

Université de Montréal

**L'orientation mentale maternelle :
Relation avec le développement du langage et de la théorie
de l'esprit chez les enfants de 2 à 4 ans**

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Résumé

L'étude de l'orientation mentale (OM), soit l'habileté des parents à concevoir et à traiter leur enfant comme un individu disposant d'une vie mentale autonome et active (Meins, 1997), a gagné en intérêt grâce à la démonstration de ses associations avec plusieurs sphères du développement de l'enfant, entre autres avec le style d'acquisition linguistique chez les enfants de 20 mois ainsi que le développement de la théorie de l'esprit chez les enfants d'âge préscolaire (p. ex., Meins & Fernyhough, 1999). En dépit de ces résultats, l'étude du développement du vocabulaire et des stades initiaux de la théorie de l'esprit chez les enfants a été négligée dans cette littérature.

La présente thèse est composée de trois articles empiriques et vise à combler certaines lacunes de la littérature actuelle. Le premier article vise à examiner les liens longitudinaux entre l'OM maternelle et le vocabulaire expressif chez les enfants de 2 ans. Les deuxième et troisième articles ont pour but d'évaluer les relations longitudinales entre l'OM maternelle, la sécurité d'attachement des enfants et les toutes premières articulations de la théorie de l'esprit chez les enfants de 2 ans, puis 2 ans plus tard, avec la théorie de l'esprit chez les enfants de 4 ans.

Les données des trois articles proviennent de cinq visites effectuées au domicile de 84 dyades mère-enfant. À 12 mois, l'OM maternelle a été mesurée lors de jeux libres mère-enfant à l'aide du système de codification de Meins et al. (2001). À 15 mois, la sécurité d'attachement de l'enfant a été mesurée par un observateur avec le Q-Sort d'attachement (Waters & Deane, 1985). À 2 ans, les mères ont évalué le langage de leur enfant à l'aide des inventaires MacArthur du développement de la communication (Dionne, Tremblay, Boivin,

Laplante, & Pérusse, 2003). Finalement, la théorie de l'esprit de l'enfant a été mesurée à 2 et 4 ans à l'aide de diverses tâches expérimentales (Carlson, Mandell, & Williams, 2004).

Les résultats du premier article indiquent que l'OM maternelle est associée au développement du vocabulaire expressif des enfants de 2 ans. Les résultats des deuxième et troisième articles indiquent que la compréhension des enfants de 2 et 4 ans aux tâches de théorie de l'esprit est associée à l'OM maternelle. De plus, ces deux articles ont démontré que les garçons, mais pas les filles, présentant des comportements d'attachement davantage sécurés ont obtenu de meilleures performances à une tâche demandant la compréhension des perspectives visuelles de leur mère à 2 ans et de celles d'une étrangère à 4 ans. En conclusion, les résultats de la thèse suggèrent que l'utilisation que les mères font de commentaires mentaux à 12 mois semble favoriser l'acquisition de mots dans le vocabulaire expressif de leur enfant à 2 ans ainsi que le développement d'une meilleure compréhension aux tâches de théorie de l'esprit à 2 et 4 ans.

Mots-clés : orientation mentale, théorie de l'esprit, développement du langage expressif, sécurité d'attachement.

Abstract

Studies on mind-mindedness (MM), which is an indication of parents' inclination to conceive and treat their child as an independent individual with an autonomous and active mental life (Meins, 1997), have grown in interest because of the associations found with children's developmental areas, such as with 20-month-olds' acquisition of linguistic style and with preschoolers' theory of mind development (ToM) (e.g., Meins & Fernyhough, 1999). Despite these results, studies on expressive vocabulary and earlier ToM stages were neglected in this literature.

This thesis is composed of three empirical articles and aims to fill the gaps in the current literature. The first paper aims to examine the longitudinal links between maternal MM and children's expressive vocabulary at 2 years of age. The second and third articles aim to evaluate the prospective relations between maternal MM, children's attachment security and 2-year-olds' first articulations of ToM understanding, and 2 years later, with 4-year-olds' ToM understanding.

The data of the three articles was collected from five home visits made with 84 mother-infant dyads. At 12 months, maternal MM was measured during mother-child free plays with Meins et al. (2001) coding scheme. At 15 months, children's attachment security was measured with the Attachment Q-Sort (Waters & Deane, 1985) by a research assistant. At 2 years of age, mothers were asked to complete the MacArthur Communicative Development Inventory (Dionne, Tremblay, Boivin, Laplante, & Pérusse, 2003) to measure their child's expressive vocabulary. Finally, children's ToM was assessed with different experimental tasks at 2 and 4 years of age (Carlson, Mandell, & Williams, 2004).

Results of the first paper suggested that maternal MM is related to children's expressive language at 2 years of age. Results of the second and third papers proposed that 2- and 4-year-olds' understanding on ToM tasks is associated with maternal MM. Furthermore, results from these two articles showed that more securely attached boys, but not girls, performed better on a task requiring comprehension of their mothers' visual perspective at 2 years of age and of a stranger's visual perspective at 4 years of age. In conclusion, results of this thesis suggest that mothers more inclined to use mental comments at 12 months have children that acquire more words in their expressive vocabulary at 2 years of age and who show a better understanding on ToM tasks at 2 and 4 years of age.

Keywords: mind-mindedness, theory of mind, expressive language development, attachment security.

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Liste des abréviations

AAI	Adult Attachment Interview
AQS	Attachment Q-Sort
ICC	Intra-class correlation
MCDI	MacArthur Communicative Development Inventory
MM	Mind-mindedness
OM	Orientation mentale
SES	Socio economic-status
ToM	Theory of mind

« Il reste toujours quelque chose de l'enfance, toujours... »

Marguerite Duras

« On est de son enfance comme on est d'un pays. »

Antoine de Saint-Exupéry

« Saudade. »

Pour Lucia et Carlos.

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Introduction

Les parents sont les premiers agents de socialisation de l'enfant et ils jouent un rôle capital dans leur développement social (Grusec & Davidov, 2007). Cette influence qu'ils exercent sur le développement de l'enfant va au-delà de la sphère sociale. La recherche empirique a appuyé cette idée et a démontré à maintes reprises que les toutes premières expériences relationnelles avec les parents ont un impact considérable sur différents aspects du développement de l'enfant, tels que le développement cognitif (Bornstein, 1988; Dunham & Dunham, 1990; Meins, 1997), socio-affectif (voir Thompson, 2008), moral (Dunn, Brown, & Maguire, 1995) et neuroendocrinien (Spangler, Schieche, Ilg, Maier, & Ackermann, 1994). Les études ont cherché ce qui dans la relation avec le parent venait influencer ces différentes sphères du développement de l'enfant. Plusieurs comportements parentaux spécifiques ont été identifiés, tels que la sensibilité maternelle et le soutien à l'autonomie (p. ex., Fei-Yin Ng, Kenney-Benson, & Pomerantz, 2004; Lemelin, Tarabulsky, & Provost, 2006). L'exploration des divers comportements parentaux pouvant influencer le développement de l'enfant se poursuit.

L'orientation mentale

C'est dans ce contexte scientifique que Meins (1999) a proposé le concept d'orientation mentale (OM) comme comportement parental pouvant également influencer le développement de l'enfant. L'OM est cette habileté des parents à considérer leur enfant comme un individu disposant d'une vie mentale autonome et active, plutôt qu'uniquement comme une créature ayant des besoins à satisfaire. L'OM demande que les parents considèrent leur enfant comme possédant leurs propres pensées, désirs, croyances, et puissent les inférer correctement à partir du comportement de l'enfant (Meins, 1997).

Lors de l'introduction du concept d'OM, Meins (1997) a proposé que l'OM puisse être un antécédent à la sensibilité maternelle, soit la capacité des mères de percevoir les signaux de leur enfant et d'y répondre de façon rapide et appropriée (Ainsworth, Bell, & Stayton, 1971). Meins explique qu'afin que les mères puissent faire preuve de sensibilité, elles doivent avant tout faire preuve d'OM et se montrer capables de comprendre les pensées, les désirs et les croyances sous-jacents aux signaux de leur enfant. À partir de cette lecture adéquate de la vie mentale de leur enfant, les mères pourront ensuite répondre rapidement et de façon appropriée aux signaux de leur enfant. Ainsi, l'OM serait nécessaire et préalable à la sensibilité maternelle. Des résultats empiriques (Laranjo, Bernier, & Meins, 2008; Lundy, 2003) appuient d'ailleurs cette idée et suggèrent que l'OM serait effectivement un pré-requis à la sensibilité maternelle.

Afin de mesurer l'OM, Meins et al. (1998; 2001) ont mis au point deux méthodes de mesure, soit une par entrevue (représentationnelle) et une par observation d'interaction parent-enfant (comportementale). La majorité des études dans ce domaine s'étant penchées sur l'étude de l'OM chez les mères, la description des mesures qui suit sera faite en fonction de l'OM maternelle.

La mesure par entrevue consiste en une question ouverte qui invite les mères à décrire leur enfant. La réponse des mères est analysée de façon à ce que chaque descripteur soit classé dans une catégorie: comportemental, général, mental et physique. Le but de l'entrevue est d'évaluer la tendance des mères à concevoir leur enfant comme un être ayant une vie mentale autonome, telle que reflétée par leur tendance à décrire leur enfant en termes mentaux plutôt que généraux, comportementaux ou physiques. Des études récentes (Demers, Bernier, Tarabulsky, & Provost, 2010; McMahon & Meins, 2011) ont bonifié la mesure par entrevue en

y ajoutant la valence des descripteurs mentaux (positifs, négatifs ou neutres) et la richesse de la description (utilisation d'exemples pour soutenir l'utilisation de descripteurs mentaux) et ont démontré que l'utilisation de descripteurs mentaux positifs et la richesse de la description sont associées à la sensibilité maternelle.

Les études qui ont utilisé la mesure d'OM par entrevue sont arrivées à des résultats contradictoires. Alors que Meins et al. (1998) ont démontré que les mères d'enfants présentant un attachement de type sécure ont significativement plus tendance à décrire leur enfant de 35 à 38 mois en termes mentaux que les mères d'enfants présentant un attachement de type insécure, Bernier et Dozier (2003) ont plutôt trouvé une corrélation négative entre la sécurité d'attachement d'enfants et le nombre de descripteurs mentaux fournis par leurs mères d'accueil lors d'une entrevue effectuée lorsque les enfants avaient entre 6 et 25 mois. Bernier et Dozier (2003) expliquent ce résultat inattendu en suggérant qu'il peut être inapproprié, en termes de sensibilité maternelle, d'accorder autant d'attention aux caractéristiques mentales d'enfants d'un si jeune âge, puisque la vie mentale, à cet âge, est peu manifeste de façon observable. Ces résultats contradictoires ont éveillé un doute quant à l'utilisation de la mesure par entrevue, laissant ainsi la place à la mesure comportementale de l'OM comme mesure privilégiée.

La mesure comportementale consiste en l'observation d'un jeu libre mère-enfant au cours de la première année et demie de vie de l'enfant, soit entre 6 et 18 mois. La définition même de l'OM propose la présence chez les mères d'une habileté à se représenter et à refléter la vie mentale de leur enfant en commentant ses états mentaux lorsqu'en interaction avec celui-ci. La mesure comportementale est donc plus à même de mesurer l'entièreté du concept. Cinq comportements avaient originalement été considérés comme étant des indicateurs de

l'OM de la mère et étaient tenus en compte lors de la codification: l'imitation de l'enfant, la réponse de la mère aux actions dirigées de l'enfant vers un objet, la réponse de la mère aux changements de direction du regard de l'enfant, la pertinence des commentaires de la mère sur l'état mental de l'enfant, et l'encouragement à l'autonomie. Les résultats empiriques ont toutefois démontré que la pertinence des commentaires de la mère sur l'état mental de l'enfant à 6 mois était le seul aspect de l'OM relié à la sécurité d'attachement à 12 mois (Meins et al., 2001; Meins et al., 2002), à la compréhension de la théorie de l'esprit à 45 et 48 mois (Meins et al., 2002; Meins et al., 2003), et à la capacité des enfants à 55 mois d'attribuer des pensées à des individus engagés dans diverses activités (Meins et al., 2003). En raison de ces résultats, parmi les cinq composantes originellement proposées afin de mesurer l'OM maternelle de façon comportementale, seule la *pertinence des commentaires mentaux* est maintenant utilisée (Meins, 1999; Grille de codification; Voir Annexe A). La définition même de l'OM propose la présence chez les mères d'une habileté à se représenter et à refléter la vie mentale de leur enfant en commentant ses états mentaux lorsqu'en interaction avec celui-ci. Contrairement à la mesure par entrevue qui ne tient compte que de l'aspect représentationnel, l'utilisation de commentaires mentaux pertinents est plus à même de mesurer l'entièreté du concept puisqu'elle tient compte à la fois de la capacité représentationnelle chez les mères vis-à-vis la vie mentale de leur enfant et de leur capacité à refléter cette vie mentale à leur enfant via l'utilisation des commentaires mentaux.

La mesure comportementale d'OM semble en apparence très similaire à la mesure bien connue du « *mental-state talk* », mais en réalité, elle se veut bien différente. Le « *mental-state talk* » tient compte de la tendance des parents à s'engager dans un discours de nature mentale avec leur enfant, en utilisant un style de conversation qui implique de fréquentes références

aux désirs, aux pensées et aux émotions *des individus en général* (Bartsch & Wellman, 1995; Ruffman et al., 2002). Quant à elle, la mesure comportementale d'OM se centre sur l'utilisation que font les parents de commentaires sur les états mentaux *de leurs enfants* spécifiquement, lorsqu'ils s'adressent à eux. Également, la mesure comportementale d'OM tient compte de la *pertinence* de ces commentaires, en veillant à ce qu'ils soient en accord avec l'état mental de leurs enfants, ce dont la mesure du « *mental-state talk* » ne tient pas compte.

Tel que mentionné, Meins (1997) avait proposé que l'OM pourrait jouer un rôle dans le développement des enfants. Principalement, ce rôle a été considéré en lien avec le développement de la sécurité d'attachement des enfants. Les études subséquentes, tout en appuyant cette hypothèse, ont en fait démontré que l'OM jouerait un rôle important dans plusieurs et diverses sphères du développement des enfants.

En effet, plusieurs études ont trouvé des associations entre l'OM maternelle et le développement de la sécurité d'attachement chez les enfants (p. ex., Laranjo et al., 2008; Lundy, 2003). Les mères plus susceptibles de décrire leur enfant de 3 ans avec des descripteurs mentaux ou qui utilisent davantage de commentaires mentaux appropriés lorsqu'en interaction avec leur enfant de 6 mois ont des enfants qui, entre 11 et 13 mois, présentent un attachement davantage sécurisant (Meins et al., 1998; Meins et al., 2001). Demers et ses collègues (2010) ont ajouté que les mères qui utilisent plus de commentaires mentaux *négatifs* en interaction avec leur enfant ont des enfants plus susceptibles de développer un attachement de type insécure.

Également, des associations ont fréquemment été trouvées entre l'OM maternelle et le développement socio-cognitif des enfants, soit avec la théorie de l'esprit (compréhension des

enfants des états mentaux, tels que les désirs, les croyances et les intentions) et les fonctions exécutives des enfants (ensemble de processus qui sous-tendent le comportement intentionnel visant la réalisation d'un objectif, tels l'inhibition volontaire, la mémoire de travail et la flexibilité attentionnelle). Des études ont démontré que l'OM maternelle et la théorie de l'esprit des enfants sont associées : les mères qui utilisent davantage de descripteurs mentaux afin de décrire leur enfant à 3 ans ou qui font davantage de commentaires mentaux appropriés en interaction avec leur enfant à 6 mois ont des enfants qui par la suite, à 4 et 5 ans, obtiennent des résultats supérieurs aux tâches de théorie de l'esprit, soit celles de compréhension des fausses croyances, d'apparence-réalité et des émotions, ainsi que celles demandant d'attribuer des pensées à des individus engagés dans diverses activités à 55 mois (Meins & Fernyhough, 1999; Meins et al., 2002; Meins et al., 2003). Également, l'OM maternelle est associée aux fonctions exécutives des enfants de 18 mois (mémoire de travail) et 26 mois (flexibilité cognitive et contrôle d'impulsion) (Bernier et al., 2010).

En somme, plusieurs études démontrent l'importance de l'OM maternelle dans plusieurs sphères du développement de l'enfant, tant sur le plan socio-affectif avec la sécurité d'attachement chez les enfants de 12 et 18 mois (Laranjo et al., 2008; Lundy, 2003; Meins et al., 1998; Meins et al., 2001), que sur le plan socio-cognitif avec le développement des fonctions exécutives chez les enfants de 18 à 26 mois (Bernier et al., 2010), et la théorie de l'esprit chez les enfants d'âge préscolaire (Meins & Fernyhough, 1999; Meins et al., 2002; Meins et al., 2003). Une étude récente démontre même que l'OM maternelle est associée à la consolidation du sommeil chez les enfants d'âge préscolaire, c'est-à-dire au pourcentage de sommeil de nuit chez les enfants de 3 et 4 ans (Bordeleau et al., 2012). Toutefois, certaines questions demeurent.

À ce jour, les études avec l'OM maternelle se sont penchées sur les stades avancés de la théorie de l'esprit vers 4 et 5 ans, négligeant ainsi l'étude du développement des stades précoces de la théorie de l'esprit chez les enfants. Ces études ont également centré leur intérêt sur les tâches de fausses croyances et d'émotions, négligeant ainsi les sphères de la théorie de l'esprit qui apparaissent très tôt dans le développement de l'enfant, tels que la compréhension des désirs et des perspectives visuelles. Par ailleurs, les autres sphères de développement chez les enfants ont été négligées, car la littérature a mis l'accent sur le développement de la théorie de l'esprit, en effleurant les fonctions exécutives. Le langage, un très proche corrélat de la théorie de l'esprit et un important indicateur du développement cognitif des enfants, n'a jamais été investigué en relation avec l'OM maternelle.

Il semble donc pertinent, pour la suite de la recherche sur l'OM, que des études examinent ces associations avec le langage chez les enfants ainsi que les stades précoces de la théorie de l'esprit. Ce sont ces objectifs que la thèse poursuit.

Le langage

Le développement du langage est associé de près au développement de la théorie de l'esprit chez les enfants (voir Milligan, Astington, & Dack, 2007). Les premières acquisitions du langage expressif se font autour de 12-13 mois (Fenson et al., 1994) et le développement se poursuit de façon lente lors des premiers mois de la 2^{ème} année. Toutefois, une augmentation rapide et un grand progrès au niveau de l'acquisition du vocabulaire surviennent lors de la seconde moitié de la 2^{ème} année ou après le cap des 50 premiers mots appris (Dapretto & Bjork, 2000). Cette période est connue sous le nom de « poussée du vocabulaire » (*vocabulary spurt*; Mc Carthy, 1946; qui cite Dewey, 1935; qui cite Decroly, 1934). Les jeunes enfants passent alors d'apprendre de 1 à 3 nouveaux mots par mois, à 10 à 20 nouveaux mots par

semaine (Berk, 2003). Cette croissance fulgurante au niveau de l'acquisition du vocabulaire est une étape très importante des développements cognitif et linguistique (Choi & Gopnik, 1995; Gershkoff-Stowe & Smith, 1997), qui indique la présence d'un changement cognitif majeur au cours de la seconde année de vie (Kagan, 1981; Lifter & Bloom, 1989). Notons toutefois que Ganger et Brent (2004) ont récemment démontré que bien que bon nombre d'enfants traversent cette période de croissance fulgurante au niveau du vocabulaire, cette étape ne serait pas « un rite de passage universel dans le développement du langage » chez les enfants. Malgré tout, la période de poussée du vocabulaire à 2 ans demeure tout de même une période du développement langagier fort propice à l'étude des différences individuelles chez les enfants.

L'acquisition du langage joue un rôle déterminant au cours des premières années de vie de l'enfant, soit au niveau : (a) de la préparation scolaire, telle que manifestée par les performances aux Q.I. verbal et non-verbal (Bornstein & Haynes, 1998); (b) de l'alphabétisation, soit la capacité d'apprendre à lire et à écrire (Chall, Jacobs, & Baldwin, 1990); (c) de la réussite scolaire (Beitchman, 2005); (d) des conduites agressives (Dionne, Tremblay, Boivin, Laplante, & Pérusse, 2003); et (e) du développement social, tel que manifesté par la présence de troubles de comportement ou encore d'inclinaison à être victime d'intimidation ou de rejet (Beitchman et al., 1996; Cohen, 2005).

Par ailleurs, plusieurs auteurs insistent sur l'influence de la qualité de la relation parent-enfant sur le développement du langage des enfants (p. ex., Kelly, Morisset, Barnard, Hammond, & Booth, 1996; Meins, 1998; Plomin & Dale, 2000). Différents indicateurs de la relation parent-enfant, tels que le discours parental (Hart & Risley, 1995), les attributions maternelles sur le sens des vocalisations (Meins, 1998) et la sensibilité maternelle (Bornstein,

1989; Tamis-LeMonda, Bornstein, & Baumwell, 2001) sont associés au développement du langage de l'enfant. L'OM maternelle pourrait, elle aussi, contribuer à expliquer une part du langage expressif des enfants.

En effet, afin de décoder les mots que son enfant tente de prononcer, le parent doit interpréter ce que ce dernier pense ou désire communiquer, en utilisant les connaissances passées, les gestes et les expressions de son enfant. Le parent qui fait preuve d'OM est plus susceptible de tenter de comprendre les états mentaux présents chez son enfant et de lui refléter les mots associés à ces états mentaux, permettant ainsi l'apprentissage chez l'enfant des termes appropriés pour décrire ses pensées, ses désirs ou ses intentions. Il est donc probable qu'un parent faisant preuve d'OM quotidiennement permette un développement plus rapide du langage expressif chez son enfant, de par l'exposition régulière aux termes appropriés décrivant l'expérience interne de l'enfant en lien avec les objets de son environnement (« Tu veux un verre de jus », « Tu l'aimes cette girafe », etc.). Bien qu'à ce jour aucune étude n'ait démontré que l'OM maternelle soit associée au langage expressif chez les enfants, des relations ont été observées avec le style d'acquisition linguistique chez les enfants de 20 mois, soit à un plus grand recours à des noms communs et moins aux « frozen phrases ». Celles-ci réfèrent à un ensemble de mots qui contient au moins un mot qui n'a pas été produit de façon singulière dans le vocabulaire de l'enfant auparavant et dont les mots ne sont pas dits en tant que mots distincts et séparés. Ces phrases se distinguent des combinaisons flexibles et originales de mots multiples que l'enfant construit à partir de mots individuels de son vocabulaire (Meins, 1998; Meins & Fernyhough, 1999). Davantage de recherche est donc nécessaire dans ce sens.

Théorie de l'esprit

Un des développements importants de la période préscolaire est l'acquisition de la théorie de l'esprit. Par l'acquisition de la théorie de l'esprit, qui se déroule surtout entre 1 et 6 ans, les enfants peuvent d'abord concevoir l'existence d'états mentaux, chez eux-mêmes et chez les autres, puis ils en viennent à comprendre qu'un lien existe entre les pensées des gens et leurs actions, ainsi qu'à comprendre que les gens agissent en fonction de leurs croyances et ce, même si celles-ci sont erronées. Ceci mène ultimement à la compréhension que les individus ont des intentions et sont dirigés par leurs perceptions, leurs émotions et leurs croyances (Cohen & Cashon, 2006; Tomasello, 2000).

La théorie de l'esprit est un facteur important dans le développement de la compétence sociale (pour une revue de la littérature, voir Hughes, 2011; Hughes & Leekam, 2004). Plusieurs études ont démontré que développer, le plus tôt possible, la théorie de l'esprit et la compréhension des émotions d'autrui avait des conséquences positives sur la qualité des relations sociales des enfants. Les enfants de 3 et 4 ans obtenant de meilleurs résultats à diverses tâches de théorie de l'esprit se montrent plus enclins à faire des propositions communes et à attribuer des rôles lors de jeux symboliques (Astington & Jenkins, 1995), plus matures au niveau socio-émotionnel (Lalonde & Chandler, 1995), capables de créer des personnages imaginaires dans leurs jeux symboliques et d'avoir recours à la fantaisie (Taylor & Carlson, 1997), et plus enclins à utiliser un jeu symbolique de haute qualité (Youngblade & Dunn, 1995). Le jeu est un bon indicateur de la compétence sociale de l'enfant puisqu'il fournit à l'enfant un cadre privilégié pour la rencontre avec ses pairs et permet le développement de ses relations sociales.

La compréhension des fausses croyances, qui consiste en la reconnaissance que les autres peuvent avoir des croyances sur le monde qui ne sont pas justes, est l'aspect de la théorie de l'esprit qui a reçu le plus d'attention par les chercheurs. Toutefois, la théorie de l'esprit ne se limite pas à la compréhension des fausses croyances mais est multidimensionnelle, s'étendant également notamment à la compréhension des perspectives visuelles, qui permettent de saisir d'où les gens tirent les informations à la base de leurs croyances (Flavell, Flavell, & Green, 1983; Flavell, Flavell, Green, & Wilcox, 1980). Flavell et ses collègues ont distingué deux niveaux de développement de la compréhension des perspectives visuelles (Flavell, 1974; Lempers, Flavell, & Flavell, 1977; Masangkay et al., 1974) : (1) Niveau 1, où les enfants comprennent que les autres peuvent voir des objets seulement si leurs yeux sont ouverts et dirigés vers l'objet, et si rien ne bloque leur vision de l'objet (Brooks & Meltzoff, 2002; Flavell, 1992); puis (2) Niveau 2, où les enfants comprennent que le même objet peut présenter plusieurs apparences/perspectives visuelles, et ainsi que si deux individus regardent ce même objet à partir de positions différentes, ceci donne lieu à différentes impressions visuelles. Des études récentes ont démontré que certains précurseurs du Niveau 1 des perspectives visuelles sont présents avant même l'âge de 2 ans, soit aussi tôt qu'à 12.5 mois (Luo & Baillargeon, 2007). Il est donc possible de mesurer, beaucoup plus tôt qu'on ne l'avait d'abord crû, des différences individuelles dans la compréhension des perceptions visuelles d'autrui. L'habileté à apprécier les désirs d'autrui, et le fait que ceux-ci puissent être différents de ceux de l'enfant lui-même, est un autre aspect de la théorie de l'esprit qui est en acquisition avant l'âge de 2 ans. Par exemple, les enfants de 18 mois peuvent reconnaître qu'une autre personne peut vouloir quelque chose qu'eux-mêmes ne

désirent pas (Repacholi & Gopnik, 1997), et peuvent prédire comment cette personne va se sentir si son désir est ou n'est pas satisfait (Wellman & Banerjee, 1991).

Ainsi, il est bien démontré que certains éléments de la théorie de l'esprit sont présents tôt dans le développement, dès l'âge de 2 ans. De plus, la recherche a permis d'observer d'importantes différences individuelles entre les enfants de 2 ans dans leur niveau de maîtrise de ces notions (Carlson, Mandell, & Williams, 2004; Hughes & Ensor, 2005). Ce qui explique ces différences individuelles dans les premiers stades du développement de la théorie de l'esprit est, toutefois, beaucoup moins connu.

De façon générale, les différences individuelles dans l'acquisition de la théorie de l'esprit peuvent être en partie expliquées par les expériences sociales des enfants (Carpendale & Lewis, 2004; 2006). En particulier, le discours maternel, notamment l'utilisation que font les mères de commentaires sur les états mentaux de leur enfant lors d'interactions, a été identifié comme étant un important prédicteur de la théorie de l'esprit chez les enfants (Symons, 2004). Lors des premiers mois de vie, une exposition quotidienne à ces commentaires mentaux offrirait aux enfants un contexte qui leur permet de comprendre leurs propres comportements en termes d'états mentaux sous-jacents, ce qui les aiderait à devenir davantage conscients de leurs propres états mentaux et de ceux des autres. Dunn et ses collègues sont les premiers à avoir souligné l'importance du contenu des conversations parent-enfant en démontrant que les enfants qui ont grandi dans des familles où il y avait davantage de « *mental-state talk* », ou de conversations à propos des émotions et des causes probables d'actions, réussissaient mieux dans des tâches de compréhension de fausses croyances et d'émotions (Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). Plusieurs études subséquentes ont d'ailleurs confirmé que le « *mental-*

state talk » est bénéfique à la compréhension de la théorie de l'esprit des enfants (Cutting & Dunn, 1999; de Rosnay, Pons, Harris, & Morrell, 2004; Ensor & Hughes, 2008; Taumoepeau & Ruffman, 2006; 2008). L'OM, qui s'apparente au « *mental state talk* », pourrait donc également contribuer à expliquer une part du développement de la théorie de l'esprit chez les enfants. Quelques études ont d'ailleurs rapporté des associations entre l'OM et le développement de la théorie de l'esprit chez les enfants de 4 et 5 ans (Meins & Fernyhough, 1999; Meins et al., 2002; Meins et al., 2003). Toutefois, à elle seule, l'OM ne peut pas expliquer le développement de la compréhension de la théorie de l'esprit chez les enfants. D'autres composantes de la dyade mère-enfant pourraient venir également jouer un rôle.

Plusieurs études ont documenté l'importance de la sécurité d'attachement dans les stades avancés de la théorie de l'esprit vers les âges de 4 et 5 ans (DeRosnay & Harris, 2002; Greig & Howe, 2001; Laible & Thompson, 1998; Ontai & Thompson, 2002; Repacholi & Trapolini, 2004; Steele, Steele, Croft, & Fonagy, 1999). En effet, il est souvent suggéré que le contexte relationnel dans lequel prennent place les commentaires sur les états mentaux des enfants est crucial (p. ex., Hughes & Leekam, 2004; Ontai & Thompson, 2008). Une relation d'attachement sécurisante permettrait à l'enfant de bénéficier de plus « d'espace mental » pour explorer les vies mentales d'autrui (Main, 1991). De plus, un attachement sécurisant procurerait à l'enfant des représentations stables et organisées des désirs et croyances de sa figure d'attachement, qui peuvent alors être généralisées à la compréhension des états mentaux d'autrui (Ontai & Thompson, 2008). Peu d'études, toutefois, ont considéré à la fois l'OM (ou le *mental-state talk*) et la sécurité d'attachement pour comprendre le développement de la théorie de l'esprit chez les enfants.

En somme, les études précédentes ont négligé l'examen des stades précoces de la théorie de l'esprit. Également, la recherche a identifié l'OM maternelle et la sécurité d'attachement, quoique rarement mesurées dans une même étude, comme étant toutes deux associées au développement des stades avancés de la théorie de l'esprit chez les enfants de 4 et 5 ans. En conséquence, ces deux variables seront considérées en relation avec deux aspects du développement précoce de la théorie de l'esprit chez les enfants, soit la compréhension des désirs et la compréhension des perspectives visuelles à 2 ans.

Objectifs de recherche

La thèse vise donc à faire avancer les connaissances sur les résultantes développementales de l'OM, et se centre sur deux d'entre elles : le langage expressif et la théorie de l'esprit chez les enfants. Ces deux importants indices de compétence socio-cognitive représentent également d'excellents prédicteurs du développement cognitif futur chez les enfants. La présente thèse, rédigée sous forme de trois articles scientifiques, examine donc trois principales questions de recherche.

Tout d'abord, le premier article de la thèse visera à examiner les liens longitudinaux entre l'OM maternelle et le langage expressif chez les enfants de 2 ans.

Par la suite, le deuxième article aura pour but d'évaluer les relations longitudinales entre l'OM maternelle, la sécurité d'attachement de l'enfant et les toutes premières articulations de la théorie de l'esprit à l'âge de 2 ans, soit la compréhension des désirs d'autrui et le Niveau 1 des perspectives visuelles.

Finalement, le troisième article est dans la continuité du deuxième article de thèse et visera à évaluer à nouveau, 2 ans plus tard, les liens longitudinaux entre l'OM maternelle, la sécurité d'attachement et la théorie de l'esprit à l'âge de 4 ans, avec la mesure classique de la

théorie de l'esprit, soit les fausses croyances, ainsi que le Niveau 2 des perspectives visuelles. Cet article aura pour but de vérifier la robustesse développementale des résultats à 2 ans, âge assez précoce pour mesurer la théorie de l'esprit, alors que 4 ans est l'âge classique pour ce faire.

Article 1

Children's Expressive Language in Early Toddlerhood: Links to Prior Maternal Mind-Mindedness

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Running head: MATERNAL MIND-MINDEDNESS; LANGUAGE DEVELOPMENT;
CHILD EXPRESSIVE VOCABULARY.

Children's Expressive Language in Early Toddlerhood: Links to Prior Maternal Mind-
Mindedness

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Abstract

This study examines the prospective links between early maternal mind-mindedness, including references to different types of mental states, and child subsequent expressive vocabulary. 84 mother-infant dyads took part in two assessments. At 1 year of age, maternal mind-mindedness was assessed during mother-child free play in the home, and at 2 years, mothers completed the MacArthur Communicative Development Inventory to evaluate children's expressive vocabulary. Maternal mind-mindedness was related to children's expressive language, above and beyond family SES. Specifically, only maternal comments on child cognitions were related to children's expressive language. The findings suggest that maternal mind-mindedness is relevant to understanding children's language development, while highlighting the importance of considering the exact nature of mind-related comments.

Key words: maternal mind-mindedness; language development; child expressive vocabulary.

Children's Expressive Language in Early Toddlerhood: Links to Prior Maternal Mind-Mindedness

It is now well established that early language development is driven by both genetic and environmental factors, with environmental influences explaining most of the variance (Dale et al., 1998; Dionne, Tremblay, Boivin, Laplante, & Pérusse, 2003). A great deal of research has thus focused on identifying specific environmental factors that explain individual differences in children's early language ability. One environmental factor that has been the object of much investigation is the quality of parent-child relationships. Several key elements of mother-child interactions have been found to relate to children's early language development, such as parental sensitivity, responsiveness and stimulation (e.g., Hirsh-Pasek & Burchinal, 2006; Magill-Evans & Harrison, 2001; Paavola, Kempainen, Kumpulainen, Moilanen, & Ebeling, 2006; Raviv, Kessenich, & Morrison, 2004; Stein, Malmberg, Sylva, Barnes, & Leach, 2008; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Furthermore, consistent findings indicate that language input in maternal discourse is reliably linked to variation in children's language development: mothers who provide more input overall have children whose early vocabulary grows more rapidly (e.g., Hart & Risley, 1995; Hoff & Naigles, 2002; Hurtado, Marchman, & Fernald, 2008; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Weizman & Snow, 2001). In addition to the quantity or frequency of mothers' utterances, the specific content of maternal discourse during mother-child interactions has drawn researchers' attention. In particular, mothers' use of mental-state language (i.e., their tendency to refer to mental states such as thoughts and desires) while talking to their child is a key aspect of maternal verbal behavior (e.g., Taumoepeau & Ruffman, 2008). When this proclivity is expressed by mothers commenting *on their infant's* putative internal states during

mother-infant interactions, it is considered to be maternal mind-mindedness (Meins & Fernyhough, 1999).

Mind-mindedness is presumed to be an indication of mothers' inclination to treat their child as an independent individual and to reflect upon experience from the child's perspective (Mcquaid, Bigelow, McLaughlin, & MacLean, 2008; Meins, Fernyhough, Fradley, & Tuckey, 2001). It can be understood as mothers' propensity to « treat their infant as an individual with a mind » (Meins et al., 2001, p. 638). Mind-minded mothers consider their infants as having their own desires, thoughts, and intentions, and hold a comprehension of their infants' mental lives. Mind-mindedness is evidenced through parental comments on infants' mental activity as it occurs during parent-infant interactions, and thereby results in a greater tendency to provide verbal labels for infants' putative inner states. This has been proposed as likely to help children develop their own internal-state language, that is, the ability to talk about mental states such as desires, cognitions, intentions, beliefs, or emotions. Recent studies confirm that mothers' use of mind-related comments is related to children's internal-state language (Fernyhough et al., 2009; Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003; Mcquaid et al., 2008; Taumoepeau & Ruffman, 2006; 2008).

Hence, previous research that uncovered links between mothers' use of mind-related comments and children's language has focused specifically on internal-state language. However, other aspects of language development are also important building blocks of children's socio-emotional and cognitive development. Notably, expressive vocabulary in the first years of life shows compelling links to children's later verbal and performance IQ (Bornstein & Haynes, 1998), academic success and literacy (Biemiller, 2006), peer competence (NICHD, 2001) and decreased aggressive behaviors (Dionne et al., 2003). Thus,

early expressive vocabulary is a well-documented predictor of children's later socio-cognitive development. As we describe next, it is also a likely developmental consequence of maternal mental-state discourse during mother-child interactions.

Regular exposure to maternal mind-related comments could favor not only internal-state language, but also children's expressive language development, because these comments necessarily occur within a broader context of discourse. During a conversation or play sequence, mind-minded mothers are more likely to attempt decoding the words that their child is trying to pronounce, and to try to interpret what he or she is thinking or trying to communicate. When a child manifests a desire, thought, or intention, it is often related to an external object. Given that mind-minded mothers, by definition, pay careful attention to their child's line of thinking, they are more likely to reflect a thorough interpretation of their child's current mental activity with accompanying context (for example: "You want a *cup of orange juice*", "You like this animal, *it's a giraffe*"). Such comments are likely to favor children's expressive language, by helping them gradually integrate a wide array of words in their own developing discourse.

More broadly, children's language learning occurs in a context in which parents scaffold the development of their cognitive skills (Tamis-LeMonda & Rodriguez, 2008). Children who live in a cognitively stimulating family environment, for instance one in which parents are more inclined to comment on their presumed current mental activity, are thought to be advantaged in their language learning process. Thus, it is proposed that parental behavior that is cognitively stimulating, such as commenting on the child's mental states, provides a foundation for the development of language.

Further operationalizing the notion of cognitively stimulating parenting, two studies built on the classic work of Dunn, Brown, and Beardsall (1991) and Bartsch and Wellman (1995), and investigated maternal references to specific *types* of mental states. Taumoepeau and Ruffman (2006; 2008) sought to understand what aspects precisely of maternal mental-state talk were beneficial for children's internal-state language. Examining maternal talk about desires, cognitions, and emotions, the authors found that references to desires when children were 15 month-old, and references to thoughts and knowledge when children were 24 month-old, were predictors of children's internal-state language at 24 and 33 months of age respectively. These results suggest that the importance of references to different classes of mental states may vary across outcomes and children's age. In fact, mind-minded mothers are likely to be sensitive to their child's current level of social understanding, and to adjust their discourse accordingly. In turn, these references to different classes of mental states appear to show different degrees of relevance, at least when predicting children's internal-state language (Taumoepeau & Ruffman, 2006; 2008). Whether or not this can be generalized to children's expressive language remains unknown, and will be investigated in this study.

Previous research has often operationalized mind-mindedness through the ratio of mind-related comments to total number of comments made by mothers during mother-infant interaction sequences. These studies reported links between mind-mindedness so assessed and maternal sensitivity (Lundy, 2003; Meins et al., 2001), parent-child attachment security (Arnott & Meins, 2007; Lundy, 2003; Meins et al., 2001) and child theory of mind understanding (Meins et al., 2003). However, recent studies using the sheer frequency (rather than ratio) of mind-related maternal comments have found similar results, with the same outcomes (Demers, Bernier, Tarabulsy, & Provost, 2010; Laranjo, Bernier, & Meins, 2008;

Laranjo, Bernier, Meins, & Carlson, 2010). This suggests that frequency counts are also valid indicators of maternal mind-mindedness. The current study will therefore rely on the frequency of maternal mind-related comments during mother-infant interactions to assess maternal mind-mindedness. However, in order to account for mothers' different levels of verbosity, socio-economic status (SES) will be controlled for in analyses. Research has documented strong relations between mothers' speech when interacting with their infant and SES (Hoff, 2003; Hoff, Laursen, & Tardif, 2002; Hoff & Tian, 2005; Rowe, 2008). Lower-SES mothers have consistently been found to talk less, to use a more limited vocabulary, and to ask fewer questions to their children than higher-SES mothers (Hoff et al., 2002). Therefore, controlling for family SES will allow us to pinpoint maternal mind-mindedness rather than general verbosity.

In sum, existing studies have demonstrated that mothers' mental-state talk (or mind-mindedness) is related to children's internal-state language (Fernyhough et al., 2009; Mcquaid et al., 2008; Taumoepeau & Ruffman, 2006; 2008). However, research has yet to investigate the links between such maternal verbal behavior and children's expressive language, although these links appear just as plausible. Accordingly, the current study set out to explore the links between maternal use of mind-related comments and children's expressive language. We further examined maternal references to specific types of child mental states.

Given the apparently salient role played by maternal mind-mindedness during infancy (Meins & Fernyhough, 1999; Meins et al., 2003), the spurt in the growth of vocabulary toward the end of the second year of life (*vocabulary spurt*; Dapretto & Bjork, 2000), and the need to avoid cross-sectional data and related problems in interpretation, a longitudinal design was used, assessing maternal mind-mindedness at 1 year (i.e., before the appearance of expressive

vocabulary; Trudeau & Sutton, 2011) and child expressive vocabulary at 2 years. It was expected that greater use of mind-related comments by mothers would be associated with enhanced child expressive vocabulary, one year later. Furthermore, although no *a priori* hypotheses were formulated, we examined whether mothers' references to specific infant mental states would be differentially associated to children's subsequent language.

Method

Participants

The sample consisted of 84 mother–infant dyads, 50 girls and 34 boys. The families were recruited from random birth lists of a large Canadian metropolitan area, provided by the Ministry of Health and Social Services. Two home visits were conducted, when children were 12 ($M = 12.6$, $SD = 1.1$) and 26 months ($M = 26.0$, $SD = 1.04$) of age (T1 and T2 below). Mothers were between 20 and 45 years old ($M = 31.2$, $SD = 4.51$). Mothers had 15.64 years of education on average ($SD = 2.09$), and fathers 15.62 ($SD = 2.14$). Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average in the \$60,000 - \$79,000 bracket. Criteria for participation were full-term pregnancy and the absence of any known physical or mental disability or severe developmental delay in the infant. Most families had French as the language they used at home (93%), and the remainders were native English speakers.

Procedure

Data were collected through two visits that took place in the families' homes. At T1 (12 months), a 20-minute mother–infant play sequence was videotaped. Mothers were asked to play as they normally did with their infant, using a standard set of toys brought by the research

assistants. The videotaped interactions were later coded for maternal mind-mindedness (see below). At T2 (26 months), mothers reported on their children's expressive language.

Measures

Maternal mind-mindedness. Videotaped interactions from the T1 visit were coded by a trained assistant using Meins et al.'s (2001) coding system. Five categories of comments were assessed: (a) comments on the infant's mental state, such as thoughts, desires, knowledge (e.g., "You want this book", "You know this game"); (b) comments on mental processes (e.g., "Where do you think the block goes?", "You find this game difficult"); (c) comments on the infant's emotional engagement (e.g., "You had enough"); (d) comments on the infant's attempts to manipulate other people's thoughts (e.g., "You're making fun of me"); and (e) comments that involved the mother speaking for the infant (e.g., "See mom, it's easier this way").

Each comment was then coded as appropriate or inappropriate according to Meins et al.'s (2001) guidelines. A comment is considered appropriate when it fits at least one of these three criteria: the coder agrees with the mother's comment on her infant's state of mind, the comment is linked with a past, future or current activity (e.g., "Do you remember seeing a camel at the zoo?" [while the child is playing with a toy camel] or, "We'll be going on a train tomorrow" [while the child is playing with a train]), or the comment clarifies how to proceed after a lull in the interaction. In line with Meins et al. (2001), the number of appropriate comments in each of the five categories (mental state, processes, emotional engagement, attempts to manipulate other people's thoughts, and mother speaking for the infant) was summed into a total score used in all further analyses, representing the total number of appropriate mind-related comments used by mothers during the free-play sequence. A

randomly selected 48% ($n = 40$) of videotapes were coded by a second trained rater, blind to all other measures. Inter-rater reliability (intra-class correlation; ICC) was .89 for total number of mind-related comments made during the play sequence.

In addition to Meins et al.'s (2001) coding and following Bartsch and Wellman's (1995) criteria, all appropriate mind-related comments were further divided into three categories: (a) references to the child's desires (e.g., "You want to play with the blocks"); (b) references to the child's cognitions (e.g., "You know this game"); and (c) references to the child's emotions (e.g., "You're excited"). 40% ($n = 34$) of videotapes were coded by a second trained rater. ICC coefficients were the following: .99 for desires and cognitions, and .95 for emotions.

Children's expressive language. At T2, mothers completed the *MacArthur Communicative Development Inventory* (MCDI; Fenson et al., 1993), a parental report on children's expressive vocabulary. Parents are asked to identify from a list which words they have heard their child say. Fenson et al. (1994) report excellent reliability indices for the instrument. The original 688-item MCDI was initially validated in French for a Canadian population by Frank, Trudeau, and Poulin-Dubois (1996). Based on these two longer versions, Dionne et al. (2003) developed brief 77-item versions for French- and English-speaking Canadian populations. The authors report excellent and equivalent properties for both versions. In the current study, Dionne et al.'s brief French or English version was used, according to the language spoken in the family's home.

Results

Preliminary analyses

Descriptive statistics for maternal mind-related comments and child expressive language are presented in Table 1. During the 20-minute play sequence, mothers made between 6 and

87 comments on their infants' mental states. They commented mostly on children's desires and cognitions, while a low frequency was observed for mothers' comments on children's emotions. Number of references to cognitions was unrelated to the two other types of references, while a marginal association was found between the number of references to desires and emotions, $r(84) = .20, p < .10$. As for children's expressive vocabulary, mothers reported that their child could say between 4 and 96 of the 98 words proposed in the MCDI.

A composite index of family SES was created by averaging the standardized scores of maternal and paternal education and family income (r 's ranging from .55 to .66). This SES composite score was related to children's expressive language, $r(84) = .26, p < .05$, and maternal mind-mindedness, $r(84) = .26, p < .05$, and therefore covaried in the main analyses.

Finally, children's expressive language was unrelated to number of older siblings, $r(84) = -.02, ns$, and child gender, $r(84) = .02, ns$. These variables were therefore not retained as covariates.

Main analyses

Correlations between maternal mind-related comments and maternal references to the specific categories of mental states with children's expressive language are presented in Table 2. As expected, the correlation between maternal mind-related comments and children's expressive language was positive and significant: mothers who made more mental comments during free play at 1 year had children who could express more words at 2 years. Of the three specific categories of mental states, only frequency of maternal comments on children's cognitions was significantly related to children's expressive language. Maternal comments on children's desires and emotions were not related to children's expressive language, and were therefore dropped from further analyses.

Given previous findings that family SES is associated with maternal mind-mindedness (Demers et al., 2010), with mothers' verbosity when interacting with their infant (Hoff, 2003; Hoff et al., 2002; Hoff & Tian, 2005; Rowe, 2008) and with child language (Bradley & Corwyn, 2002; see White, 1982), it was deemed critical to rule out the common variance due to family SES as a confounding factor accounting for the links between maternal mind-mindedness and child expressive language. In order to examine if maternal mind-related comments and maternal comments on children's cognitions added to the prediction of children's expressive language above and beyond what was explained by SES, two multiple regressions analyses were carried out. Table 3 presents the results of these analyses. In the first equation, SES was entered in the first block, followed by maternal overall mind-related comments in the second block. SES accounted for 6.9% of the variance in children's expressive language ($\beta = .26$), while mind-related comments added a unique 4.5% to the prediction ($\beta = .22$). The second equation revealed that maternal comments on children's cognitions added a unique 4.8% to the prediction of children's expressive language ($\beta = .22$) after accounting for the variance explained by SES.

Discussion

The main purpose of this report was to investigate the prospective association between early maternal mind-mindedness and children's subsequent expressive language. As expected, mothers' increased use of mind-related comments while interacting with their 1-year-old infants was related to children's enhanced expressive language at 2 years of age. Importantly, this relation held after accounting for the common variance due to family SES, a documented correlate of maternal mind-mindedness (Demers et al., 2010), children's language (Bradley & Corwyn, 2002), and mothers' verbosity when interacting with their infant (Rowe, 2008).

These results reiterate the need to investigate the nature and quality of maternal verbal behavior when examining potential caregiving influences on children's developing language: maternal mind-mindedness appears to be an additional dimension of parenting that can explain individual differences in children's expressive vocabulary. The well-documented benefits of maternal mental-state talk in general, and mind-mindedness in particular, thus appear to go beyond children's internal-state talk, and to extend to children's expressive language. Importantly, only 5 of the 96 words proposed by the MCDI are internal-state terms, confirming that the current results are not due to general vocabulary being confounded with internal-state language.

A secondary goal was to explore which of the three types of maternal references to children's mental states were related to children's expressive language. Maternal references to children's cognitions were the most telling in this respect: they were found to be significantly associated with children's expressive language above and beyond SES. Importantly, the specificity of these results cannot be attributed to greater frequency or variation in maternal references to children's cognitions compared to the two other types, and is not an artifact of slightly different effect sizes which would have been detected as significant in the case of cognitions and as only marginal with desires or emotions. In fact, maternal references to children's desires were at least as frequent as those on cognitions, and their relation to language was nonetheless 1.5 times lower than the relation between references to cognitions and child language.

Although not specifically predicted a priori, these results are intuitively appealing in hindsight, when considering what was assessed in mothers' behavior. Indeed, references to children's desires and emotions may require a lesser mind-minded orientation on the part of

the parent, as they may be prompted more readily by the child's overt behavior: the child will look at or point to a desired object, will crawl in the direction where he/she wants to go, will display a facial expression of joy, sadness, or anger. In contrast, the nature of the child's thoughts (e.g., remembering that s/he saw a similar truck on TV last night) is not made as evident by his or her behavior, and thus maternal comments on children's cognitions may require more mind-mindedness. Such comments require that mothers use the child's gestures, expressions and vocalizations, as well as the child's prior experience and knowledge, to infer what is going through his or her mind. This appears to require an additional layer of effort or interpretation, and should thus be seen mostly among parents showing a greater inclination to consider their child's mental activity as underlying his or her overt behavior. Hence, maternal comments on child cognitions may be indicative of a different or more marked predisposition.

This study presents some methodological limitations that call for careful interpretation of the results. First, children's general cognitive ability has been reported to be a predictor of their later language development (Colombo, Mccardle, & Freund, 2008; Rose, Feldman, & Jankowski, 2009). However, this was not controlled for in the current study. Second, mothers were both observed for the mind-mindedness assessment and requested to report on their child's expressive vocabulary one year later. Meins (1998) raised concern that mind-minded mothers could be more inclined to notice words pronounced by their child or even to interpret words from their child's babbling. This suggests that the use of maternal reports of child language is not ideal when examining the relation between mothers' mind-mindedness and their children's language, as the latter may be a function of both the child's actual vocabulary and the mother's own tendency to attribute meaning to the child's vocalizations, due to her mind-minded orientation. This concern is lessened, however, by the use of the well-validated

MCDI, which shows excellent psychometric properties, including demonstrated convergence between mother-reported MCDI scores and external evaluations, such as standardized evaluations of cognitive and linguistic performance and observations obtained by analysis of language samples (Breault, 2004, *as cited in* Boudreault, Cabirol, Trudeau, Poulin-Dubois, & Sutton, 2007; Dale, 1991; Dale, Bates, Reznick, & Morisset, 1989; Fenson et al., 1994). Nonetheless, future research should consider the use of father reports or other external sources when investigating the links between maternal mind-mindedness and child language.

Finally, given the correlational design, it may be worthy to consider the reverse directionality: infants' first vocalizations might stimulate mothers' mind-mindedness by drawing their attention to their child's mental activity. However, previous studies have demonstrated that it is maternal discourse that drives children's language development, rather than the reverse (Ruffman, Slade, & Crowe, 2002; Taumoepeau & Ruffman, 2006; 2008). Furthermore, at 1 year of age (when mind-mindedness was assessed here), children say extremely few if any words. In addition, mind-mindedness has been shown to be stable from pregnancy (assessed as mothers' tendency to represent the foetus as a potential child in the future) to the infant's first year of life (Arnott & Meins, 2008). Therefore, the hypothesis that children's initial language fluency would have stimulated mothers' mind-mindedness appears unlikely.

Previous studies have demonstrated that maternal mind-mindedness is related to children's socio-affective development, as indicated by their security of attachment between 12 and 18 months (Laranjo et al., 2008; Lundy, 2003; Meins et al., 1998; 2001), and to children's socio-cognitive development, such as executive functioning at 2 years (Bernier, Carlson, & Whipple, 2010) and theory of mind as well as general emotional understanding at

4 and 5 years of age (Meins & Fernyhough, 1999; Meins et al., 2003). To date, only one study had investigated the links between maternal mind-mindedness and children's language, examining more specifically children's style of linguistic acquisition (Meins, 1998). The results of the present study thus add to the existing literature on maternal mind-mindedness, suggesting that it may be beneficial for children's language development, when this becomes a salient developmental task at two years of age. Expressive language is a critical tool for healthy child development, as it constitutes a protective factor against aggressive behaviors (Dionne et al., 2003) and plays a determinant role in later verbal and performance IQ (Bornstein & Haynes, 1998), academic success and literacy (Biemiller, 2006), and peer competence (NICHD, 2001). The continued investigation of the ways in which different aspects of the caregiving environment can favor child expressive language skills will thus provide early intervention tools to promote harmonious child development.

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Table 1

Range, mean and standard deviation values for all main variables

	Minimum	Maximum	Mean	SD
Maternal variables				
Mental Comments	6	87	29.08	14.99
References to Desires	1	67	13.44	10.11
References to Cognitions	0	43	12.98	8.91
References to Emotions	0	17	2.49	2.73
Child variable				
Expressive Language	4	96	64.49	22.29

Table 2

Correlations between children's expressive language scores and frequency of mothers' mind-related comments

	Children's language
Mental Comments	.26*
Desires	.16
Cognitions	.27*
Emotions	.01

Note. Children's language = children's total scores on the MCDI; Mental Comments = total number of maternal mental comments; Desires = maternal references to children's desires; Cognitions = maternal references to children's cognitions; Emotions = maternal references to children's emotions.

* $p < .05$

Table 3

Regression analyses predicting children's expressive language

Predictor	R ² total	R ² unique	β
Step 1. SES	6.9%	6.9%	.26*
Step 2. Mental comments	11.4%	4.5%	.22*
Step 1. SES	6.9%	6.9%	.26*
Step 2. Cognitions	11.7%	4.8%	.22*

Note. SES = family socio-economic status; Mental Comments = total number of maternal mental comments; Cognitions = maternal references to children's cognitions.

* $p < .05$

Article 2

Early Manifestations of Children's Theory of Mind: The Roles of Maternal Mind-Mindedness and Infant Security of Attachment

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Contribution des auteurs

Jessica Laranjo: conceptualisation de l'article, analyse statistique, interprétation des résultats, rédaction et révision de l'article.

Annie Bernier: conceptualisation de l'article, soutien à l'interprétation des résultats et révision de l'article.

Elizabeth Meins: révision de l'article.

Stephanie M. Carlson : révision de l'article.

Running head: MIND-MINDEDNESS, ATTACHMENT AND THEORY OF MIND.

Early Manifestations of Children's Theory of Mind: The Roles of Maternal Mind-Mindedness
and Infant Security of Attachment

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Abstract

This study investigated two aspects of mother-child relationships – mothers' mind-mindedness and infant attachment security – in relation to two early aspects of children's theory of mind development (ToM). Sixty-one mother-child dyads (35 girls) participated in testing phases at 12 (T1), 15 (T2), and 26 months of age (T3), allowing for assessment of maternal mind-mindedness (T1), infant attachment (T2), and child ToM understanding (T3). Results indicated that children's understanding of discrepant desires and visual perspectives was positively related to their mothers' earlier use of appropriate mind-related comments in certain contexts. Furthermore, more securely attached boys, but not girls, performed better on a task requiring comprehension of their mothers' visual perspective. Hence, the links previously found between competent parenting and older children's ToM performance appear to extend, to a certain degree, to toddlers' first manifestations of ToM understanding.

Early Manifestations of Children's Theory of Mind: The Roles of Maternal Mind-Mindedness and Infant Security of Attachment

One of the hallmarks of the preschool period is the acquisition of a theory of mind (ToM), or children's understanding of mental states, such as desires, perceptions, beliefs, and intentions. ToM enables children to understand their own and others' mental states, and is thus an important factor in the development of social competence (for a review, see Hughes & Leekam, 2004). Early investigations of ToM acquisition that were limited to false belief tasks suggested that this ability develops around 4 years of age (Astington, Harris, & Olson, 1988; Gopnik & Wellman, 1994; Perner, 1991; Wellman, 1990; see Wellman, Cross, & Watson, 2001, for a review). There is increasing evidence, however, that certain aspects of ToM begin to develop much earlier (e.g., Onishi & Baillargeon, 2005), evolving between 1 and 6 years of age, and ultimately leading to the understanding that a causal association exists between mental states and behavioral outputs, and thus that people are intentional agents governed by their perceptions, emotions, and beliefs (Cohen & Cashon, 2006; Tomasello, 2000).

Hughes and Leekam (2004) and Tager-Flusberg (2000) have argued that the initial stages of ToM understanding are probably implicit, in that children possess basic socio-perceptual skills that allow them to negotiate the social world, while lacking the verbal ability explicitly to describe their understanding of people's motivations and intentions. These implicit features are thus manifest in behavioral rather than verbally-mediated measures (Ruffman, Garnham, & Rideout, 2001). One such early acquired aspect of ToM is an understanding of visual perception. Children come to understand that people can see objects only if their eyes are open and directed towards the object, and if nothing else blocks their vision of the object (Brooks & Meltzoff, 2002; Flavell, 1992). Through this understanding,

children are capable of simple (Level 1) visual perspective-taking, which they can use to guide their behavior (e.g., showing the parent what they want him/her to see), although they would be unable to describe their reasoning explicitly. Later on, children appreciate that the same object can present different visual appearances to two individuals if they look at it from different positions (Level 2 visual perspective-taking). Using verbally-mediated measures, research initially suggested that children possessed some knowledge of the conditions governing the visibility of objects around 3 years of age (Flavell, 1978; Flavell, Shipstead, & Croft, 1978; Piaget, 1928). However, recent research using implicit/behavioral measures indicates that 12.5-month-old (Luo & Baillargeon, 2007), 14.5-month-old (Song & Baillargeon, 2008), and 18-month-old infants (Poulin-Dubois, Sodian, Metz, Tilden, & Schoeppner, 2007) can already take into account what objects an individual can see, or has seen, when predicting or interpreting his or her actions. The ability to appreciate desires is another early aspect of ToM acquired by 18 months of age. For example, 18-month-olds are able to recognize that another person might want something that they do not want themselves (Repacholi & Gopnik, 1997), and can predict how this person will feel if his or her desires are satisfied or not (Wellman & Banerjee, 1991). It is thus acknowledged that precursors to a fully-fledged ToM are present in toddlerhood.

However, there are considerable individual differences in children's ToM acquisition, which can in part be explained by children's early social experiences (see Carpendale & Lewis, 2004; 2006). In particular, maternal discourse, notably the use of mental-state talk, when interacting with the child has been identified as an important predictor of children's understanding of mind and emotion (see Symons, 2004 for a review). During ToM's early developmental period, some mothers talk a great deal about children's desires when

interacting with them (Beeghly, Bretherton, & Mervis, 1986; Huttenlocher & Smiley, 1990; Ruffman, Slade & Crowe, 2002). Dunn and colleagues were the first to highlight the importance of the *content* of parent–child conversation for children’s ToM development, reporting that children who succeeded on false-belief and emotion understanding tasks were more likely to come from families where emotions and their causes were often discussed (Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). Other studies have shown that discussions about mental states across a range of contexts are beneficial for children’s ToM understanding (Cutting & Dunn, 1999; de Rosnay, Pons, Harris, & Morrell, 2004; Dunn, Bretherton, & Munn, 1987; Ensor & Hughes, 2008; Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003; Ruffman et al., 2002; Taumoepeau & Ruffman, 2006; 2008 - but see Ereky-Stevens, 2008 for different findings).

It is often proposed that the relational context in which mental-state talk occurs is crucial (e.g., Hughes & Leekam, 2004; Ontai & Thompson, 2008). In line with Main’s (1991) proposition that a secure attachment relationship gives infants an opportunity to benefit from more “mental space” for exploring others’ mental lives, several studies have found that emotion understanding was higher in children who were securely attached to their mother (de Rosnay & Harris, 2002; Fonagy, Redfern, & Charman, 1997; Greig & Howe, 2001; Laible & Thompson, 1998; Ontai & Thompson, 2002; Repacholi & Trapolini, 2004). While these studies found concurrent associations between attachment security and emotion understanding, others have found similar results with prospective designs showing associations between early attachment security and later ToM (Meins, Fernyhough, Russell, & Clark-Carter, 1998; Steele, Steele, Croft, & Fonagy, 1999). According to Ontai and Thompson (2008), a secure attachment relationship provides the child with stable and organized mental representations of

the caregiver's beliefs and desires, which can be generalized to understand other people's mental states as well. In contrast, other studies have failed to find associations between attachment security and ToM, either concurrently (Ontai & Thompson, 2008) or prospectively (Meins et al., 2002; 2003; Symons & Clark, 2000). Repacholi and Trapolini (2004) proposed that the relation between attachment security and ToM may be dependent on the "attachment-relevance" of ToM tasks. In support of this proposal, they found that preschoolers who had high scores for attachment avoidance on the separation anxiety test (Klagsbrun & Bowlby, 1976) had more difficulty understanding their mothers' false beliefs than those of an unknown female experimenter.

Despite this abundance of research, relatively few studies have included measures of both maternal mental-state talk and attachment security to investigate social influences on children's ToM. Meins and colleagues have addressed this issue by assessing infant-mother attachment security and mothers' *mind-mindedness* (Meins, 1997), operationalized in terms of mothers' tendency to comment appropriately on their infants' putative internal states during infant-mother interactions in the first year of life. Meins et al. (2002, 2003) found that mothers' tendency to comment appropriately on their 6-month-olds' internal states predicted children's mentalizing abilities during their fifth year, whereas infant-mother attachment security did not. Meins et al. (2003) speculated that regular exposure to such 'mind-minded' comments in infancy provides a context in which infants have the opportunity to understand their own behaviors in terms of their underlying mental states. Other studies further suggest that mothers' references to different types of mental states (e.g., thoughts, desires, emotions) while interacting with the child are differentially related to child ToM performance (Dunn et al., 1991; LaBounty, Wellman, Olson, Lagattuta, & Liu, 2008; Ruffman et al., 2002; Symons,

Fossum, & Collins, 2006; Taumoepeau & Ruffman, 2008). Accordingly, the current study examines both general mind-mindedness and references to specific mental states during infant–mother interactions.

It is possible that gender differences might help explain the mixed pattern of findings regarding the link between attachment security and ToM. For instance, although main effects of gender are not consistently reported (see Wellman et al., 2001), some studies have found gender differences on false belief understanding (Charman, Ruffman, & Clements, 2002; Happé, 1995), “nasty” ToM (Ronald, Happé, Hughes, & Plomin, 2005), emotion understanding (Dunn et al., 1991), assessment of story characters’ motives and feelings (Bosacki & Astington, 1999), and understanding of emotion display rules (Banerjee, 1997). In addition, child gender is frequently found to be a moderator of developmental processes (Maccoby, 1998; Poulin & Pedersen, 2007; Rose & Rudolph, 2006). Only one study has examined the moderating role of gender in links between parenting and child ToM. Hughes, Deater-Deckard, and Cutting (1999) reported that ToM performance was positively associated with parental warmth specifically in girls, whereas boys’ ToM performance was positively related to the severity of parental discipline. This suggests that the specific aspect of the parent-child relationship under investigation may be key to understanding the role of child gender. Focusing on attachment security as one such aspect, one uncovers an interesting set of findings: mother-child attachment security has often been found to relate to positive socio-emotional outcomes in boys but not in girls (Cohn, 1990; Erickson, Sroufe, & Egeland, 1985; Etzion-Carasso & Oppenheim, 2000; Lewis, Feiring, McGuffog, & Jaskir, 1984), or more consistently in boys than girls (Turner, 1991). In contrast, we are aware of very few studies that have found attachment security to be more clearly related to outcomes in girls than boys

(see Farrar, Fasig, & Welch-Ross, 1997, for one exception). Hence, it is conceivable that child gender moderates the link between attachment security and child ToM understanding, and may thus have obscured gender-specific attachment-ToM relations in some earlier studies.

In sum, previous research has examined associations between child attachment security, mothers' mental-state references, and the later-developing stages of children's ToM (i.e., emotion and false-belief understanding). In contrast, very little is known about the antecedents of the first stages of children's social understanding (i.e., implicit appreciation of motivational and informational states), despite clear demonstrations that individual differences in these areas are present as early as the first two years of life (e.g., Carlson, Mandell, & Williams, 2004), and are meaningfully related to other aspects of child development (e.g., Hughes & Ensor, 2005; 2006). In fact, Hughes and Leekam (2004) argue that these aspects of ToM not only emerge earlier than more explicit indices of ToM, but may also show distinct relations to children's social experiences. Hence, research needs to investigate whether the social influences that have been documented with respect to later ToM are also relevant to understanding fledgling ToM skills. Furthermore, few studies have considered attachment and mind-mindedness (or mental-state talk) together as predictors of ToM, or used prospective designs. Finally, ToM includes distinct components that may be related to different aspects of the child's relational experiences (Hughes & Leekam, 2004), but studies often fail to consider specific aspects of ToM separately.

Accordingly, the current study aimed to evaluate the longitudinal associations between maternal mind-mindedness, infant attachment security, and two aspects of children's first articulations of ToM: understanding of discrepant desires and level 1 visual perspective-taking. While an unfamiliar female experimenter was the target of the discrepant desires task,

we used children's mothers to assess their understanding of visual perspectives, owing to previous suggestions that attachment security to one figure may be particularly relevant to children's understanding of the same figure's mental states (Ontai & Thompson, 2008; Repacholi & Trapolini, 2004). It was predicted that children whose mothers make more appropriate mind-related comments while interacting with them at 12 months, and children who show more secure attachment behaviors at 15 months, will be more advanced in their understanding of desires and visual perspectives at 2 years of age. In order to shed light on previous mixed results, we also investigated the moderating role of gender in associations between attachment and ToM.

Method

Participants

Families were recruited from random birth lists of a large Canadian metropolitan area, provided by the Ministry of Health and Social Services. Criteria for participation were full-term pregnancy and the absence of any known physical or mental disability or severe developmental delay in the infant. The sample consisted of 61 infant-mother dyads, 36 girls and 25 boys. Three home visits were conducted, when children were 12 to 13 months of age (T1; $\chi = 12.9$ months), 15 to 16 months (T2; $\chi = 15.6$ months), and 26 months (T3; $\chi = 26.4$ months). Mothers were between 19 and 44 years old ($\chi = 30.5$); the majority had a college degree (77.0%) and were Caucasian (80.3%). The 20% of non-Caucasian mothers were either Arabo-Canadian (9.8%) or Afro-Canadian (9.8%). Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average between \$60,000 and \$79,000 CDN. Most families had French as their first language (93%), and the remainder were native English-speakers.

Procedure

Data were collected through three visits that took place in the family's home and lasted between 70 and 90 minutes. Two 10-minute infant-mother play sequences were videotaped during the first visit (T1). Mothers were asked to play as they normally did with their infant. The first 10-minute sequence was free play using a standard set of toys brought by the research assistants, whereas the second 10-minute sequence consisted of an interaction without toys (see Madigan, Pederson, & Moran, 2006). This sequence challenged mothers to maintain infants' attention verbally and to entertain them through one-on-one interaction not relying on toys. The videotaped interactions were later coded for maternal mind-mindedness (see below).

Infant security of attachment was assessed with the Attachment Q-Sort completed by a trained observer at T2. The visit included a brief interview with the mother, infant-mother problem-solving tasks, a free play period, and a series of questionnaires that the mother had to complete while the infant was not looked after or kept busy by the research assistant. This visit was modeled after the work of Pederson and Moran (1995), and was purposely designed to create a situation where maternal attention was being solicited by both research tasks and infant demands, thereby placing the dyad in a challenging situation likely to activate the infant's attachment system. The AQS was rated based on observations performed throughout this home visit. Finally, children's ToM abilities were tested at the last visit when children were 26 months of age.

Measures

Mother questionnaires. Questionnaires were completed by mothers at T1 and T3 in order to assess three factors that presented relations with either mind-mindedness, ToM or both in previous studies: maternal education (Cutting & Dunn, 1999; Meins & Fernyhough,

1999), number of older siblings (Ruffman, Perner, Naito, Parkin, & Clements, 1998), and child language skills (e.g., de Villiers & de Villiers, 2000; Lohman & Tomasello, 2003). At T1, mothers completed an investigator-devised questionnaire gathering socio-demographic information, including maternal education and number of children in the family. At T3, they completed the *MacArthur Communicative Development Inventory* (MCDI; Fenson et al., 1993), a parental report on children's expressive vocabulary. Parents are asked to identify from a list which words they have heard their child say. Fenson et al. (1994) report excellent reliability indices for the instrument. The original 688-item MCDI was initially validated in French for a Canadian population by Frank, Trudeau, and Poulin-Dubois (1996). Based on these two longer versions, Dionne, Tremblay, Boivin, Laplante, and Pérusse (2003) developed brief 77-item versions for French- and English-speaking Canadian populations. The authors report excellent and equivalent properties for both versions. In the current study, we thus used Dionne et al.'s brief French or English version, according to the language used in the family's home.

Maternal mind-mindedness. Videotaped interactions from the T1 visit were coded by a trained assistant using Meins et al.'s (2001) coding system. Five categories of comments were assessed: (a) comments on the infant's mental state, such as thoughts, desires, knowledge (e.g., "You want this book", "You know this game"); (b) comments on mental processes (e.g., "Where do you think the block goes?", "You find this game difficult"); (c) comments on the infant's emotional engagement (e.g., "You've had enough"); (d) comments on the infant's attempts to manipulate other people's thoughts (e.g., "You're making fun of me"); and (e) comments that involved the mother speaking for the infant (e.g., "See mom, it's easier this way").

Each comment was then coded as appropriate or inappropriate according to Meins et al.'s (2001) guidelines. A comment is considered appropriate when it fits at least one of three criteria: the coder agrees with the mother's comment on her infant's state of mind, the comment is linked with a past, future or current activity, or the comment clarifies how to proceed after a lull in the interaction. Because infant-mother free play with and without toys has been shown to evoke different patterns of maternal behaviors, with mothers displaying less optimal interactive behaviors when playing without toys (Madigan et al., 2006), the two sequences were coded separately. In line with Meins et al. (2001), the number of appropriate comments in each category (mental state, processes, etc.) was summed into a total score, thereby yielding two scores for analyses: total number of appropriate mind-related comments for each play sequence, with and without toys. Technical difficulties with one videotape precluded rating of the sequence without toys.

In addition to Meins et al.'s (2001) coding and following Bartsch and Wellman's (1995) criteria, all appropriate references to mental states were further divided into three categories: (a) references to the child's desires (e.g., "You want to play with the blocks"); (b) references to the child's cognitions (e.g., "You know this game"); and (c) references to the child's emotions (e.g., "You're excited"). In order to examine the possibility that mothers' references to children's perceptions would enhance their ability to appreciate visual perspectives, a fourth category was added: (d) references to the child's perceptions (e.g., "You just saw the camera"). This was done separately for the sequences with and without toys.

A randomly selected 56% ($n = 34$) of videotapes were coded by a second trained rater, blind to all other measures. Inter-rater reliability (intra-class correlation; ICC) was .89 for total appropriate mind-related comments made during the free play with toys, and .82 for the free

play without toys. With respect to specific categories of mother's references, ICC coefficients were the following: from .82 to .99 for the free play with toys and between .97 and .99 for the free play without toys.

Infant security of attachment. It was assessed at T2 with the Attachment Q-Sort (AQS; Waters & Deane, 1985), following the home-visit procedure described above. Trained home visitors observed infant behaviors throughout the visit and completed the AQS immediately after. The AQS consists of 90 items measuring the quality of the child's attachment behaviors toward a specific figure (the mother in this case). Items are sorted into nine clusters, ranging from very similar to very unlike the observed child's behaviors. The global score for attachment security consists of the correlation between the observer's sort of the 90 items and a criterion sort for the prototypically secure infant, provided by Waters and Deane (1985). Thus, AQS scores range from -1.0 (highly insecure) to 1.0 (highly secure). Meta-analytic data (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004) suggest that the observer-AQS shows excellent construct validity, with scores converging with attachment security assessed with the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978) and with maternal sensitivity and child socio-emotional adaptation.

In order to maximize the validity of attachment security scores, we followed Pederson and Moran's (1995) guidelines to train and supervise our home visitors. Graduate research assistants first attended a two-day training workshop pertaining to 1) early infant-mother interactions, 2) observation of attachment-relevant behavioral sequences, and 3) techniques of home visiting. After the training workshop, the assistants performed their first few home visits with a more experienced colleague, and they completed the AQS together. The first few visits

made independently by the junior home visitors were followed by a debriefing session either with the P.I. or with an experienced graduate student, in order to review the salient elements of the visit before scoring the AQS. The assistants then went on to using the AQS independently.

In the current study, a second home visitor was present for 17 visits (28%) and completed the AQS independently, in order to assess inter-rater reliability. Agreement between the two raters was satisfactory, ICC = .77. Note that double independent scoring was performed only by assistants who had already completed the whole training process.

Child theory of mind. The tasks aimed to measure two early developing aspects of children's ToM at age 26 months: understanding of discrepant desires and of visual perspectives.

Discrepant desires (adapted from Repacholi & Gopnik, 1997). This task aimed to evaluate children's capacity to consider that others may have desires that are different from their own. Books were placed on a tray in two distinct piles in front of the child. One pile consisted of attractive, colorfully illustrated children's books, whereas the other contained colorless academic books of tedious appearance. The tray of books was placed near the child who was asked "do you want to look at some books?" and left free to explore the books for approximately 45 seconds. The books that the child spontaneously chose to play with during this exploration phase were considered his/her favorites (59 of the 61 children showed the expected preference for the colorful books; the other two were excluded from analyses – no child showed a mixed or unclear preference between the two sets of books). The experimenter then took the books back and began to replace the child's preferred books in a pile on the tray, with vocalizations and facial expressions indicating disgust and disinterest. The other books were also placed back in a pile, but this time the experimenter expressed clear joy and interest

in these books. The experimenter then told the child that she would like to read, and asked to be offered a book to read. She thanked the child regardless of which type of book she was handed, briefly “read” the book with a neutral facial expression, and then told the child that she still felt like reading and would like one more book. The score consisted of the number of correct responses provided by the child (between 0 and 2). A correct response corresponds to giving the experimenter a book in which she manifested a preference, which is different from the child’s preference. In order to avoid the possibility that the child gave the experimenter the academic books simply to keep the attractive ones, several books of each kind were provided.

Visual perspectives (Carlson et al., 2004). This task evaluated children’s capacity to consider another person’s perspective so as to understand whether this person can see an object. We used Carlson et al.’s task because it specifically asks the child to take the mother’s perspective. The experimenter presented one toy at a time to the child, asking him/her to show the object to his/her mother. Four toys were presented to the child in turn. The mother could not see the toy unless her child implemented a correction. For the first toy, the mother was asked by the experimenter to close her eyes and not to open them unless the child asked her, one way or another. For the second toy, the mother had to put her hands in front of her eyes, the third time, she needed to turn her back to the child and hence face the wall, and for the fourth toy, there were no particular instructions for the mother but the child had to show her a toy that had only one side. The child thus had to turn the toy towards the mother. Child performance on each of the four tasks was scored on a 5-point scale developed by Carlson et al. The child obtained 1 point if he/she didn’t show the toy to his/her mother or dropped it near her, 2 points if he/she held the toy near the mother but did not make the necessary correction for her to see the object, 3 points if a partial correction was initiated but was abandoned before

the mother could see the object, 4 points if a complete correction was made but the toy was not shown, and 5 points if a complete correction was made and the toy was presented and seen by the mother. Scores could thus vary from 4 to 20.

Results

Preliminary analyses

Means and standard deviations for appropriate mind-related comments, attachment, ToM, and expressive language are presented in Table 1 for the whole sample as well as by gender. Scores ranged from 0 to 39 and 41, respectively, for appropriate mind-related comments in the free play with and without toys, and from $-.28$ to $.82$ for attachment. Observed scores on both ToM tasks corresponded to their full theoretical range (between 0 and 2 for the discrepant desires task, and between 4 and 20 for the visual perspective task). Finally, mothers reported that their child could say between 2 and 55 of the 77 words proposed in the MCDI. With respect to references to specific types of mental state, Table 1 shows that mothers commented mostly on children's desires and cognitions during both play sequences. Little variability was observed in mothers' comments on children's perceptions and emotions during both play sequences. Scores for these latter two categories were therefore omitted from subsequent analyses.

Children's performance on both ToM tasks was unrelated to maternal education, number of older siblings, or child gender, age, and language ability (all $r_s < .19$, *ns*). Maternal education, number of siblings, and child gender and age were therefore not retained as covariates in the main analyses. However, given strong associations found in previous studies between verbal ability and ToM understanding (e.g., de Rosnay & Harris, 2002; Meins et al., 2002; see Milligan, Astington, & Dack, 2007), and because child language has been found to

mediate relations between parenting and ToM (Hughes & Ensor, 2005), language was controlled for in subsequent analyses. For the purpose of clarity, we report results with and without controlling for language.

Total numbers of mind-related comments made in each play sequence were marginally different, $t(59) = 1.84, p < .10$, and only mildly correlated to each other, $r = .24$, as were the two scores of ToM, $r = .11$ (see Carlson et al., 2004 for a similar, low correlation between these two tasks with same-age children). These are thus all kept as distinct scores for analyses. Finally, with respect to specific categories of mental-state comments, mothers commented more frequently on children's cognitions while playing with than without toys, $t(59) = 3.73, p < .001$. No such context differences were observed for references to child desires. The correlations between frequency of comments in the sequences with and without toys were $r = .34$ for cognitions and $r = .17$ for desires.

Main analyses

Mind-mindedness and ToM. As shown in Table 2, children's performance on the discrepant desires task was positively related to mothers' overall use of appropriate mind-related comments during the free play without toys, and their performance on the visual perspective task was positively related to maternal appropriate mental comments made during the free play with toys. When individual differences in child language were controlled, these associations remained significant, and essentially similar in magnitude. In contrast, no relation was found between discrepant desires and appropriate mind-related comments during the free play with toys, or between visual perspective and comments during the play without toys. Thus, maternal mind-mindedness in different contexts seems to be related to different aspects of children's ToM in this sample. Given the mean difference presented above suggesting that

mothers' emphasis on different mental states can differ according to the play context, one hypothesis is that the specificity of the results with play context might be due to the specific types of mental states that are evoked by mothers in each. Table 3 presents the correlations between child ToM performance and mothers' specific references to desires and cognitions in each play context. Children's understanding of discrepant desires was positively related to mothers' references to desires, $r(58) = .26, p < .05$, and marginally linked to mothers' references to cognitions, $r(58) = .25, p = .06$, in the free play without toys. Children's understanding of visual perspectives was marginally linked to mothers' references to desires, $r(61) = .24, p = .07$, in the free play with toys.

Attachment security and ToM. Table 4 shows that for the sample as a whole (upper panel), attachment security was unrelated to children's performance on both ToM tasks. However, after controlling for children's expressive language, a positive marginal trend was observed for the relation between children's performance on the visual perspective task and attachment security. The relation between children's performance on discrepant desires and attachment security remained non-significant.

Child gender as a moderator. According to Baron and Kenny (1986), unexpectedly weak relations between a predictor and a criterion variable are often due to the presence of a moderating effect, that is, the expected association is present but only for a specific and non-random portion of the population, and thus goes undetected with a main effects analysis. We thus conducted separate analyses by gender to test whether the weak associations between attachment and children's ToM performance could be attributed to a moderating effect of gender. As displayed in Table 4 (lower panel), these analyses showed that there was no significant association between attachment security and understanding of discrepant desires

for boys or girls. However, for boys, there was a positive relation between attachment security and performance on the visual perspective task, which was not the case for girls. These two correlations were significantly different from each other, Fisher's $Z = 2.16, p < .05$. Thus, more securely attached boys, but not girls, performed better on a task requiring comprehension of their mother's visual perspective. These relations remained similar for both boys and girls after controlling for child language (see Table 4).

Discussion

This study examined prospective associations between maternal mind-mindedness, infant attachment security, and 2-year-olds' first articulations of ToM. The results showed that mothers' use of appropriate mind-related comments during certain play contexts at 1 year of age was positively related to aspects of children's ToM understanding at age 2. Hence, associations found in previous studies between mothers' mental references and later-developing stages of preschoolers' ToM (e.g., Laible & Thompson, 2000; Meins et al., 1998; 2002; Raikes & Thompson, 2006) appear to extend to toddlers' appreciation of informational and motivational states.

The results suggest very specific links, however, as maternal mind-mindedness measured in particular play contexts was related to different aspects of toddlers' ToM: children showed better performance on discrepant desires understanding when their mothers made more appropriate mental comments during free play without toys 14 months earlier, while superior understanding of visual perspectives was positively associated with mothers' appropriate mental comments during free play involving toys. One potential explanation is that the different play contexts trigger references to distinct types of mental activities by mothers, thus contributing to children's understanding of different aspects of minds. However,

the results did not support this hypothesis: references to child desires did not differ by context and were no more closely associated with understanding of discrepant desires than were those to child cognitions, whereas low variability in mothers' specific references to child perceptions precluded us from testing the specific association with children's understanding of visual perspectives.

Alternatively, one may speculate that maternal discourse during such an object-based interaction as free play with toys provides a particularly favorable context for the child to understand what the mother can or cannot see in the room, accounting for the specific link between mind-mindedness during play with toys and children's subsequent visual perspective-taking abilities. In the other play context, in the absence of toys distracting their attention, infants may have paid greater attention to their mothers' comments, such as those pertaining to their distinct preferences for activities (e.g., "Now that we have sung your favorite song, would you like to help me sing my favorite?"). Given that maternal comments on children's desires were the most frequently used during the play without toys (see bottom of Table 1), the putatively greater attention paid by children to their mothers' comments in this context could have contributed, especially, to their understanding of their own and others' desires.

In sum, the associations found between children's early ToM abilities and mothers' use of specific types of mind-minded comments across different play contexts remain intriguing, and call for future research to tease apart the exact content of maternal discourse from interactive context as potential moderators of the links between maternal mind-mindedness and child ToM. In fact, although maternal mind-mindedness has been found to relate to several aspects of child development, research has yet to examine whether mind-related

comments made in different contexts (e.g., problem-solving, emotional distress, etc.) may predict child competence in different spheres.

How do the results of the current study relate to previous research on early manifestations of ToM abilities? Hughes and Ensor (2005; 2006) investigated relations between parenting and 2-year-olds' ToM, but used ToM tasks quite different from those used in the current study (elicited pretend play, a deceptive identity task, and a penny-hiding game). Performance on these tasks was found to relate negatively to "harsh parenting" (Hughes & Ensor, 2006), and positively to "positive parenting" (Hughes & Ensor, 2005). This latter association, however, did not hold when child language was controlled (this was not tested in Hughes & Ensor, 2006). For this reason, children's expressive language was controlled in the current study's main analyses. The associations between maternal mind-mindedness and children's ToM were essentially the same whether or not child language was controlled. These results stand in contrast to those reported by Hughes and Ensor (2005), in that language abilities cannot explain the links we found between parenting and child ToM.

There are several potential reasons for the discrepancy in results. First, the samples involved are quite different, with ours being middle to upper-middle-class, while Hughes and Ensor's (2005) was more varied and disadvantaged with respect to SES, with considerable variability in children's language and ToM abilities. Second, the two studies used markedly different language assessments. Hughes and Ensor assessed children's receptive and expressive abilities using subtests of the British Abilities Scales (Elliott, Murray, & Pearson, 1983), whereas the current study relied on maternal report of expressive language assessed using the MCDI. As outlined by many (e.g., de Villiers & de Villiers, 2000; Tager-Flusberg, 2000), expressive language is a necessary means for children to succeed on more advanced

ToM tasks requiring a verbal response from the child (e.g., false-belief and emotion-understanding tasks). In contrast, it is less obvious how expressive vocabulary is implicated in child performance on behavioral tasks tapping into more implicit aspects of ToM (Ruffman et al., 2001; Tager-Flusberg, 2000). Owing to the behavioral nature of the ToM tasks used in the current study, the observed lack of association between expressive vocabulary and ToM performance is not unexpected. Finally, the current study addressed links between a very specific aspect of mother-infant interactions, mind-mindedness, and children's early ToM abilities, whereas Hughes and Ensor focused on more pervasive parenting practices. While mind-mindedness is unrelated to children's linguistic and cognitive abilities, harsh parenting as assessed by Hughes and Ensor was related to children's performance on standardized language scales.

Associations between parenting strategies and children's understanding of desires and visual perspectives have previously been investigated in a socio-economically diverse sample of 3- and 4 year-old children (Pears & Moses, 2003). The authors found associations between mothers' instructional responses (such as talking to the child about how dangerous a behavior was) and their children's desire and perception understanding. Thus, the three studies to date that have examined the same aspects of ToM as in the current study (Pears & Moses, 2003), or ToM at the same age (Hughes & Ensor, 2005; 2006), converge with the present results in suggesting that children's ToM abilities may relate to various aspects of children's experiences with their mothers, such as positive versus harsh parenting, mothers' instructional responses, or mind-mindedness. However, it also appears that the nature and magnitude of these links, as well as the role played by child verbal ability, may vary according to aspects of

parenting and ToM examined, type of population, and interactive context in which parental behavior is measured.

Evidence for a relation between early ToM and attachment security was less convincing. Attachment was not related to children's understanding of discrepant desires, and was marginally related to their understanding of their mothers' visual perspective only after controlling for child language. However, follow-up analyses showed that there was a clear positive relation between attachment and performance on the visual perspective task specifically in boys. This moderating effect of child gender could help explain previous mixed findings concerning the association between attachment and ToM (see Carpendale & Lewis, 2004; 2006; for reviews). One may speculate that this moderating effect may have been at play in some previous studies, thus masking gender-specific associations between attachment and ToM.

According to Belsky (1997; 2005), children may present differential susceptibilities to their environment, and it has often been found that boys are more vulnerable to environmental risk than girls, in certain areas at least (Maccoby, 1998). As outlined in the Introduction, attachment security has also been related more clearly to child outcomes in boys than in girls (Cohn, 1990; Erickson et al., 1985; Etzion-Carasso & Oppenheim, 2000; Lewis et al., 1984; Turner, 1991). It may be that this greater impact of attachment security on boys is due to the gender composition of the parent-child dyad. In the studies cited above, the attachment figure was always the mother. An alternative take on these findings, then, is that attachment security to the opposite-sex parent may play a special role. Such a phenomenon appears plausible for relations between attachment security and ToM development, in light of previous results suggesting that having an opposite-sex sibling conferred more benefit for children's ToM

understanding than having a same-sex sibling (Cassidy, Fineberg, Brown, & Perkins, 2005). The authors speculated that a “gender difference between siblings may offer greater opportunity than does a gender match to consider the workings of a mind different from one's own, and this may enhance ToM abilities” (p. 97). Hence, one possibility is that within secure attachment relationships, the gender difference between mothers and their sons provides a fruitful context for boys to understand a mind distinctively different from their own. A thorough investigation of this possibility, however, requires the study of father-daughter attachment in order to tease apart child gender from overall gender composition of the dyad.

Nonetheless, our findings with boys provide partial support for the idea put forward by other investigators (Ontai & Thompson, 2008; Repacholi & Trapolini, 2004), that attachment security is especially relevant to children's understanding of their attachment figures' mental states, compared to those of non-attachment figures. Our design does not permit us, however, to tease apart the aspect of ToM that is assessed (visual perspective and discrepant desires) and the target figure (mother and unfamiliar adult female). A significant improvement to the design, then, would be to assess similar aspects of ToM pertaining to different figures, including mother, father, and non-attachment figures. Given our findings, large enough groups should be used for separate analyses to be conducted with boys and girls, and attachment security to both mother and father should be assessed.

This study presents some methodological limitations that call for careful interpretation of the results, while suggesting further avenues for research. We have assessed only two aspects of toddlers' ToM, while several other ToM components could have been examined in this age group (e.g., Carlson et al., 2004; Hughes & Ensor, 2005). The different patterns of results found with visual perspectives and discrepant desires lend support to Hughes and

Leekam's (2004) hypothesis that distinct aspects of ToM may relate to different aspects of the child's relational experiences. Given that these appear to be componential rather than unitary constructs, it will be fruitful for future research to investigate specific links between numerous indicators of fledgling ToM abilities and precise aspects of parent-child relationships.

Furthermore, future studies assessing emerging ToM abilities in very young children should consider using more socio-economically diverse samples and larger sample sizes, which would benefit from greater statistical power by yielding more individual differences in variables often associated with children's ToM, such as maternal education or child cognitive functioning. Larger samples would also allow for the use of regression analyses, which would be especially well-suited to test moderating effects such as that found here with gender, while accounting for all other potential predictors simultaneously.

In conclusion, the study presented here suggests that maternal mind-mindedness in different contexts relates to different aspects of toddlers' first articulations of ToM, and that attachment security is related to understanding of the mother's visual perspective, although only for boys. These findings re-affirm that toddlers' social understanding, a cornerstone of their current and later social functioning, is influenced by specific aspects of their early social environment.

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Table 1

Range, mean and standard deviation for all main variables and for maternal references to the specific categories of mental states

Variable	N	Minimum	Maximum	Mean	SD
Total sample					
Appropriate mental comments (with toys)	61	0	39	14.72	8.42
Appropriate mental comments (without toys)	60	0	41	12.32	8.84
Attachment	61	-.28	.82	.47	.25
Discrepant desires	59	0	2	.56	.86
Visual perspective	61	4	20	13.85	5.34
Expressive language	61	2	55	19.75	14.29
Girls					
Appropriate mental comments (with toys)	36	0	29	14.31	7.79
Appropriate mental comments (without toys)	35	0	41	13.12	10.78
Attachment	36	-.28	.82	.48	.24
Discrepant desires	35	0	2	.54	.89
Visual perspective	36	4	20	14.06	5.16
Expressive language	36	2	55	21.18	14.22
Boys					
Appropriate mental comments (with toys)	25	0	39	15.32	9.53
Appropriate mental comments (without toys)	25	3	23	11.40	5.45
Attachment	25	-.21	.78	.47	.27
Discrepant desires	24	0	2	.58	.83
Visual perspective	25	4	20	13.56	5.69
Expressive language	25	2	50	17.59	14.44
With toys					
Desires	61	0	19	5.93	4.11
Cognitions	61	0	25	8.03	6.02
Perceptions	61	0	6	.67	1.14
Emotions	61	0	5	.64	1.00
Without toys					
Desires	60	0	24	5.73	5.46
Cognitions	60	0	26	4.80	5.16
Perceptions	60	0	5	.43	1.02
Emotions	60	0	12	1.85	2.19

Table 2

Correlations between appropriate mind-related comments and performance on the two ToM tasks

	App Mental Comments (toys)	App Mental Comments (without toys)	Desires	Visual Perspectives
App Mental Comments (toys)	1.00			
App Mental Comments (without toys)	.24 ^t	1.00		
Desires	.05 (.05)	.33** (.34**)	1.00	
Visual Perspectives	.27* (.28*)	.06 (.11)	.11	1.00

Note. ^aApp Mental Comments (toys) = total number of appropriate mental comments (free play with toys); App Mental Comments (without toys) = total number of appropriate mental comments (free play without toys); Desires = score on the discrepant desires task; Visual Perspectives = score on the visual perspectives task. ^bPartial correlations after controlling for expressive language are shown in parentheses.

^t $p < .10$; * $p < .05$; ** $p < .01$

Table 3

Correlations between maternal references to the specific categories of mental states and performance on the ToM tasks

	Discrepant Desires	Visual Perspective
With toys		
Desires	.06	.24 ^t
Cognitions	.01	.18
Without toys		
Desires	.26*	-.08
Cognitions	.25 ^t	.15

^t $p < .10$; * $p < .05$

Table 4

Correlations between attachment security and performance on the ToM tasks for the whole sample, and for boys and girls separately

	Attachment security
Total sample	
Desires	-.11 (-.15)
Visual Perspectives	.16 (.24 [†])
Boys	
Desires	-.08 (-.04)
Visual Perspectives	.46* (.50**)
Girls	
Desires	-.13 (-.16)
Visual Perspectives	-.09 (-.06)

Note. ^aAttachment = attachment security; Desires = score on the discrepant desires task; Visual Perspectives = score on the visual perspectives task. ^bPartial correlations after controlling for expressive language are shown in parentheses.

[†] $p < .10$; * $p < .05$; ** $p < .01$

Article 3

The Roles of Maternal Mind-Mindedness and Infant Security of Attachment in Predicting Preschoolers' Understanding of Visual Perspective-Taking and False Belief

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Contribution des auteurs

Jessica Laranjo: conceptualisation de l'article, analyse statistique, interprétation des résultats, rédaction et révision de l'article.

Annie Bernier: conceptualisation de l'article, soutien à l'interprétation des résultats et révision de l'article.

Elizabeth Meins: révision de l'article.

Stephanie M. Carlson : révision de l'article.

Running head: Mind-mindedness, attachment and theory of mind

The Roles of Maternal Mind-Mindedness and Infant Security of Attachment in Predicting
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Abstract

This study is a follow up of a previous study that examined two aspects of mother–child relationships — mothers’ mind-mindedness and infant attachment security — in relation to toddlers’ early manifestations of theory of mind understanding at 2 years of age. The current study aimed to assess the same two aspects of mother–child relationships in relation to children’s ($N = 59$) theory of mind performance at age 4. Results of the current study confirmed and expanded on relations observed at age 2. Preschoolers’ understanding of false belief and Level 2 visual perspective-taking were positively related to their mothers’ use of appropriate mind-related comments when they were 1 year of age, over and above earlier theory of mind understanding. Furthermore, more securely attached boys, but not girls, performed better on a task requiring Level 2 visual perspective-taking. Confirmation of the results across these two time points supports the robustness of the associations found between maternal mind-mindedness, boys’ attachment security, and children’s subsequent social understanding.

The Roles of Maternal Mind-Mindedness and Infant Security of Attachment
in Predicting Preschoolers' Understanding of Visual Perspective-Taking
and False Belief

During their first years of life, children gradually learn to put themselves in others' "mental shoes" and imagine how others may perceive, think, or feel about an object or event (Moll & Meltzoff, 2011). This capacity to understand others' mental states (e.g., desires, perceptions, beliefs, intentions) is called theory of mind (ToM), and has been the object of much theorization and empirical research in the last decades (see Hughes, 2011). For a long time, false belief understanding, usually achieved at 4 years of age, served as a hallmark of children's ToM. Consisting of the recognition that others can have beliefs about the world that are inaccurate, false belief understanding is the most widely documented transition in preschoolers' understanding of others' mental states (Flavell & Miller, 1998; Wellman, Cross, & Watson, 2001; Wellman & Liu, 2004), and a great deal of research has been devoted to studying the social factors that favor the development of this ability (see Hughes, 2011). In contrast, less is known about the social antecedents of other aspects of children's ToM.

Harris' simulation theory (1992, 1996) proposes that children between 3 and 5 years of age develop the ability to conceive of what others might see or believe, even if it is counterfactual to what they personally perceive or believe. This ability to simulate others' cognitive or visual perspectives allows understanding of false belief and visual perspective-taking. To grasp both of these concepts, children must set aside their own point of view and adopt the perspective of another. Hence, visual perspective-taking is another important aspect of children's ToM, with logical connections to false belief understanding.

Visual perspective-taking develops in two steps. First, children come to understand that

people can see objects only if their eyes are open and directed toward the object, and if nothing else blocks their vision of the object (Brooks & Meltzoff, 2002; Flavell, 1992). Through this understanding, children are capable of simple visual perspective-taking (Level 1). Different studies suggest that this ability emerges between 12.5 and 18 months of age (Luo & Baillargeon, 2007; Poulin-Dubois, Sodian, Metz, Tilden, & Schoeppner, 2007; Song & Baillargeon, 2008). Later on, children appreciate that the same object can present different visual appearances to two individuals if they look at it from different positions, reflecting the comprehension that the same object can be construed in multiple ways, depending on one's point of view (Level 2 visual perspective-taking). While research initially suggested that children began to engage in Level 2 visual perspective-taking between the ages of 4 and 5 years (Flavell, Everett, Croft, & Flavell, 1981), recent research indicates that some manifestations are present as early as 3 years of age (Moll & Meltzoff, 2011).

Harris' simulation theory (1992, 1996) predicts that false belief understanding and Level 2 visual perspective-taking would be developmentally and conceptually related and would emerge in close proximity. Consistent with this prediction, recent studies showed that Level 2 visual perspective-taking emerges around the same time as false belief understanding (Bigelow & Dugas, 2008; Carlson, Mandel, & Williams, 2004; Farrant, Fletcher, & Maybery, 2006). Furthermore, researchers have suggested that the delays observed in congenitally blind children's false belief abilities were due to a blind-specific problem that impedes the acquisition of false belief due to limitations in mutual gaze, joint attention, and observation of emotional states (Brambring & Asbrock, 2010).

Thus, despite being less intensively studied than false belief understanding, visual perspective-taking constitutes an important socio-cognitive ability. In fact, the comprehension

of Level 2 visual perspective-taking has been shown to relate to other developmental milestones such as language development, executive functioning, and performance on other aspects of ToM such as the discriminative use of deceptive ploys (Bigelow & Dugas, 2008; Carlson et al., 2004; Farrant et al., 2006). Its developmental antecedents, however, are largely unknown. Available evidence suggests that visual perspective-taking is related to demographic variables such as maternal education and family income, and to parenting variables such as instructional comments (e.g., talking to the child about how dangerous it was to cross the street without looking both ways first; Pears & Moses, 2003). However, other important reported predictors of children's ToM development, such as quality of mother-child verbal exchanges and relationships, have seldom been studied in relation to children's visual perspective-taking abilities.

It has often been proposed that maternal discourse when interacting with the child, notably the use of mental-state talk, is an important precursor of children's ToM abilities. Meins et al. (2003) argued that regular exposure to such 'mind-minded' comments in infancy is beneficial because it provides a context in which infants have the opportunity to understand their own and eventually others' behaviors in terms of underlying mental states. Consistent with this, many studies have highlighted that discussions about mental states across a range of contexts are beneficial for children's ToM understanding (e.g., de Rosnay, Pons, Harris, & Morrell, 2004; Dunn, Bretherton, & Munn, 1987; Ensor & Hughes, 2008).

However, it is also proposed that the relational context in which mother-child talk occurs is crucial (e.g., Hughes & Leekam, 2004; Ontai & Thompson, 2008). In particular, attachment theorists have argued that conversations are a critical feature of the attachment relationship and can serve as a process by which experiences are shared and discussed, and

psychological understanding is achieved (see Bretherton, 2005, for review; Laible & Thompson, 2000). Children in secure attachment relationships benefit from a communication style that permits greater sharing of feelings and thoughts (Bretherton, 1990), notably through the use of maternal mind-related comments (Laranjo, Bernier, & Meins, 2008; Lundy, 2003; Meins, Fernyhough, Fradley, & Tuckey, 2001). Overall, a secure attachment relationship is presumed to provide infants with stable and organized mental representations of their own and the caregiver's beliefs and desires, which can gradually be generalized to understand other people's mental states as well (Ontai & Thompson, 2008). Consistent with this, several studies using various measures of attachment have found that ToM understanding was higher in children who were securely attached to their mother, both concurrently (de Rosnay & Harris, 2002; Fonagy, Redfern, & Charman, 1997; Greig & Howe, 2001; Laible & Thompson, 1998; Ontai & Thompson, 2002; Repacholi & Trapolini, 2004) and longitudinally (Meins, Fernyhough, Russell, & Clark-Carter, 1998; Steele, Steele, Croft, & Fonagy, 1999) - although other studies failed to find relations between attachment and ToM (Meins et al., 2002; Ontai & Thompson, 2008; Symons & Clark, 2000).

Overall, both maternal mental-state talk and child attachment security have proven useful in explaining individual differences in certain aspects of children's ToM, in particular emotion and false belief understanding. However, relatively few studies have included measures of both these relational factors, and even fewer have looked at them in association with children's visual perspective-taking. Studies by Meins et al. (1998) and by our team [***: Reference omitted for blind review] began to fill these gaps by studying *maternal mind-mindedness* (Meins, 1997) as the measure of mothers' mental-state talk. Mind-mindedness is the caregiver's tendency to treat the young child as an individual with a mind,

and is operationalized in terms of caregivers' tendency (a) to describe the child with reference to mental characteristics (Meins et al., 1998), (b) to attribute meaning to infants' early non-word utterances (Meins, 1998), or (c) to comment in an appropriate manner on infants' putative thoughts and feelings while interacting with them (Meins et al., 2001). Meins et al. (1998) reported that children securely attached in infancy showed better understanding of false belief at age 4, and that mothers' tendency to focus on mentalistic attributes predicted children's performance on a false belief and emotion task at age 5. Our previous study revealed that children's Level 1 visual perspective-taking performance at age 2 was positively associated with mothers' previous use of appropriate mind-related comments during free play at age 12 months. Relations between attachment security at 15 months (assessed using the Attachment Q-Sort; Waters & Deane, 1985) and Level 1 visual perspective-taking performance were significant only for boys, with boys' security scores being positively associated with Level 1 visual perspective-taking scores. These findings thus added to scant evidence that relational factors, which are well-documented predictors of ToM as traditionally conceived (Hughes, 2011), could also be relevant to explaining individual differences in young children's visual perspective-taking. Investigating this question further, the current study aimed to examine these associations two years later, when the same children were 4 years of age, and thus conceivably mastering Level 2 of visual perspective-taking.

Investigating the developmental robustness of the previously observed associations was deemed important for two main reasons. First, our boys-only findings with attachment security were not expected *a priori*, and it was therefore difficult to determine if they were generalizable, age-specific, or even spurious. Second, developmental specificity versus breadth may be a particularly salient issue when examining mind-mindedness or mental-state

talk in relation to ToM. In fact, recent studies show that different types of mental-state comments (e.g., on desires, cognitions, emotions) relate to children's ToM understanding at different ages, suggesting that the importance of references to different classes of mental states is best appreciated through a developmental lens (Taumoepeau & Ruffman, 2006; 2008). For instance, mothers' talk about desires and cognitions at 2 years has been found to be the strongest predictor of children's ToM at 4 years (Ensor & Hughes, 2008), whereas only mothers' talk about cognitions showed concurrent associations with children's understanding of false belief and emotions at 6 years of age (Ensor & Marks, 2009). To push this investigation further, our team created a hybrid measure of Meins et al.'s (2001) and Bartsch and Wellman's (1995) codification systems, by categorizing all appropriate maternal mind-related comments during mother–infant interactions in specific categories (desires, cognitions, emotions). With this hybrid measure, our previous study [***] suggested that maternal comments on children's desires could be related to 2-year-olds' Level 1 visual perspective-taking. In light, however, of the previously identified age differences in links between references to different classes of mental states and children's performance on other aspects of ToM, it is unclear whether the more developmentally advanced Level 2 visual perspective-taking will show similar relations to maternal mind-related comments as did the first level.

Accordingly, the current study aimed to extend the examination of the longitudinal associations between maternal mind-mindedness, infant attachment security, and children's ToM at 4 years of age. Given its prominent role in the ToM literature, children's false belief understanding was investigated first. However, more central to our purposes was the examination of Level 2 visual perspective-taking, for which relational antecedents have received very little attention. It was predicted that children whose mothers made more

appropriate mind-related comments while interacting with them at 12 months, and children (perhaps especially boys) who showed more secure attachment behaviors at 15 months, would be more advanced in their understanding of Level 2 visual perspective-taking and false belief at age 4. It was also expected that these relations would be independent of children's visual perspective-taking scores at age 2. Furthermore, although no *a priori* hypotheses were formulated, we examined whether mothers' appropriate comments on specific infant mental states (desires, cognitions and emotions) would be differentially associated with preschoolers' understanding of false belief and Level 2 visual perspective-taking.

Method

Participants

Families were recruited from random birth lists of a large Canadian metropolitan area, provided by the Ministry of Health and Social Services. Criteria for participation were full-term pregnancy and the absence of any known physical or mental disability or severe developmental delay in the infant. The current sample consisted of 59 (34 girls, 25 boys) of the original 61 child-mother dyads who had taken part in the first study two years earlier [***]. Four home visits were conducted in total, when children were 12 to 13 months of age (T1; $M = 12.9$ months), 15 to 16 months (T2; $M = 15.6$ months), 2 years (T3; $M = 26.4$ months), and 4 years of age (T4; $M = 48.9$ months). The current report focuses on T1, T2, and T4, while using the T3 data (reported in ***) as covariates as appropriate. Mothers were between 19 and 44 years old ($M = 30.5$); the majority had a college degree (82.2%) and were Caucasian (78.9%). The non-Caucasian mothers were either Arabo-Canadian (10.5%) or Afro-Canadian (10.6%). Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average in the \$60,000 to \$79,000 CDN bracket.

Procedure

Data were collected through four visits that took place in the families' homes and lasted between 70 and 90 minutes (see Table 1 for an overview of measures and time points). Two 10-minute infant–mother play sequences were videotaped during the first visit (T1). Mothers were asked to play as they normally did with their infant. The first 10-minute sequence was a free play using a standard set of toys brought by the research assistants, whereas the second 10-minute sequence consisted of an interaction without toys (see Madigan, Pederson, & Moran, 2006). This second sequence challenged mothers to maintain infants' attention verbally and to entertain them through one-on-one interaction not relying on toys. The videotaped interactions were later coded for maternal mind-mindedness (see below). Infant security of attachment was assessed with the Attachment Q-Sort (AQS) completed by trained observers at T2. This visit included a brief interview with the mother, infant–mother problem-solving tasks, a free play period, and a series of questionnaires that the mother had to complete while the infant was not looked after or kept busy by the research assistant. This visit was modeled after the work of Pederson and Moran (1995), and was purposely designed to create a situation where maternal attention was being solicited by both research tasks and infant demands, thereby placing the dyad in a challenging situation likely to activate the infant's attachment system. The AQS was rated based on observations performed throughout this home visit. Children's ToM abilities were tested at 2 years of age (T3) with a Level 1 visual perspective-taking task, and at 4 years (T4) with false belief and Level 2 visual perspective-taking tasks, described below. Finally, given the well-documented relations between children's language and some aspects of ToM (see Milligan, Astington, & Dack, 2007), children's verbal IQ was also assessed at T4.

Measures

Socio-demographic factors. At T1, mothers completed an investigator-devised questionnaire gathering socio-demographic information, including maternal education and number of children in the family, both documented correlates of children's ToM (Cutting & Dunn, 1999; Ruffman, Perner, Naito, Parkin, & Clements, 1998).

Maternal mind-mindedness. Videotaped interactions from the T1 visit were coded by a trained assistant using Meins et al.'s (2001) coding system. Five categories of comments were assessed: (a) comments on the infant's mental states, such as thoughts, desires, knowledge (e.g., "You want this book", "You know this game"); (b) comments on mental processes (e.g., "Where do you think the block goes?", "You find this game difficult"); (c) comments on the infant's emotional engagement (e.g., "You've had enough"); (d) comments on the infant's attempts to manipulate other people's thoughts (e.g., "You're making fun of me"); and (e) comments that involved the mother speaking for the infant (e.g., "See mom, it's easier this way").

Each comment was then coded as appropriate or non-attuned according to Meins et al.'s (2001) guidelines. A comment is considered appropriate when it fits at least one of three criteria: the coder agrees with the mother's comment on her infant's state of mind, the comment is linked with a past, future or current activity, or the comment clarifies how to proceed after a lull in the interaction. Because infant-mother free play with and without toys has been shown to evoke different patterns of maternal behaviors, with mothers displaying less optimal interactive behaviors when playing without toys (Madigan et al., 2006), the two sequences were coded separately. In line with Meins et al. (2001), the number of appropriate comments in each category (mental states, processes, etc.) was summed into a total score,

thereby yielding two scores for analyses: total number of appropriate mind-related comments for each play sequence, with and without toys.

In addition to Meins et al.'s (2001) coding and following Bartsch and Wellman's (1995) criteria, all appropriate references to mental states were further divided into three categories: (a) references to child desires (e.g., "You want to play with the blocks"); (b) references to child cognitions (e.g., "You know this game"); and (c) references to child emotions (e.g., "You're excited"). This was done separately for the two sequences, with and without toys. Thus, a hybrid measure combining Meins et al.'s (2001) and Bartsch and Wellman's (1995) codification systems was used, categorizing all appropriate mental comments in different categories (desires, cognitions, emotions).

A randomly selected 58% ($n = 34$) of videotapes were coded by a second trained rater, blind to all other measures. Inter-rater reliability (intra-class correlation; ICC) was .95 for total appropriate mind-related comments made during the free play with toys, and .89 for the free play without toys. With respect to references to specific categories of mental states, ICC coefficients were the following: from .82 to .99 for the free play with toys and between .97 and .99 for the free play without toys.

Infant security of attachment. It was assessed at T2 with the Attachment Q-Sort (AQS; Waters & Deane, 1985), following the home visit described above. Trained home visitors observed infant behaviors throughout the visit and completed the AQS immediately after. The AQS consists of 90 items measuring the quality of the child's attachment behaviors toward a specific figure (the mother in this case). Items are sorted into nine clusters, ranging from very similar to very unlike the observed child's behaviors. The global score for attachment security consists of the correlation between the observer's sort of the 90 items and

a criterion sort for the prototypically secure infant, provided by Waters and Deane (1985). Thus, AQS scores range from -1.0 (highly insecure) to 1.0 (highly secure). Meta-analytic data (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004) suggest that the observer-AQS shows excellent construct validity, with scores converging with attachment security assessed with the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978) and with maternal sensitivity and child socio-emotional adaptation.

In the current study, a second home visitor was present for 17 visits (29%) and completed the AQS independently, in order to assess inter-rater reliability. Agreement between the two raters was satisfactory, $ICC = .77$.

Children's theory of mind. The Level 1 visual perspective-taking task (Carlson et al., 2004; Flavell et al., 1981) used at 2 years of age (T3) evaluated children's capacity to consider another person's perspective so as to understand whether this person can see an object. The experimenter presented one toy at a time to the child, asking him/her to show the object to his/her mother. Four toys were presented to the child in turn, and in each case the child needed to implement a correction for his or her mother to be able to see the object (e.g., ask her to open her eyes).

The tasks at 4 years of age (T4) aimed to measure two aspects of children's ToM: understanding of false belief and Level 2 visual perspective-taking.

Contents false belief. This task was adapted by Carlson et al. (2004) from Perner et al. (1987) and Gopnik and Astington (1988). Children were shown a Band-Aid box and were asked a control question, what they thought was inside (all said "Band-Aids"). Then the experimenter opened the box to reveal that it actually contained crayons. The experimenter closed the box and asked, "When you first saw this box, before we opened it, what did you

think was inside, Band-Aids or crayons?” Children were then shown a doll, Alice, and told that she had never looked inside the box. The experimenter asked children what Alice thought was inside the box. Finally, children were asked to identify the true contents of the box. A correct answer on the control question was necessary for credit on the “self” and “other” test questions. Scores reflected the number of correct responses (0-3) provided by the child: Band-Aids, Band-Aids, and crayons.

Level 2 visual perspective-taking (Carlson et al., 2004; Flavell et al., 1981). This task evaluated children’s capacity to comprehend another person’s visual perspective. Children were shown drawings and asked to determine how the drawings looked from another person’s perspective, “right side up” or “upside down.” The experimenter first asked children whether a cup (held up right, then inverted) was held “right side up” or “upside down”, to ensure understanding of these terms. All children understood them. Then the experimenter, who was sitting across a table, facing the child, presented three animal pictures flat on the table (turtle, bird, and pig, in turn) and asked children how the animal looked *to the experimenter*. Each card was presented twice — right side up and upside down from the child’s perspective — in a fixed alternating order. To succeed in this task and receive a point for each picture presentation, the child had to place himself/herself in the experimenter’s position and tell if the picture was presented right side up or upside down from the experimenter’s perspective, rather than from his/her own perspective (score: 0-6). Next, the experimenter showed children a picture book right side up and then upside down and asked them to describe how it looked from *their* perspective (child perspective - not scored). Then the experimenter stated that for the rest of the game, the child should describe how the book looked from *her* perspective (experimenter perspective). Three trials followed — twice upside down and once right side up

from the experimenter's point of view. Again, to receive a point for each picture presentation, the task required that the child placed himself/herself in the experimenter's position and tell if the picture was presented right side up or upside down from the experimenter's perspective rather than from his/her own perspective (score: 0-3). The total score for visual perspective reflected the number of correct responses (0-9) on trials pertaining to the experimenter's perspective across these two tasks.

Children's verbal IQ. It was assessed at T4 with the *Information Subscale* of the *Wechsler Preschool and Primary Scale of Intelligence (WPPSI-III)*. The WPPSI is a measure of intelligence designed for children aged 2 to 7 years. The current version, *WPPSI-III* (Wechsler, 2002) provides subtest and composite scores that represent intellectual functioning in verbal and performance cognitive domains, as well as a composite score that represents children's general intellectual ability. The *Information Subscale* of the *WPPSI-III* is a core verbal subtest. It is composed of 34 items and assesses children's ability to acquire, retain, and retrieve general factual knowledge. Children are asked to answer questions concerning general knowledge topics. It involves auditory perception and comprehension as well as verbal expressive ability (Cooper, 1995). This subtest was chosen to index child verbal ability because it shows high correlations to measures of expressive language (r 's between .78 and .86) and to the overall verbal IQ score ($r = .88$; Wechsler, 2002).

Results

Preliminary analyses

Table 2 presents the observed ranges, means and standard deviations for all main variables. With respect to categories of mental comments, mothers commented mostly on children's desires and cognitions during both play sequences, with less variability observed for comments on children's emotions. Scores ranged from -.28 to .82 for attachment. Observed scores on the false belief and the Level 2 visual perspective-taking tasks corresponded to their full theoretical range (respectively, 0 to 3 and 0 to 9). Finally, children's raw scores on the WPPSI's *Information Subscale* ranged between 9 and 28 (for a theoretical range of 0-34).

Total numbers of mind-related comments made in each play sequence were unrelated ($r = .22, p = .11$). Likewise, the false belief and Level 2 visual perspective-taking scores at 4 years of age were unrelated to each other ($r = .05, p = .72$) and were thus kept as distinct scores for analyses. Maternal mind-mindedness and children's attachment security were marginally related ($r = .23, p = .09$).

Children's performance on the false belief and the Level 2 visual perspective-taking tasks was unrelated to maternal education, number of older siblings or child gender (all r s < .19, *ns*). Therefore, these variables were not retained as covariates in the main analyses. However, children's scores on the Level 2 visual perspective-taking task at 4 years were marginally linked to previous scores on the Level 1 visual perspective-taking task at 2 years ($r = .22, p = .09$), and significantly related to children's current age ($r = -.35, p < .01$). No relation was found between children's performance on the Level 2 visual perspective-taking task at 4 years and verbal IQ ($r = .01, p = .93$). As for children's false belief understanding, a positive association was found with verbal IQ ($r = .30, p < .05$) and with children's age ($r = .26, p < .05$). No significant relation was found between children's false belief understanding

and previous scores on the Level 1 visual perspective-taking task at 2 years ($r = .13, p = .33$). Given these results, and for uniformity purposes, children's age, previous scores on the Level 1 visual perspective-taking task at 2 years, and verbal IQ were all retained as covariates in subsequent regressions predicting children's understanding of Level 2 visual perspective-taking and false belief at 4 years.

Main analyses

Mind-mindedness and ToM. Children's performances on the 4-year false belief and Level 2 visual perspective-taking tasks were unrelated to maternal mind-mindedness during the free play without toys (respectively, $r = .10, p = .50$; $r = .08, p = .55$). Therefore, mind-mindedness in the context of free play without toys was not used in further analyses. In contrast, mothers' overall use of appropriate mind-related comments during the free play with toys three years earlier was related to children's performance on both tasks. Table 3 presents these correlations, as well as the correlations between children's performance on both 4-year ToM tasks and mothers' specific references to desires, cognitions, and emotions, also in the free play with toys. Children's Level 2 visual perspective performance was positively related to mothers' references to desires and cognitions. Children's understanding of false belief was positively related to mothers' references to cognitions and emotions.

Next, in order to examine whether mind-mindedness adds to the prediction of children's performance on Level 2 visual perspective-taking above and beyond the relevant covariates, a multiple regression analysis was carried out. Children's age, earlier performance on Level 1 visual perspective-taking, and verbal IQ were all entered in the first block, followed by appropriate mind-related comments in the second block. Table 4 (upper panel) presents the results of this analysis. The overall model was significant, $F(4, 54) = 4.48, p <$

.01. The three covariates accounted for 15.5% of the variance of children's Level 2 visual perspective-taking at 4 years, while appropriate mind-related comments added a significant 9.4% to the prediction. A further regression analysis (Table 4, lower panel), also significant, $F(5, 53) = 3.35, p < .05$, showed that of the specific types of mind-related comments, only mothers' references to child cognitions added a significant contribution above and beyond the covariates.

Similar regression equations were carried out on children's performance on false belief understanding and are presented in Table 5. Children's age, earlier performance on visual perspectives and verbal IQ accounted for 16.1% of the variance of children's performance on the false belief task, while appropriate mind-related comments added a significant 14.4% to the prediction (upper panel), $F(4, 54) = 3.36, p < .01$. Another regression analysis (lower panel), $F(5, 52) = 3.47, p < .01$, showed that mothers' references to child cognitions added a significant contribution, while references to emotions added a marginal contribution.

Attachment security and ToM. Table 6 shows that for the sample as a whole, attachment security was unrelated to children's performance on either ToM tasks. However, in light of our previous results when these children were aged 2, we conducted separate analyses by gender to test whether the weak associations between attachment and children's ToM performance could be attributed to gender-specific relations. As displayed in Table 6, these analyses showed that there was no significant association between attachment security and understanding of false belief for boys or girls. However, for boys, there was a positive relation between attachment security and performance on the Level 2 visual perspective-taking task, which was not the case for girls. Thus, similar to what we found with the same children when

they were two years younger, more securely attached boys, but not girls, performed better on a task requiring comprehension of another person's visual perspective. A regression analysis showed that boys' earlier visual perspective-taking performance accounted for 4.1% of the variance in their performance on the second-level visual perspectives task at 4 years, while attachment security added a significant 13.9% to the prediction ($\beta = .38, p < .05$).

Exploratory analyses

The boys-specific findings with attachment security in the previous and in the current study prompted us to investigate further, in order to examine whether these boys-specific findings could reflect an artifact due to gender differences on core study variables. This does not appear to be the case: there were no gender differences on attachment security scores, $t(58) = .09, p = .93$, maternal mind-mindedness scores, $t(57) = .61, p = .55$, or verbal IQ scores, $t(58) = .68, p = .50$.

Discussion

This study examined the longitudinal associations between maternal mind-mindedness, infant attachment security, and two aspects of preschoolers' ToM understanding. The results showed that mothers' use of appropriate mind-related comments during a free play with toys at 1 year of age was positively related to children's Level 2 visual perspective-taking and false belief understanding at age 4, even when their perspective-taking abilities at age 2 were controlled. Hence, the well documented links between mothers' mental-state talk and aspects of preschoolers' ToM such as false belief and emotion understanding (e.g., Laible & Thompson, 2000; Meins et al., 2002; Raikes & Thompson, 2006) were replicated here with false belief, and were extended to preschoolers' appreciation of visual perspectives. The current results also suggest the developmental robustness of our prior findings, regarding links

between maternal mind-mindedness and children's appreciation of more rudimentary aspects of visual perspectives. Importantly, the new findings are statistically independent from the previous ones, given that we partialled out prior visual-perspective performance when predicting the same ability at 4 years. Maternal mind-mindedness may therefore play a meaningful role in children's developing understanding of false belief, and of both Level 1 and 2 visual perspective-taking, and can thus be added to the few known predictors of visual perspective-taking: maternal education, family income, parenting instructional responses, and children's executive functions (Carlson et al., 2004; Pears & Moses, 2003).

Hence, the current results reaffirm the suggestion that exposure to mind-minded comments is beneficial to infants' social understanding. Although the precise mechanisms through which this would happen are a matter for future research, some potential explanations can be proposed. It has been suggested that parents' ability to talk about different mental states serves the function of enabling their infants to distance themselves from, and to reflect upon, the experience of underlying mental states (Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986). Stern (1985) argues that this allows infants and their parents to "negotiate shared meanings" about experience. Once infants are able to create shareable meanings about themselves and their world, they develop a new set of capacities: to be self-reflective and to comprehend others' mental states. Furthermore, one may speculate that parental labeling of mental states can help infants develop concepts about others' minds by gradually fostering a spontaneous tendency to consider others as inherently mental beings, and an early capacity to realize that their own perspectives and experiences are not necessarily universal. This inclination to put oneself in others' "mental shoes" would give young children a fundamentally mental perspective on surrounding interpersonal events, thereby providing

them with the essential building blocks of an increasingly sophisticated understanding of others' minds, including false belief and visual perspectives.

When considering references to specific classes of mental states, mothers' references to child cognitions appeared especially meaningful, as this score had a significant unique contribution to the variance in children's understanding of both visual perspectives and false belief, above the relevant covariates (while references to emotions added a marginal contribution to the prediction of false belief understanding only). In our previous study, we found that maternal comments on children's desires at 1 year of age made a marginal contribution to visual perspective-taking at age 2. Taken together, these results reiterate that the specific content of maternal discourse during mother-child interactions can only be examined properly within a developmental frame. They also tentatively suggest that maternal comments on infant desires might play a salient role in children's first stages of social understanding, whereas comments on their cognitions may become more relevant as children develop an understanding of more advanced stages of ToM. While such results would be consistent with those reported by Ensor and Hughes (2008), one needs to bear in mind that in the current study, only prospective relations were examined, as maternal talk was assessed solely at 1 year of age. The design did not allow us to tease apart early from later maternal discourse, and it is therefore unclear whether the traces left by specific maternal mental references at 1 year gradually began to play a role in distinct aspects of children's ToM as they grew older or, instead, if mothers' talk tended to be stable over the years, such that mothers who used more cognitive references in infancy continued referring often to their preschoolers' cognitions three years later. Hence, while it is becoming increasingly clear that time and development need to be considered when studying the content of maternal discourse in

relation to children's ToM, further research is needed to tease apart longitudinal predictions from stability in maternal verbal behavior.

Relational factors are well-known predictors of ToM (Hughes, 2011). However, some studies failed to find relations between attachment and ToM (Meins et al., 2002; Ontai & Thompson, 2008; Symons & Clark, 2000). In the current study, no significant association was found between attachment security and preschoolers' understanding of false belief or visual perspective-taking when considering the whole sample. However, for boys, a positive relation was found between attachment security and performance on the visual perspective-taking task, which was not the case for girls. These results are striking in that they replicate what was found with the same children when they were two years younger: more securely attached boys, but not girls, had been found to show better Level 1 visual perspective-taking, on a task that required comprehension of their mother's perspective. We had then suggested that this might be partly explained by the gender composition of the parent-child dyad, such that attachment security to the opposite-sex parent would play a special role: within secure attachment relationships, the gender difference between mothers and their sons could provide a fruitful context for boys to understand a mind distinctively different from their own (see Cassidy, Fineberg, Brown, & Perkins, 2005). The current results build on these, given that boys more securely attached to their mothers were again found to have superior performance, this time on a Level 2 visual perspective-taking task, requiring comprehension of an unknown female experimenter's perspective. This relation remained significant when adjusting for boys' performance on the 2-year visual perspective task. The combination of results across methodological parameters (children's age, level of visual perspective-taking tapped, relationship to the individual involved in the task) now permits the suggestion that attachment

security to their mother is relevant to understanding boys' comprehension of adults' visual perspectives. Studies also considering father-daughter and father-son attachment are needed, however, to tease apart child gender and gender mix of the dyad in interpreting this finding.

Total numbers of mind-related comments made in each play sequence were unrelated to each other. Likewise, no association was found between children's 4-year ToM performance and maternal mind-mindedness during the free play without toys. This suggests that the two free play sessions (with and without toys) solicit different behaviors from mothers, with different implications. In the free play with toys, toy-directed child actions might provide clues as to what the child is experiencing. Such a context, helping to disambiguate children's mental states, is likely to reveal relevant individual differences in mothers' tendency to comment on such mental states. Hence, actions and objects may provide a scaffold for mind-minded mothers to express their mental inclination verbally, thus yielding better predictive power in relation to child socio-cognitive development.

This study presents some methodological limitations that call for careful interpretation of the results, while suggesting further avenues for research. First, maternal mind-mindedness was measured only once, when children were 12 months of age. It is therefore unclear whether the results found truly represent prospective associations, or simply reflect stability in mothers' mind-mindedness between 1 and 4 years of children's age. Meins et al. (2003) measured mind-mindedness at 6 months and 4 years of age and found that it was the early measure that predicted children's mentalising abilities. These results suggest that in the current study, the relations could represent prospective associations – however, this cannot be confirmed. A result that requires attention is the negative relation that we found between children's scores on the visual perspective-taking task at 4 years and their exact age in months.

This may represent a spurious finding (especially in light of the small age range, 47 to 50 months), and the marginal but positive link between scores on this task and on the prior visual-perspective task does provide confidence in score validity. It remains, however, an unexpected finding, difficult to explain at this point. Also, the fact that the association found between Level 1 and Level 2 visual perspective-taking at 2 and 4 years of age was only marginal may seem unexpected, but is consistent with results of previous studies. For instance, Carlson et al.'s (2004) results also revealed a marginal relation between Level 1 and Level 2 visual perspective-taking at 2 and 3 years of age. Finally, the absence of relation between children's verbal IQ and Level 2 visual perspective-taking understanding, versus the presence of a significant association between children's verbal IQ and false belief understanding, is noteworthy. It may be that false belief understanding requires from children more verbal ability, for instance inner/private speech (Vygotsky, 1987), in order to reason about others' beliefs, whereas visual perspective-taking might be less demanding verbally and rely more on perceptual abilities. However, these hypotheses require further investigation.

The study presented here, along with [***], suggests that maternal mind-mindedness during mother–infant interactions relates to different aspects of children's subsequent ToM development, and that attachment security is related to understanding of visual perspectives, specifically in boys. Replication of these findings across two time points, namely 2 and 4 years of age, above and beyond stability in perspective-taking between these ages, supports the robustness of the associations found between maternal mind-mindedness, mother–son attachment security, and children's subsequent social-cognitive understanding. These findings suggest that toddlers' and preschoolers' social cognition may be influenced by specific aspects of their early social environment. Future studies should continue to investigate these

longitudinal associations with subsequent stages of ToM understanding while accounting for stability in the quality of parent–child interactions and gender differences.

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Table 1

Measures taken at different time points in the study

Age	Measures
12 months (T1)	<ul style="list-style-type: none"> • Socio-demographic factors • Maternal mind-mindedness (Meins et al., 2001)
15 months (T2)	<ul style="list-style-type: none"> • Infant security of attachment (Attachment Q-Sort; Waters & Deane, 1985)
2 years (T3)	<ul style="list-style-type: none"> • Level 1 visual perspective-taking (Carlson et al., 2004; Flavell et al., 1981)
4 years (T4)	<ul style="list-style-type: none"> • Level 2 visual perspective-taking (Carlson et al., 2004; Flavell et al., 1981) • False belief (adapted by Carlson et al., 2004) • Children's verbal IQ (WPPSI-III; Wechsler, 2002)

Table 2

Observed range, mean and standard deviation for all main variables

Variable	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Maternal variables				
Mental comments (with toys)	0	29	13.53	7.72
Desires	0	18	5.21	3.63
Cognitions	0	24	7.37	5.87
Emotions	0	3	.54	.85
Mental comments (without toys)	0	41	12.54	8.72
Desires	0	24	5.83	5.77
Cognitions	0	21	4.81	4.48
Emotions	0	7	1.54	1.77
Child variables				
Attachment security	-.28	.82	.47	.25
False belief	0	3	2.03	.89
Visual perspective	0	9	3.47	3.48
Verbal ability	9	28	22.23	3.30

Table 3

Correlations between maternal appropriate mind-related comments and children's performance on the ToM tasks at 4 years

	Visual Perspectives	False Belief
Appropriate mind-related comments	.43**	.37**
Desires	.28*	.15
Cognitions	.39**	.36**
Emotions	.06	.31**

* $p < .05$; ** $p < .01$

Table 4

Regression analyses predicting children's Level 2 visual perspective-taking at 4 years of age

Predictor	R ² total	R ² unique	β
Block 1. Covariates	15.5%	15.5%	
Children's age			-.37**
Visual perspective (2 years)			.20
Children's verbal IQ			.01
Block 2. Appropriate mind-related comments	24.9%	9.4%	.34*
Block 1. Covariates	15.5%	15.5%	
Children's age			-.37**
Visual perspective (2 years)			.20
Children's verbal IQ			.01
Block 2. Comments on desires and cognitions	24.0%	8.5%	
Desires			.10
Cognitions			.27*

* $p < .05$; ** $p < .01$

Table 5

Regression analyses predicting children's false belief understanding at 4 years of age

Predictor	R ² total	R ² unique	β
Block 1. Covariates	16.1%	16.1%	
Children's age			.20
Visual perspective (2 years)			.09
Children's verbal IQ			.29*
Block 2. Appropriate mind-related comments	30.5%	14.4%	.42**
Block 1. Covariates	16.3%	16.3%	
Children's age			.20
Visual perspective (2 years)			.09
Children's verbal IQ			.29*
Block 2. Comments on cognitions and emotions	39.4%	23.1%	
Cognitions			.44**
Emotions			.23 [†]

[†] $p < .10$; * $p < .05$; ** $p < .01$

Table 6

Correlations between attachment security and performance on the ToM tasks for the whole sample, and for boys and girls separately

	Attachment security
Total sample	
False Beliefs	-.13
Visual Perspectives	.20
Boys	
False Beliefs	-.19
Visual Perspectives	.41*
Girls	
False Beliefs	-.11
Visual Perspectives	.06

* $p < .05$

Conclusion

Résumé des objectifs et des résultats

L'objectif principal de la thèse et des articles qui la composent était de contribuer de trois façons à l'avancement des connaissances sur l'orientation mentale (OM) et ses résultantes développementales. Dans un premier temps, en examinant les liens longitudinaux entre l'OM maternelle et le développement du langage expressif chez les enfants de 2 ans. Par la suite, en explorant les relations longitudinales entre l'OM maternelle, la sécurité d'attachement des enfants et les premières articulations de la théorie de l'esprit chez les enfants de 2 ans (compréhension des désirs d'autrui et du Niveau 1 des perspectives visuelles). Finalement, en explorant à nouveau, 2 ans plus tard, les liens longitudinaux entre l'OM maternelle, la sécurité d'attachement des enfants et la théorie de l'esprit chez les enfants de 4 ans (compréhension des fausses croyances et du Niveau 2 des perspectives visuelles).

Tout d'abord, les résultats du premier article de la thèse ont permis de conclure que l'OM maternelle est associée au développement du langage expressif chez les enfants de 2 ans. En effet, une utilisation accrue par les mères de commentaires mentaux appropriés avec leur enfant à 1 an est associée à l'acquisition d'un plus grand nombre de mots dans le vocabulaire expressif chez leur enfant à l'âge de 2 ans, lors du « *vocabulary spurt* », période importante dans la croissance du vocabulaire chez les enfants. La relation trouvée est demeurée significative après avoir contrôlé le statut socio-économique familial (variable généralement associée au développement du langage chez les enfants : Brooks-Gunn, Duncan, & Brito, 1999; Stipek & Ryan, 1997; Walker, Greenwood, Hart, & Carta, 1994). Parmi les différents types de commentaires mentaux que les mères ont utilisé, seuls les commentaires sur les cognitions de l'enfant étaient significativement associés au développement du langage

expressif. De la même façon que chez les enfants, la tendance à faire référence aux cognitions est considérée comme étant une indication d'une représentation mentale plus avancée (Bartsch & Wellman, 1995), les commentaires que font les mères sur les cognitions de leur enfant pourraient leur demander un effort supplémentaire d'interprétation comparativement aux autres types de commentaires (désirs et émotions) à cause de l'aspect représentationnel que nécessitent les références sur les cognitions. En effet, les commentaires sur les désirs et les émotions pourraient être plus faciles à employer par les mères puisque ceux-ci sont généralement plus manifestes, par exemple, l'enfant affichant un désir pour un jouet en particulier ou encore manifestant de la colère lorsqu'un jouet lui est retiré. Quant aux commentaires sur les cognitions, ils font référence à des éléments davantage implicites chez les enfants, tels que leurs processus de pensée. En conséquence, ce type de commentaires qui se veut moins « visible » ou « apparent » pour les mères pourrait être indicateur d'une prédisposition d'OM différente ou plus marquée.

Les études antérieures ont démontré que l'OM maternelle aurait un rôle à jouer dans l'acquisition du style linguistique des enfants (Meins & Fernyhough, 1999) et dans le développement du langage sur les états mentaux internes des enfants (Meins, Fernyhough, Johnson, & Lidstone, 2006). Grâce au premier article de la thèse, le rôle de l'OM peut maintenant être étendu au développement du langage expressif chez les enfants alors que celui-ci devient une tâche développementale saillante.

Les résultats des second et troisième articles de la thèse ont permis de démontrer que l'OM maternelle est associée au développement initial de la compréhension de la théorie de l'esprit chez les enfants de 2 ans (après avoir contrôlé leurs habiletés verbales concomitantes), puis de vérifier la robustesse développementale de ces résultats et les étendre au

développement de la compréhension de la théorie de l'esprit chez les mêmes enfants à 4 ans (après avoir contrôlé leur théorie de l'esprit préalable). Dans un premier temps, les résultats suggèrent que les mères qui font davantage de commentaires mentaux appropriés lors d'un jeu libre à 1 an ont des enfants qui obtiennent des performances supérieures sur une tâche de compréhension des désirs d'autrui à 2 ans. Les commentaires sur les désirs sont significativement associés à la compréhension que les enfants développent des désirs d'autrui. Ce type de commentaires est d'ailleurs celui le plus fréquemment utilisé par les mères. Étant donné la fréquence à laquelle surviennent ces commentaires, il est possible qu'ils favorisent la compréhension que les enfants développent de leurs propres désirs ainsi que de ceux d'autrui. Pour ce qui est de la deuxième tâche de théorie de l'esprit, soit la compréhension des perspectives visuelles de Niveau 1, la performance des enfants à l'âge de 2 ans est supérieure lorsque les mères utilisent davantage de commentaires mentaux appropriés 1 an plus tôt. Toutefois, aucun des types de commentaires n'est spécifiquement associé à la performance des enfants à cette tâche. Deux ans plus tard, les enfants, alors âgés de 4 ans, ont fait preuve de performances supérieures sur des tâches de compréhension des fausses croyances et de Niveau 2 des perspectives visuelles lorsque leurs mères ont eu recours à davantage de commentaires mentaux appropriés à 1 an. Ces résultats sont indépendants de ceux trouvés à 2 ans, la théorie de l'esprit préalable ayant été contrôlée. Seuls les commentaires sur les cognitions de l'enfant sont associés à ces deux tâches de théorie de l'esprit à 4 ans.

Les résultats des trois études suggèrent qu'au-delà de la propension des mères à faire preuve d'OM par l'entremise de commentaires mentaux appropriés, il y aurait dans le discours mental adressé à l'enfant des types de commentaires mentaux spécifiques qui favoriseraient le développement de différentes sphères de la théorie de l'esprit et du langage chez les enfants à

différents âges. Dans un premier temps, il semble possible que les commentaires sur les désirs de l'enfant jouent un rôle saillant dans le développement des premiers stades de la théorie de l'esprit (compréhension des désirs). Les commentaires sur les cognitions, qui seraient indicateurs d'une prédisposition d'OM différente ou plus marquée chez les mères, deviendraient plus importants alors que l'enfant développe une compréhension des stades plus avancés de la théorie de l'esprit (compréhension des fausses croyances et du Niveau 2 des perspectives visuelles) et lors du développement du vocabulaire expressif. Les résultats des articles de la thèse proposent qu'au-delà de la propension à faire des commentaires mentaux généraux et appropriés à l'état mental de l'enfant, une attention plus précise devrait être portée à ce qui, dans le discours mental du parent, semble favoriser différentes sphères de développement de l'enfant.

Enfin, les deuxième et troisième articles de la thèse ont également permis de conclure que la sécurité d'attachement pourrait elle aussi être bénéfique au développement de la compréhension des perspectives visuelles de Niveau 1 et 2, toutefois seulement chez les garçons, pas chez les filles. Ces résultats sont cohérents avec l'idée de Belsky (1997; 2005) à savoir que les enfants présenteraient une susceptibilité différentielle à leur environnement. Afin d'expliquer ce plus grand impact de la sécurité d'attachement chez les garçons, il a été proposé que ceci soit possiblement dû à la composition de la dyade parent-enfant dont la sécurité d'attachement a été mesurée, les garçons étant exposés à une vie mentale potentiellement très différente de la leur, soit la vie mentale d'un adulte de sexe opposé.

En somme, les résultats de la thèse viennent s'ajouter à ceux de la littérature existante sur l'OM et suggèrent que ce comportement maternel pourrait avoir un rôle à jouer dans le développement du langage expressif chez les enfants ainsi que dans le développement de la

théorie de l'esprit, et ce, plus tôt qu'on ne le croyait, soit dès l'âge de 2 ans, et serait associée au développement des perspectives visuelle de Niveau 1 et de Niveau 2, ce qui n'avait jamais été étudié auparavant. Étant donné le rôle important que semble jouer ce comportement maternel dans plusieurs différentes sphères du développement de l'enfant, des questions se posent concernant l'origine de ce construit : D'où vient l'OM? Chez qui peut-on l'observer? Peut-on la favoriser et l'inclure dans des programmes d'intervention?

Origines de l'OM

Dans les dernières années, des études se sont intéressées à l'origine du construit d'OM et ont cherché à découvrir la provenance de ce comportement parental. Meins et ses collègues (2006) ont ainsi démontré que les mères faisant preuve d'OM ne démontraient pas ce comportement à travers toutes leurs interactions, mais qu'elles en feraient plutôt preuve en interprétant les comportements d'un enfant précis avec qui elles ont formé une relation. L'OM ne se manifesterait donc pas chez tout adulte qui est amené à côtoyer un enfant, mais serait plutôt un construit spécifique à la relation (Arnott & Meins, 2008).

L'OM du parent émergerait au même moment que l'apparition des premiers développements de la relation entre le parent et son enfant, et ce, avant même la naissance de l'enfant. Dès l'annonce de la grossesse, le parent verrait émerger la capacité à se représenter le fœtus comme une entité séparée, un enfant en devenir avec son futur propre. L'OM est bien plus qu'un trait cognitif et comportemental chez le parent, et serait une capacité à se représenter un enfant avec qui le parent a formé une relation, que cet enfant soit présent en chair et en os ou un être en devenir. Grâce à cette capacité de représentation, le parent serait plus enclin à considérer les goûts, les intérêts ainsi que les différentes réactions émotionnelles de son enfant. Il serait donc mieux outillé, par la suite, pour refléter ce qu'il a observé et appris

ce faisant, par l'entremise du discours adressé à son enfant.

Caractéristiques du parent. Des études ont vérifié si la propension à faire preuve d'OM serait associée à des facteurs tels que le statut socio-économique et l'éducation du parent, et ne sont pas arrivées à des preuves importantes à l'effet que l'OM serait déterminée par ces facteurs sociaux généraux (Meins et al., 1998; Meins et al., 2002; Meins, Fernyhough, Arnott, Turner, & Leekam, 2011). Quel facteur pourrait donc être à l'origine de l'habileté à se représenter et à lire la vie mentale de son enfant?

L'habileté à faire preuve d'OM demanderait au parent de se détacher de sa vie mentale afin d'interpréter celle de son enfant et ne pas se laisser aller au jeu de ses propres projections sur son enfant. Les parents préoccupés ou stressés, ou encore ceux aux prises avec la détresse psychologique (dépression, schizophrénie), pourraient avoir davantage de difficulté à se représenter la vie mentale de leur enfant. La détresse psychologique et le stress pourraient potentiellement entraver la capacité du parent à faire preuve d'OM, les symptômes dépressifs, psychotiques ou le stress ayant un effet négatif sur l'habileté du parent à « s'accorder » avec l'état interne de son enfant. Toutefois, aucune preuve importante n'a corroboré l'effet des rôles présumés de la détresse psychologique (dépression et schizophrénie) sur l'habileté à faire preuve d'OM de façon appropriée (Demers et al., 2010; Meins et al., 2011; Pawlby et al., 2010 – résultat différent pour la dépression, Lundy, 2003). Néanmoins, il semble que le stress serait négativement associé à l'OM (Demers et al., 2010; McMahon & Meins, 2011), suggérant qu'un parent vivant davantage de stress se montrerait moins enclin à faire preuve d'OM auprès de son enfant. Cependant, la perception que le parent entretient du soutien social disponible ne semble pas être associée à son habileté à faire preuve d'OM (Meins et al., 2011). Ces résultats amènent donc à se questionner sur les autres

caractéristiques du parent, autre que le stress que vivent les parents, qui pourraient jouer un rôle auprès de l'OM.

Le facteur qui se montrerait le plus associé à la capacité du parent à faire preuve d'OM est son état d'esprit face à ses expériences passées d'attachement (mesuré par le *Adult Attachment Interview* [AAI]; George, Kaplan & Main, 1985). Le AAI, qui permet d'explorer les représentations actuelles que le parent possède à l'égard de ses diverses expériences d'enfance avec ses propres parents, se montre associé à l'habileté subséquente que le parent développe à faire preuve d'OM auprès de son enfant (Arnott & Meins, 2007; Bernier & Dozier, 2003; Demers et al., 2010). L'autonomie du parent face à ses expériences passées d'attachement et la liberté qu'il possède à évaluer ses expériences objectivement lui laisseraient une plus grande disponibilité émotionnelle et cognitive, lui accordant le loisir d'être plus alerte aux signaux de son enfant et d'interpréter ceux-ci de façon moins distordue (van Ijzendoorn, 1995). Ainsi, les parents autonomes au AAI, contrairement à ceux qui se montreraient évitants, préoccupés ou désorganisés, seraient mieux outillés pour considérer la vie mentale de leur enfant, ne pas distordre les signaux de celui-ci en attributions négatives, et ainsi avoir accès à une meilleure habileté à faire preuve d'OM auprès de leur enfant.

Une avenue qui n'a pas encore été l'objet d'exploration et qui mérite qu'on s'y attarde est la possibilité que l'OM prenne ses racines dans la théorie de l'esprit du parent. La capacité du parent à se représenter la vie mentale de son enfant pourrait être une extension de sa compréhension de sa propre vie mentale ainsi que de celle des autres, soit sa théorie de l'esprit. Un parent ne devrait-il pas avant tout être au fait de ce qui habite sa vie mentale afin d'être en mesure de décoder ce qui habite autrui et son enfant? Une avenue intéressante de

recherche pour le futur serait de considérer les relations entre la théorie de l'esprit du parent et sa capacité à faire preuve d'OM auprès de son enfant. Bien entendu, il serait attendu que les parents les plus performants sur des tâches de théorie de l'esprit se montreraient plus habiles à faire preuve d'OM auprès de leur enfant.

Caractéristiques de l'enfant. La recherche en psychologie du développement de l'enfant pose souvent la question de l'influence circulaire du parent sur son enfant, et de l'enfant sur son parent. L'OM parentale qui prendrait racine dans la relation à l'enfant mène à se questionner à savoir si l'enfant pourrait avoir une influence sur l'OM de son parent. Les résultats antérieurs n'apportent pas de soutien à l'idée que les mères se montreraient plus enclines à faire preuve d'OM lorsque leur enfant est plus habile cognitivement, plus engagé socialement, plus interactif, etc. En effet, l'OM ne se montre pas associée à des variables propres à l'enfant qui pourraient potentiellement contribuer aux interactions avec les parents, telles que l'habileté cognitive générale (Meins et al., 2001; Meins et al., 2002), l'activité simultanée de l'enfant (Meins et al., 2001), ainsi que le tempérament de l'enfant (Demers et al., 2010; Meins et al., 2011).

Caractéristiques de la relation. Des résultats d'études récentes suggèrent que l'OM maternelle serait associée à certains aspects de l'histoire obstétrique des mères, soit à la planification de la conception ainsi qu'à l'évaluation de la grossesse. Les mères qui percevraient leur grossesse comme étant plus facile et ayant planifié la conception seraient plus susceptibles de faire preuve d'OM que celles pour qui la grossesse n'était pas planifiée (Meins et al., 2011).

Finalement, puisque l'OM se montre spécifique à la relation, est-ce que cette prédisposition à faire preuve d'OM se manifesterait de la même façon chez tous les enfants

d'une même famille ou encore se manifesterait-elle de façon différente auprès de chacun des enfants? Afin de vérifier si l'OM se généralise à travers les différentes relations, il serait intéressant d'explorer si l'OM varie entre les frères et sœurs d'une même famille, et si oui, de quelle façon. Si les parents qui ont davantage tendance à commenter de façon appropriée ou non-appropriée la vie mentale de leur premier enfant ont tendance à commenter de façon similaire la vie mentale de leur deuxième enfant, ceci supporterait l'idée que l'OM serait un trait davantage cognitif et comportemental chez le parent, indépendant des caractéristiques de l'enfant. Ceci demeure toutefois à être exploré et serait une intéressante piste de recherche pour le futur.

En somme, à ce jour, les résultats d'études proposent que la prédisposition à se représenter la vie mentale de son enfant prendrait racine avant même la naissance de celui-ci dans la capacité du parent à se représenter le fœtus ainsi que dans certains aspects de l'histoire obstétrique des mères, tels que la planification de la conception ainsi que l'évaluation de la grossesse. L'OM se montrerait également influencée par les représentations que le parent entretient par rapport à ses propres expériences d'attachement passées avec ses parents, ainsi que par le stress vécu dans sa vie quotidienne.

OM et « *mental-state talk* »

L'OM se veut différente de l'utilisation d'un discours général sur les états mentaux à la maison (Dunn et al., 1991) ou lors de tâches de laboratoire (p. ex., Taumoepeau & Ruffman, 2008). Elle se différencie par l'utilisation *appropriée* de commentaires mentaux reflétant l'état interne actuel de l'enfant. C'est précisément cette capacité de représentation que le parent possède qui différencie l'OM mesurée de façon comportementale (utilisation de commentaires mentaux appropriés en interaction) de la mesure du « *mental-state talk* » introduite par Dunn

et ses collègues (1991). Bien qu'en apparence les deux mesures soient similaires, l'OM va au-delà du fait de commenter les états mentaux des diverses personnes de la vie environnante de l'enfant mais va plutôt spécifier chez *cet* enfant ce qui se passe à l'intérieur de *sa* vie mentale et ainsi lui permettre de s'approprier son monde mental. Les deux mesures considèrent donc des éléments différents. D'une part, le « *mental-state talk* » mesure l'ensemble des commentaires mentaux qu'un parent émet sur ce qui entoure l'enfant dans son environnement, alors que l'OM permet à l'enfant d'avoir accès, de comprendre et de s'approprier *sa* propre vie mentale.

Le « *mental-state talk* » est un concept ayant fait l'objet de plusieurs études et qui se montre associé à plusieurs sphères de développement chez l'enfant, telles que le langage sur les états mentaux chez les enfants de 24 et 33 mois (Tamoepau & Ruffman, 2006; 2008), la performance sur des tâches de compréhension de théorie de l'esprit et des émotions de 2 à 10 ans (Dunn, Bretherton, & Munn, 1987; Dunn et al., 1991; Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003; Moeller & Schink, 2006; Peterson & Slaughter, 2003; Ruffman, Slade, & Crowe, 2002; Ruffman, Slade, Devitt & Crowe, 2006; Tamoepau & Ruffman, 2006) ainsi que les interactions avec les amis à 5 ans (McElwain, Booth-LaForce, & Wu, 2011). La qualité des interactions avec les pairs n'a pas fait l'objet d'études en lien avec l'OM parentale. L'OM pourrait favoriser l'émergence d'une meilleure compréhension de l'univers social de l'enfant et lui permettre d'avoir accès à une meilleure lecture de ses états mentaux ainsi que ceux des autres. Cette meilleure compréhension sociale permettrait à l'enfant d'avoir des interactions plus positives avec ses pairs.

Il serait d'ailleurs intéressant que les recherches futures adressent ces différences entre l'OM et le « *mental-state talk* » et mesurent si ces deux formes de discours mental expliquent

de façons indépendantes la prédiction des différentes sphères du développement de l'enfant, soit en particulier dans le développement de la théorie de l'esprit chez l'enfant. Il serait intéressant de départager ce qui dans le discours mental des mères s'avère un meilleur prédicteur du développement de la compréhension sociale de l'enfant, le discours mental général (« *mental-state talk* ») ou le discours mental approprié et propre à la vie mentale de l'enfant (OM).

L'évolution du discours mental chez les parents

Une piste de réflexion additionnelle réside dans l'évolution du discours mental chez les parents au fur et à mesure que l'enfant grandit. Des études suggèrent que des changements se produiraient dans l'utilisation dont font les mères des commentaires sur les états mentaux entre 13 et 28 mois (Beeghly, Bretherton, & Mervis, 1986). La fréquence et la variété des commentaires sur les états mentaux lors de conversations augmenteraient avec l'âge de l'enfant. Les résultats suggèrent qu'au fur et à mesure que l'enfant vieillit, les mères auraient tendance à augmenter les références qu'elles font sur les états mentaux des autres. Le discours mental des mères serait donc plus centré sur l'état mental de l'enfant dans ses premières années de vie, lui permettant d'avoir accès à sa vie mentale, puis plus tard, davantage de références sur les états mentaux des autres seraient faites au fur et à mesure que l'enfant vieillit, lui permettant d'avoir accès au monde mental de son entourage.

Également, des résultats suggèrent que l'OM se montrerait stable chez le parent; un parent plus enclin à faire preuve d'OM conserverait cette habileté peu importe l'âge de son enfant. Meins et ses collègues (2003) rapportent que l'utilisation de commentaires mentaux à 6 mois serait associée à la propension des mères à utiliser des descripteurs mentaux afin de décrire leur enfant à 4 ans. De la même façon, l'OM mesurée de façon comportementale à 3

mois puis à nouveau à 7 mois se montre stable (Meins et al., 2011). Il est à noter que dans l'ensemble, les mères utiliseraient davantage de commentaires mentaux appropriés et non-appropriés lorsque leur enfant vieillit, toutefois, en termes de positions relatives, elles se montrent relativement stables dans leur propension à faire preuve d'OM.

Ainsi, indépendamment des changements liés à l'âge de l'enfant et de la façon dont les mères parlent à leur enfant, les mères qui ont tendance à commenter d'une certaine façon les états mentaux de leur enfant à un certain âge continueraient à le faire plus tard. L'OM serait donc un trait relativement stable chez les parents, mais qui pourrait, dans un premier temps, se centrer davantage sur les états mentaux de l'enfant (en OM) puis, alors que l'enfant vieillit, se centrer davantage sur les états mentaux d'autrui (en « *mental-state talk* »).

L'OM chez les mères et les pères

Lors des premières années de vie, les parents sont les premiers agents de socialisation et les premières figures de soins de l'enfant. Des études ont démontré que l'OM se manifesterait de façon différente chez la mère et le père. En effet, alors que l'utilisation de commentaires mentaux appropriés chez les mères est indépendante de l'utilisation de commentaires mentaux non-appropriés (Arnott & Meins, 2008; Meins et al., 2001), chez les pères, ces deux indices se montrent fortement négativement corrélés (Arnott & Meins, 2008). Également, les pères utiliseraient plus de commentaires mentaux inappropriés que les mères (Arnott & Meins, 2007). Ces résultats suggèrent que les pères pourraient être moins habiles que les mères dans la lecture des états mentaux de leur enfant. L'OM se déploierait donc de façons différentes chez les parents.

Bien que les pères des nouvelles générations s'impliquent de plus en plus auprès de leur enfant, il n'en demeure pas moins que la majorité des mères sont toujours les principales

figures de soins auprès de leur enfant, surtout lors de la première année de vie. Des résultats récents suggèrent que les pères continuent à être moins impliqués que les mères dans les soins fournis à l'enfant lors de la première année de vie (Leerkes & Burney, 2007) et ils rapportent leur implication davantage au niveau des jeux que dans le « prendre soin » (Hawkins, Lovejoy, Holmes, Blanchard, & Fawcett, 2008). Si les pères s'engagent plus dans des jeux, où les émotions positives ont tendance à prédominer, il se peut qu'ils développent moins leur capacité à discriminer la panoplie d'états internes chez leur enfant. Quant à elles, les mères ont davantage d'occasions de se montrer attentives aux émotions négatives signalées par leur enfant lors des moments où elles prennent soin de lui, et ainsi elles développeraient davantage d'habiletés à lire adéquatement les signaux manifestés par leur enfant. Une autre hypothèse suggérée par Arnott et Meins (2007) est que les mères sont également plus susceptibles de se documenter sur l'éducation et l'approche à adopter auprès de leur enfant, soit par l'entremise de lectures, de cours ou de groupes de soutien.

En somme, l'OM se manifeste différemment chez les parents. D'ailleurs, certains auteurs ont proposé que les parents agissent de façons différentes mais complémentaires afin de favoriser le développement de l'enfant (Paquette, 2004), toutefois, d'autres auteurs ont ajouté qu'il y aurait également un rôle compensateur des parents avec les forces d'un parent compensant les lacunes de l'autre parent (Martin, Ryan, & Brooks-Gunn, 2007; Simons & Conger, 2007). Toutefois, qu'en est-il pour l'OM parentale? Bien que les études aient comparé l'OM maternelle et paternelle, aucune étude n'a considéré le rôle unique de l'OM paternelle dans le développement socio-cognitif de l'enfant. Viendrait-elle également contribuer au développement du langage et de la théorie de l'esprit chez les enfants?

Labounty et ses collègues (2008) ont mesuré les associations entre le « *mental-state*

talk » chez les pères et les mères, et le développement de la théorie de l'esprit chez les enfants entre 3.5 et 5 ans. Les résultats ont suggéré que les mères et les pères différaient dans leur utilisation de « *mental-state talk* » et que ces différences semblaient avoir d'importantes implications dans le développement de la compréhension sociale des enfants. Bien que les deux parents faisaient référence aux états internes de leur enfant de façon équivalente, ils se montraient différents dans le *type* de références utilisé lors des conversations. Les mères faisaient davantage références aux émotions et utilisaient plus d'explications concernant les émotions que les pères, ce résultat se montrant cohérent avec ceux des études précédentes (Kornhaber & Marcos, 2000; Kuebli, Butler, & Fivush, 1995; Leaper, Anderson, & Sanders, 1998). Les mères étaient donc les agents de socialisation principaux dans la compréhension des émotions. Pour ce qui est des pères, la fréquence à laquelle ils faisaient références aux désirs et émotions, mis de pair avec la fréquence à laquelle ils abordaient les émotions négatives, avaient une influence sur la compréhension de la vie mentale de leur enfant. Les pères se montraient alors d'importants agents de socialisation dans le développement de la théorie de l'esprit de leur enfant. Ces résultats réitérent l'importance d'inclure les pères dans les recherches futures. Plusieurs questions demeurent sans réponse concernant le rôle de l'OM paternelle dans le développement de la compréhension sociale chez les enfants. Il est donc important que celles-ci soient considérées dans le futur.

Limites de la thèse

Tel que mentionné dans la section discussion de chacun des articles, les études qui constituent le cœur de la thèse présentent des limites méthodologiques qui méritent d'être énoncées.

Principalement, les trois études ont été réalisées auprès d'une population canadienne majoritairement de race blanche et à faible risque socioéconomique. En ce sens, il est difficile de généraliser les résultats de ces études à des populations à risque ou qui proviennent d'autres cultures. Ensuite, il est important de souligner que les devis utilisés ne permettent pas de faire d'inférences causales. On ne peut que spéculer sur la direction des relations observées. D'autre part, bien que l'utilisation de mesures observationnelles constitue une force de la thèse, le langage de l'enfant a été mesuré à l'aide d'un questionnaire complété par la mère. Étant donné que la mère est susceptible de surestimer ou de sous-estimer le nombre de mots que son enfant dit (Marjanovic-Umek, Fekonja, Podlesek, & Kranjc, 2011), cela constitue une limite importante. Également, deux limites concernant la mesure de l'OM méritent d'être évoquées: l'absence de contrôle de la verbosité maternelle ainsi que le fait que l'OM n'a été mesurée qu'une seule fois dans le temps. En effet, la mesure de l'OM par utilisation de commentaires mentaux appropriés aurait bénéficié d'avoir comme variable de contrôle la verbosité générale des mères. Ceci devrait d'ailleurs être à tout coup contrôlé dans les études futures qui s'intéressent à l'OM. Puis, dans les deuxième et troisième études, il aurait été également pertinent de mesurer l'OM à plus d'une reprise afin de constater l'évolution et la stabilité de l'OM, puis de vérifier si le discours mental à un certain âge de l'enfant s'avère davantage bénéfique au développement de sa compréhension sociale, plutôt qu'à un autre âge. En terminant, la thèse a été réalisée auprès des mères seulement. Étant donné le rôle important que le père joue auprès de l'enfant dès ses premières années de vie, il s'agit d'une lacune importante.

Méthodes d'intervention

Les résultats de la thèse suggèrent que l'OM aurait possiblement un rôle important au niveau du développement cognitif de l'enfant. Les interventions parentales devraient donc tenir compte de l'OM ou plus généralement de l'importance des représentations que les parents se font de leur enfant. Il y a quelques années, certaines interventions ont été mises en place, telles que « Minding the Baby » (Slade, Sadler, & Mayes, 2005) et « Watch, Wait and Wonder » (Cohen et al., 1999). Par exemple, « Minding the Baby » est un programme de visites à domicile basé sur la relation parent-enfant afin d'aider les mères à risque en améliorant leur capacité de mentalisation, favorisant ainsi le développement de leur enfant. Cette approche a pour mandat d'aider les participantes à faire sens des états mentaux de leur enfant, ainsi que des leurs, avec pour objectif le développement d'une saine relation mère-enfant. Ce programme vise particulièrement les familles qui vivent sur ou sous le seuil de la pauvreté et qui sont de cultures minoritaires. Les familles sont vues de façon hebdomadaire avant la naissance de l'enfant jusqu'à son premier anniversaire. Beaucoup des familles desservies sont des mères adolescentes. Pour ce qui est du programme « Watch, Wait and Wonder », cette approche psychothérapeutique utilise l'activité spontanée de l'enfant lors d'un jeu libre afin d'augmenter la sensibilité et la réponse maternelle, le sens de soi et l'auto-efficacité de l'enfant, la régulation des émotions, et la relation d'attachement parent-enfant. L'aspect central est d'apprendre au parent à développer sa capacité à refléter à son enfant son monde interne, ses émotions, ses pensées et ses désirs, et ainsi apprendre au parent à reconnaître le soi séparé de son enfant.

Au Québec, l'OM parentale a été abordée dans certains programmes d'intervention tels que le programme de soutien pour jeunes parents (Tarabulsky, 2002). Dans ce programme,

l'importance de ce comportement auprès des enfants est expliquée aux parents, leur fournissant ainsi un outil afin d'avoir une meilleure compréhension de leur enfant et finalement les aider à accompagner leur enfant dans son développement. Étant donné l'impact qu'ont certaines formations telles que « Minding the Baby » et « Watch, Wait, and Wonder » dans d'autres pays, l'OM devrait possiblement être intégrée dans les programmes de prévention et d'intervention au sein des populations à risque du Québec et du Canada. Des études d'efficacité devraient investiguer les répercussions que pourraient avoir ces programmes dans les développements socio-affectif et socio-cognitif des enfants.

Conclusion

Malgré ses limites méthodologiques, la thèse a atteint ses objectifs initiaux qui étaient de contribuer à l'avancement des connaissances sur l'OM et ses relations avec le développement socio-cognitif de l'enfant. Cette thèse visait à mettre en lumière le rôle de l'OM dans le développement du langage expressif chez les enfants de 2 ans, ainsi que dans les stades de développement initiaux et ultérieurs de la théorie de l'esprit des enfants de 2 et 4 ans. Les résultats obtenus grâce aux trois articles de la thèse paraissent prometteurs quant à leur contribution à la littérature sur l'OM, notamment ses résultantes développementales cognitives. Finalement, les résultats de la thèse soulèvent la pertinence potentielle d'enrichir les programmes d'intervention et de prévention auprès des dyades parent-enfant de la notion d'OM parentale.

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Annexe A

Grille de codification de l'orientation mentale à 12 mois :

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity:

Mother's comments on infant's mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry*, 42, 637-648.

COMMENTAIRES MENTAUX

Commentaires sur l'état mental	Commentaires sur les processus mentaux	Commentaires sur le degré d'engagement de l'enfant	Commentaires sur les tentatives de l'enfant de « manipuler » les pensées des autres	Tentative d'interpréter les pensées de l'enfant
<p>Identifier les commentaires de la mère faisant référence aux <u>désirs de l'enfant.</u></p> <p>Exemples</p> <p>Tu aimes ça les animaux.</p> <p>Tu l'aimes ce jeu là.</p> <p>Par lequel veux-tu commencer?</p> <p>Veux-tu essayer?</p> <p>Veux-tu qu'on le fasse ensemble?</p>	<p>Identifier les commentaires faisant référence <u>aux processus mentaux de l'enfant, aux connaissances et idées.</u></p> <p>Exemples</p> <p>C'est quoi tout ça?</p> <p>Qu'est-ce que c'est cet animal là?</p> <p>Qu'est-ce qu'elle fait la vache?</p> <p>Tu penses à comment tu devrais t'y prendre?</p>	<p>Identifier les commentaires maternels faisant <u>référence au degré d'engagement émotionnel de l'enfant.</u></p> <p>Exemples</p> <p>Tu es excité.</p> <p>Tu es content.</p> <p>Tu n'as plus envie de jouer.</p>	<p>Identifier les commentaires maternels faisant référence aux <u>tentatives de l'enfant de « manipuler » les pensées des autres.</u></p> <p>Exemples</p> <p>Tu me fais des blagues, tu ris de moi, tu me joues des tours, tu veux faire le contraire de ce que je te dis.</p>	<p>Identifier les commentaires maternels faisant référence aux <u>tentatives de la mère à interpréter les pensées de son l'enfant.</u></p> <p>La mère dit ce qu'elle pense que l'enfant se dit dans sa tête.</p> <p>Exemples</p> <p>« ça me tente pas » « je trouve ça plate moi ce jeu là » « C'est plus intéressant la caméra que ces jouets là »</p>

Annexe B

Q-sort d'attachement à 15 mois :

Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in attachment behavior: Q-methodology and the organization of behavior in infancy and early childhood. In I. Bretherton & E. Waters (Eds), *Growing points of attachment theory and research. Monographs of the Society for Research in Child Development*.

Items du Q-Sort d'attachement

1. B partage facilement avec M ou la laisse tenir des objets si elle lui demande. *Atypique: refus*
2. Lorsqu'il revient près de M après avoir joué, il est parfois maussade (grognon) sans raison apparente. *Atypique: il est joyeux et affectueux lorsqu'il revient près de M, entre ou après ses périodes de jeu.*
3. Lorsqu'il est bouleversé ou blessé, il acceptera d'être réconforté par des adultes autres que M. *Atypique: M est la seule personne par qui il accepte de se faire réconforter.*
4. Est soigneux et doux avec les jouets et les animaux domestiques.
5. Est plus intéressé par les gens que par les objets. *Atypique: plus intéressé par les objets que les gens.*
6. S'il est près de M et qu'il voit quelque chose avec lequel il veut jouer, il devient accaparant ou essaie d'amener M vers l'objet. *Atypique: va de lui-même vers l'objet qu'il désire avec entrain ou sans essayer d'amener M vers cet objet.*
7. Rit et sourit facilement à plusieurs personnes différentes. *Atypique: M peut l'amener à rire ou à sourire plus facilement que toute autre personne.*
8. Lorsqu'il pleure, il pleure fort. *Atypique: pleure, sanglote, mais ne pleure pas fort ou si cela lui arrive, ça ne dure jamais très longtemps.*
9. Est de bonne humeur et enjoué la plupart du temps. *Atypique: a tendance à être sérieux, triste ou ennuyé la majorité du temps.*
10. Pleure ou résiste souvent quand M l'amène au lit pour sa sieste ou au moment du coucher.
11. Souvent se serre ou se blottit contre M sans qu'elle lui est demandé ou invité à le faire. *Atypique: ne se serre pas ou ne s'étreint pas souvent sauf si M l'étreint la première ou qu'elle lui demande de lui faire une caresse.*
12. Va rapidement aller vers les personnes ou va utiliser les objets qui initialement le gênaient ou l'apauraient. *Neutre: s'il n'est jamais gêné ou effrayé.*

13. Lorsqu'il est bouleversé par le départ de M, il va continuer à pleurer ou va se fâcher après qu'elle soit partie. *Atypique: arrête de pleurer juste après son départ. Neutre: s'il n'est pas bouleversé par son départ.*
14. S'il découvre quelque chose de nouveau pour jouer, il va l'apporter à M ou le lui montrer à travers la pièce. *Atypique: joue calmement avec le nouvel objet ou va dans un endroit où il pourra jouer avec, sans être interrompu.*
15. Accepte de parler à de nouvelles personnes, de leur montrer des jouets ou de leur montrer ce qu'il est capable de faire si M lui demande.
16. Préfère les jouets qui peuvent représenter des êtres vivants (poupées, animaux en peluche, etc.). *Atypique: préfère les ballons, les blocs, les casseroles, etc.*
17. Perd rapidement son intérêt pour les adultes nouveaux s'ils font quelque chose qui l'ennuie.
18. Agit facilement selon les suggestions de M, même lorsqu'elles sont clairement des suggestions et non des ordres. *Atypique: ignore ou refuse ses suggestions sauf si elle lui ordonne.*
19. Quand M lui demande de lui apporter ou de lui donner quelque chose, il obéit. (Ne pas tenir compte des refus qui font partie d'un jeu à moins que cela ne devienne clairement de la désobéissance). *Atypique: M doit prendre elle-même l'objet ou élever la voix pour l'obtenir.*
20. Réagit peu à la plupart des coups, des chutes et des sursauts. *Atypique: pleure suite aux coups ou sursauts mineurs.*
21. Surveille les déplacements de M quand il joue dans la maison: •appelle M de temps en temps •remarque ses déplacements d'une pièce à une autre •remarque si elle change d'activités. *Neutre: s'il n'est pas autorisé ou s'il n'y a pas d'endroit où il peut jouer loin de M.*
22. Agit comme un parent affectueux envers ses poupées, les animaux domestiques ou les jeunes enfants. *Atypique: joue avec eux d'une autre manière. Neutre: s'il ne joue pas ou qu'il ne possède pas de poupées, d'animaux domestiques ou qu'il n'a pas de jeunes enfants dans son entourage.*

23. Quand M est assise avec les autres membres de la famille ou qu'elle est affectueuse avec eux, il essaie d'obtenir son affection pour lui seul. *Atypique: laisse M être affectueuse avec les autres. Peut participer, mais pas d'une manière jalouse.*
24. Lorsque M lui parle fermement ou qu'elle élève la voix, il devient bouleversé, désolé ou honteux de lui avoir déplu. (Ne pas coter typique s'il est simplement bouleversé par le ton de la voix ou qu'il a peur d'être puni).
25. Il est difficile pour M de savoir où il est lorsqu'il joue hors de sa vue. *Atypique: parle et appelle M lorsqu'il est hors de sa vue: • facile à trouver • facile de savoir avec quoi il joue. Neutre: s'il ne joue jamais hors de la vue de M.*
26. Pleure lorsque M le laisse à la maison avec une gardienne, l'autre parent ou l'un des grands-parents. *Atypique: ne pleure pas s'il est avec une de ces personnes.*
27. Rit lorsque M le taquine. *Atypique: contrarié quand M le taquine. Neutre: si M ne le taquine jamais durant les jeux ou les conversations.*
28. Aime relaxer assis sur les genoux de M. *Atypique: préfère relaxer sur le plancher ou sur une chaise, lit, sofa, etc. Neutre: s'il ne s'assoit jamais pour relaxer.*
29. Par moment, il est tellement concentré à quelque chose qu'il ne semble pas entendre lorsque quelqu'un lui parle. *Atypique: même s'il est très impliqué dans un jeu, il prête attention lorsque quelqu'un lui parle.*
30. Se fâche facilement contre les jouets.
31. Veut être le centre d'attention de M. Si M est occupée ou qu'elle parle à quelqu'un, il l'interrompt. *Atypique: ne remarque pas ou n'est pas préoccupé d'être le centre d'attention de M.*
32. Quand M lui dit "non" ou qu'elle le punit, il cesse de se comporter mal (au moins à ce moment-là). Elle n'a pas à lui dire deux fois.

33. Quelque fois il signale à M (ou lui donne l'impression) qu'il veut être posé par terre. Lorsqu'elle le pose, il devient aussitôt maussade et veut être repris de nouveau. *Atypique: toujours prêt à aller jouer au moment où il lui signale de le poser par terre.*
34. Quand il est bouleversé lorsque M le quitte, il s'assoit à l'endroit où il est et pleure. Ne la suit pas. *Atypique: suit activement M quand il est bouleversé. Neutre: s'il n'est jamais bouleversé quand M le quitte.*
35. Est indépendant avec M. Préfère jouer seul: quitte facilement M quand il veut jouer. *Atypique: préfère jouer avec ou près de M. Neutre: s'il n'est pas autorisé ou qu'il n'y a pas de pièces où il peut jouer loin de M.*
36. Montre clairement qu'il utilise M comme point de départ de ses explorations: •s'éloigne pour jouer •revient ou joue près de M •s'éloigne pour jouer encore, etc. *Atypique: toujours loin jusqu'à ce que M le retrouve ou demeure toujours près de M.*
37. Est très actif. Bouge toujours. Préfère les jeux actifs aux jeux calmes.
38. Est exigeant et impatient envers M. S'obstine et persiste sauf si M fait immédiatement ce qu'il veut.
39. Est souvent sérieux et méthodique lorsqu'il joue loin de moi ou quand il est seul avec ses jouets. *Atypique: exprime souvent du plaisir ou rit quand il joue loin de M, seul avec ses jouets.*
40. Examine les nouveaux objets ou jouets dans les moindres détails. Essaie de les utiliser de différentes manières ou de les démonter. *Atypique: jette un coup d'oeil rapide aux nouveaux objets ou jouets (cependant il peut s'y intéresser plus tard).*
41. Lorsque M lui demande de le suivre, il le fait. (Ne pas tenir compte des refus ou délais qui font partie d'un jeu, sauf s'ils deviennent clairement de la désobéissance)
42. Reconnaît la détresse de M (lorsqu'elle est bouleversée): •devient calme ou bouleversé. •essaie de la reconforter •demande ce qui ne va pas, etc.

43. Demeure ou revient près de M, plus souvent que le requiert le simple fait de rester en contact avec elle. *Atypique: ne se tient pas au courant de façon précise de la localisation de M ou de ses activités.*
44. Demande et prend plaisir quand M le prend, l'embrasse et le caresse. *Atypique: n'est pas spécialement enthousiaste pour ces démonstrations d'affection. Les tolère mais ne les recherche pas ou se tortille pour être posé par terre.*
45. Aime danser ou chanter au son de la musique. *Atypique: est indifférent à la musique OU N'aime pas mais ne déteste pas la musique.*
46. Marche et court sans se cogner, tomber ou trébucher. *Atypique: coups, chutes ou faux pas se produisent tout au long de la journée (même si aucune blessure n'en résulte).*
47. Acceptera et prendra plaisir aux bruits forts ou sautillera près de la source du bruit en jouant si M lui sourit et qu'elle lui montre que c'est supposé être plaisant. *Atypique: devient bouleversé même si M lui signale que le bruit ou l'activité est sécuritaire ou plaisant.*
48. Permet facilement aux nouveaux adultes de tenir les objets qu'il a et les partage avec eux s'ils lui demandent.
49. Court vers m avec un sourire gêné quand de nouvelles personnes les visitent à la maison. *Atypique: même s'il sera éventuellement chaleureux envers les visiteurs, sa réaction initiale est de courir vers M en pleurnichant ou en pleurant. Neutre: s'il ne court pas vers M quand des visiteurs arrivent.*
50. Sa réaction initiale quand des gens les visitent à la maison est de les ignorer ou de les éviter, même s'il deviendra éventuellement chaleureux avec eux.
51. Aime grimper sur les visiteurs quand il joue avec eux. *Atypique: ne recherche pas un contact intime avec les visiteurs quand il joue avec eux. Neutre: s'il ne joue pas avec les visiteurs.*
52. A de la difficulté à manipuler de petits objets ou à assembler de petites choses. *Atypique: très habile avec de petits objets, crayons, etc.*

53. Met ses bras autour de M ou met la main sur l'épaule quand M le prend. *Atypique: accepte d'être pris dans les bras de M, mais ne l'aide pas particulièrement ou ne se tient pas après M.*
54. Agit comme s'il s'attendait à ce que M empiète sur ses activités quand elle essaie simplement de l'aider avec quelque chose. *Atypique: accepte facilement l'aide de M sauf si elle intervient dans une situation ou son aide n'est pas nécessaire.*
55. Imité un certain nombre de comportements ou de manières de faire les choses en observant le comportement de M. *Atypique: n'imité pas visiblement le comportement de M.*
56. Devient mal à l'aise ou perd de l'intérêt quand il semble qu'une activité pourrait être difficile. *Atypique: pense qu'il peut faire des tâches difficiles.*
57. Est aventureux (sans peur). *Atypique: est prudent ou craintif.*
58. En général, ignore les adultes qui les visitent à la maison. Trouve ses activités plus intéressantes. *Atypique: trouve les visiteurs très intéressants même s'il est un peu gêné au début.*
59. Quand il termine une activité ou un jeu, il trouve généralement autre chose à faire, sans revenir vers M entre ses activités. *Atypique: quand il termine une activité ou un jeu, il revient vers M pour jouer, pour chercher de l'affection ou pour chercher de l'aide afin de trouver une autre chose à faire.*
60. Si M le rassure en lui disant "c'est correct" ou "cela ne te fera pas mal", il approchera ou jouera avec des choses qui initialement l'avaient rendu craintif ou l'avaient effrayé. *Neutre: s'il n'est jamais craintif ou effrayé.*
61. Joue brutalement avec M. Frappe, égratigne ou mord durant les jeux physiques. (Ne signifie pas qu'il me blesse). *Atypique: joue à des jeux physiques sans faire mal à M. Neutre: si ses jeux ne sont jamais très physiques.*
62. S'il est de bonne humeur, il le demeure toute la journée. *Atypique: sa bonne humeur est très changeante.*
63. Même avant d'essayer des choses par lui-même, il essaie d'avoir quelqu'un pour l'aider.

64. Aime grimper sur M quand ils jouent. *Atypique: ne veut pas spécialement plusieurs contacts intimes avec M quand ils jouent.*
65. Est facilement bouleversé quand M le fait passer d'une activité à une autre, même si la nouvelle activité est quelque chose qu'il aime souvent faire.
66. Développe facilement de l'affection pour les adultes qui le visitent à la maison et qui sont amicaux envers lui.
67. Lorsque notre famille a des visiteurs, il désire que ceux-ci lui portent beaucoup d'attention.
68. Généralement, il est une personne plus active que M. *Atypique: généralement, il est une personne moins active que M.*
69. Demande rarement de l'aide à M. *Atypique: demande souvent de l'aide à M.* Neutre: s'il est trop jeune pour demander de l'aide à M.
70. Salue rapidement M avec un grand sourire lorsqu'il entre dans la pièce où elle est. (Montre un jouet, fait signe ou dit: "Bonjour maman"). *Atypique: ne me salue pas, sauf si je le salue en premier.*
71. Après avoir été effrayé ou bouleversé, il cesse de pleurer et se remet rapidement, si M le prend dans ses bras. *Atypique: n'est pas facilement réconforté ou consolé.*
72. Si des visiteurs rient et approuvent ce qu'il fait, il recommence maintes et maintes fois. *Atypique: les réactions des visiteurs ne l'influencent pas de cette manière.*
73. A un jouet qu'il caresse ou une couverture qui le rassure (doudou), qu'il apporte partout, qu'il amène au lit ou qu'il tient quand il est bouleversé. (Cela n'inclut pas sa bouteille de lait ou sa suce s'il a moins de 2 ans)
74. Quand M ne fait pas ce qu'il veut immédiatement, il se comporte comme si elle n'allait pas le faire (pleurniche, se fâche, fait d'autres activités, etc.). *Atypique: attend un délai raisonnable comme s'il s'attendait à ce qu'elle fasse bientôt ce qu'il lui avait demandé.*

75. À la maison, il devient bouleversé ou pleure quand M sort de la pièce où ils étaient. (Peut ou non la suivre) *Atypique: remarque le départ de M; peut la suivre mais ne devient pas bouleversé.*
76. S'il a le choix, il jouera avec des jouets plutôt qu'avec les adultes. *Atypique: jouera avec les adultes plutôt qu'avec des jouets.*
77. Lorsque M lui demande de faire quelque chose, il comprend rapidement ce qu'elle veut. (Peut ou non obéir) *Atypique: quelques fois incertain, perplexe ou lent à comprendre ce que M veut. Neutre: s'il est trop jeune pour comprendre.*
78. Aime être étreint et tenu par des personnes autres que ses parents et/ou ses grands-parents.
79. Se fâche facilement contre M. *Atypique: ne se fâche pas contre M sauf si elle est vraiment intrusive ou qu'il est très fatigué.*
80. Considère les expressions faciales de M comme étant une bonne source d'information quand quelque chose semble risqué ou menaçant. *Atypique: évalue par lui-même la situation sans surveiller d'abord les expressions faciales de M.*
81. Pleurer est une façon pour lui d'obtenir que M fasse ce qu'il veut. *Atypique: pleure surtout à cause d'un véritable inconfort (fatigue, tristesse ou peur).*
82. Passe la plupart de ses temps de jeu avec seulement quelques jouets préférés ou pratique ses activités favorites durant ces moments.
83. Lorsqu'il s'ennuie, il vient vers M, cherchant quelque chose à faire. *Atypique: flâne ou ne fait rien pendant un certain temps jusqu'à ce que quelque chose arrive.*
84. Fait au moins un certain effort pour être propre et soigné à la maison. *Atypique: souvent se tache et renverse des choses sur lui ou sur les planchers.*
85. Est fortement attiré par les nouvelles activités et les nouveaux jouets. *Atypique: ne délaissera pas ses jouets et activités familiers pour de nouvelles choses.*

86. Essaie d'amener M à l'imiter ou remarque rapidement et prend plaisir quand M l'imité de sa propre initiative.

87. Si M rit ou approuve quelque chose qu'il a fait, il recommence maintes et maintes fois.

Atypique: n'est pas particulièrement influencé de cette manière par les réactions de M.

88. Lorsque quelque chose le bouleverse, il reste où il est et pleure. *Atypique: vient vers M quand il pleure. N'attend pas que M vienne vers lui.*

89. Ses expressions faciales sont claires et marquées quand il joue avec quelque chose.

90. Si M s'éloigne très loin de lui, il la suit et continue son jeu dans ce nouvel endroit. (N'a pas à être sollicité ou amené dans l'autre pièce. N'arrête pas de jouer ou ne devient pas bouleversé). *Neutre: s'il n'est pas autorisé ou s'il n'y a pas de pièces où il soit vraiment loin de M.*

Annexe C

Tâches de théorie de l'esprit à 2 ans :

Carlson, S. M., Mandell, D. J., & Williams, L. (2004). Executive function and theory of mind:

Stability and prediction from age 2 to 3. *Developmental Psychology, 40*, 1105-1122.

Repacholi, B., & Gopnik, A. (1997). Early understanding of desires: Evidence from 14 and

18-month-olds. *Developmental Psychology, 33*, 12-21.

Tâche de compréhension des désirs

Matériel : 4 livres pour enfants. 4 livres pour adultes. Plateau.

Placer les livres sur le plateau en deux piles distinctes. L'une contenant les livres pour enfant et l'autre, les livres sans images. Laisser l'enfant regarder les livres qu'il souhaite pendant 45 secondes. Les livres qu'il choisit de regarder sont considérés comme étant ses préférés.

Rapprocher ensuite le plateau de vous pour qu'il soit hors de portée de l'enfant. Manipuler les livres (les enlever du plateau, puis les remettre en pile). Commencer par replacer les livres préférés de l'enfant en faisant un signe de dégoût « Eeew » (cette expression doit être claire et durer assez longtemps pour que l'enfant ait l'occasion de comprendre que vous n'aimez pas les livres en question). Placer ensuite les autres livres sur le plateau en montrant clairement votre préférence « Ooooh ». Cette expression doit aussi être claire et durer au moins quelques secondes.

Rapprocher le plateau de l'enfant tout en tendant la main entre les deux piles de livres et en demandant à l'enfant de donner un livre.

« Moi j'ai envie de lire. Peux-tu me donner un livre SVP ? »

Faire semblant de vous intéresser à ce livre quelques instants. Ensuite dire « *J'ai envie de regarder un autre livre. Veux-tu m'en donner un SVP ?* »

Cotation : proportion entre le nombre de réponses correctes et le nombre de demandes formulées.

Tâches de compréhension des perspectives visuelles

Matériel : Jouet 1 : Orignal. Jouet 2 : Autobus. Jouet 3 : Canard. Jouet 4 : Petite fille. Carton plastifié de consignes pour la mère

Expliquer à la mère que vous aurez besoin de sa collaboration pour la prochaine activité.

« Pour la prochaine tâche, j'aurais besoin de votre aide. Je vais m'asseoir ici et votre enfant sera assis face à moi. Je vais vous demander de vous asseoir dans l'autre coin de la pièce (prévoir au moins 2 mètres de distance). Je vais présenter des jouets à votre enfant et lui demander d'aller vous les montrer. Il devra aller vous montrer 4 jouets. Nous allons toutefois faire en sorte que vous ne puissiez pas voir ce qu'il vous présente, à moins que ... (nom de l'enfant) ne fasse une correction. Par exemple, la première fois vous devrez fermer les yeux et vous pourrez les ouvrir seulement si votre enfant vous le demande, d'une façon ou d'une autre. Je vous ai apporté un petit aide mémoire afin que vous sachiez quoi faire à chaque fois. Pour le premier objet, vous devrez fermer les yeux, pour le deuxième, mettre vos deux mains

devant vos yeux, la troisième fois je vous demanderai de vous tourner pour faire face au mur (l'enfant doit pouvoir circuler entre le mur et la mère). La quatrième fois, vous n'aurez rien de particulier à faire mais ... va devoir vous montrer un jouet qui n'a qu'une seule face pour que vous puissiez voir ce qu'il vous montre, il devra la tourner, je vous demanderais de ne pas l'aider. Il sera important que vous ne modifiez pas votre position à moins que votre enfant vous le demande. On va débiter, dès que je présente le jouet à votre enfant je vous demanderais de suivre les instructions sur votre carton. »

Administration : « *Regarde ce que j'ai. Tiens, va le montrer à maman.* » Lorsque l'enfant a montré le jouet à sa mère, lui demander de revenir.

Cotation :

1 = n'a pas montré le jouet à sa mère ou l'a laissé tomber près d'elle et s'est éloigné

2 = a tenu le jouet près de sa mère mais n'a tenté aucune correction

3 = correction partielle

4 = correction complète mais n'a pas montré le jouet

5 = correction complète et a montré le jouet

Total pour chaque jouet est sur 5.

Grand total est sur 20 points.

Annexe D

Tâches de théorie de l'esprit à 4 ans :

Carlson, S. M., Mandell, D. J., & Williams, L. (2004). Executive function and theory of mind:

Stability and prediction from age 2 to 3. *Developmental Psychology, 40*, 1105-1122.

Flavell, J. H., Everett, B. A., Croft, K., & Flavell, E. R. (1981). Young children's knowledge about visual perception: Further evidence for the Level 1–Level 2 distinction.

Developmental Psychology, 17, 95-120.

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, 26-37.

Perner, J., Leekam, S., & Wimmer, H. (1987). Three-year-olds' difficulty with false belief:

The case for a conceptual deficit. *British Journal of Developmental Psychology, 5*, 125-137.

Tâche de compréhension des perspectives Visuelles – Niveau 2

Matériel : 1 tasse, 3 images (tortue, oiseau, cochon), un livre.

Dans cette tâche l'expérimentatrice montre des images à l'enfant et lui demande de déterminer si les dessins sont dans le bon sens selon la perspective d'une autre personne (ici l'expérimentatrice), dans le bon ou dans le mauvais sens? Afin de préparer l'enfant, l'expérimentatrice demande à l'enfant si elle tient la tasse à l'endroit ou à l'envers alors qu'elle la tient à l'endroit, puis elle repose la question alors qu'elle tient la tasse à l'envers. Ce réchauffement est fait dans le but de voir si l'enfant saisit la notion d' « à l'endroit » et « à l'envers ».

Condition 1 : L'expérimentatrice présente 3 images d'animaux (une tortue, un oiseau et un cochon à tour de rôles) et demande à l'enfant comment l'expérimentatrice voit l'image : « Est-ce que je vois l'image à l'envers ou à l'endroit? ». Chaque image est présentée deux fois – une fois à l'envers et une fois à l'endroit-en alternant le sens.

Condition 2 : Ensuite, l'expérimentatrice montre l'image d'un livre dans le bon et dans le mauvais sens et demande à l'enfant si le livre est dans le bon sens selon la perspective de l'enfant. L'expérimentatrice fait trois essais – deux fois dans le mauvais sens et une fois dans le bon sens, selon la perspective de l'expérimentatrice.

Les scores sont calculés selon la proportion de bonnes réponses pour les deux conditions (X/9).

Tâche de compréhension de fausses croyances

Matériel : Une boîte de “plasters”, des crayons et une figurine playmobil.

L'expérimentatrice montre une boîte de “Band-Aid” à l'enfant et lui demande qu'est-ce qu'il y a dans la boîte (les enfants répondent “Band-Aid”). Ensuite, l'expérimentatrice ouvre la boîte et montre à l'enfant qu'elle contient des crayons. Par la suite, l'expérimentatrice ferme la boîte et demande à l'enfant : “Quand tu as vu la boîte, avant que je l'ouvre, qu'est-ce que tu pensais qu'il y avait dans la boîte, des crayons ou des « plasters »?”

Ensuite, l'expérimentatrice montre une petite fille à l'enfant, Alice, et dit qu'Alice ne sait pas ce qu'il y a dans la boîte, elle n'a pas regardé dedans encore. L'expérimentatrice demande à l'enfant : “Qu'est-ce que tu crois qu'Alice pense qu'il y a dans la boîte?” et pour terminer, l'expérimentatrice demande à l'enfant qu'est-ce qu'il y a réellement dans la boîte.

Le score est calculé selon la proportion de bonnes réponses données par l'enfant. Pour avoir un score parfait, l'enfant doit donner les bonnes réponses à toutes les questions.

Annexe E

Inventaire MacArthur du développement de la communication :

Dionne, G., Tremblay, R., Boivin, M., Laplante, D., & Pérusse, D. (2003). Physical aggression and expressive vocabulary in 19- month-old twins. *Developmental Psychology*, 39, 261–273.

Langage

Aïe	<input type="radio"/>	Bêêê bêêê	<input type="radio"/>	Miaou	<input type="radio"/>	Oh oh	<input type="radio"/>
Wouf wouf	<input type="radio"/>	Canard	<input type="radio"/>	Chat	<input type="radio"/>	Cheval	<input type="radio"/>
Chien	<input type="radio"/>	Oiseau	<input type="radio"/>	Ours	<input type="radio"/>	Auto	<input type="radio"/>
Bateau	<input type="radio"/>	Avion	<input type="radio"/>	Jeu	<input type="radio"/>	Balle	<input type="radio"/>
Livre	<input type="radio"/>	Jus	<input type="radio"/>	Biscuit	<input type="radio"/>	Bonbon	<input type="radio"/>
Coke	<input type="radio"/>	Compote	<input type="radio"/>	Viande	<input type="radio"/>	Lait	<input type="radio"/>
Pois	<input type="radio"/>	Soulier	<input type="radio"/>	Bas	<input type="radio"/>	Chapeau	<input type="radio"/>
Collier	<input type="radio"/>	Oreille	<input type="radio"/>	Jambe	<input type="radio"/>	Main	<input type="radio"/>
Menton	<input type="radio"/>	Vidanges	<input type="radio"/>	Assiette	<input type="radio"/>	Balai	<input type="radio"/>
Moppe	<input type="radio"/>	Peigne	<input type="radio"/>	Plat	<input type="radio"/>	Serviette	<input type="radio"/>
Banc	<input type="radio"/>	Chambre	<input type="radio"/>	Escalier	<input type="radio"/>	Four	<input type="radio"/>
Lit	<input type="radio"/>	Balançoire	<input type="radio"/>	Ciel	<input type="radio"/>	Drapeau	<input type="radio"/>
Étoile	<input type="radio"/>	Pluie	<input type="radio"/>	École	<input type="radio"/>	Fête	<input type="radio"/>
Ami	<input type="radio"/>	Maman	<input type="radio"/>	Personne	<input type="radio"/>	Allô	<input type="radio"/>
Bye	<input type="radio"/>	Merci	<input type="radio"/>	Non	<input type="radio"/>	Acheter	<input type="radio"/>
Aimer	<input type="radio"/>	Brasser	<input type="radio"/>	Coller	<input type="radio"/>	Courir	<input type="radio"/>
Essayer	<input type="radio"/>	Déchirer	<input type="radio"/>	Faire semblant	<input type="radio"/>	Vouloir	<input type="radio"/>
Écouter	<input type="radio"/>	Finir	<input type="radio"/>	Goûter	<input type="radio"/>	Jeter	<input type="radio"/>
Penser	<input type="radio"/>	Transporter	<input type="radio"/>	Vite	<input type="radio"/>	Chaud	<input type="radio"/>
Content	<input type="radio"/>	Dernier	<input type="radio"/>	Doux	<input type="radio"/>	Froid	<input type="radio"/>
Mouillé	<input type="radio"/>	Parti	<input type="radio"/>	Petit	<input type="radio"/>	Sous	<input type="radio"/>
Après	<input type="radio"/>	Ce soir	<input type="radio"/>	Jour	<input type="radio"/>	Beaucoup	<input type="radio"/>
Tout/toute	<input type="radio"/>	Si	<input type="radio"/>	À eux	<input type="radio"/>	Ça	<input type="radio"/>
Nous	<input type="radio"/>	Nôtre/nos	<input type="radio"/>	Où	<input type="radio"/>	À côté de	<input type="radio"/>
À terre	<input type="radio"/>	Besoin	<input type="radio"/>				

