Examining the Relationships Among Parental Mind-Mindedness, Parental Connected Talk, Mental-State Talk, and Children's Social Understanding: A Longitudinal Study

Kei Ki Wong

School of Psychology, University of Birmingham

MSc by Research in Psychology

Dr Rory T. Devine

March 10, 2021

Table of Contents

List of Tables

List of Figures

Abstract

***Introduction*:** Socioconstructivist accounts suggest that children gain insights into other people's mental states through conversation. Previous studies have identified some parental predictors of children's theory of mind (ToM, i.e., the capacity to understand people's behaviours using internal states), such as parental mind-mindedness (parental MM), parental connected talk, and parental mental-state talk (MST). However, it remains unclear whether these parental predictors are related to one another and whether these parenting constructs have unique influences on children's ToM. Moreover, it is unknown if these parental predictors have domain-specific or domain-general influences on children's ToM and language ability. ***Aims*:** To (a) examine the uniqueness and specificity of the longitudinal association between the parental measures and children's ToM; (b) examine the overlaps between parental MM, parental connected talk and parental MST and the unique contribution of parental behaviour to children's ToM (c) determine whether there are child-driven effects on parental MM and MST. ***Method*:** In total, 117 parent–child dyads participated in this study. The average age of the children at Time 1 was 3.94 (*SD* = .53, range = 1.95). Additionally, 103 parent–child dyads participated at Time 2. Of the children, 57 were girls (48.7%), and 60 were boys (51.3%). The average age of the children at Time 2 was 5.11 years (*SD* = .54, range = 2.17). ***Results*:** I examined the link between these parental predictors and used cross-lagged longitudinal analysis to examine the directions of the associations between these parental constructs and children's ToM. The main findings of this study were as follows: (a) parental MST was the only parenting measure that predicted children's later ToM, (b) these parenting measures were unrelated to each other, and (c) children's language predicted parents' later MST. ***Discussion*:** Overall, these results suggest that parental MST has a specific influence on children's ToM. In addition, parental MM, parental connected talk, and MST appear to represent different domains of parenting skills, which is in line with

the domain-specificity framework outlined by Grusec and Davidov (2010). Moreover, children who demonstrated more advanced language development earlier elicited more MST from their parents later on. These findings are consistent with the socioconstructivist perspective, which suggests that children's exposure to language that draws upon parents' internal states promotes children's ToM.

Acknowledgements

First and foremost, I would like to express my gratitude to my supervisor Dr Rory. T. Devine for the continuous support he has offered me during my MSc studies. Thank you for your exceptional guidance and supervision. I would like to thank you for giving me advice and training on all aspects of academic skills and for dedicating your time to providing feedback on my work. I have learned a lot from you during my time at Birmingham, and I feel fortunate to have met such a supportive supervisor.

Second, I would like to thank my secondary supervisor, Dr Fay Julal, who made me feel welcome when I first arrived in Birmingham.

In addition, I would like to extend my gratitude to my family and friends, both here and back home. I would like to thank my sister for encouraging me to apply for the master's course and for constantly giving me advice. Thank you to my parents, who supported me with love and understanding. I would like to thank my friends for checking up on me. Thank you for lending an ear to listen to me.

I would also like to thank the editor at Cambridge Proofreading LLC for proofreading my thesis. Lastly, I would like to thank everyone at the university for doing their best to create a safe study environment for students and staff during the pandemic.

Examining the Relationships Among Parental Mind-Mindedness, Parental Connected Talk, Mental-State Talk, and Children's Social Understanding

A Longitudinal Study

Chapter 1: Parental Behaviour and Children's Social Understanding

Extensive research in recent decades has examined how children develop an understanding of others' minds. Theoretically, socioconstructivist accounts propose that children access alternative ideas from other people through talk (Carpendale & Lewis, 2004; Nelson et al., 2003), which promotes their knowledge of other people's internal states. Therefore, theoretical reasons exist for speculating a link between environmental factors and individual differences on children's social understanding. One aspect of children's social understanding that has received significant attention. is theory of mind (ToM), which is the capacity to make sense of others' behaviours in terms of their internal states (Wellman et al., 2001). ToM commonly is assessed by measuring preschool children's false-belief understanding (FBU), which is the capacity to know that a person's mind might be distinct from the reality. The purpose of the current thesis was to test and refine the socioconstructivist account of ToM by examining the uniqueness and specificity between aspects of parenting and children's ToM. Recently published meta-analyses (e.g., Devine & Hughes, 2018; Tompkins et al., 2017) have identified numerous parental predictors of children's ToM. One of them is *parental mind-mindedness* (MM), or parents' capacity to consider their children's cognition, emotions, and desires (Meins, 2013). A meta-analysis reported a small but statistically significant association between parental MM and children's ToM ($r = .16$, $p < .001$; Devine & Hughes, 2018), which suggests that parents' ability to process their children's internal states can foster social understanding in children.

Another often-studied predictor of ToM is parental *connected talk*, which is conversation that reflects a parent's capacity to be in sync with their child's mind. Connected

talk is evident when parents and children engage in conversations that focus on the same topic (Slomkowski & Dunn, 1996). A longitudinal study reported that children's connected talk at 47 months old (N = 38) showed a moderate and significant association with their ToM, assessed at 40 months old (r = .39, p < .05; Slomkowski & Dunn, 1996). This supports the view that children who are capable of thinking about their interlocutor's perspective (Slomkowski & Dunn, 1996) demonstrate better understanding of other people's beliefs (i.e., FBU) later on.

More recently, two meta-analyses established a link between parents' mental-state talk (MST) and children's ToM, which suggests that parents' tendency to engage in conversation related to internal states (i.e., thoughts, feelings, desires) is related to individual differences in children's ToM. For instance, a modest and statistically significant relationship exists between parental MST and children's ToM (r = .31, p < .001; Devine & Hughes, 2018). The magnitude reported in this meta-analysis was higher than what was identified in another meta-analysis (r = .15, p < .001; Tompkins et al., 2017). According to Brown et al. (1996), MST can promote children's awareness of how people can think distinctively from one another.

Despite these findings linking different aspects of parenting with children's ToM, it remains unclear if these constructs overlap or are distinct from each other. To date, very few studies have examined the associations among parental mind-mindedness, parental MST, and parent-child connected talk. Another issue is that it is unclear whether these aspects of parenting have specific effects on ToM or relatively general effects on children's cognitive development. Before describing this study's research aims, it is necessary to provide some background on the domain-specific approach. According to the domain-specific framework, different parenting behaviours vary in their importance for specific aspects of children's social development (Grusec & Davidov, 2010). That is, Grusec and Davidov (2010) suggest

that parenting behaviours consist of multiple skill sets, and certain skills might matter most for some areas of children's development. The domain-specific approach draws a distinction between parenting skills that might matter most for certain child outcomes (i.e., domain-specific parenting) and those skills that have a more wide-ranging influence on child outcomes (i.e., domain-general parenting). In the current thesis, I seek to address these gaps in the literature. In this chapter, I examine how parental MM, parental connected talk, and MST are defined and measured and whether these aspects of parental behaviour exert domain-specific or domain-general effects on children's ToM. I also consider the possible overlaps among these parental behaviours based on the idea of responsive and sensitive parenting.

Parental MM and Children's Social Understanding

Parental MM is the tendency to view others as individuals who possess their own thoughts, feelings, and desires (Meins, 2013). In other words, parental MM represents their capacity to "tune in" to their children mentally (Meins, 2013). In infancy, parental MM is measured by considering the proportion of mind-related comments used by parents to describe children's behaviour during parent–child interactions (Fishburn et al., 2017; Meins et al., 2001). For children over the age of 1 year old, parental MM is studied by asking parents to describe their children during an interview. Parents' descriptions of their children are categorised into mental attributes and nonmental attributes (i.e., behavioural, physical, and general attributes; Meins & Fernyhough, 2015). Although parental MM is examined using different methods for children at different ages, both of these measurements use parents' descriptions of their children's mental life (Meins, 1999; Zeegers et al., 2017) and are thought to indicate the parents' capacity to think of their children as people whose behaviours are influenced by their internal states (Meins & Fernyhough, 2015). Thus, parental MM examines how parents interpret their children's mental states (Meins, 1999) and

parents' tendency to acknowledge their children as individuals (Meins et al., 2001).

Originally, parental MM was conceptualised to elaborate on the role of maternal sensitivity, and Meins et al. (2001) argued that existing approaches to studying maternal sensitivity deviated from its original definition. They proposed that studies of maternal sensitivity should consider parents' capacity to evaluate their infants' internal states and that parents' responses towards their children should reflect their understanding of their children (Meins, 1999; Meins et al., 2001). Meins et al. (2014) also suggested that a parent's tendency to perceive their child as an individual with their own mind might differ from the broader definition of understanding other people in all types of social relationships. In comparing how adults describe different individuals (e.g., friends, famous people, and spouses), adults tend to describe those with whom they are most closely related on a personal level (i.e., their children, spouse, and friends) using more mental attributes, as compared with how they describe others with whom they do not share a close bond (e.g., famous figures and artwork). Therefore, Meins et al. (2014) suggested that parental MM specifically represents the quality of the relationship between parents and their children, which distinguishes it from MM and the "trait-like" tendency of understanding other people's minds in social situations. Previous studies have established an association between parental MM and children's ToM. In a longitudinal study, Meins et al. (2013) measured parents' attuned comments (i.e., comments that reflect the child's behaviours and wants; Meins & Fernyhough, 2015) when the children were 8 and 26 months old (N = 206; 98 boys, 108 girls). They reported a weak but statistically significant relationship between parents' attuned comments and children's ToM at 51 months old (r = .24, p < .01). The link between parents' MM and children's ToM remained weak but statistically significant after controlling for parents' socioeconomic status (r = .21, p < .01; Meins et al., 2013). These findings show that parents who tend to view their children as individuals with their own mental states also tend to have children who

demonstrate more advanced ToM. Meta-analyses have indicated a weak but statistically significant relationship between parental MM and children's ToM after controlling for children's language (r = .19, p < .001; Devine & Hughes, 2018). These findings suggest that the relationship between parental MM and children's ToM is independent of the influence of children's language.

Theoretically, parental MM is related to children's ToM because secure parent–child attachment is linked to parental MM. Meins (1999) suggested that parents whose children were securely attached to them tend to make more references to their children's internal states when asked to talk about their children. Furthermore, longitudinal data indicated that only parents' attuned mind-related comments about their 6-month-old children (N = 57; 29 boys, 28 girls) during parent–child interactions were related, moderately and positively, to children's security of attachment at 12 months old (r = .42, p < .005), whereas parents' non-attuned comments were inversely associated with children's attachment security (r = .54, p < .005; Meins et al., 2002). Parents whose children are securely attached to them are committed to offering support to their children by considering what is appropriate for their children's comprehension (Meins, 1997; Sharp & Fonagy, 2008). Mind-minded parents may be more willing to regard their children's behaviours as a reflection of their children's mental states (Meins, 1999). Likewise, parents who mentalise about their children also demonstrate greater capacity for behaving responsively towards their children's internal states (Fonagy et al., 2007). For instance, Meins (1997) suggested that parental MM represents the parents' tendency to consider their children's thoughts during joint activities. Therefore, parents having a tendency to heed their children's internal states helps children to develop their own identities as individuals (Fonagy et al., 2007). Furthermore, Meins (1999) stated that mind-minded parents were more likely to engage their children in interactions that referred to internal states. Thus, parents' capacity for showing attunement towards their children's

internal states helps those children to recognise that behaviours are influenced by mental states. Lundy (2013) found that parental MM had an indirect influence on children's ToM (N = 39; 22 boys, 17 girls) through the parents' capacity to aid their children by considering their children's cognition during a collaborative activity (termed *interactional attunement*). These findings align with theoretical work suggesting that parental MM promotes children's ToM because mind-minded parents tend to be more responsive towards their children. Therefore, some evidence appears to suggest that parental MM has domain-specific associations with children's ToM, rather than general effects on children's cognitive development.

Parental MM and Other Parental Behaviours

Previous studies have investigated the link between parental MM and other parental behaviours. This has important implications for the current study, in which I adopted a similar approach to examine parental MM alongside other parental behaviours. Evidence suggests that parental MM does not represent a unique influence on children's ToM. That is, parental MM might overlap with other parental behaviours linked with children's ToM. For example, in a longitudinal study, Ontai and Virmani (2010) assessed parental MM when children were 11 months old (N = 35; 15 boys, 20 girls). They analysed parents' speech samples from a reading task with their children at 12 and 18 months old. There was a moderate and statistically significant association between parental MM and parents' tendency to relate to their children's speech at both 12 months (r = .41, p < .05) and 18 months of age (r = .34, p < .05; Ontai & Virmani, 2010). It seems that parents who were more mind-minded demonstrated greater sensitivity towards their children's comments during the joint activity.

Parental MM has also been examined alongside other parental behaviours in older children, and findings have highlighted a link between parental MM and more optimal parenting behaviours. Lok and McMahon (2006) examined mothers' MM using interviews and assessed a joint activity in which parents and their children sketched a picture together,

which was then followed by parent–child interaction with toys. The researchers assessed mothers' behaviours with their children (N = 89; 44 boys, 45 girls) based on the mothers' sensitivity, non-intrusiveness, and non-hostility using the Emotional Availability Scale (Lok & McMahon, 2006). Although parental MM was unrelated to mothers' sensitivity, Lok and McMahon (2006) reported a modest but statistically significant relationship between mother's non-intrusiveness and parental MM (r = .25, p < .05). A modest but significant association also existed between mothers' nonhostility and parental MM (r = .23. p < .05). Parental MM significantly predicted parental nonhostility during parent–child interactions. Parents who were more mind-minded also made more connections to their children and demonstrated fewer negative parenting behaviours during joint tasks.

Parental MM and Children's Language Ability

Although the studies mentioned in the previous sections highlight a critical role for parental MM in children's ToM development, it is unclear whether parental MM exerts specific effects on children's ToM or benefits children more broadly. Considering the domain-specific and domain-general effects of parental behaviour (Grusec & Davidov, 2010), parental MM might have a domain-general influence on other aspects of children's cognition such as children's language ability.

Meins et al. (2013) reported a weak but statistically significant relationship between parent's appropriate mind-related comments at 8 months old and children's (N = 206; 98 boys, 108 girls) language, measured using the British Picture Vocabulary Scale at 51 months old (r = .17, p < .05). The association between parental MM and children's language was weak but still statistically significant after controlling for the parents' socioeconomic status (SES; r = .19, p < .05). Likewise, Laranjo and Bernier (2013) assessed parental MM during parent–child interactions when children were 12 months old (N = 84; 34 boys, 50 girls). When the children were 26 months old, parents reported the language used by their children

using the MacArthur Communicative Development Inventory. Parents' mind-minded comments concerning their child's mental life at 12 months were moderately and significantly related to children's language, as reported by parents 14 months later. After controlling for SES, parents' comments concerning their child's mental life were a statistically significant predictor of children's language at 26 months old, although the magnitude of the effect was small ($r = .22$, $p < .05$). Parents' comments concerning their children's cognition were a significant predictor of children's language at 26 months old, after controlling for SES ($r = .22$, $p < .05$; Laranjo & Bernier, 2013). These results suggest that parents' early mind-related comments predict their children's language outcomes, above and beyond factors that are more general (e.g., SES). These findings support the notion that parental MM not only is linked to children's social understanding, but also has a general impact on other aspects of children's cognition, over and above factors that are more general, such as SES.

More recently, Bernier et al. (2017)[1] examined the link between parental MM and children's language in a longitudinal study of school readiness. They measured parental MM during parent–child interactions when the children were 1 year old. They also measured children's language outcomes at the age of 2 years. They reported a moderate and significant association between the parental MM and children's language outcomes ($r = .21$, $p < .01$). Moreover, they found a moderate and significant association between parental MM and children's school readiness assessed at the age of 5 years. The relationship between mothers' MM and children's language outcomes at 2 years old remained statistically significant ($p = .046$) after controlling for covariates, including children's earlier cognitive attainment, gender, SES, and mother's sensitivity. The magnitude of this association represents a

[1] The number of children for different time points were 204 (Time 1), 185 (Time 2), 183 (Time 3), 175 (Time 4), and 161 children at Time 5 (Bernier et al., 2017).

moderate association.

More recently still, Meins et al. (2019) examined the influence of parental MM on children's language at 4, 7, and 11 years old (N = 104; 49 boys; 55 girls). Parental MM and sensitivity were assessed during parent–child interactions when the children were 8 months old. Children's language was assessed using the British Picture Vocabulary Scale at the age of 51 months old, and their reading was assessed at the age of 7 and 11 years old. Parents' attuned mind-related comments predicted children's language at 4 years old (r = .198, p < .05), reading at the age of 7 years old (r = .18, p < .05), and reading at 11 years old (r = .23, p < .01). The association between parents' attuned mind-related comments and children's language was the strongest when the children were 11 years old, compared with their language measured at the age of 4 and 7 years old. Inversely, parents' nonattuned mind-related comments, which did not reflect parental MM, were not related to children's language or reading at 4, 7, or 11 years old (Meins et al., 2019).

Overall, these findings draw attention to the possibility that parental MM may influence children's development beyond influencing just their social understanding. However, the evidence is somewhat mixed. In a longitudinal study, Meins et al. (2002) assessed parental MM as parents played with their children at 6 months old (N = 57; 29 boys, 28 girls). The children were tested on their ToM at the age of 45 months (using the appearance-reality and deceptive box tasks). At 48 months old, the children completed the ToM assessment (unexpected transfer task) and were assessed on their language using the British Picture Vocabulary Scale. There was no significant relationship between parents' attuned mind-minded comments at 6 months old and children's language at 48 months old (r = −.01). These findings suggest that parental MM assessed at 6 months old was not related to children's language at 48 months old in the study.

In view of what has been mentioned so far, one may suppose that parental MM not

only affects children's ToM, but also is related to children's language outcomes. The current study examines whether parental MM exhibits domain-specific or domain-general links with children's ToM and/or language ability. If parental MM has a specific effect on children's ToM, then parental MM should predict only children's ToM over broader factors such as children's language ability, age, gender, and SES. Alternatively, if parental MM has a general effect on children's cognition, then parental MM should predict both children's ToM and their language ability, above and beyond factors that are more general (Devine & Hughes, 2017). Therefore, the first objective of my first aim was to examine the specificity of the association between parental MM and children's ToM.

Parental Connected Talk and Children's Social Understanding

The previous section has shown that parental MM affects children's ToM and language. In the next section, I provide an overview of parental connected talk and its implications for children's ToM and language outcomes. Connected talk is a measure of conversational quality and occurs when one speaker's utterance coherently builds upon another speaker's previous statement (Slomkowski & Dunn, 1996). A common approach to measuring parental connected talk is by examining the conversational turns between interlocutors (Brophy & Dunn, 2002). At first glance, the concept of parental connected talk appears to overlap with other parental behaviours such as *mutually responsive orientation* (Kochanska, 2002), which describes the degree to which parent–child dyads are inclined to work with each other in a positive and responsive manner (Kochanska, 2002), and the construct of *parent–child dyadic synchrony*, which measures the extent to which parent–child dyads engage with each other mutually during interactions (Harrist & Waugh, 2002). A common feature of these parenting constructs is their focus on reciprocity between parents and their children, which involves attempts within the dyad to acknowledge each other's verbal or nonverbal behaviour and their tendency to cooperate with each other using these

cues.

To date, various methods have been developed to measure connected talk (Rowe & Snow, 2020). Brown et al. (1996) devised a fine-grained approach with which to study parental connected talk, which Ensor and Hughes (2008) modified. This approach involves analysing the categories of statements within each speaker's conversational turns (i.e., whether the interlocutor's reply builds on the pragmatic content of the previous speaker). According to Rowe & Snow (2020), other ways of measuring connected talk include a global approach of rating the synchronisation between the dyad on a scale from 1 to 7 (Adamson et al., 2012) using a child-worn device called the Language ENvironment Analysis (LENA) System to record the utterances of the child, parents, and dyad (Romeo et al., 2018).

I selected the fine-grained approach to examine the quality of parental connected talk because it is commonly used in previous studies (e.g., Ensor & Hughes, 2008; Nawaz & Lewis, 2018) to examine the link between parent–child connected talk and children's ToM. In the current study, I used this approach to examine connected talk by identifying connected conversational turns between parents and children. I used the coding scheme initially devised by Brown et al. (1996) and modified by Ensor and Hughes (2008) to measure parental connected talk. This coding scheme involves sorting conversational turns into three mutually exclusive categories: initiations (i.e., one speaker initiates a new topic, and the other speaker provides a response that is semantically linked to the topic started by the previous speaker), failed bids (i.e., one speaker starts a new topic but the other speaker does not respond in a semantically related manner), and connected turns (i.e., a speaker's utterance is semantically related to the other speaker's previous utterance; Ensor & Hughes, 2008).

Dunn and Cutting (1999) documented a link between children's connected talk in the context of different relationships (e.g., friends or siblings) and children's ToM. These findings suggest that connected talk promotes children's social understanding because it

extends a child's capacity to build upon the other person's bids with a responsive stance (Dunn & Cutting, 1999) and requires the ability to address the other person's cognition and emotions (Slomkowski & Dunn, 1996). On the other hand, failed bids—which indicate a breakdown of the conversation between speakers (Dunn & Cutting, 1999)—may suggest a lapse in children's or parents' social understanding (Ensor & Hughes, 2008). Children's exposure to connected talk encourages them to become more aware of other speakers' mental states, thereby promoting the children's social understanding.

Supporting this view, one pioneering longitudinal study examined the relationship between children's connected talk with their peers at the age of 47 months and their later ToM (N = 38; 16 boys, 22 girls; Slomkowski & Dunn, 1996). Children's connected talk with peers showed a moderate and significant association with children's ToM (r = .39, p < .05; Slomkowski & Dunn, 1996). These findings suggest that children who demonstrate better ToM performance earlier on also tend to engage in more connected talk with their friends. Children who were more successful at coconstructing connected talk with parents or peers—which presumably requires the ability to reflect upon other people's viewpoints and internal states (Slomkowski & Dunn, 1996)—also showed more advanced ToM. A more recent longitudinal study identified an association between parents' connected talk and 2- to 4-year-old children's ToM, and reported a link between children's connected talk and their later ToM (N = 120; 75 boys, 45 girls; Ensor & Hughes, 2008). Connected talk was analysed from parent–child interactions at ages 2, 3, and 4 years during mealtime. Parents' connected turns were moderately associated with children's ToM at the age of 2 years (r = .36, p < .01), 3 years (r = .27, p < .01), and 4 years (r = .33, p < .01). Likewise, parents' initiations showed a modest but significant association with children's ToM at the ages of 2 years (r = .24, p < .01), 3 years (r = .27, p < .01), and 4 years (r = .27, p < .01; Ensor & Hughes, 2008). These results suggest that parents' capacity to induce a relevant response from their children and

their capacity to acknowledge their children's internal states in order to adapt a responsive communication style might facilitate children's emerging ToM.

Although relatively few studies have examined the links between parental connected talk and social understanding, studies focusing on cooperation between parent–child dyads might offer indirect evidence to suggest that connected talk influences children's social understanding. Sung and Hsu (2014) examined parent–child cooperation (using verbal and nonverbal behaviours from their interactions) and children's ToM (N = 78; 42 boys, 36 girls). Children's ToM was positively and significantly related to children's cooperation with parents (r = .39, p < .01). However, parents' failed attempts to cooperate had a negative association with children's ToM (r = −.31, p < .01). Children's failed attempts to cooperate were inversely related to their ToM (r = −.48, p < .001). Children's cooperation (β = .32, p < .01) was a significant predictor for children's ToM. Moderator analyses suggested that parents' cooperation predicted children's ToM, but only when the children were also cooperating with their parents. The interaction effect reported by Sung and Hsu (2014) suggests that parent–child connected talk may only affect children's ToM if the children have a higher tendency to work closely with their parents.

Further indirect evidence comes from a) longitudinal study by McElwain et al. (2019), who examined how parent–child collaboration influenced children's later ToM. Parent–child cooperation was assessed based on their ability to acknowledge each other's words and behaviours when the children were 2.8 years old (N = 128). The children completed the ToM measures at 3.3, 4.8, and 5.4 years old. The quality of parent–child collaboration was significantly related to children's ToM at 3.3 years old (r = .26, p < .01) and at 5.4 years old (r = .40, p < .01). These findings suggest that children who experienced greater cooperation with their parents earlier performed better in their ToM. Together, these findings support the view that parent–child connected talk is associated with superior ToM in children. Therefore,

parent–child connected talk may have a domain-specific link with children's social understanding.

However, new evidence has challenged the view that parent–child connected talk is linked with children's ToM. Nawaz and Lewis (2018) examined parent–child talk and social understanding among children aged 3 to 5 years old in Pakistan ($N = 71$). They found a significant moderate relationship between parents' initiations at Time 1 and children's ToM at Time 2 ($r = .40$, $p < .05$). In addition, mothers' failed bids at Time 2 showed a moderate inverse correlation with children's concurrent ToM ($r = -.41$, $p < .05$; Nawaz & Lewis, 2018). Yet, the findings from the multiple regression revealed that neither mothers' initiation at Time 1 nor their failed bids at Time 2 predicted children's ToM when these measures of parent–child connected talk were considered alongside other factors, such as the children's age or the amount of MST produced by the children at both time points. One possibility is that these contrasting findings indicate that connected talk may influence children's ToM in toddlerhood but not at older ages.

Parental Connected Talk and Children's Language Ability

Challenging the view that connected talk exerts domain-specific influences on children's ToM, some evidence exists that connected talk is linked with other aspects of development, such as children's language ability (i.e., the domain-general view). Hirsh-Pasek et al. (2015) found that parent–child connected talk at 24 months was a significant predictor of children's language at 36 months ($N = 60$). Parent–child connected talk accounted for 27% of the variance in the children's later language ability, which was assessed a year later, when the children were 36 months old (Hirsh-Pasek et al., 2015). These findings suggest that parent–child connected talk not only influences children's social understanding, but also influences other aspects of children's development, particularly their language.

Likewise, Gilkerson et al. (2018) examined links between connected parent–child

talk when the children were aged between 2 and 36 months (N = 329; 167 boys, 162 girls) and children's vocabulary. Parent–child connected talk at 18–24 months was the only significant predictor of children's language and cognitive outcomes at 9–14 years old (p = .02), over their performance in the early language measures. Parent–child connected talk at 18–24 months old explained 28% of the variance in children's later performance on the language and cognitive assessment (Gilkerson et al., 2018). To summarise, these findings support the domain-general view that parent–child connected talk might benefit children's language outcomes. A note of caution is due here, in that both studies used measures that are distinct from the fine-grained conversation analysis I used in this study to examine parental connected talk. For instance, Hirsh-Pasek et al. (2015) used LENA to examine the conversational turns between the parents and their children, which they defined as a statement met with a reply within a 5-s interval. Gilkerson et al. (2018) used the global rating of parent–child interaction developed by Adamson et al. (2012), in which a rating of 1 represents no attempt between the parents and children to establish effective communication, and a rating of 7 suggests that the parents and children demonstrated a high degree of synchronisation. Taken together, these studies did not consider parent–child connected talk based on the link between the topic addressed by the speaker and the reply provided by the interlocutor, as outlined by Ensor and Hughes (2008).

It is important to consider why parental connected talk might influence children's language outcomes. A recent meta-analysis indicated that parents' sensitivity and responsiveness were modestly associated with children's language (r = 0.27; Madigan et al., 2019). These findings suggest a link between parental responsiveness and children's language, with implications for connected talk, which reflects parents' responsiveness towards their children (Dunn & Cutting, 1999). Therefore, parental connected talk may have domain-general influences on children's language and social understanding. Hence, the

second objective of my first aim is to examine the specificity of the longitudinal association between parental connected talk and children's ToM.

Parental MST

As stated by Brown et al. (1996) and Sharp et al. (2007), mental-state talk (MST) refers to conversations about one's inner insights involving the use of mental-state terms that describe a person's cognition, emotional states, and desires (Ensor & Hughes, 2008). MST is measured by examining the number of terms uttered that address each category of mental-state attribute. As mentioned earlier, the meta-analyses conducted by Devine and Hughes (2018) and Tompkins et al. (2017) reported a weak to moderate association between parental MST and children's ToM. However, two questions remain unexplored in previous studies. The first question concerns the uniqueness of MST for children's ToM, which means that it is unclear if MST exhibits a unique link with children's ToM over and above other aspects of parent–child interaction. If parental MST has a unique influence on children's ToM, this would suggest that the association does not represent the effects of general talk (i.e., talk that does not refer to mental states) or other aspects of parental behaviour on children's ToM. The second question that previous studies have not addressed is the specificity of the link between parental MST and children's ToM, as suggested by Devine and Hughes (2017). It remains unclear if parental MST has a specific influence on children's ToM or influences language and cognition more globally. Therefore, the third objective of my first aim was to examine the uniqueness and specificity of the links between parental MST and children's ToM.

Theoretically, linking behaviour with mental states is vital for children's social understanding (Fonagy et al., 2007). In one pioneering longitudinal study, Dunn et al. (1991) examined the relationship between the quality of talk that occurred in different relationships (i.e., parent–child talk, parent–older sibling talk, and child–older sibling talk) and 33-month-old children's ToM (N = 50; 23 boys, 27 girls). Parents' use of MST (r = .31, p < .05) and

causal talk (r =.28, p < .05) were modestly but significantly associated with children's ToM. These results suggest that children who are exposed to a greater frequency of mental-state words perform better in terms of their ToM. One possibility is that MST allows children to understand that people can have different perspectives and that their behaviours can be influenced by internal states (Brown et al., 1996). Brown et al. (1996) suggested that when parents engage their children in elaborative talk about their children's mental states, these children begin to make sense of the motives behind behaviours.

Having considered some of the reasons why parental MST has implications for children's ToM, let us now turn to the evidence from longitudinal studies on the links between parental MST and children's ToM. Ruffman et al. (2002) examined the link between ToM and interactions between parents and their children while talking about pictures together when the children were aged 3.01, 3.41, and 4.04 years.[2] Mothers' MST when children were 3.01 years old was moderately and significantly related to children's ToM at 3.41 years of age (r = .50, p < .001) and at 4.04 years of age (r = .39, p < .01). Mothers' MST when the children were 3.41 years old also showed a modest but statistically significant association with children's ToM at the age of 4.04 years (r = .30, p < .05). Inversely, mothers' non-MST when the children were 3.01 and 3.41 years old was not significantly related to children's ToM at any of the time points. Mothers' MST when their children were 3.01 years old also moderately predicted children's ToM at 3.41 years old (r = .50, p < .001) and at 4.04 years old (r = .39, p < .01), above and beyond children's early ToM and MST, SES, and mothers' non-MST and age. Similarly, parental MST when children were 3.41 years old also predicted children's ToM at the age of 4.04 years, although the strength of the association was weak (r = .30, p < .05). To summarise, Ruffman et al. (2002) identified a specific impact of parents'

[2] There were 82 children at Time 1, 41 of whom were boys and 41 were girls. At Time 2, there were 79 children in total, which included 39 boys and 36 girls. At Time 3, there were 72 children, 36 of whom were boys and 36 were girls (Ruffman et al., 2002).

mental-state language on children's ToM. Parental MST predicted children's later ToM, but parents' general talk without mental-state references did not predict children's ToM (Ruffman et al., 2002). This seems to suggest that MST measures a distinct characteristic of conversations, which is independent from the general conversation in the absence of mental-state words. In the same vein, Barreto et al. (2017) assessed parental MST and children's ToM when the children were 4.5 years old (Time 1; $N = 73$, 38 boys, 35 girls) and 5.5 years old (Time 2). At Time 1, parent–child dyads read a book together, after which the children's ToM was assessed. Children's ToM at Time 1 was weakly but significantly related to mothers' MST ($r = .24$, $p < .05$; Barreto et al., 2017). Taken together, these findings confirm the significance of parental MST on children's ToM. Specifically, MST was a significant predictor of children's ToM after controlling for parents' non-MST (Ruffman et al., 2002). This seems to suggest that the link between parental MST and children's ToM is not due to the parents' verbosity. Overall, these findings suggest that conversations involving discussion about internal states (as opposed to the overall amount of conversation) facilitate children's ToM (Fonagy et al., 2007).

In contrast, Ensor and Hughes (2008) reported that only children's MST occurring in connected turns was a significant predictor of children's ToM at the age of 4 years old ($\beta = .24$, $p < .01$), whereas mothers' MST was not a significant predictor of children's ToM at that age. Furthermore, both mothers' connected MST ($\beta = .21$, $p < .05$) and children's connected MST were significant predictors of children's ToM assessed at the age of 4 years ($\beta = .22$, $p < .05$; Ensor & Hughes, 2008). These findings suggest that the capacity for both the parents and children to engage in talk about mental states within connected conversation—which represents a successful attempt to make sense of the other speaker's stance and internal states (Slomkowski & Dunn, 1996)—predicts children's later ToM. Based on the findings presented thus far, one may suppose that parental MST is associated

specifically with children's ToM but not with the other aspects of children's cognition.

Parental MST and Children's Language Ability

In the following section, I discuss the possibility that parental MST not only facilitates children's ToM but also promotes other child outcomes. A longitudinal study reported by Devine and Hughes (2017) examined whether parental MST was associated with both 4-year-old children's ToM and language ability in a 1-year longitudinal study.[3] Parental MST at the initial phase was modestly and significantly associated with children's concurrent language ability ($r = .20$, $p < .05$) and their language ability at follow-up ($r = .23$, $p < .01$; Devine & Hughes, 2017). These findings suggest that parental MST not only influences children's ToM but also is linked to children's language ability. A recent longitudinal study conducted by, Olson and Masur (2020) examined the link between parental MST and children's vocabulary ($N = 29$). Parental MST at 13 months showed a modest association with children's receptive and expressive language, both concurrently ($r =. 31$, $p < .05$) and at 17 months ($r = .55$, $p < .01$). The magnitude of the association between parental MST and children's language at 17 months old was moderate. These recent findings provide further support for the association between parental MST and children's language, and they suggest that parental MST may also have positive effects beyond children's ToM.

Overlap Between These Parental Predictors

Thus far, parental MM, parental connected talk, and parental MST have been examined individually. However, there are reasons to speculate that those aspects of parenting (i.e., parental MM, parental connected talk, and MST) might overlap with each other to influence children's ToM. For instance, Ensor and Hughes (2008) found that mothers' MST within connected turns was a significant and unique predictor of children's

[3] The number of children who participated at Time 1 was 120, and 103 children took part at Time 2 (Devine & Hughes, 2017).

ToM at the age of 4, after accounting for other factors such as children's initial ToM, language, or mothers' education ($\beta = .22$, $p < .05$; Ensor & Hughes, 2008). On this basis, there are reasons to propose that parental connected talk would interact with parents' MST to predict children's ToM. The findings of Ensor and Hughes (2008) also provide evidence to hypothesise a moderation effect between parental MM and parents' MST on children's ToM. That is, children's ToM might be moderated by the interaction between both the parents' capacity to represent their children's mental states (i.e., parental MM) and parents' use of MST. Moreover, findings from previous studies often have focused only on either children's ToM or children's language. In the current study, I seek to redress this imbalance in the literature by considering the relations among three aspects of parenting previously associated with children's ToM. Furthermore, I seek to examine the interactions among these parental correlates for predicting children's ToM and language by considering whether parental connected talk moderates the link between (a) parental MM and children's ToM and (b) parental MST and children's ToM.

Parental MM and Parental Connected Talk

At first glance, parental MM and parental connected talk appear to have a conceptual overlap. Parental MM is defined as the parents' tendency to consider their children as individuals with their own internal states (Meins, 2013), which seems to suggest that parental MM represents the parents' capacity to engage with their children mentally. Likewise, connected talk is defined as the ability to "tune in to each other's thoughts and desires" (Slomkowski & Dunn, 1996, p. 443). Therefore, parental MM and parental connected talk both may rely on the capacity to draw upon another person's internal states. In addition, Meins (1999) suggested that parental MM requires parents to not only behave sensitively and responsively towards their children but also demonstrate "attunement" towards their children's internal states. These definitions suggest that parents' ability to reflect on their

children's mental states may underpin both parental MM and parental connected talk. As Brown et al. (1996) suggested, attempts to interact with others jointly require one speaker to compare their ideas and desires with those of the other speaker. Parents who are more mind-minded also demonstrate a more responsive stance towards their children's apprehension (Lundy, 2013) and sensitivity towards their children's word choices (Ontai & Virmani, 2010). On this basis, parental MM and parental connected talk may be positively associated with each other because both appear to be linked to reciprocity (Grusec & Davidov, 2010) and responsiveness (Bornstein et al., 2008) between the parent–child dyad.

Parental Connected Talk and Parental MST

Both theoretical and empirical evidence suggests a potential link between parental connected talk and parental MST. Connected talk relies on the speaker's capacity to understand the other person's mental states (Slomkowski & Dunn, 1996). Connected talk appears to overlap with the concept of parental MST, which allows parents and children to share their mental states (Brown et al., 1996). In a longitudinal study, Ensor and Hughes (2008) reported that parental MST mostly is addressed within connected turns. These findings seem to suggest that parental MST and parental connected talk are related to each other because parents' language for addressing internal states in a semantically related manner is related to children's ToM.

Parental MM and Parental MST

As pointed out by Devine and Hughes (2017), parental MM and parental MST both draw upon parents' capacity to consider their children's internal states, although parental MM among parents with children over the age of 1 year old does not involve the use of mental-states language in parent–child interactions (Meins & Fernyhough, 2015). As noted by Meins (1999) noted, mind-minded parents engage their children using words that refer to mental states. These theoretical frameworks suggest that parental MM and parental MST are related

to each other.. However, Devine and Hughes (2017) reported that parental MM (measured using interviews) was unrelated to parental MST (measured during parent–child play and book reading). Given the potential overlaps among parental MM, parental connected talk, and parental MST, the second aim of the present study was to examine the overlap between these parental behaviours and the unique contribution of each to children's ToM.

Child-Driven Effects on Parenting

To date, relatively few studies have adopted cross-lagged designs to examine links between parental behaviours (e.g., parental MM and parental connected talk and MST) and children's ToM. This is noteworthy because the relations between parental MST and children's ToM could reflect child-driven effects (Bell, 1968). After all, children are "active agents" (Kuczynski & Parkin, 2006) or "social partners" in parent–child relationships (Grusec, 2011). Therefore, children who have greater insight into others' minds influence their parents to use more mental-state language. Likewise, children who show high levels of ToM may prompt parents to describe those children in more mind-minded terms (e.g., "He's sensitive and caring"; Devine & Hughes, 2017). Ruffman et al. (2002) conducted one of the few studies to examine child-driven effects on MST in parents. The authors found that neither children's ToM nor MST predicted parents' later MST (Ruffman et al., 2002).

In the current study, a cross-lagged design is adopted to test how children influence parents' later behaviour, including MST. With few exceptions (e.g., Ruffman et al., 2002), the majority of studies on social correlates of children's ToM do not consider how children influence parental MM or parental MST. A key aspect of children's ToM is how children's experiences with their parents contribute to the differences in their emerging social understanding. However, the research to date has tended to focus on the influences of parenting on children's social outcomes, rather than on children's influence on parenting dynamics (i.e., child-driven effects; Devine & Hughes, 2017). Thus, the third aim of this

study was to examine the child-driven effects on parental MM and MST.

Potential Confounds

To understand the unique links between parental behaviour and children's outcomes, it is important to rule out potential confounds. Two pioneering studies examined gender-related differences in parental MST, but their findings were inconsistent. LaBounty et al. (2008)'s longitudinal study invited 106 parents and their children to go through a wordless book together. Children were aged 3.5 years at Time 1 and 5.5 years at Time 2. Interestingly, mothers used more MST related to wants[4] and cognitions[5] with their girls than with their boys. On the other hand, Roger et al. (2012) reported the opposite findings, in which they examined parent-child talk based on pictures of children showing different emotions (N = 57; 28 boys, 29 girls). They reported that parents of boys engaged in more conversation about mental states with their children compared with parents of girls, $F(1,55) = 5.04$, $p < .05$ (Roger et al., 2012). Given these inconsistent findings, I included child gender as a covariate in my analyses.

Alongside gender, parental SES has been linked with children's ToM (Devine & Hughes, 2018) and patterns of parent–child talk (Hart & Risley, 1995) but has often been viewed as distinct from aspects of parental behaviour such as mind-mindedness (Meins et al., 2011). Given the possible confounding effects of parental SES, I included a measure of parental SES as a covariate in my analyses.

SUMMARY OF THE AIMS

The present longitudinal study examines the influence of parental behaviours on children's social understanding. There are three key aims:

1. to examine the uniqueness and specificity of the longitudinal associations between the

[4] $F(1, 104) = 5.37$, $p < .05$ (LaBounty et al., 2008)
[5] $F(1, 104) = 5.20$, $p < .05$ (LaBounty et al., 2008)

parental measures (i.e., parental MM, parental connected talk, and parental MST) and children's ToM,

2. to examine the effects of interactions among parental MM, parental connected talk, and parental MST on children's ToM, and
3. to determine whether there are child-driven effects on parental MM and parental MST.

HYPOTHESES

In this study, I aimed to test and refine the following hypotheses:

1. If parental MST, MM, and connected talk are separable parenting dimensions, then they will exhibit unique associations with children's ToM, If MST, MM, and connected talk are domain-specific (Grusec & Davidov, 2010), then each aspect of parenting will be associated with ToM but not children's language ability.
2. If the relationships between MST and ToM are contingent on either MM or connected talk, then there will be a significant interaction between MST and either MM or connected talk in predicting children's ToM.
3. If there are child-driven effects on parental behaviour, then Time 1 child measures will uniquely predict Time 2 parental MST and MM. If MST and MM represent parental effects on children's ToM, then there will be a significant unique cross-lagged association between Time 1 parental MST and MM and Time 2 ToM.

Chapter 2: Method

The present study is a secondary analysis of the dataset from an existing study conducted by Devine and Hughes (2017). I was responsible for formulating the research questions and coding parental MM at Time 2, using transcripts from the parents' speech samples, and the parent–child connected talk at Time 1, using transcripts and videos from the parent–child Play-Doh interaction. I conducted all of the statistical analyses.

Participants

In the current study, 117 parent–child dyads participated at Time 1 of testing. Parents and children were recruited from nurseries and playgroups in the East of England. At Time 1, the children were 3.94 years old on average (*SD* = .53, range = 1.95). Next, 103 parent–child dyads took part in the follow-up study (Time 2), which occurred approximately 13 months after initial testing. At Time 2, the children were 5.11 years old on average (*SD* = .54, range = 2.17). At Time 1, 57 girls (48.7%) and 60 boys (51.3%) were involved in the study. At Time 2, 50 girls (48.54%) and 53 boys (51.46%) took part in the study. 66.6% of the children who took part were White British. On average, these children spent 18.99 hours at nursery per week (*SD* = 11.12, range = 45). During the first visit to the university laboratory, parents filled out questionnaires, which included questions about their education level and employment. The majority of parents had an undergraduate degree (81%), and the majority of children came from families where both caregivers were in paid employment (64%).

Procedures

Parents and children attended two visits at a laboratory. At both time points, the children took part in ToM and language assessments in a fixed format. Each visit involved 15 minutes of parent–child interaction. The parents filled out questionnaires, and the researchers asked the parents to describe their children during an interview. This study received ethical approval from the University of Cambridge Research Ethics Committee.

Measures

Parental MM

The researchers asked the parents to talk about their children using the following question: “Can you please describe [child’s name] for me?” (Meins & Fernyhough, 2015). Using the manual originally developed by Meins et al. (2015), I coded the parents’ responses into one of the following four categories: mental attributes (i.e., relating to the child’s mental life), behaviours (i.e., a statement related to the child’s actions or routines), physical (i.e., physical qualities such as physical features or the age of the child), and general (i.e., other comments that do not fall into any of the above categories). I did not count any descriptions that the parents repeatedly mentioned as new attributes. The interrater reliability for the coding, based on statements from 76 transcripts (20%), was acceptable ($\kappa = .75$, $p < .001$). The number of parental mental attributes during the MM interview is reported in the descriptive statistics. The percentage of the mental attributes out of the total number of attributes mentioned by the parents was used in the main analyses.

Parental Connected Talk

The experimenters recorded the parent–child conversation as they interacted using a Hasbro Play-Doh Sweets Lunchbox play box for 5 minutes. In the current study, I coded the quantity and quality of parent–child talk using the connected talk manual developed by Ensor and Hughes (2008). The transcripts recorded utterances spoken by both the parent and the child. For each transcript, I considered the quantity and quality of talk. The quantity of parental connected talk included the number of turns (i.e., an utterance spoken by one speaker bounded by the utterance of another speaker or a silence lasting longer than 5 seconds). In the present study, I used the parents’ connected turns as the main variable of parental connected talk, which is the number of turns within each conversational bout. I categorised the quality of each turn into four mutually exclusive groups, as follows:

- connected, in which the speaker's statement was semantically related to the other speaker's statement;
- initiation, in which the speaker started a new topic that was not relevant to the other speaker's previous turn and the other speaker responded in a conceptually related manner;
- failed bid, in which the speaker's turn was directed to the other speaker but did not elicit a relevant response from the other speaker; and
- unclear, when the statement was too unclear to be assigned to the other categories.

Following my training and feedback, I coded 20 transcripts (20%) to test the interrater reliability. The intraclass correlations (ICCs) for parents' connected turns (ICC = .75) and children's connected turns (ICC = .83) were acceptable ($p < .001$). Due to time constraints, it was not possible to analyse parental connected talk at Time 2.

Parental MST

The researchers examined parental MST based on the number of words they used to describe their own thoughts, feelings, or desires during a 10-minute book-reading task and a 5-minute free-play session. For the book-reading task, the experimenters provided the parents and children with a picture book, which was written by Meyer (1969). For the free-play task, parents and children played together using the Hasbro Play-Doh Sweets Lunchbox.[6] The experimenters recorded and transcribed the parent–child interactions. For the coding of MST, the experimenters selected a pool of mental-state vocabulary from existing coding schemes, such as that of Ensor and Hughes (2008), and used the Linguistic Inquiry and Word Count (LIWC) software developed by Tausczik and Pennebaker (2010) to detect and count the

[6] Both the MST and connected talk were coded based on the same parent–child play session with the Hasbro Play-Doh Sweets Lunchbox.

frequency of the parents' use of words about thoughts (e.g., "think," "forgot"), feelings (e.g., "excited," "happy"), or wants (e.g., "want," "hope"; Ensor & Hughes, 2008). Moreover, the experimenters only considered "like" as a mental-state word in the context of indicating one's preferences.

Regarding the reliability of the MST coding, the raters analysed 25% of the transcripts; then, the experimenters compared this coding with the transcripts coded using the software LIWC. The interrater reliability for the different categories of MST, specifically thoughts (ICC = .85), feelings (ICC = .85), and wants (ICC = .98), were considered reliable. The experimenters summed the number of mental-state words used by parents during both the book-reading task and the free-play session to obtain the total number of mental-state words. The experimenters counted the number of other words that did not express mental states and then entered these words as covariates to ensure that the analysis of MST was independent from the influence of parents' talkativeness (Ruffman et al., 2002).

Children's ToM

The children completed a battery of false-belief understanding tasks in both waves of the data collection.

Change-of-Location False-Belief Task. The children participated in two tasks (Perner et al., 2011). Both involved a character leaving an object at a certain location, before disappearing from the scene. Next, a second character entered the scene and transferred the object from its original place to another location. When the first character returned, the children answered control questions that assessed their understanding of the storyline (e.g., the object's initial location and current location). The children had to give correct answers to these questions in order to continue with the remaining part of the story, in which the first character reappeared in the scene. When children failed to answer correctly, the researchers reiterated the story to the children. If the children could not provide the correct answer to any

of the questions, the testing was terminated. The researchers asked the children to predict where the first character would look for the object upon their return (i.e., the false-belief prediction task). The children who provided correct responses to the question received a score of 1, and the children who did not answer correctly received a score of 0. Following that, the researchers asked the children to share why they thought the character would expect the object to be at the location provided in their answers. The children received an additional point for a correct explanation.

Unexpected Contents False-Belief Task. The researchers showed the children a box of plasters (Gopnik & Astington, 1998). Initially, the researchers invited the children to describe what they thought the box contained before telling the children to look inside the box to reveal its contents (i.e., crayons). After replacing the crayons and sealing the box, the children answered three further questions. The children reported first on what they believed was in the box before looking inside the box (termed the *representational change question*). Next, the children reported on the actual contents of the box (termed the *reality-control question*). Finally, the children reported what another person (i.e., their parent), who had no prior access to the contents, would think was inside the box (termed *false-belief question*). The children had to give a correct response to the control question before they could move on to the other questions. Correct answers for the representational change task and the false-belief task were summed to give a score of 2 points.

Unexpected Identity False-Belief Task. At Time 1, the experimenters showed the children a pop-up book (Moerbeek, 1994), which contained images of animals' eyes on each page (Hughes, 1998). The experimenters showed the children a page from the book and asked the children to talk about what they saw. The experimenters asked the children three questions. The first question was about what the children expected before the experimenters had showed them the page from the book (termed the *representational change question*).

Following this question, experimenters asked the children to name what they saw (termed *reality-control question*), and eventually asked the children to state what another person would think was behind the page without having seen the book before. The researchers summed the children's scores in the representational change and false-belief tasks to give a score ranging from 0 to 2 points.

Second-Order False-Belief Task. At Time 2, the children completed second-order false-belief tasks using picture books (Sullivan et al., 1994). In both stories, one of the characters misleads the other character into believing something false. For instance, in one of the scenarios, Peter's mother misleads Peter into believing that he will receive a toy, when in reality, his mother will be giving him a puppy. The experimenters asked the children about the actual gift that Peter would receive (termed the *reality-control question*) and the gift that Peter thought he was getting (termed the *false-belief question)*. Following this, the children saw that Peter finds the puppy after his mother leaves the setting. The children were asked what Peter's mother thought that Peter believed he was getting for his birthday (termed the *second-order false-belief question*) and to explain their answer (termed the *second-order false-belief justification question*) and whether Peter's mother knew that Peter had found the puppy (termed the *reality-control question*). When the children answered the false-belief question and the reality-control question accurately, they received a score of 1 point. If the children answered the second-order false-belief question accurately and provided justification, they received 1 point for each correct answer. In total, the children received 3 points for each story if they answered all of the questions correctly, with correct answers for the first-order false-belief question, second-order false-belief question, and justification question accounting for 1 point each.

Emotions Based on the False-Belief Task. During the follow-up phase of the study, the children participated in two tasks, during which the experimenters showed them a book

with images and required them to think about the characters' emotions, drawing on cues from the characters' mental states. At Time 2, the children took part in two tasks involving a picture book to assess their ability to attribute an emotional state to a character based on the character's desires and beliefs (Harris et al., 1989). The experimenters showed the children two characters. Afterwards, the experimenters informed the children about the characters' favourite and least favourite foods. In the questions for the task, the children had to address a character's attitudes towards a food item. Following this, the experimenters showed that the other character changed the food items that were originally in the lunch set with the first character's least preferred food. Afterwards, the experimenters asked the children what the first character might think the lunchbox contained (termed the *false-belief* question). After the false-belief question, the experimenters asked the children what could be found in the lunchbox (termed the *reality-control* question). Following the false-belief and reality-control questions, the experimenters asked the children how the character felt before knowing that there had been a change in the contents of the lunchbox and were asked to elaborate on their responses. The children who successfully addressed the two comprehension questions would score 1 point for each of their answers. A correct response for the false-belief and reality-control questions would result in a score of 1 point. Following these questions, the experimenters asked the children how the character likely would feel after discovering what was inside the lunchbox and the experimenters asked the children to elaborate on their answers. The children who provided correct responses for both of these questions were considered successful at representing the characters' emotional states, based on the ideas of the characters that were different from reality. The children could be awarded 3 points for each story if they answered all of the questions correctly—1 point for assigning an emotion using false belief, 1 point for a correct response to justify their thinking, and 1 point for considering the character's false beliefs. The ToM items were summed to create the ToM

score. For Time 1, the scores for the Change-of-Location False-Belief Task, Unexpected Contents False-Belief Task, and Unexpected Identity False-Belief Task were summed together to create the ToM score. For Time 2, the scores for the Change-of-Location False Belied Task, Second-Order False-Belief Task, and Emotions Based on the False-Belief Task were added together to create the ToM score. Both scores were standardized around 0.

Children's Language

The experimenters assessed the children's receptive vocabulary using the Wechsler Preschool and Primary Scale of Intelligence (Rust, 2003). First, the experimenters presented the children with a book with images on each page. The experimenters asked the children to point at the image corresponding to the word that the experimenters named. The experimenters tested the children on 38 trials, and the children received 1 point for each correct answer. All of the analyses used the raw summed scores from the verbal ability task.

Chapter 3: Results

Analysis Plan

I used autoregression to analyse the longitudinal data. Autoregressive analysis allows researchers to control for the rank-order consistency of an individual's position in the dependent variable across various time points (Devine, 2017). Rank-order stability can be examined using the standardised autoregressive coefficient (Hertzog & Nesselroade, 2003). A small autoregressive coefficient represents less stability in an individual's rank order (Hertzog & Nesselroade, 2003; Selig & Little, 2012). Using the autoregressive approach, I examined the lagged effects by considering how a predictor variable (e.g., parental MST) affected the outcome variable (e.g., ToM at Time 2), while controlling for the outcome variable from the first wave (e.g., ToM at Time 1; Selig & Little, 2012). A significant relationship between the predictor and outcome would suggest a longitudinal or developmental association between the earlier measure and later outcome (Devine & Hughes, 2017).

Tables 1, 2, 3 and 4 present the descriptive statistics for each main measure of this study and the amount of missing data. I used multiple imputation to handle missing data. The sample size for the pooled data was 117. The proportion of variance is not reported in the analysis because it is not calculated when multiple imputation is used.

Missing Data

Prior to running multiple imputation, I used the *pattern of missing data* function on SPSS to analyse the amount of missing data for each measure, which I provide below. The percentage of missing data for the children's measures included those of receptive vocabulary at Time 2 (14%, $n = 14$) and ToM at Time 2 (12%, $n = 14$).

As for parents' measures, the percentages of missing data included those of parental MM at Time 1 (0.85%, $n = 1$), parental MM at Time 2 (14.5%, $n = 17$), parents' initiations

(14.5%, *n* = 17), parents' failed bids (14.5%, *n* = 17), parents' connected turns (14.5%, *n* = 17), parental MST at Time 1 (2.56%, *n* = 3), parental MST at Time 2 (14.5%, *n* = 17), parents' non-MST at Time 1 (2.56%, *n* = 3), and parents' non-MST at Time 2 (14.5%, *n* = 17). I adapted a full information approach, in which I used multiple imputation to handle missing data. Multiple imputation involved using linear regression to substitute missing values with complete data points that had similar predictive values to those of the missing data (van Ginkel et al., 2019). In the present study, the data were imputed five times to generate pooled data. The sample size for the pooled data was 117.

Analysis Strategy

To control for the verbosity of the parent–child dyad, in this project, I controlled for the amount of non-MST by parents. I conducted two autoregressive models to examine two research topics: (a) the influence of parenting on children's ToM and language and (b) the influence of children's characteristics on the parenting measures.

For Model 1, I examined the links between the parental predictors (i.e., parental MM, parental connected talk, and parental MST) at Time 1 and children's ToM and language at Time 2, while controlling for ToM and language at Time 1. Because parental education and employment were correlated ($\Phi = .43$, $p < .001$), I created a single measure of SES (ranging from 0 to 3 points) by summing together parental education (0 = no degree, 1 = degree) and parental employment (0 = neither parent employed, 1 = one parent employed, 2 = both parents employed). To control for the influence of children's and parents' characteristics on children's outcome variables, I entered the children's ages, gender, and SES as covariates in the second step of the analysis. I followed this with a moderation analysis to examine further the interplay between these parental behaviours, as well as any nonlinear relationship between these parenting predictors and children's variables. For Model 2, I examined the longitudinal link between the children's characteristics (e.g., their ToM and language) and

parental behaviours by controlling for the parental behaviours at Time 1 and general covariates such as SES.

Tables 4 and 5 present the bivariate correlations between the main study variables. To reduce the effect of multicollinearity on the results, I mean-centred parental connected talk, parental MST, and parental MM before running the multiple regression and the generalised linear model (GLM; Cohen et al., 2003). Failure to mean-centre variables is likely to result in high standard errors.

Structure of the Results Section

The first section of this chapter presents the descriptive statistics for parent–child measures and parental measures. I then present the longitudinal stability of and changes to the parental measures and the children's measures. This is followed by reporting the bivariate correlation between the longitudinal children's and parents' measures, to address the associations among parental measures, children's ToM, and children's language ability. I then present longitudinal analyses examining the uniqueness and specificity of the associations between parental measures and children's ToM and language ability (i.e., specificity of these parental measures). Following this, I report findings from the correlation and regression models to examine the links between different aspects of parental measures within and across time. Specifically, I consider whether parental MM and parental MST exhibit a unique link with each other longitudinally using multiple regression. Next, I examine the interplay between the parental measures in predicting children's ToM. Finally, I examine the child-driven effects on parenting measures by testing the link between children's characteristics (e.g., ToM and language) at Time 1 and parental variables at Time 2 (i.e., parental MM and parental MST).

Descriptive Statistics for Parent and Child Measures

Prior to conducting multiple imputation, I obtained descriptive statistics using the raw data to inspect the data's central tendency, which I divided into descriptive statistics for parental measures and children's measures. Tables 1, 2, and 3 provide the descriptive statistics at both time points. Table 3 presents the descriptive statistics for the children's measures at Times 1 and 2. The Cronbach's alphas for the children's ToM at Times 1 and 2 were .75 and .77, respectively, which is considered acceptable (Hair et al., 2013). For the dependent variables of the study, the skewness of children's ToM at Time 2 was .11 (*SE* = .24), with the kurtosis of −1.42 (*SE* = .48). The skewness of the children's language at Time 2 was −.24 (*SE* = .24), with the kurtosis of −.63 (*SE* =.48). As a rule of thumb, Hair et al. (2013) suggested that skewness with a value ranging between −2 and +2 and a kurtosis that fits within the range of −7 and +7 should be treated as normally distributed. Therefore, children's ToM at Time 2 and language at Time 2 were normally distributed. The skewness and kurtosis of the parenting measures are reported in Table 1. The skewness of all the parental variables is within the range of −2 and +2, as suggested by Hair et al. (2013). The kurtosis of the measures is within the range of −7 and +7 (Hair et al., 2013), except for parents' initiation (%). However, I used the raw counts of initiations rather than the percentage of initiations to conduct further analyses when controlling for parents' verbosity (i.e., parents' non-MST). Parental MST was the only parental measure with an outlier, in which participant 1,036 had a raw count of 79 in parental MST at Time 2, which was considerably higher than the number of MST of other participants. Therefore, I conducted separate analyses to compare the results of the analyses involving the outlier versus another analysis without the presence of an outlier. However, the patterns of the results did not change, which suggests that the outlier did not influence results. Therefore, I retained the outlier in the analyses. These results are presented in the section titled Longitudinal

Association Between MM and MST as well as the section titled Children's Effects on Parenting.

Table 1

Skewness and Kurtosis of the Parenting Variables

Time Points	Parents' Variables	Skewness	*SE* of Skewness	Kurtosis	*SE* of Kurtosis	Missing Data (%)	Valid Cases *(N)*
T1	Parental MM (%)[7]	.06	.23	−.49	.45	1(0.85%)	116
	Initiations[8]	.46	.24	.43	.48	17(14.5%)	100
	Failed bids	1.09	.24	1.96	.48	17(14.5%)	100
	Connected turns	.19	.24	−.50	.48	17(14.5%)	100
	Initiations (%)	1.71	.24	8.98	.48	17(14.5%)	100
	Failed bids (%)	.52	.24	.65	.48	17(14.5%)	100
	Connected turns (%)	−.07	.24	1.97	.48	17(14.5%)	100
	MST	.95	.23	2.36	.45	3(2.56%)	114
	Non-MST	.88	.23	1.23	.45	3(2.56%)	114
T2	Parental MM (%)	.31	.24	.34	.48	17(14.5%)	100
	MST	.29	.24	−.01	.48	17(14.5%)	100

[7] MM (%) represents the percentage of mental attributes from the total number of attributes described by the parents.
[8] Initiations represent the raw counts of parents' initiations.

Note. T1 = Time 1, T2 = Time 2; MM (%) = Parental mind-mindedness, MST = Parental mental-state talk, Non-MST = Parents' non-mental-state talk, SE = Standard Error.

Table 2

Descriptive Statistics for Parents' Variables

	Parents' variables	*M*	*SD*	Min	Max	Range	Missing data (%)	Valid cases (*N*)
T1								
	Parental MM[9]	15.08	6.41	3	35	32	1 (0.85%)	116
	Initiations	6.69	3.21	0	16	16	17 (14.5%)	100
	Failed bids	5.13	3.43	0	18	18	17 (14.5%)	100
	Connected turns	14.88	6.46	1	30	29	17 (14.5%)	100
	MST[10]	29.41	15.19	3	97	94	3 (2.56%)	114
	Non-MST[11]	570.15	203.47	197	1221	1024	3 (2.56%)	114
T2	Parental MM	17.08	6.99	1	42	41	17 (14.5%)	100
	MST	37.28	16.21	2	79	77	17 (14.5%)	100
	Non-MST	1,034.87	357.65	70	1845	1838	17 (14.5%)	100

Note. T1 = Time 1, T2 = Time 2, parental MM = Parental mind-mindedness, MST = mental-state talk, non-MST = non-mental-state talk.

[9] Parental MM in this table refers to the raw count of mental attributes described by the parents during parental MM interviews.
[10] MST refers to the raw count of parental MST.
[11] Non-MST refers to the raw counts of parents' non-MST.

Table 3

Descriptive Statistics for the Children's Variables

	Children's variable	*M*	*SD*	Min	Max	Range	Missing data (%)	Valid cases (*N*)
T1								
	ToM[12]	.01	.80	−1.50	1.56	3.07	0	117
	Language	23.04	5.12	8	31.00	23.00	0	117
	Age	3.94	.53	3.00	4.95	1.95	0	117
	SES	2.40	.79	.00	3.00	3.00	0	117
T2	ToM	.01	.42	−.66	.79	1.45	14 (11.97%)	103
	Language	27.08	3.82	17.00	34.00	17.00	14 (11.97%)	103
	Age	5.11	.54	4.00	6.17	2.17	14 (11.97%)	103

Note. T1= Time 1, T2 = Time 2, ToM = theory of mind.

[12] ToM represents the standardised score of ToM at each time point.

Stability and Change Over Time

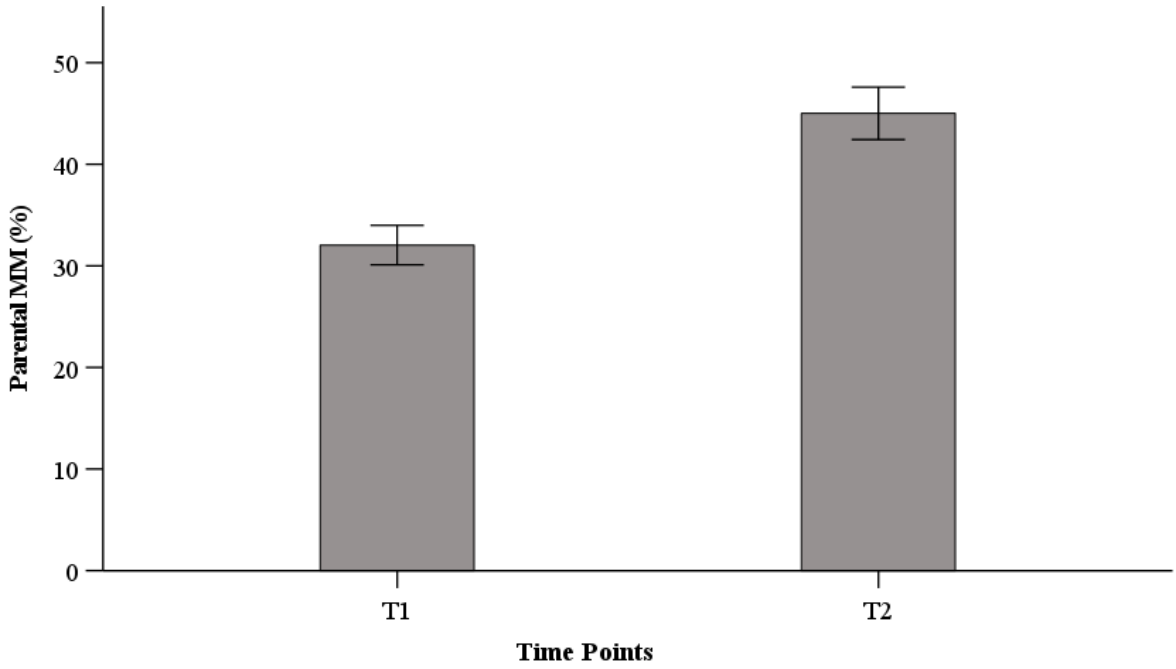
I have organised the following section into two parts. In the first part, I describe the changes of two parental measures, namely parental MM and parental MST, over 13 months. In the second part of this section, I address the stability of the individual differences in the measures for children and their parents.

Longitudinal Changes in Parental MM and MST

I present the longitudinal changes of parental MM in Figure 1. A paired sample *t*-test showed that parents were more mind-minded at Time 2, $M = 45.02$, $SD = 12.94$, than at Time 1, $M = 32.05$, $SD = 9.74$, $t\ (98) = -9.06$, $p < .001$. The Cohen's *d* effect size for parental mind-mindedness is 1.13, which represents a large effect size (Cohen, 1988).

Figure 1

Changes in Parental MM at Times 1 and 2

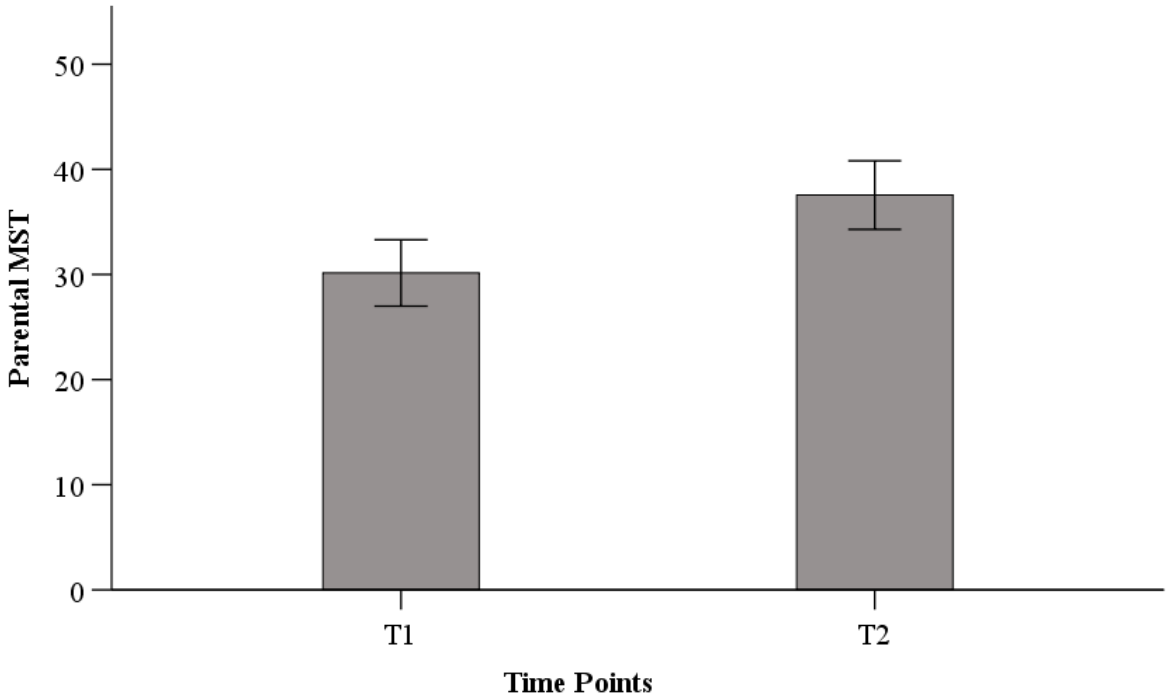


Note. T1 = Time 1, T2 = Time 2. Parental MM = Parental mind-mindedness (%). Error bars represent 95% confidence intervals.

Next, I present the longitudinal changes of parental MST in Figure 2. A paired-sample *t*-test revealed that parents used more MST at Time 2 (M = 37.55, SD = 16.26) compared with Time 1 (M = 30.14, SD = 15.74), and this difference was statistically significant, t (97) = −4.48, $p < .001$. The Cohen's d effect size for parental MST is 0.31, which is regarded as a moderate effect size (Cohen, 1988). In summary, these results show that parents used more words related to mental attributes to describe their children and more mental-state terms when talking to their children at Time 2 as compared to Time 1. Having considered the longitudinal changes of parental MM and parental MST, I now turn to the stability of individual differences for parental and children's measures.

Figure 2

Changes in Parental MST at Times 1 and 2



Note. T1 = Time 1, T2 = Time 2. Parental MST = Parental mental-state talk (i.e., raw counts of parental mental-state talk). Error bars represent 95% confidence intervals.

As for the stability of individual differences in parenting measures over time, parental MM at Time 1 was moderately correlated with parental MM at Time 2 (see Table 4). Likewise, parental MST at Time 1 was moderately correlated with the MST at Time 2 (see Table 4). As for the stability of individual differences in children's measures, children's ToM at Time 1 was moderately correlated with their ToM at Time 2 (r = .55, p < .001). With respect to the stability of individual differences in children's language, children's language at Time 1 was moderately correlated with their language at Time 2 (r = .59, p < .001). To summarise, both measures for both parents and children show a moderate and statistically significant correlation across time points, which suggests that the individual differences for these measures are stable over time.

Table 4

Bivariate Correlation Between Concurrent and Longitudinal Parenting Variables

		Parents' variables								
		T1						**T2**		
		Parental MM (%)	Initiations (%)	Failed bids (%)	Connected turns (%)	MST	Non-MST	Parental MM (%)	MST	Non-MST
	Parents' variables									
T1	Parental MM (%)									
	Initiations (%)	−.07								
	Failed bids (%)	.01	**−.29****							
	Connected turns (%)	.00	**−.42****	**−.61****						
	MST[13]	−.05	**.21***	−.04	−.11					
	Non-MST[14]	−.13	**.26***	.01	−.08	**.62****				
T2	Parental MM (%)	**.24***	−.04	.10	−.05	−.07	−.09			
	MST	−.13	.00	−.04	.03	**.48****	**.41****	.04		
	Non-MST	−.01	.13	.03	−.01	**.37****	**.56****	−.09	**.71****	

Note. T1 = Time 1, T2 = Time 2, Parental MM = Parental mind-mindedness, MST = mental-state talk, Non-MST = non-mental-state talk; **p* < .05, ***p* < .01.

[13] MST represents the raw counts of parental mental-state talk.
[14] Non-MST represents the raw counts of parents' non-mental state talk.

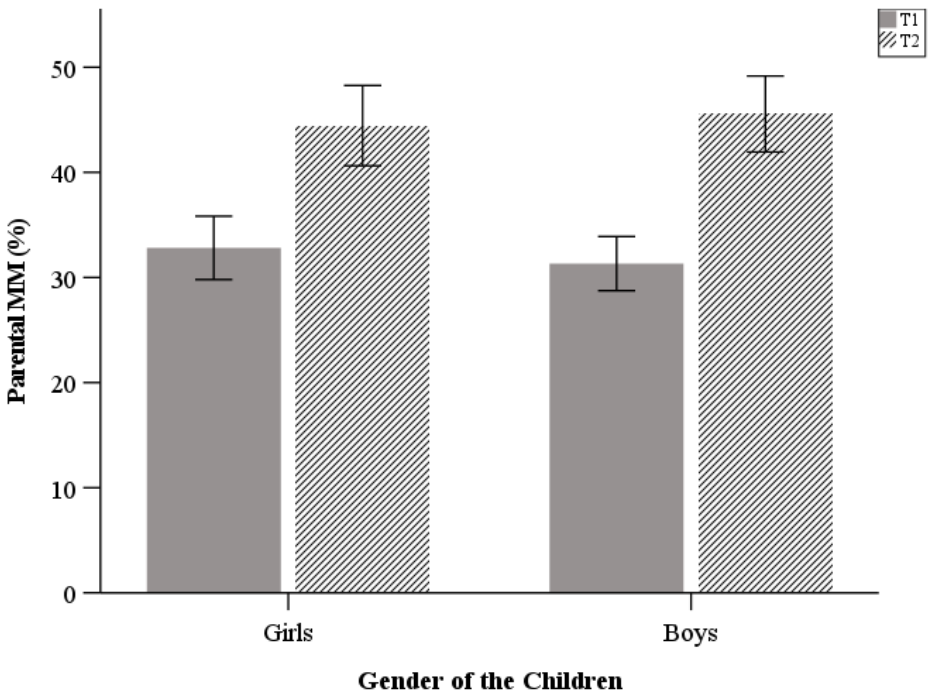
Difference in Parenting Measures by Child Gender

I conducted mixed ANOVAs and an independent *t*-test to examine whether children's gender had any influence on these parenting measures (i.e., parental MM, parental MST, and parental connected talk). The longitudinal changes in parenting measures in relations to child gender are presented in Figures 3, 4, and 5.

I conducted two separate mixed ANOVAs to examine if children's gender had any effects on parental MM and parental MST over time; there was a significant main effect of time on parental MM, F (1,97) = 81.35, $p < .001$, $\eta_p^2 = .46$, with parents being more mind-minded towards their children at Time 2 (M = 45.01, SE = 1.31), compared to Time 1 (M = 32.07, SE = .98). On the other hand, gender did not have a significant main effect on parental MM, F (1,97) = .01, p = .914 (see Figure 3). Additionally, there was no significant interaction effects between time and child's gender on parental MM, F (1,97) = .82, p = .367.

Figure 3

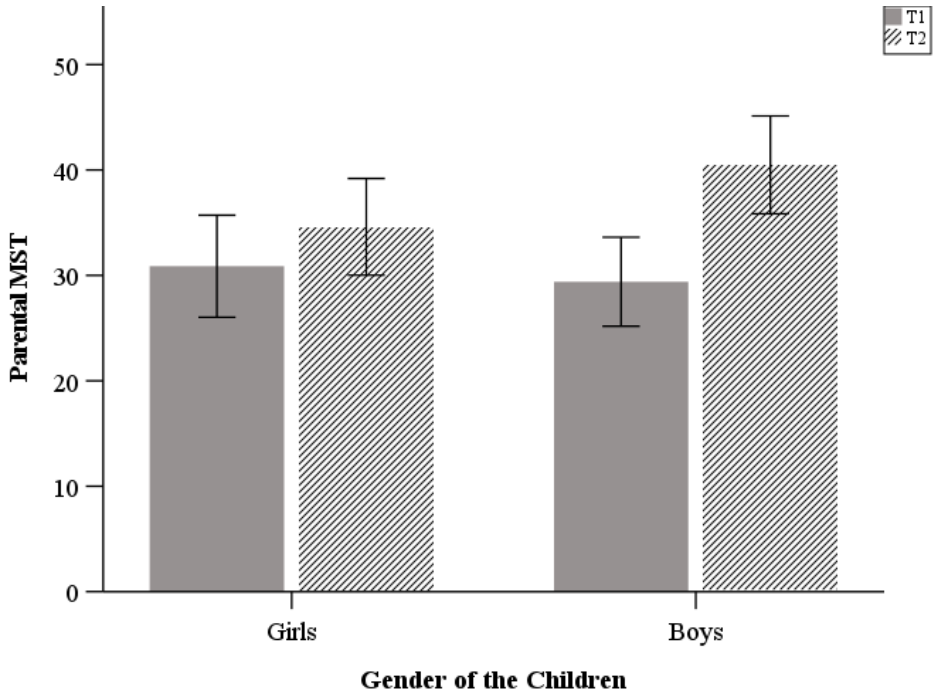
Parental MM at Times 1 and 2 by Child Gender



Note. T1=Time 1, T2=Time 2, Parental MM = Parental mind-mindedness (%)

Figure 4

Parental MST at Times 1 and 2 by Child Gender



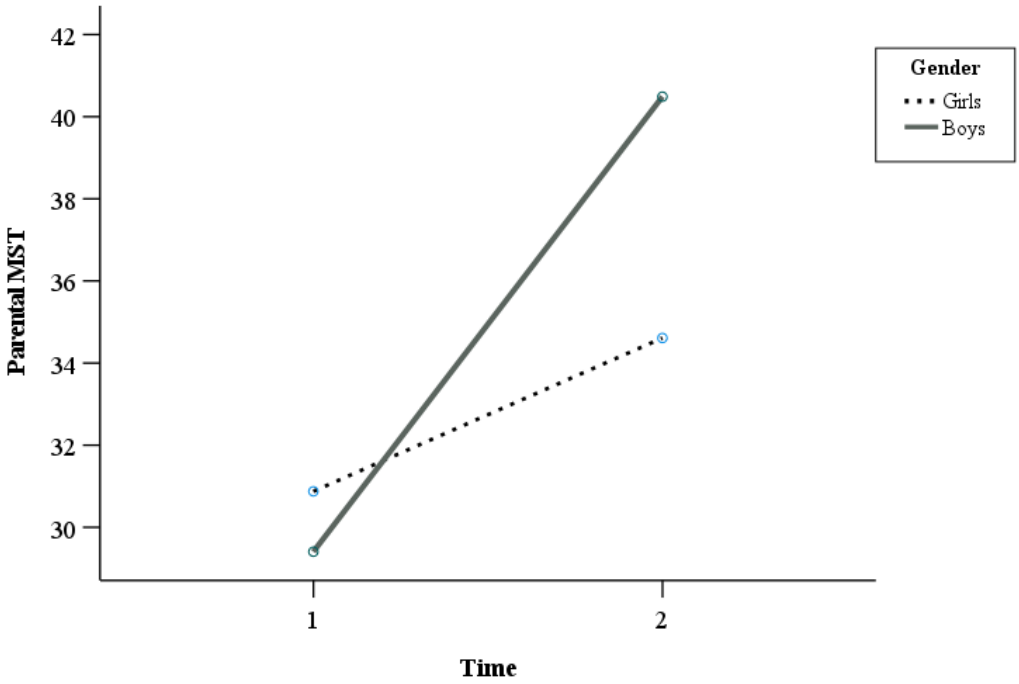
*Note.*T1= Time 1, T2 = Time 2, Parental MST = Parental mental-state talk (i.e., raw score of parental mental-state talk); error bars represent 95% confidence intervals.

In the case of parental MST, the results from the mixed ANOVA suggest that there was a main effect of time on parental MST, F (1,96) = 20.94, $p < .001$, with parents using more MST at Time 2 (M = 37.55, SE = 1.62), compared to Time 1 (M = 30.14, SE = 1.60, η_p^2 = .18). Child gender did not have a significant main effect on parental MST, F (1,96) = .63, p = .43 (see Figure 4). However, there was a significant interaction effect between time and child gender on parental MST, F (1,96) = 5.15, p = .026, η_p^2 = .05. The time*child gender interaction suggests that there are gender differences in the rate of increase in MST over time. As shown in Figure 5, the rate of increase in parental MST was greater among boys from Time 1 (M = 29.41, SE = 2.26) to Time 2 (M = 40.49, SE = 2.30), compared to the changes in

MST among parents with girls from Time 1 (*M* = 30.88, *SE* = 2.26) to Time 2 (*M* = 34.61, *SE* = 2.30). Parents with girls used more MST at Time 1 (*M* = 30.88, *SE* = 2.26), compared to parents with boys (*M* = 29.41, *SE* = 2.26). However, parents with boys engaged in more MST at Time 2 (*M* = 40.49, *SE* = 2.30), compared to parents with girls (*M* = 34.61, *SE* = 2.30) (see Figure 5).

Figure 5

Interaction Between Time and Child Gender on MST

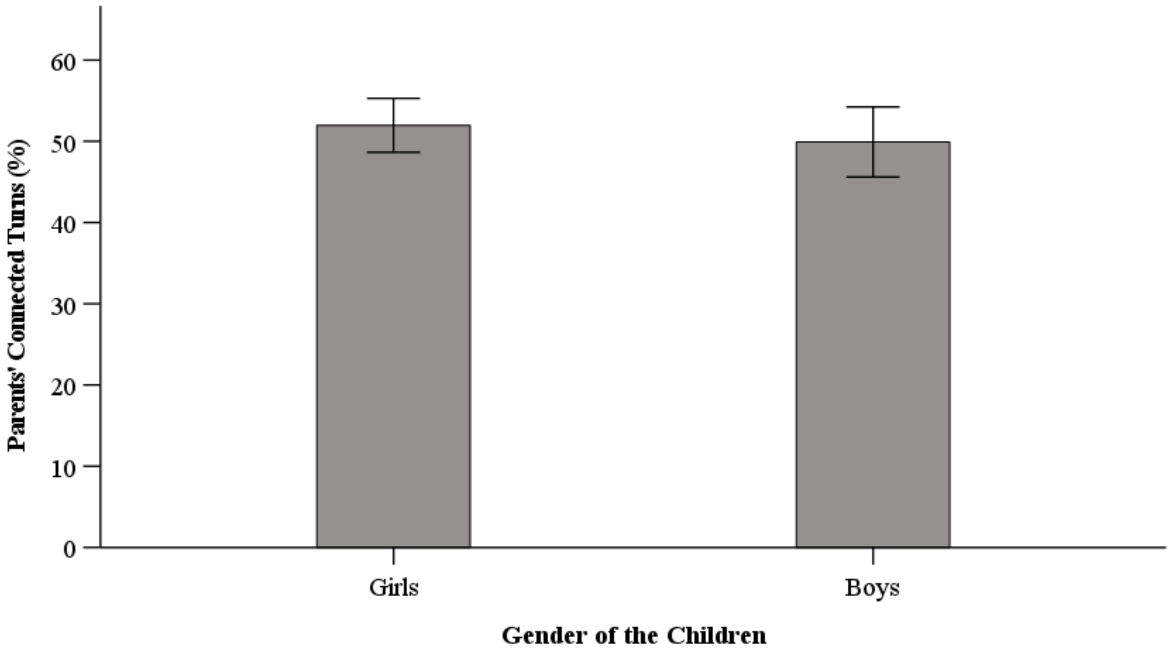


Note. Parental MST represents the raw counts of parental MST.

An independent *t*-test was conducted to examine effects of child gender on parents' connected turns. As for parents' connected turns, parents with girls had more connected talk with their children (*M* = 51.98, *SD* = 12.04) compared to parents with boys (*M* = 49.93, *SD* = 14.71), but this difference was not statistically significant *t* (98) =.764, *p* = .446 (see Figure 6).

Figure 6

Parents' Connected Turns by Child Gender



Note. Parents' connected turns represents the percentage of parents' connected turns from the total number of turns. Error bars represent 95% confidence intervals.

Concurrent and Longitudinal Relations Between Parenting Dimensions and Children's ToM and Language

Following the descriptive statistics reported in the previous section, let us now examine the concurrent and longitudinal link between parental measures and children's ToM. I will address the association between parental measures and children's ToM by considering

the findings from the bivariate correlation. To answer the question on the uniqueness and specificity of the longitudinal association between parental measures and ToM, I conducted a regression analysis to examine which aspects of parenting would predict children's ToM specifically.

Correlation Between the Concurrent and Longitudinal Parents' and Children's Measures

Table 5 shows the correlations between the variables for children and parents (see Table 5). Parental MM at Time 1 and parental connected talk at Time 1 were not related to children's concurrent or later ToM or language (see Table 5). Similarly, parental MM at Time 2 was not significantly associated with children's concurrent ToM or language at Time 2. In summary, parental MST at Time 1 was the only parental measure related to children's concurrent and later ToM and language. Parental MM was not associated with any of the children's variables at either time point.

Table 5

Bivariate Correlation Between Variables for Children and Parents

		Parents' variables								
					T1			**T2**		
		Parental MM (%)[15]	Initiations (%)	Failed bids (%)	Connected turns (%)	MST[16]	Non-MST	Parental MM (%)	MST	Non-MST
	Children's Variables									
T1	ToM	.12	.08	−.05	−.03	**.22***	.14	−.02	−.02	−.06
	Language	−.08	−.00	−.01	−.01	**.20***	.04	.13	.16	−.04
	Age	−.02	.13	−.03	−.11	.15	.03	−.02	−.01	−.18
	Gender	−.10	.10	.07	−.08	−.06	.16	.03	.16	.11
	SES	−.13	−.10	.04	−.06	.03	−.02	.10	−.01	−.01
T2	ToM	−.13	.04	−.09	.01	**.34****	.07	.02	.18	−.07
	Language	.07	.01	−.05	.01	**.34****	.03	−.04	.12	−.07
	Age	−.04	.05	−.04	−.04	.16	.01	−.06	−.01	**−.20***

Note. T1 = Time 1, T2 = Time 2, MST = mental-state talk, non-MST = parents' non-mental-state talk, parental MM = parental mind-mindedness, ToM = theory of mind;
*$p < .05$, **$p < .01$.

[15] Parental MM (%) represents the percentage of mental attributes from the total number of attributes described by the parents.
[16] MST and non-MST represent the raw counts of the parents' MST and non-MST.

Uniqueness and Specificity of the Associations Between Parenting Measures and Children's ToM and Language. This begins with an examination of the uniqueness and specificity of the influence of parenting on children's ToM and language. Table 6 presents the results from the multiple regression, which examined the effects of each parenting dimension on children's ToM and language. Concerning parental predictors, Table 6 shows that parents' earlier MST was a significant, unique predictor of children's Time 2 ToM. On the other hand, parental MM and parental connected talk were not significant predictors for children's Time 2 ToM. Hence, parental MST uniquely predicted children's Time 2 ToM, over and above individual differences in children's language, ages, gender, and SES.

As for children's Time 2 language, Table 6 shows that none of the parenting dimensions were unique longitudinal predictors of children's Time 2 language ability. Together, these findings suggest that although parental MST uniquely predicts children's ToM, none of the parental measures uniquely explain the variance of children's language longitudinally.

Table 6

Parents' Effects on Children's Longitudinal ToM and Language

	ToM (T2)			Language (T2)		
	Est.	***SE***	**Std. Est.**	**Est.**	***SE***	**Std. Est.**
ToM at Time 1	**.15***	.05	**.29****	**1.30****	.42	**.27****
Language at Time 1	.02	.01	.18	**.32*****	.07	**.42*****
Non-MST at Time 1[17]	.00	.00	−.18	.00	.00	.00
Age at Time 2	**.21****	.08	**.27****	.72	.65	.10
Gender	.05	.07	.05	.34	.66	.04
SES	.06	.05	.11	.12	.48	.02
Parental MM at Time 1(%)[18]	−.01	.00	−.11	.05	.03	.13
Parents' initiations at Time 1	.00	.01	.02	−.10	.11	−.09
Parents' failed bids at Time 1	−.00	.01	−.02	−.14	.09	−.12
Parents' connected turns at Time 1	−.00	.01	−.01	−.05	.05	−.09
Parental MST at Time 1 [19]	**.01****	.00	**.29****	.03	.03	.11

[17] Parents' non-MST at Time 1 represents the raw counts of parents' non-mental-state talk.
[18] Parental MM at Time 1 (%) represents the percentage of the mental attributes from the total number of attributes described by parents.
[19] Parents' MST at Time 1 represents the raw counts of parents' mental-state talk.

Note. *$p < .05$, **$p < .01$. Parents' initiations at Time 1 (%), parents' failed bids at Time 1, parents' connected turns represent the raw counts of parents' initiations/failed bids/connected turns from the total number of turns. T2 = Time 2, ToM = theory of mind, Parental MM = Parental mind-mindedness, MST = parental mental-state talk, Est. = unstandardised estimate; *SE* = standard error; Std. Est. = standardised estimate.

Links Between Parental Measures Within and Across Time

This section deals with the second aim of the study: to examine the overlap between parental MM, parental connected talk, and parental MST and the unique contribution of each to children's ToM. Firstly, I reported the bivariate correlation between the parental measures to address the link between the various aspects of parenting. Afterwards, I examined whether parental MM and MST predicted each other over time, to test if these two measures are longitudinally linked. To further understand if these parental measures exhibit any nonlinear relationship to predict children's ToM, I then examined the interaction effects of these parental measures on predicting children's ToM.

Relationship Between Parental Measures

As shown in Table 4, parental MM at both time points was unrelated to any of the other parenting variables. Parents' initiations at Time 1 were the only parental measure significantly associated with parental MST at Time 1. Parents who were more successful in eliciting a semantically related response from their children were also more likely to use more MST at Time 1. However, I did not control for other child factors (i.e., children's early language development, early ToM, ages, and gender) or family factors (i.e., SES) when examining the bivariate correlation between these parental variables. Therefore, it is not possible to conclude that parents' initiations at Time 1 exhibit a unique association with parents' concurrent MST.

Longitudinal Association Between Parental MM and Parental MST. To understand whether these parental measures were related to each other over time, I conducted two regression models to investigate whether parental MM and parental MST predicted each other longitudinally after controlling for the stability of the parental variable at Time 1 (e.g., Parental MM at Time 1), parents' non-MST, SES, and the predictor measured at Time 1 (see Table 7). In Model 1, I examined whether parental MST at Time 1 predicted parental MM at

Time 2. In the first step of my analysis, I entered parental MM at Time 1 to control for stability in parental MM and controlled for parents' MST at Time 1. I then entered SES as the covariate in the second step and, eventually, parental MST at Time 1 into the final step of the regression analysis. In the case of Model 2, I examined whether parental MM at Time 1 predicted parental MST at Time 2. I controlled for parental MST at Time 1 and parents' non-MST at Time 1 to the initial step of the regression analysis for the second model. I then entered SES as the covariate. In the final step of the analysis of the second model, I entered parental MM at Time 1 as the predictor.

As shown in Table 7, the results from Model 1 suggested that parental MST did not predict parental MM over time when controlling for parental MM, which was examined at the early phase, parents' verbosity (i.e., parents' non-MST), or SES. However, the correlation between SES and parental MM was marginally significant (p = .057). To summarise, parental MST did not predict parental MM over time. For the second model, parental MM did not predict parental MST over time after controlling for the parental MST in the early phase, parents' non-MST, and SES. Parents' initial MST was the only significant predictor of parental MST at Time 2 in Model 2. To summarise, the results from the cross-lagged models suggest that there was no longitudinal association between parental MM and parental MST.

Table 7

Longitudinal Association Between Parental MM and Parental MST

	Model 1			**Model 2**		
	Parental MM (T2)(%)[20]			Parental MST (T2)[21]		
	Est.	***SE***	**Std. Est.**	**Est.**	***SE***	**Std. Est.**
Parental MM at Time 1(%)	**.41****	.15	**.29****	−.12	.16	−.07
MST at Time 1	−.06	.11	−.06	**.36****	.12	**.33****
Parents' non-MST at Time 1	.00	.01	.06	.01	.01	.18
SES	4.29^	2.13	**.24***	−.90	2.12	−.04

Note: T2 = Time 2, Parental MM = Parental mind-mindedness, MST = mental-state talk, Est. = unstandardised estimate; *SE* = standard error; Std. Est. = standardised estimate. ^p = .05, *p < .05, **p < .01, *** p < .001

[20] Parental MM represents the percentage of mental description from the total number of attributes described by the parents.
[21] MST represents the raw counts of the parental mental-state talk.

Interplay Between Measures of Parenting in Predicting Children's ToM and Language. Previously, I examined the uniqueness and specificity of parental predictors on children's ToM and language ability using multiple regression. However, it is also important to consider the nonlinear associations between these parental measures and children's ToM and language by examining the interaction between the parenting constructs and children's outcome variables. Therefore, I tested whether parental connected talk (i.e., parents' connected turns) moderated the link between parental MM and children's ToM and language, as reported in Table 8. I conducted a generalised linear model in SPSS to examine this research question. As evident in Table 8, parental connected turns was not a significant moderator of the link between parental MM at Time 1 and children's ToM at Time 2. Likewise, the multiplicative interaction between parental connected talk and parental MM was not a significant predictor of language at Time 2. To summarise, parental connected talk did not moderate the relation between parental MM and children's ToM or language longitudinally.

Table 8

Children's Longitudinal Outcome as Moderated by the Interaction Between Parental Connected Talk and Parental MM

	ToM (T2)			Language (T2)		
	Est.	***SE***	**Std. Est.**	**Est.**	***SE***	**Std. Est.**
ToM at Time 1	**.17*** **	.05	**.31*** **	**1.35** **	.46	**.29*** **
Language at Time 1	**.02***	.01	**.23***	**.32** **	.09	**.42*** **
Predictor						
Parental MM at Time 1(%)[22]	−.00	.00	−.12	.03	.03	.11
Moderator						
Parents' connected turns (%)[23]	−.00	.00	−.02	−.01	.04	.03
Covariates						
Ages at Time 2	**.21***	.08	**.29** **	.90	.73	.11
Gender: Girls	−.02	.06	−.07	−.13	.66	−.01
Gender: Boys	0	−	0	0	−	0
SES	.06	.05	.11	.16	.48	.04
Interaction effects						
Parents' connected turns (%) x Parental MM (%)	−.00	.00	−.13	−.00	.00	−.04

[22] Parental MM represents the percentage of the mental attribution from the total number of attributes described by the parents.
[23] Parents' connected turns represents the percentage of the parents' connected turn from the total number of turns.

Note. *$p < .05$, **$p < .01$, *** $p < .001$. T2 = Time 2, ToM = theory of mind, Parental MM = parental mind-mindedness, Est. = unstandardised estimate; *SE* = standard error; Std. Est. = standardised estimate.

Next, I examined whether parental connected talk moderates the link between parental MST at Time 1 and children's ToM and language ability at Time 2 (see Table 9). Table 9 shows that parental connected talk did not moderate the link between parental MST and children's ToM or language at Time 2.

Table 9

Children's Longitudinal Outcome as Moderated by the Interaction Between Parental Connected Turns and Parental MST

	ToM (T2)			Language (T2)		
	Est.	**SE**	**Std. Est.**	**Est.**	**SE**	**Std. Est.**
ToM at Time 1	**.15*** **	.04	**.29*** **	**1.47*** **	.41	**.30*** **
Language at Time 1	**.02***	.01	**.20***	.29***	.07	**.39*** **
Predictor						
Parental MST at Time 1[24]	**.01****	.00	**.29****	.03	.02	.12
Moderator						
Parents' connected turns[25]	.00	.00	.01	−.07	.02	−.12
Covariates						
Ages at Time 2	**.21****	.08	**.28****	.65	.65	.09
Gender: Girls	−.04	.06	−.10	−.09	.64	−.02
Gender: Boys	0	-	0	0	-	0
SES	.06	.04	.10	.09	.44	.02
Non-MST at Time 1[26]	.00	.00	−.14	−.00	.00	−.06
Interaction effects						
Parents' connected turns x Parental MST	.00	.00	.17	.00	.00	.04

[24] Parental MST at Time 1 represents the raw counts of parental MST.
[25] Parents' connected turns represent the raw counts of parents' connected turns.
[26] Parents' non MST at Time 1 represents the raw counts of parents' non-MST.

Note.*$p < .05$, **$p < .01$, *** $p < .001$. T2 = Time 2, ToM = theory of mind, MST = parental mental-state talk, Est. = unstandardised estimate; *SE* = standard error; Std. Est. = standardised estimate.

Child-Driven Effects on Parental MM and Parental MST

I examined children's influence on parental MM and parental MST at Time 2. I first entered parental MM at Time 1 into the analysis to control for stability in parental MM. Next, I entered other family factors as covariates, followed by the children's ToM and language at Time 1. Table 10 shows that parents' initial MM was the only significant predictor for parental MM at Time 2, above and over their ToM, language, ages at Time 2, gender, or SES.

Next, I considered the longitudinal influence of children's ToM and language ability on parental MST (see Table 10). Children's gender was significant predictor of parental MST at Time 2. Specifically, parents engaged in more MST with boys at Time 2. Moreover, children's language at Time 1 predicted parental MST longitudinally ($p < .05$). Therefore, there was a child-driven effect on parenting, specifically for parental MST. Parents with children who demonstrated more advanced language ability at Time 1 used more MST in the follow-up phase of the study. To summarise, although there was no child-driven effect on parental MM, children's language ability at Time 1 predicted parental MST longitudinally. The longitudinal association between children's language and parental MST was unique from the influence of other factors, including children's ToM at Time 1, children's ages at Time 2, their gender, and SES.

Table 10

Children's Effects on Parental MM and Parental MST

	Parental MM (%)[27] (T2)			MST (T2)[28]		
	Est.	***SE***	**Std. Est.**	**Est.**	***SE***	**Std. Est.**
Parental MM at Time 1(%)	**.42****	.14	.30	-	-	-
MST at Time 1	-	-	-	**.40*****	.12	**.36*****
Non-MST at Time 1[29]	-	-	-	.01	.01	.15
Ages at Time 2	−5.33	4.07	−.21	−3.78	3.35	−.13
Gender	2.45	2.86	.09	**7.30***	3.20	**.22***
SES	2.97	1.90	.16	−2.48	2.11	−.12
ToM at Time 1	−.46	1.93	−.03	−3.53	2.26	−.17
Language at Time 1	.78	.41	.28	**.95***	.44	**.29***

Note. ^p = .05, *p < .05, **p < .01, *** p < .001. T2 = Time 2, parental MM = parental mind-mindedness, MST = parental mental-state talk, Est. = unstandardised estimate, *SE* = standard error; Std. Est. = standardised estimate.

[27] Parental MM (%) represents the percentage of the mental attributes from the total number of attributes described by the parents.
[28] Parental MST represents the raw counts of parental MST.
[29] Parents' non-MST represents the raw counts of parents' non-MST at Time 1.

Summary of the Findings

My first research aim was to examine the uniqueness and specificity of the parental measures (i.e., parental MM, parental connected talk, and MST). The results suggest that only parental MST predicted children's ToM longitudinally. Interestingly, there was a significant interaction effect between time and child gender on parental MST. Specifically, parents with boys showed a greater increase in their MST over time, compared to parents with girls. For the second aim of the study—that is, to examine the effects of interactions among these parental measures on children's ToM—the results suggest that none of the parental measures were related to each other. I conducted two regression analyses to further understand the link between these parental measures over time but did not find any longitudinal association between parental MM and MST during the follow-up analysis. Additionally, results from the GLM analysis suggest that parental connected turns did not moderate the link between parental MM and children's ToM or language. Likewise, there were no interaction effects between parental connected turns and MST on children's ToM or language. Regarding the third aim of this study, which was to examine whether there was a child-driven effect on parenting, the findings suggest that children's language predicted parental MST longitudinally when controlling for the effects of parents' early MST, children's ages at Time 2, gender, SES, and children's early ToM. On the other hand, I did not find any child-driven effects on parental MM across time.

Chapter 4: Discussion

The present study is based on a longitudinal design to examine how three parental measures (i.e., parental MM, parental connected talk, and parental MST) contribute to the development of ToM between ages 3.94 (*SD* = .53, range = 1.95; Time 1) and 5.11 (*SD* = .54, range = 2.17; Time 2). This study also represented an attempt to address how children's characteristics might predict these parenting dimensions. Regarding the first aim of the study, the results suggest that MST was the only parental measure that predicted children's ToM longitudinally, above other parenting behaviours and child factors. For the second aim of this study—the results suggest that there was an absence of a link between these parental measures (i.e., parental MM, parental connected talk, and parental MST). Moreover, there was a significant interaction between time and gender related to parental MST only, but not parental MM. Precisely, there was a greater increase in parental MST among parents with boys over time, compared to parents with girls. There were no interaction effects among parental connected talk and two other parental measures (parental MM and parental MST) on children's ToM and language. Regarding the third aim of this study, I found that children's language at Time 1 uniquely predicted parental MST at Time 2, and parents with boys used more MST at Time 2 compared to parents with girls.

Concurrent and Longitudinal Relations Between Parenting Dimensions and Children's ToM and Language

Let us now consider these findings in light of the research. I will begin by addressing the uniqueness and specificity of the longitudinal association between parental measures and children's ToM. Initially, I discuss the correlation between parental and children's measures. Next, I consider the multiple regression analysis of whether parental MM, parental connected

talk, and parental MST made a unique contribution to children's ToM or language ability. I follow this with the implications of these findings in relation to the theoretical work and findings reported by other research.

Correlation Between Concurrent and Longitudinal Parents' and Children's Measures

My findings from the preliminary analysis suggest that parental MST is the only parental measure from Time 1 significantly correlated with children's concurrent and longitudinal measures of ToM and language. I follow this by considering the specificity of parental measures and children's ToM.

Domain-Specific and Domain-General Effect of Parenting on Children's Longitudinal ToM and Language. My first research aim in the study was to examine whether three parental dimensions—parental MM, parental connected talk, and parental MST—exhibit specific links with children's ToM (the domain-specific view of parenting) or more general links with children's language ability (the domain-general view of parenting; Grusec & Davidov, 2010). Surprisingly, I found that parental MST was the only parenting construct that predicted children's ToM over time. These findings seem to be in line with existing research reporting a link between parental MST and children's ToM (e.g., Devine & Hughes, 2017; Tompkins et al., 2017). There are at least two possible interpretations of these findings. The first is that parental MST has a domain-specific influence on children's ToM rather than exerting a domain-general influence on children's broader cognition (Grusec & Davidov, 2010). The second interpretation is that parental MST might influence children's expressive language specifically rather than exerting influence on their receptive vocabulary, which we used to measure children's language ability in the present study. Previous findings established a link between parental MST and children's language outcomes, specifically in terms of children's expressive language. As

mentioned in the literature review, Olson and Masur (2020) found a modest association between parental MST at 13 months and children's receptive and expressive language measured 4 months later. A note of caution is due here, as Olson and Masur (2020) only partially controlled for gender and the mothers' total number of words, but not children's language in the early phase. Hence, the possible influence of children's initial language on the longitudinal link between parental MST and children's language cannot be ruled out. Likewise, McElwain et al. (2019) reported a moderate correlation between parent–child cooperation and children's expressive language at 2.8 years old ($r = .32$, $p < .001$; McElwain et al., 2019). These previous findings seem to suggest that parental MST might have a greater influence on children's expressive language, rather than a general influence on their receptive language. Therefore, future researchers should consider examining the influence of parental MST on children's expressive language.

Absence of a Link Between Parental MM, Parental Connected Talk, and Children's Later ToM and Language. In the previous section, I discussed the findings from the multiple regressions, which revealed parental MST as the only significant predictor of children's ToM at Time 2. Let us now turn to the implications of the absence of relations between parental MM and parental connected talk as well as children's later ToM and language in the present study. A possible explanation for these findings might be that the choice of parent–child activity did not adequately elicit parental MM and parent–child connected talk. For instance, Lundy (2013) asked parent–child dyads to take part in a joint activity that required parents and children to cooperate. Parental MM (measured using interviews) had an indirect effect on children's ToM through parents' sensitivity towards their children's cognition during cooperative tasks (Lundy, 2013). However, in the present study, I used a free-play task to examine parental connected talk.

The open-ended nature of the free-play task and the setting might have restricted the type of conversation that could be generated from the activity. Cooperative activities might be important for examining the influence of parental connected talk on children's ToM, if connected talk promotes children's understanding about another person's mental state through the possibility of exposure to other people's cognition (Brown et al., 1996; Slomkowski & Dunn, 1996).

Previous studies identified an age-related influence on the type of talk that children generated when playing with various toys. For instance, Ryckebusch and Marcos (2004) compared the effects of toys (i.e.., construction toys and free play) on children's talk among children 12–18 months old, 20–23 months old, and 26–29 months old.[30] Children aged over 2 years engaged in a significantly higher amount of elaborative talk when playing with constructive toys as opposed to free play (Ryckebusch & Marcos, 2004). However, these effects were not seen among younger children (just over 1 year to under 2 years old). Likewise, Kwon et al. (2013) examined the influence of structured tasks and free play on the talk that children aged 16–37 months produced (N = 35 boys). Parents demonstrated a marginally significant amount of sensitivity towards their children's thinking and used more diversified language during free play, as opposed to structured play (Kwon et al., 2013). Children also demonstrated marginally more mutuality with their parents and used more diversified words during free play rather than structured play (Kwon et al., 2013). Taken together, these findings suggest that although free play might elicit more positive parenting qualities and more diverse words (i.e., Kwon et al., 2013), goal-directed collaborative tasks, such as the constructive task used by Ryckebusch and Marcos (2004), might be important for examining connected talk that demands children follow the stance of the other person (Slomkowski & Dunn, 1996). Therefore, it might be important for

[30] Thirty children participated in this study. There were five girls and five boys in each age group: 12–18 months old, 20–23 months old, and 26–29 months old (Ryckebusch & Marcos, 2004).

future research to examine parent–child talk using a wider range of context, such as joint activities that elicit parent–child cooperation in a home environment (Ensor & Hughes, 2008). Interestingly, my findings from the correlation (see Table 4) suggest that both parental MM and parental MST showed rank order stability over time. Parents exhibited significantly more mind-mindedness towards and engaged in more MST with their children at Time 2, as compared to Time 1. This seems to suggest that the measure of free play can capture meaningful variations in parental MM and parental MST.

Another reason for the lack of association between parental connected talk and children's ToM may be that previous studies focused on younger children (e.g. McElwain et al., 2019; Ensor & Hughes, 2008; Sung & Hsu, 2014). For instance, the children were 2–3 years old in Ensor and Hughes's (2008) study, 2.5 years old in Sung and Hsu's (2014) study, and 2.8 years old in McElwain et al.'s (2019) study. Therefore, it is possible that parental connected talk might matter most for children's ToM at a younger age, if connected talk plays a prominent role in children's ability to work with another person (i.e., joint attention; Adamson et al., 2013) and is related to parents' responsiveness towards their children's emerging skills to initiate interaction (Bornstein et al., 2008; Vallotton et al., 2017). This might explain the absence of a unique link between parental connected talk and children's ToM in the current study, which focused on children aged 3–4 years at Time 1. However, it remains unclear if parental connected talk might matter most for children at a younger age. As mentioned, I did not examine longitudinal changes in parental connected talk, which makes it difficult to speculate whether parental connected talk might matter more for children's ToM and language at a certain age. Therefore, apart from adapting a longitudinal design to examine parental connected talk, future researchers should consider examining how the characteristics of parental connected talk differ among parents with

children in various age groups. On the other hand, it is worth noting that there are fewer studies examining the link between parental connected talk and ToM than parental MM or parental MST. Therefore, the association between parental connected talk and ToM is less well understood. The second interpretation for the absence of the longitudinal association between parental connected talk and children's ToM could be the various ways by which parental connected talk is measured across studies. In the present study, I examined the semantic relatedness between the parents and children's talk (Brophy & Dunn, 2002; Slomkowski & Dunn, 1996). However, I may have underestimated the connectedness between the parents and children, as I only considered the pragmatic content of the statements uttered. Previous researchers, such as Sung and Hsu (2014) and McElwain et al. (2019), examined the connectedness between parents and children using methods that are different from those used in the present study. Both studies consider connectedness based on the language used and the behaviours of the dyads, which showed an awareness of the other person's intention and their willingness to work together. As mentioned in the literature review, the concept of parental connected talk seems to be linked to the other related measures addressing parent–child reciprocity, such as *mutually responsive orientation* (Kochanska, 2002) and *parent–child dyadic synchrony* (Harrist & Waugh, 2002). Although these measures vary in their definitions of parent–child reciprocity, it is suggested that connectedness within the parent–child relationship can be approached from various perspectives. Therefore, it is unclear whether the coding scheme used in the present study, which was devised by Brown et al. (1996) and adapted by Ensor and Hughes (2008), measures the same aspects of the parenting qualities that underpin a reciprocal stance towards children. Future researchers should consider whether different measures of connectedness between parents and children capture the same or distinctive parenting qualities

by examining the reliability between the existing schemes for measuring parent–child connectedness.

Correlation Between the Concurrent and Longitudinal Parenting Measures

As for the concurrent and longitudinal link between parental MM, parental connected talk, and parental MST, the results of this study indicated no significant association among the three. To address the absence of a link between these parental measures, I have organised this section in the following way. Firstly, I will discuss the absence of a link between parental MM and parental connected talk; I consider the implications of these findings using the existing theory and empirical evidence. Afterwards, I will address the absence of a link between parental MM and parental MST. I then discuss these results in light of the theory and existing research.

Absence of Link Between Parental MM and Parental Connected Talk

The results suggest that there was no statistically significant association between parental MM and parental connected talk, either concurrently or longitudinally. The findings from the present study seem to challenge the view that parental MM and parental connected talk are related to each other. According to Meins (1999), parental MM reflects parents' capacity to take notice of their children's mental states, whereas parental connected talk represents parents' ability to make sense of children's way of thinking (Slomkowski & Dunn, 1996). Taken together, these definitions of parental MM and parental connected talk suggest that both constructs rely on parents' capacity to show awareness of their children's mental states by addressing how they are thinking, feeling, or wanting. These findings can be interpreted in three ways.

The first interpretation is that these parenting measures are dependent on different aspects of parenting skills, as suggested by the domain-specificity framework proposed by Grusec and

Davidov (2010). As mentioned in the literature review, parental MM and parental connected talk both potentially draw on parents' capacity to gain insights into their children's internal states. For instance, Brown et al. (1996) suggested that the ability of a speaker to accommodate the mental perspectives of an interlocutor is the key to establishing parent–child connected talk. On the other hand, Lundy (2013) reported that parents who were more mind-minded towards their children showed more understanding of their children's insights during a joint activity. To summarise, what parental connected talk and parental MM have in common is that they represent parents' ability to make a connection with their children's thoughts, feelings, and wants. In addition to the focus on parents' capacity to consider their children's internal states, what parental MM and connected talk have in common is that they appear to be related to the reciprocal and responsive parenting stance. For example, Dunn and Cutting (1999) suggested that connected talk reflects the inclinations of the dyad to build on another person's cues in communication. Meins (1999) considered that parental MM represents parents' capacity to acknowledge their children's thinking. However, the current findings suggest that parental MM (as measured through parental interviews) and parental connected talk (as measured through live interactions between parents and children) draws on distinctive parenting skills, which further supports the domain-specific perspective proposed by Grusec and Davidov (2010).

A possible interpretation for the lack of association between these parental predictors could be that each of these parenting measures was examined in this study using different methods. As noted earlier, parental MM was measured using an interview for children over the age of 1 year (Meins & Fernyhough, 2015). On the other hand, parental connected talk was measured from transcribed parent–child conversations during free play. For future studies, researchers should consider examining parental MM according to parents' comments during

interactions in infancy to study the association between parental MM and parental connected talk. It is also possible that there genuinely is no link between parental MM and connected talk because the MM interview gives access to a parent's representation of their child (reflecting the quality of their relationship), and connected talk might not involve parents' capacity to make sense of their children's mental-states in practice. On the other hand, the link between parents' capacity to represent their children's minds (i.e., parental MM) and responsive parenting behaviours is relatively well documented in the research concerning parental MM (e.g., Lok & McMahon, 2006; Ontai & Virmani, 2010). Therefore, parental MM and parental connected talk might represent distinctive dimensions of parenting in practice.

Another possible explanation that might account for the absence of a link between parental MM and parental connected talk is that parental connected talk might underpin parents' capacity to show awareness of their children's cognitive needs rather than reflecting the parents' capacity to act upon their children's internal states, as suggested by Slomkowski and Dunn (1996). As noted in the introduction, Slomkowski and Dunn's (1996) definition of connected talk seems to overlap with the definition of parental MM outlined by Meins (2013), as these parenting constructs seem to represent parents' capacity to consider their children's feelings, cognition, and wants by taking a sensitive stance towards their children's internal states. Previous studies indicate that parental MM assessed during live interaction showed a significant association with parents' sensitivity ($r = .40$, $p < .005$; Meins et al., 2001). On the other hand, Vallotton et al. (2017) speculated that parents' sensitivity and stimulation might represent distinctive aspects of parenting. For instance, previous studies drew a distinction between parents' capacity to scaffold their children's language (i.e., stimulation; Bornstein et al., 2008; Vallotton et al., 2017) and parents' awareness of referencing their children's internal states (i.e.,

parental sensitivity; Lamb & Sherrod, 1981). Given the uniqueness of these parenting measures, which is similar to the operationalisation of parental MM and parental connected talk, parental MM might capture parents' capacity to make sense of their children's internal states, whereas parental connected talk might reflect parents' capacity to engage with their children's language development. However, the present study did not examine parental connected talk at Time 2 due to time constraints, which makes it difficult to compare the longitudinal changes in parent–child connected talk alongside parental MM. Hence, future studies should consider using a similar approach to that of Vallotton et al. (2017) to observe possible changes in parent–child connected talk over a longer period, which would help to clarify how multiple parenting qualities might change over time in relation to children's ages (Bornstein et al., 2008; Vallotton et al., 2017).

Absence of Link Between Parental MM and Parental MST

The present study did not offer support for a link between parental MM and parental MST during parent–child interaction (Meins & Fernyhough, 2015). These findings can be explained in terms of the specificity of these parenting measures, which seem consistent with the view that parents' experience of envisioning their children's internal states during an interview (i.e., parental MM) might differ from the experience of using mental-state language in conversation with children (i.e., parental MST; Devine & Hughes, 2017). The current study extended existing work by including measures of both parental MM and parental MST at two time points. I examined the cross-lagged effects between parental MM and parental MST to investigate whether these two parental measures predicted each other over time. However, the results from the follow-up analysis suggested that there was no longitudinal link between parental MM and parental MST (see Table 7). To summarise, the lack of association between

parental MM and parental MST suggests that these measures are dependent on different parenting skill sets (Grusec & Davidov, 2010).

The second interpretation of the absence of a link between parental MM and parental MST is that parental MM might not represent parents' capacity to use mental-state words during face-to-face interaction (Devine & Hughes, 2017). Recently, findings from Larkin et al. (2020) seemed to challenge the view that parents who are more mind-minded use more MST with their children (Meins, 1999). In this study, Larkin et al. (2020) compared mind-related comments made by individuals when talking about their friends and spouses and their use of mental-state words to describe a parent–child dyad appearing in a video.[31] Neither the attuned nor nonattuned mental-state words these individuals used to talk about the video showed significant association with their mind-related comments about their close ones (Larkin et al., 2020). This seems to support the view that a person's MM entails more than using mental-state words (Devine & Hughes, 2017), which might account for the absence of a link between parental MM and parental MST. Therefore, future studies should consider examining parents' use of internal-state words across different contexts (i.e., with their other children) and observe whether parents' use of internal-state words overlap across contexts and with their capacity to describe their children's mental attributes (Meins & Fernyhough, 2015).

So far, I have mentioned that the absence of a link between parental MM and parental MST may be due to the specificity of parenting skills (Grusec & Davidov, 2010) and that one's use of mental-state words might not be related to parental MM (Devine & Hughes, 2017). Let us turn now to an alternative interpretation of the absence of a link between parental MM and parental MST. As mentioned earlier, only parents' responses that describe their children's mental

[31] 235 parents with children between the age of 2 and 18 years old participated in this study; 21 of the parents were fathers and 214 were mothers (Larkin et al., 2020).

attributes were included as indicators of MM in the interview measure (Meins & Fernyhough, 2015). The measure of this interview seems related to other aspects of parents' cognition, such as their executive function (EF; Yatviz et al., 2018), meaning one's capacity to focus on relevant information and inhibit other thoughts (Diamond, 2013). To date, the association between parental MM and EF has only been reported by two studies that recruited parents with children who were born premature. For instance, Yatziv et al. (2018) reported a weak but statistically significant association between a mother's attuned mind-related comments about her child during an interaction and a mother's own working memory updating ($r = .23$, $p < .05$; Yatziv et al., 2018).[32] However, researchers reported distinctive findings regarding the association between parental MM and EF measured using the interview measures of parental MM in the follow-up study with the same sample. In this study, Yatviz et al. (2020)[33] asked mothers to describe their children using the parental MM interview when their children were 66 months old. They reported that there was no significant correlation between mothers' MM and EF ($r = -.04$). Future studies of typically developing parent–child dyads from the community are needed. Moreover, future work should examine parental MM using an interview and parental MST alongside tasks measuring parents' EF, to understand whether parental MM and parental MST are reliant on the same or distinctive aspects of parents' cognition. This would address the question of whether parental MM, examined using interviews and parents' use of mental-state words, is dependent on different aspects of cognition to retrieve relevant information during the task.

Interplay Between Measures of Parenting in Predicting Children's ToM and Language

[32] Total number of children was 102,61 of whom were born premature (Yatziv et al., 2018).
[33] Total number of children was 99, 59 of whom were born premature (Yatziv et al., 2020).

A moderation analysis addressed the potential interaction between parental connected talk and MM and between parental connected talk and parental MST in relation to children's later ToM and language. These parenting constructs appear to show little overlap in influence on children's ToM and language, suggesting that the links between parental MST and children's later ToM are linear in nature. For instance, the present study did not establish an interaction effect between parental connected talk and parental MST in relation to children's ToM or language. These findings are contrary to those of Ensor and Hughes (2008), who found an interaction effect between mothers' MST and connected turns in relation to children's ToM across the ages of 2, 3, and 4 years. However, it is important to note that Ensor and Hughes (2008) examined extended observations at home, which might be necessary to capture meaningful variation in parent–child connected talk. This might explain why I did not find an interaction effect between parental connected talk and parental MST in relation to children's ToM.

Children's Effects on Parental MM and Parental MST

Let us now consider the third aim of the study, which was to examine whether children's characteristics predicted parental MM and parental MST longitudinally. This research aim is important because previous studies have rarely examined the influence of children's characteristics on parenting, as mentioned in the literature review. Moreover, the regression analysis used in the present study allowed me to observe the direction of the association between children's ToM or language and parenting, which cannot be examined using a cross-sectional design. My findings suggest that there were child-driven effects for parental MST specifically but not for parental MM. In other words, parents with children who demonstrated better language ability early on used more mental-state language with their children later. These findings are

consistent with a suggestion made by Devine and Hughes (2017), who speculated that children with better language skills might elicit more MST from their parents. One of the possible interpretations is that children with better language skills demonstrate more advanced conversational skills (Fonagy et al., 2007). Given that conversation provides opportunities for children to refine how they think about others' minds (Carpendale & Lewis, 2004), children who are verbally advanced might be better at expressing their ideas about mental states to parents. This might encourage parents to use more MST with their children. In addition to the link between children's language and parental MST across time, I found that children's genders had effects on the frequency of parental MST at Time 2. Specifically, the results suggest that parents used more MST with boys at Time 2. Previous research examining the effects of children's gender on parental MST reported inconsistent findings. For instance, Aznar and Tenenbaum (2015)[34] found that parents of 4-year-old girls engaged their children in more MST during a story-reading task, compared to parents of boys. However, a recently published meta-analysis, conducted by Aznar and Tenenbaum (2020), reported that children's gender had no effects on the frequency of parental MST. Likewise, although Martin and Green (2005)[35] found that mothers used more MST with boys than girls on average, the difference in the frequency of mothers' MST was not statistically significant among children of either gender. Taken together, the findings from previous studies suggest that the possible association between these measures is not yet well understood. Therefore, for future studies, researchers should consider examining whether parental MST differs in relation to the gender of the children across various activities and settings.

[34] There were 65 children in this study. In the 4-year-old group, there were 18 boys and 18 girls. In the 6-year-old group, there were 16 boys and 13 girls (Aznar & Tememnaum, 2015).
[35] There were 55 children in this study, 25 of whom were boys. The ages of the children ranged between 40 and 42 months old (Martin & Green, 2005).

Strengths and Limitations

Having discussed the implications of the main findings and possible directions for future research, let us turn to the strengths and limitations of the present study. The current study adds to existing work (e.g., Devine & Hughes, 2018; Ruffman et al., 2002) by testing the uniqueness, direction, and specificity of the association between parental MST and children's ToM. Moreover, the current study extends existing work by considering the influence of multiple parental predictors on children's ToM simultaneously, which is of importance to understand whether these parental measures have a unique influence on children's outcomes. The present study is an attempt to address the links among parental MM, parental connected talk, and parental MST, which have rarely been examined in previous work, although these constructs seem to tap into parents' capacity to relate to their children's feelings, cognition, and wants responsively and reciprocally. Moreover, the present study includes a relatively large sample size of children (N = 117), compared to many previous studies that examined the link between different parental measures (i.e., parental MM and parental MST) and children's ToM, such as the previous research that were included in a recently published meta-analysis (Devine & Hughes, 2018). For instance, the sample size of the studies that examined the association between MST and children's ToM are ranged between 34 and 102 (Devine & Hughes, 2018). The sample size of the studies that examined the relations between parental MM and ToM are ranged between 39 and 164. As noted by previous studies (i.e., Button et al., 2013; Faber and Fonseca, 2014), sample size is related to the reliability of the data and the representation of an actual effect. Therefore, this study benefits from having a large sample size and similar gender distribution to examine the influence of parenting on children's ToM.

In the present study, my findings highlight that parental MST predicted children's ToM over time, suggesting a domain-specific effect of parenting on children's ToM. I did not find links among parental MM, parental connected talk, and parental MST. In addition to the absence of a link among these parental measures within time, parental MM and parental MST did not predict each other across time. These seem to be consistent with the domain-specificity framework (Grusec & Davidov, 2010), which suggests that these parenting behaviours are dependent on different domains of parenting skills. Additionally, the link between parental MST and children's ToM appears to be domain-specific, as the present study found that parental MST did not predict children's language longitudinally.

In terms of future research, my findings suggest that interventions aimed at increasing parental MST might be important for promoting children's ToM. Two pioneering training studies examined the impact of intervention on parental MST when discussing past experiences with their children and found that, as opposed to control groups, parents from the training group significantly increased their MST. Van Bergen et al. (2009) recruited parents with children aged 37–59 months and examined parental MST for 6 months after the intervention.[36] Compared to the parents who did not receive interventions, parents from the intervention groups engaged in more MST with their children after controlling for children's initial language ability and emotional understanding. Additionally, children with parents who received training used more MST after 6 months, as compared to their peers from the non-intervention group, regardless of their initial language ability and prior emotion understanding (Van Bergen et al., 2009). Likewise, a more recent study found that mothers with children aged 3.5–5 years engaged in

[36] Eighty children participated in the assessment at the initial phase of the study, 71 children completed the training, 61 children completed the assessment after the training, and 44 children completed all stages of the study, including the 6-month follow-up testing (Van Bergen et al., 2009).

significantly more MST after the intervention compared to parents who did not receive training, after controlling for mothers' initial MST, children's initial language, and emotion understanding (Van Bergen et al., 2018).[37] Taken together, these findings highlight the promising effects of MST intervention on increasing parents' inclination to address mental states in their conversations. In the present study, I found that parental MST predicted children's ToM across time uniquely from the influence of other factors, such as children's prior ToM or initial language ability. Therefore, my findings suggest that future interventions should focus on enhancing parental MST, which appears to be crucial for children's ToM.

There are at least two key limitations in the current study. First, the relatively brief open-ended task for observing parent–child interaction in the present study may not have elicited parental connected talk adequately, and joint activity between parents and children in a home setting might therefore be more appropriate for studying parent–child conversation. Second, I did not use a longitudinal design to examine how connected talk might change over time. However, my findings highlight the specific influence of parental MST on children's ToM and child-driven effects of language on parental MST. These findings seem to support the socio-constructivist accounts, which suggest that parent–child interaction facilitates children's understanding about other people's beliefs and feelings (Carpendale & Lewis, 2020). To summarise, my findings highlight that parental MST appears to be the most important parenting behaviour promoting children's ToM (Devine & Hughes, 2017). The present findings are also consistent with the theoretical work on socioconstructivist accounts and previous research highlighting a link between parental MST and children's ToM (e.g., Ensor & Hughes, 2008; Ruffman et al., 2002; Tompkins et al., 2017).

[37] There were 26 children who participated in the study (Van Bergen et al., 2018).

Another limitation is that the present study focused predominantly on mothers. Previous research has noted the specific features of father–child interaction compared with mother–child interaction (e.g., Steenhoff et al., 2019). For instance, fathers have demonstrated a higher degree of autonomy compared with mothers and more physical play with their children (John et al., 2012). Considering the uniqueness of paternal parenting styles, Cabrera et al. (2018) suggested that researchers should consider adopting measures developed specifically for fathers. Therefore, more research is needed to gain an understanding of the specific aspects of paternal parenting that are important for children's social understanding.

Conclusions

In this study, I considered the unique influences of multiple parenting constructs in relation to children's ToM. Despite prior work linking parental MM, parental connected talk, and parental MST to children's ToM, these measures appear to be distinct from one another. My findings highlight that parental MST was the only parenting dimension that uniquely predicted children's ToM longitudinally, rather than having an impact on the children's general cognition. Furthermore, the results suggest child-driven effects on parental MST specifically, in which children who demonstrated more advanced language ability in the early phase of the study elicited more MST from parents at the follow up. Interestingly, parents used more MST with boys at Time 2 compared to parents with girls. Hence, these findings suggest that certain characteristics of children might induce more MST from their parents. To summarise, the findings from the present study appear to be in line with socio-constructivist accounts that highlight the link between children's early experiences with parents using talk and children's social understanding. The findings from my study suggest that parental MST promotes children's

ToM; hence, researchers should consider implementing interventions that aim to improve parental MST.

References

Adamson, L. B., Bakeman, R., Deckner, D. F., & Nelson, P. B. (2012). Rating parent–child interactions: Joint engagement, communication dynamics, and shared topics in autism, Down syndrome, and typical development. *Journal of Autism and Developmental Disorders*, *42*(12), 2622–2635.

Aznar, A., & Tenenbaum, H. R. (2015). Gender and age differences in parent–child emotion talk. *British Journal of Developmental Psychology*, *33*(1), 148–155.

Aznar, A., & Tenenbaum, H. R. (2020). Gender comparisons in mother–child emotion talk: A meta-analysis. *Sex Roles*, *82*(3), 155–162.

Barreto, A. L., Osório, A., Baptista, J., Fearon, P., & Martins, C. (2018). Association between theory of mind and mental state talk in preschoolers and later social competence and behaviour. *Infant and Child Development*, *27*(2), e2060.

Bell, R. Q. (1968). A reinterpretation of the direction of effects in studies of socialization. *Psychological Review*, *75*(2), 81.

Bernier, A., McMahon, C. A., & Perrier, R. (2017). Maternal mind-mindedness and children's school readiness: A longitudinal study of developmental processes. *Developmental Psychology*, *53*(2), 210.

Bornstein, M. H., Tamis-LeMonda, C. S., Hahn, C. S., & Haynes, O. M. (2008). Maternal responsiveness to young children at three ages: Longitudinal analysis of a multidimensional, modular, and specific parenting construct. *Developmental Psychology*, *44*(3), 867.

Brophy, M., & Dunn, J. (2002). What did Mummy say? Dyadic interactions between young "hard to manage" children and their mothers. *Journal of Abnormal Child Psychology*, *30*(2), 103–112.

Brown, J. R., Donelan-McCall, N., & Dunn, J. (1996). Why talk about mental states? The significance of children's conversations with friends, siblings, and mothers. *Child Development*, *67*(3), 836–849.

Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S., & Munafò, M. R. (2013). Power Failure: Why Small Sample Size Undermines the Reliability of Neuroscience. Nature Reviews Neuroscience, *14*(5), 365–376.

Cabrera, N. J., Volling, B. L., & Barr, R. (2018). Fathers are parents, too! Widening the lens on parenting for children's development. *Child Development Perspectiv*es, *12*(3), 152-157.

Carpendale, J., & Lewis, C. (2004). Constructing an understanding of mind: The development of children's social understanding within social interaction. *Behavioral and Brain Sciences, 27*(1), 79–151.

Carpendale, J., & Lewis, C. (2020). *What Makes Us Human: How Minds Develop through Social Interactions*. Routledge.

Carr, A., Slade, L., Yuill, N., Sullivan, S., & Ruffman, T. (2018). Minding the children: A longitudinal study of mental state talk, theory of mind, and behavioural adjustment from the age of 3 to 10. *Social Development*, *27*(4), 826–840.

Cohen J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge Academic.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge.

Devine, R. T., & Hughes, C. (2017). Let's talk: Parents' mental talk (not mind-mindedness or mindreading capacity) predicts children's false belief understanding. *Child Development*, *90*(4), 1236–1253.

Devine, R. T., & Hughes, C. (2018). Family correlates of false belief understanding in early childhood: A meta-analysis. *Child Development*, *89*(3), 971–987.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135–168.

Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development, 62*(6), 1352–1366.

Dunn, J., & Cutting, A. L. (1999). Understanding others, and individual differences in friendship interactions in young children. *Social Development, 8*(2), 201–219.

Ensor, R., & Hughes, C. (2008). Content or connectedness? Mother–child talk and early social understanding. *Child Development, 79*(1), 201–216.

Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. Dental Press Journal of Orthodontics, *19*(4), 27-29.

Fishburn, S., Meins, E., Greehow, S., Jones, C., Hackett, S., Biehal, N., Baldwin, H., Cusworth, L., & Wade, J. (2017). Mind-mindedness in parents of looked after children. *Developmental Psychology, 53*(10), 1954–1965.

Fonagy, P., Gergely, G., & Target, M. (2007). The parent–infant dyad and the construction of the subjective self. *Journal of Child Psychology and Psychiatry, 48*(3–4), 288–328.

Gilkerson, J., Richards, J. A., Warren, S. F., Oller, D. K., Russo, R., & Vohr, B. (2018). Language experience in the second year of life and language outcomes in late childhood. *Pediatrics, 142*(4), 1–11.

Gopnik, A., & Astington, J. W. (1988). Children's understanding of representational change and its relation to the understanding of false belief and the appearance-reality distinction. *Child Development, 59*(1), 26–37.

Grusec, J. E., & Davidov, M. (2010). Integrating different perspectives on socialization theory and research: A domain-specific approach. *Child Development, 81*(3), 687–709.

Grusec, J. E. (2011). Socialization processes in the family: Social and emotional development. *Annual Review of Psychology, 62,* 243–269.

Hair, J. F., Black, W. C., Anderson, R. E., & Babin, B. J. (2013). *Multivariate data analysis*. Pearson Education Limited.

Harris, P. L., Johnson, C. N., Hutton, D., Andrews, G., & Cooke, T. (1989). Young children's theory of mind and emotion. *Cognition & Emotion*, *3*(4), 379–400.

Harrist, A. W., & Waugh, R. M. (2002). Dyadic synchrony: Its structure and function in children's development. *Developmental Review*, *22*(4), 555–592.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experiences of young American children*. Paul H. Brookes Publishing Co., Inc.

Hertzog, C., & Nesselroade, J. R. (2003). Assessing psychological change in adulthood: An overview of methodological issues. *Psychology and Aging*, *18*(4), 639.

Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., Yust, P. K., & Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science*, *26*(7), 1071–1083.

Hughes, C. (1998). Finding your marbles: Does preschoolers' strategic behavior predict later understanding of mind? *Developmental Psychology*, *34*(6), 1326.

John, A., Halliburton, A., & Humphrey, J. (2013). Child–mother and child–father play interaction patterns with preschoolers. *Early Child Development and Care*, *183*(3–4), 483-497.

Kochanska, G. (2002). Mutually responsive orientation between mothers and their young children: A context for the early development of conscience. *Current Directions in Psychological Science*, *11*(6), 191–195.

Kuczynski, L., & Parkin, C. M. (2007). Agency and bidirectionality in socialization: Interactions, transactions, and relational dialectics. In J. E. Grusec & P. D. Hastings (Eds.*), Handbook of socialization: Theory and research* (pp. 259–283). The Guilford Press.

Kwon, K. A., Bingham, G., Lewsader, J., Jeon, H. J., & Elicker, J. (2013). Structured task versus free play: The influence of social context on parenting quality, toddlers' engagement with parents and play behaviors, and parent–toddler language use. *Child & Youth Care Forum. 42(3),* 207–224

LaBounty, J., Wellman, H. M., Olson, S., Lagattuta, K., & Liu, D. (2008). Mothers' and fathers' use of internal state talk with their young children. *Social Development, 17*(4), 757–775.

Laranjo, J., & Bernier, A. (2013). Children's expressive language in early toddlerhood: Links to prior maternal mind-mindedness. *Early Child Development and Care, 183*(7), 951–962.

Larkin, F., Schacht, R., Oostenbroek, J., Hayward, E., Fernyhough, C., Muñoz Centifanti, L. C., & Meins, E. (2020). Mind-mindedness versus mentalistic interpretations of behavior: Is mind-mindedness a relational construct? *Infant Mental Health Journal* 1–12.

Lamb, M., & Sherrod, L. R. (1981). *Infant social cognition: Empirical and theoretical considerations.* L. Erlbaum Associates.

Little, T. D. (2013). *Longitudinal structural equation modeling*. Guilford Press.

Lok, S. M., & McMahon, C. A. (2006). Mothers' thoughts about their children: Links between mind-mindedness and emotional availability. *British Journal of Developmental Psychology, 24*(3), 477–488.

Lundy, B. L. (2013). Paternal and maternal mind-mindedness and preschoolers' theory of mind: The mediating role of interactional attunement. *Social Development, 22*(1), 58–74.

Madigan, S., Prime, H., Graham, S. A., Rodrigues, M., Anderson, N., Khoury, J., & Jenkins, J. M. (2019). Parenting behavior and child language: A meta-analysis. *Pediatrics, 144*(4), 1–12.

Martin, R. M., & Green, J. A. (2005). The use of emotion explanations by mothers: Relation to preschoolers' gender and understanding of emotions. *Social Development, 14*(2), 229–249.

McElwain, N. L., Ravindran, N., Emery, H. T., & Swartz, R. (2019). Theory of mind as a mechanism linking mother–toddler relationship quality and child–friend interaction during the preschool years. *Social Development, 28*(4), 998–1015.

Meins, E. (1997). *Essays in developmental psychology. Security of attachment and the social development of cognition.* Psychology Press/Erlbaum (UK), Taylor & Francis.

Meins, E. (1999). Sensitivity, security and internal working models: Bridging the transmission gap. *Attachment & Human Development, 1*(3), 325–342.

Meins, E. (2013). Sensitive attunement to infants' internal states: Operationalizing the construct of mind-mindedness. *Attachment & Human Development, 15*(5–6), 524–544.

Meins, E., & Fernyhough, C. (2015). *Mind-mindedness coding manual, Version 2.2* [Unpublished manuscript]. Department of Psychology, University of York, York, United Kingdom.

Meins, E., Fernyhough, C., Arnott, B., Leekam, S. R., & de Rosnay, M. (2013). Mind-mindedness and theory of mind: Mediating roles of language and perspectival symbolic play. *Child Development, 84*(5), 1777–1790.

Meins, E., Fernyhough, C., Arnott, B., Turner, M., & Leekam, S. R. (2011). Mother-versus infant-centered correlates of maternal mind-mindedness in the first year of life. *Infancy, 16*(2), 137–165.

Meins, E., Fernyhough, C., & Centifanti, L. C. (2019). Mothers' early mind-mindedness predicts educational attainment in socially and economically disadvantaged British children. *Child Development*, *90*(4), e454–e467.

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry*, *42*(5), 637–648.

Meins, E., Fernyhough, C., & Harris-Waller, J. (2014). Is mind-mindedness trait-like or a quality of close relationships? Evidence from descriptions of significant others, famous people, and works of art. *Cognition*, *130*(3), 417–427.

Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind–mindedness and attachment security as predictors of theory of mind understanding. *Child Development, 73*(6), 1715–1726.

Rowe, M., & Snow, C. (2020). (2020). Analysing input quality along three dimensions: Interactive, linguistic, and conceptual. *Journal of Child Language*, *47*(1), 5–21.

Meyer, M. (1969). *Frog, where are you?* Dial.

Moerbeek, K. (1994). *Can't sleep*. Golden Books.

Nawaz, S., & Lewis, C. (2018). Mother–child conversation and social understanding in Pakistan. *International Journal of Behavioral Development*, *42*(5), 496–505.

Nelson, K., Skwerer, D. P., Goldman, S., Henseler, S., Presler, N., & Walkenfeld, F. F. (2003). Entering a community of minds: An experiential approach to 'theory of mind'. *Human Development*, *46*(1), 24–46.

Olson, J., & Masur, E. (2020). Mothers' talk about perceptions, wants, feelings, and thoughts during play: General or specific relations to infants' internal state vocabularies and gender? *Language Learning and Development, 16*(2), 196–209.

Ontai, L. L., & Virmani, E. A. (2010). Predicting elements of early maternal elaborative discourse from 12 to 18 months of age. *Early Childhood Research Quarterly, 25*(1), 98–111.

Perner, J., Mauer, M. C., & Hildenbrand, M. (2011). Identity: Key to children's understanding of belief. *Science, 333*(6041), 474–477.

Roger, K. M., Rinaldi, C. M., & Howe, N. (2012). Mothers' and fathers' internal state language with their young children: An examination of gender differences during an emotions task. *Infant and Child Development, 21*(6), 646–666.

Romeo, R. R., Leonard, J. A., Robinson, S. T., West, M. R., Mackey, A. P., Rowe, M. L., & Gabrieli, J. D. (2018). Beyond the 30-million-word gap: Children's conversational exposure is associated with language-related brain function. *Psychological Science, 29*(5), 700–710.

Ruffman, T., Slade, L., & Crowe, E. (2002). The relation between children's and mothers' mental state language and theory-of-mind understanding. *Child Development, 73*(3), 734–751.

Rust, J. (2003). *Wechsler preschool and primary scale of intelligence* (3rd ed.; *WIPPSI-UK*). Harcourt Assessment.

Ryckebusch, C., & Marcos, H. (2004). Speech acts, social context and parent–toddler play between the ages of 1;5 and 2;3. *Journal of Pragmatics, 36*(5), 883–897.

Selig, J. P., & Little, T. D. (2012). Autoregressive and cross-lagged panel analysis for longitudinal data. In B. Laursen, T. D. Little, & N. A. Card (Eds.), *Handbook of developmental research methods* (pp. 265–278). Guilford Press.

Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development*, *17*(3), 737–754.

Slomkowski, C., & Dunn, J. (1996). Young children's understanding of other people's beliefs and feelings and their connected communication with friends. *Developmental Psychology*, *32*(3), 442.

Steenhoff, T., Tharner, A., & Væver, M. S. (2019). Mothers' and fathers' observed interaction with preschoolers: Similarities and differences in parenting behavior in a well-resourced sample. *PloS one*, *14*(8), e0221661.

Sullivan, K., Zaitchik, D., & Tager-Flusberg, H. (1994). Preschoolers can attribute second-order beliefs. *Developmental Psychology*, *30*(3), 395.

Sung, J., & Hsu, H. C. (2014). Collaborative mother–toddler communication and theory of mind development at age 4. *Journal of Applied Developmental Psychology*, *35*(5), 381–391.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24–54.

Tompkins, V., Benigno, J. P., Kiger Lee, B., & Wright, B. M. (2018). The relation between parents' mental state talk and children's social understanding: A meta-analysis. *Social Development*, *27*(2), 223–246.

Vallotton, C. D., Mastergeorge, A., Foster, T., Decker, K. B., & Ayoub, C. (2017). Parenting supports for early vocabulary development: Specific effects of sensitivity and stimulation through infancy. *Infancy*, *22*(1), 78–107.

Van Bergen, P. V., Salmon, K., Dadds, M. R., & Allen, J. (2009). The effects of mother training in emotion-rich, elaborative reminiscing on children's shared recall and emotion knowledge. *Journal of Cognition and Development*, *10*(3), 162–187.

Van Bergen, P., Salmon, K., & Dadds, M. R. (2018). Coaching mothers of typical and conduct problem children in elaborative parent-child reminiscing: Influences of a randomized controlled trial on reminiscing behaviour and everyday talk preferences. *Behaviour Research and Therapy*, *111*, 9–18.

van Ginkel, J. R., Linting, M., Rippe, R. C., & van der Voort, A. (2020). Rebutting existing misconceptions about multiple imputation as a method for handling missing data. *Journal of Personality Assessment, 102*(3), 297–308.

Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development, 72*(3), 655–684.

Yatziv, T., Kessler, Y., & Atzaba-Poria, N. (2018). What's going on in my baby's mind? Mothers' executive functions contribute to individual differences in maternal mentalization during mother-infant interactions. *PLOS One*, *13*(11), e0207869.

Yatziv, T., Kessler, Y., & Atzaba-Poria, N. (2020). When do mothers' executive functions contribute to their representations of their child's mind? A contextual view on parental reflective functioning and mind-mindedness. *Developmental Psychology, 56*(6), 1191.

Zeegers, M. A., Colonnesi, C., Stams, G. J. J., & Meins, E. (2017). Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant–parent attachment. *Psychological Bulletin, 143*(12), 1245.