [Child's name] time when he was hurt?

Child: What happened to that car?

Mother: Aww he fell off his bike and he, what do you think he he got hurt and he hurt his... It looks like he hurt his knee? Do you think he feels sad or happy?

Child: Happy

Mother: No he looks like he's sad because he's hurt. What about [child's name], when [child's name] fell off the chair. Were you sad -

....

Mother: So... what happened with the chair remember we told you to stop it from happening again, you had to sit properly on the chair? Yes?

Child: Can you get me grape?

Mother: Oh yeah, we had some grapes to make you feel better. Yes

Child: Can you get me...a... is anyone to... can I... can give me grapes, please.

Mother: Yes, we'll get you some grapes later but... you ate some grapes after to make you feel better aye?

On average, reminiscing conversations between parents and their children with autism ended in lower quality emotion resolution for both parent and child. To the best of our knowledge, these analyses examining emotion resolution for children with autism are novel. Why might children with autism be less likely to be involved in high quality emotion resolutions? One possibility may be a lack of interest or engagement in the conversation task, and a slip into other conversation topics, as

described above. Difficulties with introspection or more advanced emotion regulation strategies may have also influenced emotion resolution for the dyads where the child had autism (Baixauli et al., 2016). Because reminiscing is a socially constructed interaction, there may also have been less opportunities for children with autism to practice the skills needed for emotion resolution (Palincsar, 1998; Vygotsky & Cole, 1978). Further research should also assess the frequency and duration of typical reminiscing conversations in the home outside of the structured reminiscing task.

It is interesting that although a significant difference was found in emotion resolution, children with autism and their parents did not differ from typically developing children and their parents in the use of specific emotion words, internal states, or pronouns. While no prior research has specifically examined emotion and internal state word use within the reminiscing context, this was a particularly interesting find given the well documented difficulties with emotion that children with autism face (Goldsmith & Rothbart, 1999; Smiley & Dweck, 1994; Lane et al. 2010; Elmose, 2016; Zantinge et al., 2017). Specifically, we predicted that the difficulty in identifying and talking about their own and others' emotions and internal states would have influenced the amount of emotion and internal state words used within the dyads where the child had autism (Baixauli et al., 2016; Elmose, 2016; Fletcher-Watson et al., 2014). However, since ASD exists on a spectrum, children with autism have varying degrees of difficulty with emotions (processing, expression, and regulation). It could be that the children in our sample were relatively high functioning, therefore they might not have faced notable difficulties in using internal and emotion state words when reminiscing. One very important thing to note is that while LIWC can identify and count overall emotion word use, it cannot provide specific information about whom the emotions are attributed to. Consider one child saying, "it was a happy day", and another child saying, "I felt so happy because you let me have an ice cream". Both examples use the emotion state word "happy", yet the latter child attributes the emotion to self and gives a richer more complex explanation of the cause of the "happy". Further, more in depth coding of the emotional content of reminiscing conversations for children with autism is warranted.

4.2 Research Question 2: Associations between parent-child reminiscing for children with autism and developmental outcomes (self-esteem, behavioural and socioemotional functioning)

There was no prior research investigating the associations between parent-child reminiscing for dyads where the child had an ASD diagnosis and our developmental outcomes. However, existing research surrounding behavioural outcomes and children with autism, specifically internalising and externalising problems, indicated that children with autism tended to report a higher proportion of these -which we also found to be true for our sample (Salayev et al., 2017). In the current study, we found that developmental status (with autism or typically developing) did not significantly moderate associations between reminiscing and our developmental outcomes: self-esteem, internalising or externalising difficulties, or prosocial behaviour (the latter two as measured by the SDQ). It is interesting to note that an interaction was found that reached a moderately significant level. Parents of children with autism who had scored lower on the prosocial scale tended to be more elaborative when reminiscing compared to parents of children who had higher prosocial scores. This was a particularly unexpected and intriguing find. The measure of prosocial behaviour was parent reported. It could be that parents were attempting to compensate for their child with autism's more limited prosocial qualities by encouraging engagement in a social discussion, and richer discussion about socially relevant, emotional topics. It is also possible that some of these families had benefited from prior interventions, although this information was not collected. These findings should be interpreted with caution, however, as they did not reach statistical significance. Further research is warranted, particularly given social difficulties are a central challenge in autism. Many of the symptoms involved with ASD are around social difficulties. Longitudinal and intervention reminiscing research is also needed with children with autism, as the concurrent correlational design of this study means that any direction of causality between reminiscing and child functioning cannot be inferred.

4.3. Strengths and Limitations

The current study was able to select a sample from a large pool of participants (approximately 1,400 conversations were transcribed from the eight-year data collection wave) and was able to create a matched sample that was comparable across a number of sociodemographic variables including child age, gender, ethnicity, maternal education, and area deprivation. The narrow age range of the children in our sample (7.9 – 9.75 years of age) allowed us to reduce any potential confounding effects that a large age range might have caused. We were also able to code for a number of different aspects of reminiscing that were not accounted for in previous studies, such as resolution quality.

Regarding our sample, there were a few factors that would affect generalisability to our target population, which would be children with autism. We believe that our sample size was adequate compared to prior research (Faust, 2009: McDonnell et al. 2021). Although there were no statistically significant differences for our matched sample across a number of variables, there is a chance that the sample might not be a true match.

We included all children with autism who had a recorded parent-child emotion conversation within *Growing Up*. Although the overall *Growing Up* cohort was broadly representative of the general population at birth (Morton et al., 2015), we do not know how representative of children with autism our specific sample is. We have no prior information about their autism severity levels. It may be that many of the children with autism in our sample were of low severity and high IQ, because parents may not have opted for their non-verbal children with autism to take part in the conversation task. Our findings therefore cannot be generalised to non-verbal children with autism and/or all severity levels. Due to the nature of this reminiscing task, it might not be feasible to include non-verbal children in the sample. However, future research could include children of all severity and IQ levels to investigate any associations that parent-child reminiscing may have for these children with autism.

Regarding diagnostic validity, the children were identified as having autism via report by their parents. No formal diagnostic reports were required. Given the fact that only 54% of children receive

a diagnosis from a multidisciplinary team, it is possible that several children in our sample might have only been diagnosed by one singular professional (Eggleston et al., 2019). Further research would benefit from validated diagnostic information such as the inclusion of the Autism Diagnostic Observation Schedule (ADOS) to ensure diagnostic validity, and also obtain more information about features such as severity, and characteristics of the diagnosis (Gotham et al., 2007). This would not only increase generalisability, but also allow for researchers to consider specific features of autism and their relationship to parent-child reminiscing.

In terms of our methodology, coding from transcripts meant that non-verbal warmth and tone and other contextual information from the parent-child interaction could not be considered. Both coding schemes and LIWC formatting require the removal of all off-topic conversation, and interactions outside of the immediate conversation (e.g., sibling interruptions and interactions with the interviewer). This may have meant that we removed some elements that may be particularly important in understanding parent-child reminiscing conversations for children with autism.

While our research is only cross-sectional/based on one situation, it does reflect a general style of parent-child reminiscing for what we assume to be, verbal and high-functioning children with autism. It is interesting to note that some of the dyads occasionally expressed that they found the task quite unnatural or awkward. In particular, the children with autism in our sample may have struggled being asked to speak about an emotive topic in front of an interviewer.

4.4. Implications

The current findings have implications for parent-child communication in the autism community. While existing research demonstrates that reminiscing has socioemotional, language and cognitive benefits for children (Farrant & Reese, 2000; Koh & Wang, 2021; Reese et al., 2007; Swetlitz et al., 2021), our findings indicate that children with autism are involved in less elaborative conversations that are less likely to resolve negative emotions. These findings will have implications

for interventions targeted to support parents of children with autism. Parents may need to be flexible and adaptive, and integrate off-topic or related conversations, to stay engaged during reminiscing conversations. Although we found no differences in associations between reminiscing and the child socioemotional and behavioural measures used here, further research is needed with a range of different socioemotional and cognitive outcomes to determine whether reminiscing benefits seen among typically developing children do generalise to children with autism. Prior research has shown that language interventions for children with autism have been most effective when parents have played an active role and is quite likely to be the case for parent-child reminiscing interventions centred around specific elements of reminiscing (e.g., elaboration, resolution) (Hampton & Kaiser, 2016).

4.5 Future Directions

Future research should consider other reminiscing partners. In some transcripts, siblings appeared to be trying to help their sibling with autism to 'fill the gaps' in the story or sometimes, took over the storytelling for their sibling who was struggling. Future research could examine the role that siblings play in family reminiscing conversations for children with autism, and potentially examine relative benefits of sibling and parent reminiscing. The events in the reminiscing task for this study were all negatively valanced, so it would be interesting to see what conclusions could be drawn if this study were replicated, but with events that were positively valanced; especially given that research demonstrates strong associations of positive emotion words with self-esteem (Reese et al., 2007). Because frustration affected some of the children's willingness to participate in the task, future research could investigate individual differences such as child temperament and impulsivity and their associations with parent-child reminiscing conversations for children with autism. Another interesting point to consider would be if the distance between participation in future research and child's autism affects how a parent reminisces with their child. Specifically, a parent who was still grieving and/or

struggling to accept their child's diagnosis might not communicate in the same way that another parent would (Fernańdez-Alcántara et al., 2016).

In sum, the conclusions from our research have extended a small body of evidence suggesting that there are indeed, differences in parent-child reminiscing conversations for children with autism, compared to typically developing children. Future research is needed into this area to further examine these differences in depth, and potential associations with a range of child developmental outcomes across time. Research into this area will not only provide a deeper insight into the features of these reminiscing conversations but might also result in interventions that will provide more support to parents of children with autism.

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APPENDIX A

We will now move on to some questions about {NAME}'s behaviour and some of the things {HE/SHE} does.

For each item, please specify if you feel the statements are Not True, Somewhat True, or Certainly True about {NAME}. It would help us if you answer all items as best you can even if you are not absolutely certain. Please give your answers on the basis of the child's behaviour over the last six months.

(Choose one only for each row)		1. Not true	2. Somewhat true	3. Certainly true
14.1 Considerate of other people's feelings	SDQ1_y8Cm			
14.2 Restless, overactive, cannot stay still for long	SDQ2_y8Cm			
14.3 Often complains of headaches, stomachaches, or sickness	SDQ3_y8Cm			
14.4 Shares readily with other children, for example toys, treats, pencils	SDQ4_y8Cm			
14.5 Often loses temper	SDQ26_y8Cm			
14.6 Rather solitary, prefers to play alone	SDQ6_y8Cm			
14.7 Generally well behaved, usually does what adults request	SDQ27_y8Cm			

14.8 Many worries or often seems worried	SDQ8_y8Cm			
14.9 Helpful if someone is hurt, upset, or feeling ill	SDQ9_y8Cm			
14.10 Constantly fidgeting or squirming	SDQ10_y8Cm			
14.11 Has at least one good friend	SDQ11_y8Cm			
14.12 Often fights with other children or bullies them	SDQ12_y8Cm			
14.13 Often unhappy, down-hearted or tearful	SDQ13_y8Cm			
14.14 Generally liked by other children	SDQ14_y8Cm			
14.15 Easily distracted, concentration wanders	SDQ15_y8Cm			
14.16 Nervous or clingy in new situations, easily loses confidence	SDQ16_y8Cm			
14.17 Kind to younger children	SDQ17_y8Cm			
14.18 Often lies or cheats	SDQ28_y8Cm			
14.19 Picked on or bullied by other children	SDQ19_y8Cm			
14.20 Often volunteers to help others (parents, teachers, other children)	SDQ20_y8Cm			
14.21 Thinks things out before acting	SDQ29_y8Cm			
14.22 Steals from home, school or elsewhere	SDQ30_y8Cm			
14.23 Gets along better with adults than with other children	SDQ23_y8Cm			
14.24 Many fears, easily scared	SDQ24_y8Cm			
14.25 Good attention span, sees work through to the end	SDQ31_y8Cm			
14.26 Has many friends at school	SDQ40_y8Cm			
14.27 Has many friends outside of school	SDQ40_y8Cm			