Université de Montréal

Liens longitudinaux entre le tempérament, la qualité de la relation mère-enfant et le fonctionnement socio-émotionnel chez les enfants.

Par
Marie-Soleil Sirois

Département de psychologie
Faculté des arts et des sciences

Thèse présentée à la Faculté des études supérieures
en vue de l'obtention du grade de Philosophiae Doctor (Ph.D.)
en psychologie recherche et intervention
option psychologie clinique

Janvier 2022

Résumé

Différents éléments peuvent influencer le fonctionnement socio-émotionnel des enfants et agir comme facteurs de protection ou facteurs de risque. Il est maintenant bien reconnu que ces facteurs proviennent d'éléments propres à l'enfant ainsi que d'aspects provenant de l'environnement dans lequel il grandit. Cette thèse se centre sur les facteurs intrinsèques et environnementaux les plus étudiés concernant le développement socio-émotionnel des enfants durant la petite enfance: le tempérament de l'enfant et la qualité des relations mère-enfant. Peu d'études se sont intéressées à l'interface entre le tempérament et la qualité des relations mère-enfant mesurés dans la petite enfance pour prédire le fonctionnement socio-émotionnel à l'âge scolaire. Pourtant, l'âge scolaire est marqué d'une étape de transition des plus saillantes du développement des enfants, c'est-à-dire l'entrée scolaire. L'ajustement socio-émotionnel des enfants au cours des premières années d'école est l'un des principaux facteurs influençant leur adaptation scolaire (Robson et al., 2020). Il est donc essentiel de comprendre pourquoi certains enfants fonctionnent mieux que d'autres sur ce plan durant l'âge scolaire. Le premier article explorait le rôle modérateur de la qualité des interactions mère-enfant, observée à 2 ans, dans la relation entre la tendance à la colère des enfants et leurs comportements intériorisés, extériorisés et prosociaux à l'entrée scolaire. Les résultats ont montré que la tendance à la colère des tout-petits prédisait des difficultés socio-émotionnelles chez ceux-ci, principalement dans le contexte d'une meilleure qualité d'interactions mère-enfant. Le deuxième article examinait les liens prédictifs entre le soutien maternel à l'autonomie (observé à 15 mois) et les trajectoires des comportements intériorisés et extériorisés des enfants mesurés de 2 à 7 ans, en contrôlant les dimensions négatives du tempérament des enfants. Les résultats du deuxième article ont montré que plus les mères soutenaient l'autonomie de leur enfant, plus les comportement intériorisés

augmentaient lentement dans les années subséquentes et plus les comportements extériorisés diminuaient rapidement.

Mots clés : comportements intériorisés; comportements extériorisés; comportements prosociaux; soutien à l'autonomie; interactions mère-enfant; tempérament; modérations; trajectoires.

Abstract

Different elements can act as protective or risk factors for child socioemotional functioning. It is now well recognized that these elements come from child-specific as well as environmental factors. This thesis focuses on the most studied intrinsic and environmental factors concerning child socioemotional development during toddlerhood: child temperament and mother-child relationship quality. Few studies have investigated the interplay between temperament and mother-child relationships in toddlerhood in the prediction of child socioemotional functioning in the early school years. Yet, this period includes a major developmental transition, namely school entry. Young children's socioemotional adjustment during this period is one of the main factors influencing their school adaptation (Robson et al., 2020). It is therefore essential to understand why some children adapt better than others in early school years. The first article explored the moderating role of mother-child interactions quality, observed at 2 years old, in the association between child anger proneness and internalizing, externalizing and prosocial behaviors at school entry. The results showed that child anger proneness predicted socioemotional difficulties, primarily in the context of better mother-child interactions quality. The second article examines the predictive links between maternal autonomy support (observed at 15 months) and the trajectories of internalizing and externalizing behaviors measured from 2 to 7 years, while controlling for the negative dimensions of child temperament. The results showed that the more mothers supported their child's autonomy, the more internalizing behavior increased slowly and the more externalizing behavior decreased rapidly in later years.

Keywords: internalizing behavior; externalizing behavior; prosocial behavior; maternal autonomy support; mother-child interactions; temperament; moderations; trajectories.

Table des matières

Liste des tableaux

Article 1

Article 2

Figure

Article 1

Liste des abréviations

CBCL	Child Behavior Checklist
FIML	Full information maximum likelihood
ICC	Intra-class correlation
IQ	Intelligence quotient
LL	Log likelihood
MFI	Modèles de fonctionnement interne
MLM	Multilevel modeling
MRO	Mutually Responsive Orientation scale
SES	Socioeconomic status
SSE	Statut socio-économique
TBAQ	Toddler Behavior Assessment Questionnaire

Remerciements

J’ai eu la chance de ne jamais douter de ce que je voulais accomplir dans ma vie. J’ai su très rapidement dans l’enfance, confrontée à l’impuissance des malheurs des autres, que je voulais faire une différence et du bien autour de moi. C’est à l’adolescence que j’ai compris que ma vocation était la psychologie et que je devais faire de nombreuses années d’études, de formations et de recherche pour arriver à exercer ma passion. Aujourd’hui, je termine mes dix années d’études supérieures avec une grande fierté, mais surtout une reconnaissance immense envers les personnes qui m’ont accompagnée à travers mon parcours.

Merci infiniment, Annie Bernier, d'avoir cru en moi et de m'avoir fait confiance à travers les projets dans lesquels tu m’as permis de participer. Je pense entre autres à ces nombreux congrès auxquels j'ai assisté et à l’opportunité de travailler au laboratoire Grandir Ensemble. Tu m'as aidé à développer ma confiance en mes capacités, à me surpasser et à accroitre mes connaissances en recherche. Merci pour tout ce temps, pour ta patience et pour ta disponibilité. Merci aussi à toi Célia Matte-Gagné pour ton aide précieuse tout au long de la rédaction de ma thèse.

Merci à mes collègues Rachel Perrier, Élizabel Leblanc, Catherine Cimont-paquet, Nadine Marzougui, Marilyne Laverdière, Marie-Sarah Girard, Caroline Dupont, pour votre présence, votre écoute et votre aide. Un lien unique s’est créé entre nous. Un précieux merci à ma complice de vie et de rédaction Émilie Thétreault. Je pense à toutes ces fois où nous avons eu du mal à travailler puisque nous avions toujours tant de choses à nous dire. Je pense aux voyages que nous avons faits ensemble et aux merveilleux souvenirs qui en ont découlés. Je suis chanceuse de t’avoir aujourd’hui comme amie.

Je tiens également à remercier mes amies qui ont été présentes depuis tant d'années. Celles qui ont connu mes hauts et mes bas dans ce long processus qu'est l'atteinte de mes rêves, la remise de cette thèse. Mes *fillardises* adorées, Marie-Ève Lapointe, Alexandra Perron, Amélie Champagne, Kim Daly, Frédérique Lachapelle, Séléna Champagne, Marie-Ève Blouin, Kathy Poirier, Jessica Blouin, vous êtes des amies inestimables. Votre solidarité et votre amour inconditionnel m'ont permis de rester positive dans les moments plus durs. Votre folie me ressourçait de bonheur lorsque j'en avais le plus grand besoin.

Merci à ma famille qui a semé les assises de qui je suis aujourd'hui. Merci maman de m'avoir donné autant d'amour, de m'avoir appris l'empathie, la douceur et la persévérance. Merci papa de m'avoir fait comprendre que tout est possible. Merci ma sœur pour ta chaleur, ta sensibilité, ton écoute. Merci mon frère pour ton aide avec mes nombreuses difficultés informatiques et pour ton appui.

Introduction

Le fonctionnement socio-émotionnel à l'enfance

Le développement des enfants est complexe et multifactoriel. Il comprend entre autres le développement neuronal et biologique, l'acquisition de compétences et de connaissances variées, la compréhension grandissante de soi et des autres et l'établissement du fonctionnement social et émotionnel. Cette dernière sphère, souvent nommée fonctionnement socio-émotionnel, fait l'objet de cette thèse. Il existe plusieurs façons d'opérationnaliser le fonctionnement socio-émotionnel des enfants, telles que par le biais de leur estime de soi, de leur régulation émotionnelle ou de leur développement moral, mais il est le plus souvent mesuré en évaluant leurs comportements intériorisés, extériorisés et prosociaux. Les comportements intériorisés réfèrent à un ensemble de symptômes associés à l'anxiété, aux affects dépressifs, au retrait social et aux plaintes somatiques (Liu et al., 2011). Les comportements extériorisés comprennent les problèmes attentionnels, oppositionnels et d'agressivité (Liu, 2004). Les comportements prosociaux représentent un ensemble de compétences sociales telles que la capacité à partager, à coopérer et à se montrer empathique aux besoins des autres (Schroeder & Graziano, 2017). Les enfants qui ont un meilleur fonctionnement socio-émotionnel ont généralement plus de facilité dans les autres sphères de leur développement également. Par exemple, la littérature montre que les enfants qui ont moins de problèmes de comportement (intériorisés et extériorisés) et qui démontrent plus de comportements prosociaux ont de meilleures capacités cognitives telles qu'une plus grande capacité de concentration et de planification (Quistberg & Mueller, 2020). Ils ont également un meilleur sommeil (Astill et al., 2012), une plus grande maîtrise de soi (Raposa et al., 2015), de meilleurs résultats à l'école (Robson et al., 2020) et une perception plus positive d'eux-mêmes (Ngo et al., 2020). De plus, les problèmes de comportement présents à l'enfance

ont tendance à persister tout au long de l'enfance et de l'adolescence (Reef et al., 2011; Rockhill et al., 2010) et augmentent les probabilités de développer un trouble de santé mentale à long terme (Arslan et al., 2021). Il est donc primordial de mieux comprendre comment se développe le fonctionnement socio-émotionnel des enfants, ce qui le prédit et ce qui peut influencer les variations dans le développement socio-émotionnel normatif afin de mieux cibler les leviers de prévention et d'intervention pouvant être mis en place avant que les difficultés ne se cristallisent.

Les prédicteurs du fonctionnement socio-émotionnel

Différents éléments peuvent influencer le fonctionnement socio-émotionnel des enfants et agir comme facteurs de protection ou facteurs de risque. Il est maintenant bien reconnu que ces influences proviennent d'éléments propres à l'enfant et d'aspects provenant de l'environnement dans lequel il grandit. Cette thèse se centre sur deux des facteurs intrinsèques et environnementaux les plus étudiés concernant le développement socio-émotionnel des enfants durant la petite enfance: le tempérament de l'enfant et la qualité des relations mère-enfant.

Le tempérament

Le tempérament est la mesure prédominante pour évaluer les prédispositions émotionnelles et comportementales des enfants et leur adaptation à leur environnement. Les tendances tempéramentales des enfants forment les assises qui sous-tendent le développement des différences individuelles dans la personnalité plus tard à l'âge adulte (Evans & Rothbart, 2007). Le tempérament est influencé par les gènes, la maturation et les expériences de vie spécifiques à chaque individu (Rothbart, 2011). Les prédispositions biologiques des enfants qui orientent leurs réponses à l'environnement influencent la façon dont les personnes interagissent avec eux, leurs apprentissages et les événements auxquels ils seront confrontés. En retour, les expériences de vie façonnent les stratégies émotionnelles et comportementales des enfants qui

leur permettent de s'adapter à leur environnement (Rothbart, 2012). Le tempérament et l'environnement des enfants sont donc en constante interaction et c'est ainsi qu'ils façonnent le développement socio-émotionnel (Sanson et al., 2011).

Il existe une grande variabilité dans la façon dont le tempérament est défini et opérationnalisé. Par exemple, il peut être conceptualisé en termes de niveaux de difficulté, d'émotivité négative/ positive, de niveaux de réactivité et plus encore. Rothbart et Derryberry (1981) ont défini le tempérament comme les différences constitutionnelles individuelles observées dans la réactivité et l'autorégulation des comportements et des émotions. La réactivité désigne la rapidité et l'intensité de l'excitation émotionnelle, de l'attention et de l'activité motrice alors que l'autorégulation représente les stratégies qui permettent de moduler cette réactivité (Rothbart & Derryberry, 1981). Goldsmith et Campos (1990) ont pour leur part identifié cinq dimensions spécifiques du tempérament: la crainte sociale, la tendance au plaisir, le niveau d'intérêt/ attention, le niveau d'activité et la tendance à la colère. Ce modèle théorique est celui utilisé dans cette thèse. Plusieurs dimensions du tempérament des enfants sont liées à leur compétence sociale et à la présence de problèmes de comportements intériorisés et extériorisés (p. ex., Dyson et al., 2011; Engle & McElwain, 2011; Janson & Mathiesen, 2008).

Bien qu'elles puissent être regroupées, il est préférable de mesurer les dimensions tempéramentales séparément puisque leur pouvoir prédictif peut être distinct. Par exemple, l'étude longitudinale de Smeekens et ses collègues (2007) a montré que la tendance à la colère, mais pas à la crainte sociale, prédisait les problèmes de comportements extériorisés chez les enfants. Les dimensions du tempérament sont généralement considérées comme étant de nature plus positive ou plus négative. Pour ce qui des dimensions plus positives du tempérament (la tendance au plaisir, l'intérêt/attention), des études ont rapporté qu'elles étaient associées à un

meilleur fonctionnement socio-émotionnel (Putnam, 2012). Par exemple, les résultats de l'étude de Ghassabian et ses collègues (2014), effectuée auprès de 802 enfants, montraient que les enfants de 3 ans avec une plus grande tendance au plaisir (p. ex., intensité des sourires, fréquence des rires) avaient moins de comportements intériorisés à 6 ans. Les enfants qui démontrent plus d'émotions de joie et d'intérêt sont généralement plus attrayants pour leurs pairs, et plus de temps passé en compagnie d'autres enfants peut en retour augmenter les compétences sociales (Eisenberg et al., 2010).

Bien que les dimensions positives du tempérament soient pertinentes pour bien comprendre le fonctionnement des enfants, la plupart des études se centrent sur les dimensions tempéramentales plus négatives (la crainte sociale, le niveau d'activité et la tendance à la colère; p. ex., Eisenberg et al., 2009; Smeekens et al., 2007) car elles sont souvent de meilleurs prédicteurs du développement social et émotionnel des enfants (Sanson et al., 2011).

Goldsmith (1996) soutient que le niveau d'activité comportementale (p. ex., mouvements des membres ou locomoteurs au cours d'une variété de situations quotidiennes) représente le niveau général d'expression émotionnelle chez les enfants. L'expression émotionnelle implique des comportements d'approche (e.g., activation motrice) et de retrait (e.g., diminution motrice) face à des éléments attrayants ou déplaisants qui sont mesurés, entre autres, par le niveau d'activité comportementale. Le niveau d'activité est aussi associé à un ensemble de systèmes cérébraux sous-jacents à la réactivité et à l'autorégulation des enfants (Rothbart et al., 1994). Un niveau d'activité plus élevé dans la petite enfance est généralement associé à plus de problèmes de comportement plus tard dans le développement (Lahey et al., 2008; Rothbart & Putnam, 2002). Une plus grande tendance à la crainte sociale chez les enfants (p. ex., inhibition, détresse, retrait ou signes de timidité dans des situations nouvelles et inquiétantes de nature sociale) est

également liée à plus de difficultés socio-émotionnelles (Eisenberg et al., 2009; Smeekens et al., 2007). Par exemple, Brooker et ses collègues (2016) ont constaté que les enfants qui avaient plus de crainte sociale à 2 ans, telle qu'observée en laboratoire, avaient plus de comportements anxieux en présence de leurs pairs à l'âge de 5 ans.

Une dimension tempéramentale démontrée comme étant particulièrement problématique pour l'ajustement social et émotionnel des enfants est la tendance à la colère (p. ex., pleurs, protestations, coups et autres signes de colère dans des situations conflictuelles avec le parent ou d'autres enfants; Eisenberg et al., 2009; Smeekens et al., 2007). Une plus grande tendance à la colère est liée à une plus faible capacité de régulation cognitive et émotionnelle (Eisenberg et al., 2009; Wilkowski et al., 2010). Les enfants qui ont de la difficulté à inhiber ou moduler leurs affects colériques montrent davantage de problèmes de comportement extériorisés (Crockett et al., 2018) tels que des comportements agressifs (Perhamus & Ostrov, 2020). Il a également été observé qu'ils peuvent être moins empathiques envers leurs pairs et montrer moins de comportements prosociaux (Eisenberg et al., 2009). De plus, les enfants portés à exprimer leur colère et leur agressivité de façon peu contrôlée sont exposés au risque de rejet par les pairs et de conflits avec les adultes autour d'eux, ce qui peut entraîner des problèmes de comportement intériorisés (Crockett et al., 2018; Pedersen et al., 2007). Par conséquent, pour le premier article de la thèse, la dimension tempéramentale de la tendance à la colère sera considérée pour prédire le fonctionnement socio-émotionnel des enfants.

La qualité des relations mère-enfant

Bien que l'important rôle des prédispositions émotionnelles et comportementales de l'enfant pour son développement socio-émotionnel soit incontestable, il est aussi reconnu que ce rôle se déploie en étroite interaction avec les facteurs contextuels et sociaux qui caractérisent

l'environnement dans lequel l'enfant grandit. Par exemple, la qualité des services dans la communauté, le statut socio-économique (SSE) familial, la santé psychologique et physique des parents et de la fratrie ainsi que le niveau d'éducation des parents sont tous des facteurs environnementaux plus ou moins proximaux aux enfants, qui peuvent influencer leur développement (Erola et al., 2016; Letourneau et al., 2013; Narayanan & Nærde, 2016). Durant la petite enfance, l'environnement immédiat occupe un rôle distinctif, puisque l'enfant passe une grande partie de son temps avec sa famille et développe graduellement, grâce à celle-ci, sa compréhension du monde. Théoriquement, il est proposé que la qualité des interactions parent-enfant vécues à répétition dans le quotidien de l'enfant crée des modèles de fonctionnement interne (MFI). Les MFI sont un ensemble d'attentes chez l'enfant quant au type d'interactions qu'il entretient avec son parent. Les MFI sont présumés devenir une partie essentielle de la personnalité, servant de guide pour les futures relations proches et influençant l'adaptation des enfants à travers leur développement (Sroufe et al., 2005). Bien que les chercheurs reconnaissent l'implication grandissante des pères durant la petite enfance ainsi que leur importance pour le développement socio-émotionnel des enfant (Fitzgerald et al., 2020), les mères sont généralement l'une des figures de soins principales et la qualité des relations mère-enfant reste fortement significative (Lamb, 2011). C'est pourquoi les relations mère-enfant font l'objet de cette thèse et sont conceptualisées à l'aide du soutien maternel à l'autonomie et de la qualité des interactions dyadiques mère-enfant.

Le soutien maternel à l'autonomie. À travers les interactions avec leur enfant, les mères déploient plusieurs types de comportements parentaux (p. ex., sensibilité, orientation mentale, discipline) qui favorisent et soutiennent le développement des enfants (Grusec et al., 2017; Meins et al., 2012; Whipple et al., 2011). Il est bien démontré que la qualité des comportements

maternels contribue de manière importante à plusieurs sphères du développement de l'enfant (Bornstein et al., 2018; Morris et al., 2017; Sanders & Morawska, 2018). L'un des comportements maternels qui est de plus en plus étudié pour comprendre le fonctionnement socio-émotionnel des enfants est le soutien à l'autonomie.

Le soutien maternel à l'autonomie consiste à soutenir les objectifs, les choix et les initiatives des enfants (Grolnick & Ryan 1989; Vasquez et al., 2016). Les mères qui soutiennent l'autonomie reconnaissent le point de vue des enfants, les encouragent à explorer leur environnement et à faire de nouvelles expérimentations (Deci & Ryan, 2012). L'une des composantes centrales du soutien à l'autonomie est l'étayage, qui réfère à des interventions maternelles bien ajustées en fonction des capacités des enfants afin de leur permettre de résoudre par eux-mêmes les problèmes, en leur offrant seulement l'aide nécessaire (Mermelshtine, 2017). Pour soutenir l'autonomie des enfants, les mères doivent les considérer comme des êtres à part entière, ayant des pensées et des sentiments qui leurs sont propres. La théorie de l'autodétermination (Deci & Ryan, 2006) postule que les êtres humains ont un besoin fondamental de développer leur autonomie et que si ce besoin est satisfait, il aidera les enfants à se développer sainement. Le besoin d'autonomie des enfants fait référence au besoin de sentir qu'ils sont à l'origine de leurs propres comportements, qu'ils peuvent faire des choix et que ceux-ci émanent de leurs valeurs et intérêts personnels (Deci & Ryan, 1985). L'autonomie implique une appropriation personnelle de l'action, mais ne signifie pas une indépendance complète vis-à-vis des parents (Ryan & Deci, 2006). Le soutien à l'autonomie, en tant qu'outil central pour combler le besoin d'autonomie des enfants, leur permet de développer une plus grande estime de soi, une perception de compétence et une certaine autosuffisance (Grolnick et al., 2007).

Plusieurs études montrent que le soutien à l'autonomie est positivement associé au fonctionnement socio-émotionnel des enfants (p. ex., Matte-Gagné et al., 2015; Vasquez et al., 2016). Entre autres, les résultats de la méta-analyse de Vasquez et ses collègues (2016), basée sur 36 études, montrent qu'un plus grand soutien maternel à l'autonomie est associé à une plus grande motivation scolaire chez l'enfant, une meilleure santé psychologique, un plus grand sentiment de compétence et une attitude plus positive face à l'école. Le soutien maternel à l'autonomie est également associé à moins de problèmes de comportements intériorisés et extériorisés chez les enfants (p. ex., Matte-Gagné et al., 2015). Toutefois, à notre connaissance, seulement cinq études longitudinales ont étudié le lien entre le soutien maternel à l'autonomie mesuré au cours de la petite enfance et les problèmes de comportements intériorisés et extériorisés plus tard dans le développement (Duineveld et al., 2017; Grolnick et al., 2000; Joussemet et al., 2005; Matte-Gagné et al., 2015; Van der Bruggen et al., 2010). Parmi ces études, aucune n'a étudié le lien entre le soutien à l'autonomie et les *trajectoires* de développement des problèmes de comportement. Le deuxième article de cette thèse explore ce lien prédictif.

La qualité des interactions dyadiques mère-enfant. Bien que les comportements maternels, tels que le soutien à l'autonomie, soient importants pour bien comprendre la qualité des relations mère-enfant, ils ne représentent pas (ou peu) les contributions de l'enfant, qui pourtant constitue l'autre moitié de la dyade. Les mesures dyadiques de qualité d'interactions sont une autre façon d'opérationnaliser la qualité des relations mère-enfant, qui a l'avantage de prendre en compte les comportements de la mère et de l'enfant ainsi que leur influence réciproque. Une telle mesure est donc susceptible de fournir une image plus précise de la dynamique relationnelle à l'œuvre, qui est dyadique par définition.

Il existe plusieurs façons d'évaluer la qualité des interactions mère-enfant, telles que par le niveau de synchronie et/ou de coordination (Feldman, 2007; Hoehl et al., 2021), la qualité de la communication ou la coopération (Rescorla & Fechnay, 1996). Kochanska (1997) s'est penchée sur les dimensions qui constituent des interactions mutuelles et réciproques de qualité entre le parent et l'enfant. Un premier élément est la coopération que partagent les deux partenaires afin de répondre aux besoins de l'autre tout en considérant les propositions de chacun. Les mères qui suivent fréquemment les initiatives de leurs enfants pendant le jeu ont des enfants plus conciliants et qui, à leur tour, demeurent plus engagés dans l'échange mutuel (Kochanska et al., 2008). Un deuxième élément d'interactions mutuelles de qualité est l'échange d'affects positifs entre les partenaires (l'ambiance émotionnelle) tels que des séquences de joie et des démonstrations spontanées d'affection. Les activités dyadiques plaisantes, impliquant un échange d'émotions positives, contribuent à la volonté de l'enfant de coopérer avec le parent et à l'émergence du lien complice mutuel entre le parent et l'enfant (Kochanska, 1997). Un dernier élément est la qualité de la communication entre la mère et l'enfant. Les dyades ayant une communication harmonieuse et fluide sont capables de lire les signaux de leur partenaire avec plaisir et intérêt, de sorte que ces échanges contribuent à leur connexion (Aksan et al., 2006). Considérant que ces dimensions sont complémentaires et s'inter-influencent, il est préférable de les regrouper en un score global afin d'avoir une représentation plus fidèle de l'ensemble de la qualité des interactions mère-enfant (Kochanska, 1997). C'est pourquoi le premier article de la thèse considère la qualité globale des réponses d'orientation mutuelle mère-enfant en interaction avec la tendance à la colère des enfants pour prédire leur fonctionnement socio-émotionnel à l'entrée scolaire.

Considérant que le tempérament et la qualité des relations mère-enfant sont inter-reliés (Bates & Pettit, 2015), il est important de les considérer conjointement dans la prédiction du fonctionnement des enfants. Par conséquent, dans le premier article de la thèse, la tendance tempéramentale à la colère et la qualité des interactions mère-enfant sont considérés en interaction pour prédire les comportements intériorisés, extériorisés et prosociaux des enfants. Dans le deuxième article, les trois dimensions négatives du tempérament (la tendance à la colère, le niveau d'activité et la crainte sociale) sont utilisées comme variables contrôles pour isoler le lien spécifique entre le soutien maternel à l'autonomie et les trajectoires des problèmes de comportement des enfants.

Interactions entre le tempérament de l'enfant et la qualité des relations mère-enfant

La plupart des théoriciens du développement conviennent que les facteurs influençant le développement des enfants interagissent les uns avec les autres. Parmi les différentes formes d'interactions possibles, l'une des plus étudiées réfère à l'idée selon laquelle la qualité des relations mère-enfant est susceptible de moduler le lien entre le tempérament et le fonctionnement socio-émotionnel des enfants (Bates & Pettit, 2015). Alors que le tempérament des enfants prédispose leurs réponses à l'environnement et ouvre ainsi la voie à leur fonctionnement social et émotionnel à long terme, la façon dont leurs mères interagissent avec eux peut moduler leurs tendances initiales (Slagt et al., 2016; Zentner & Shiner, 2015). Il est proposé que certaines combinaisons de dimensions tempéramentales et de pratiques parentales sont plus optimales que d'autres. Selon l'hypothèse de "la qualité de l'ajustement" (*goodness of fit*), l'ajustement entre le parent et l'enfant est optimal lorsque les comportements parentaux sont bien adaptés aux prédispositions émotionnelles et comportementales de l'enfant. Par exemple, des interactions douces et collaboratives peuvent être mieux adaptées aux enfants avec un niveau

élevé de crainte sociale alors que des interactions plus fermes et strictes, tout en étant chaleureuses, seraient plus appropriées avec des enfants présentant une plus grande tendance à la colère ou un haut niveau d'activité tempéramentale (Kochanska et al., 2002; Kochanska et al., 2008). Cet ajustement parent-enfant est un processus important par lequel le développement socio-émotionnel des enfants est influencé (Seifer, 2000). Il est attendu qu'un bon ajustement soit associé à un développement plus sain et, à l'inverse, un ajustement pauvre soit associé à plus de problèmes de comportement à long terme (p. ex., Baer et al., 2015). La théorie de l'apprentissage par observation suggère que les interactions parent-enfant constituent un contexte où les enfants apprennent les comportements et les émotions qui sont acceptables et la façon de gérer les expériences émotionnelles. Les enfants comprennent que certaines situations provoquent des émotions et ils observent entre autres les réactions de leurs parents afin de savoir comment ils devraient réagir dans des situations similaires (Morris et al., 2007). Tout en étant influencés par leurs prédispositions tempéramentales, les enfants intègrent progressivement le style de réponses émotionnelles et de contrôle des impulsions de leurs parents (Fox, 2006) et apprennent ainsi graduellement à réguler leurs propres émotions (Calkins & Hill, 2007). Par exemple, une mère qui réagit avec empathie aux émotions de son enfant lui enseigne à être empathique en retour dans ses interactions avec ses pairs. Même s'il est dans sa nature de réagir de façon colérique, un enfant qui est plus empathique est plus conscient des émotions des autres et risque de limiter notamment ses comportements agressifs envers ceux-ci. Ainsi, les relations mère-enfant sont susceptibles de moduler la façon dont les tendances tempéramentales de base des enfants s'expriment dans leurs interactions avec les autres, influençant ainsi le fonctionnement socio-émotionnel.

Bref, il est attendu théoriquement que le tempérament de l'enfant et les comportements maternels interagissent dans la prédiction du fonctionnement socio-émotionnel de l'enfant. La recherche empirique soutient largement l'hypothèse. Par exemple, Crockenberg et Leerkes (2006) ont constaté que la sensibilité maternelle aux signaux des enfants modulait le tempérament plus difficile des enfants, réduisant le risque de développer des comportements agressifs et anxieux ultérieurement. Il a également été rapporté que les enfants ayant un niveau d'activité tempéramentale de forte intensité avaient aussi un niveau élevé de comportements colériques et résistants, surtout lorsque leur mère était très intrusive (Szabó et al., 2008). De plus, Penela et ses collègues (2012) ont observé que les enfants qui avaient un tempérament plus difficile et qui recevaient des soins maternels de qualité inférieure présentaient moins de comportements prosociaux et plus de comportements agressifs, mais ces relations n'étaient pas significatives chez les enfants qui recevaient des soins maternels de qualité supérieure. Les résultats de l'étude de Prinzie et ses collègues (2014) ont montré que la tendance tempéramentale anxieuse ou colérique des enfants augmentait les probabilités de suivre une trajectoire croissante de comportements anxieux, mais uniquement en présence d'un niveau élevé de comportements parentaux trop réactifs (irritabilité, colère et frustration). Bien que ces études aient utilisé différentes mesures du tempérament de l'enfant, du comportement maternel ou du fonctionnement socio-émotionnel de l'enfant, elles suggèrent toutes une fonction protectrice d'interactions mère-enfant de haute qualité dans l'association entre un tempérament difficile et des problèmes d'adaptation chez les enfants. Par conséquent, le premier article de la thèse explore le rôle modérateur de la qualité des interactions mère-enfant dans la relation entre la tendance à la colère des enfants et leur fonctionnement socio-émotionnel.

L’évaluation des trajectoires des problèmes de comportement intériorisés et extériorisés de la petite enfance à l’âge scolaire

Afin de décrire les processus qui sous-tendent les variations individuelles entre les enfants quant à leurs comportements intériorisés et extériorisés, il est important de comprendre comment ceux-ci se développent en moyenne dans la population. Pour ce faire, le devis longitudinal est idéal, qui consiste à recueillir des informations sur les mêmes enfants à plusieurs reprises dans le temps. Les avancées statistiques récentes ont rendu la modélisation des données longitudinales beaucoup plus rigoureuse (Geiser, 2012). Ces avancées permettent de décrire les différences intra- et interindividuelles et de prédire les différences interindividuelles dans le développement, par exemple celui des problèmes de comportement. Pour ce faire, il est essentiel d’utiliser une mesure dite « invariante », c’est-à-dire que les données recueillies conservent la même signification à chaque point de mesure, sans quoi il est impossible de déterminer si le changement observé est attribuable aux variations de l’échelle de mesure plutôt qu’à une évolution réelle dans le temps. Pour le deuxième article de la thèse, le fonctionnement socio-émotionnel a été mesuré à trois reprises, à l’aide du même instrument de mesure, de la petite enfance à l’âge scolaire.

L'une des façons de modéliser les trajectoires des problèmes de comportement à travers le temps est par la modélisation de courbes de croissance paramétriques (modèles multiniveaux de croissance), une technique utilisée dans un nombre croissant d'études. Ces analyses permettent de traiter les mesures répétées en tant que données nichées au sein des individus. Elles permettent ainsi de modéliser le changement à deux niveaux: un premier niveau qui représente le changement individuel à travers le temps (différences intra-individuelles d’un âge à l’autre) et un second niveau qui permet de quantifier à quel point le changement diffère entre les individus

(différences interindividuelles; Singer & Willett, 2003). Un autre avantage des analyses multiniveaux est qu'elles permettent d'utiliser toutes les données disponibles afin d'estimer certaines variables malgré les observations manquantes, qui sont la norme plutôt que l'exception dans les devis longitudinaux (Raudenbush & Bryk, 2002). En effet, la méthode d'estimation *full information maximum likelihood* (FIML) utilise toutes les données d'un participant pour estimer ses scores probables sur les variables où il n'a pas de donnée (Singer & Willet, 2003). Estimer ainsi les données manquantes permet de garder les sujets présentant des données manquantes, augmentant la puissance statistique et permettant d'éviter les biais inhérents au fait d'utiliser uniquement les sujets pour lesquels des données sont disponibles pour toutes les variables (Graham, 2009; Little et al., 2014).

Notamment grâce à l'utilisation de telles techniques, les trajectoires normatives des problèmes de comportement intériorisés et extériorisés des enfants de la petite enfance à l'âge scolaire sont de plus en plus documentées (Capaldi et al., 2012; Gilliom & Shaw, 2004; Karevold et al., 2011; Mathiesen et al., 2009; Meunier et al., 2011; Miner & Clarke-Stewart, 2008; Yoon et al., 2017). Cependant, les facteurs qui prédisent les différences individuelles dans ces trajectoires de développement sont encore mal compris. Pourtant, il est important d'identifier ces prédicteurs car ils peuvent être des cibles pour les efforts de prévention et d'intervention. C'est pourquoi le deuxième article de la thèse explore le lien entre le soutien maternel à l'autonomie et les trajectoires de développement des problèmes de comportement intériorisés et extériorisés de la petite enfance à l'âge scolaire, ce qui, à notre connaissance, n'a pas encore été étudié.

Les limites des études actuelles

Des limites ressortent des études longitudinales sur la prédiction du fonctionnement socio-émotionnel des enfants. D'abord, les études qui ont mesuré le soutien maternel à

l'autonomie et la qualité des interactions mère-enfant l'ont souvent fait via l'utilisation d'auto-évaluations parentales, lesquelles sont entachées de plusieurs limites. Les parents sont souvent des rapporteurs biaisés puisque leur capacité à témoigner efficacement de la qualité de leur relation avec leur enfant peut être confondue par la qualité de celle-ci (Meins et al., 2001). Les parents ont aussi tendance à présenter la relation qu'ils entretiennent avec leur enfant de façon socialement acceptable (biais de désirabilité sociale) et peuvent souffrir de biais de rappel (Locke & Prinz, 2002; Perepletchikova & Kazdin, 2004). En fait, des données méta-analytiques indiquent que la méthode de mesure est un modérateur significatif des liens de prédiction entre les relations parent-enfant et le fonctionnement des enfants: les relations parent-enfant mesurées par observation produisent des effets de plus grande taille que les questionnaires auto-évaluatifs (Rothbaum & Weisz, 1994). C'est pourquoi, dans cette thèse, le soutien à l'autonomie et la qualité des interactions dyadiques mère-enfant sont mesurés par observation plutôt que par questionnaires ou entrevues.

De plus, l'utilisation de plusieurs sources de données (p. ex., rapports de la mère, du père et des enseignants) pour accroître la qualité méthodologique des études a été largement préconisée (Kazdin, 2016); pourtant, les études utilisent souvent une seule source d'information pour mesurer le tempérament des enfants et/ou leur ajustement socio-émotionnel (Janson & Mathiesen, 2008). Par conséquent, dans cette thèse, le tempérament et le fonctionnement socio-émotionnel ont été évalués par les deux parents.

Finalement, peu d'études se sont intéressées au lien entre la qualité des relations mère-enfant et le tempérament des enfants mesurés dans la petite enfance pour prédire le fonctionnement socio-émotionnel à l'âge scolaire. Pourtant, l'âge scolaire est marqué d'une étape de transition des plus saillantes du développement des enfants, c'est-à-dire l'entrée scolaire,

qui implique de nombreux apprentissages auxquels les enfants doivent faire face simultanément (Pianta et al., 2007). L'ajustement socio-émotionnel des enfants au cours des premières années d'école est l'un des principaux facteurs influençant leur adaptation scolaire (Robson et al., 2020). Il est donc essentiel de comprendre pourquoi certains enfants fonctionnent mieux que d'autres sur ce plan durant cette période.

Les objectifs de la thèse

La thèse vise à contribuer à l'avancement des connaissances en examinant les prédicteurs du fonctionnement socio-émotionnel entre la petite enfance et l'âge scolaire. Le premier article explore le rôle modérateur de la qualité des interactions mère-enfant, observée à 2 ans, dans la relation entre la tendance à la colère des enfants et leurs comportements intériorisés, extériorisés et prosociaux à l'entrée scolaire (évalués par les deux parents). Conformément à la majorité des études antérieures, il était attendu que les interactions mère-enfant de haute qualité agissent comme facteur de protection dans le lien entre la tendance à la colère et les problèmes de comportement chez les enfants. Cet article est publié dans le *Early Childhood Research Quarterly.*

Le deuxième article examine les liens prédictifs entre le soutien maternel à l'autonomie (observé à 15 mois) et les trajectoires des comportements intériorisés et extériorisés des enfants mesurés de 2 à 7 ans (évalués par les deux parents), en contrôlant les dimensions négatives du tempérament des enfants. Il était attendu qu'un plus grand soutien à l'autonomie prédise une augmentation plus lente des comportements intériorisés et une diminution plus rapide des comportements extériorisés. Cet article est publié dans la revue *Social Development.*

**L'article de Lemelin et ses collègues (2021) est également ajouté à la thèse compte tenu de mon rôle comme co-superviseure de stage d'honneur pour l'étudiante qui en est la

première auteure. Des informations supplémentaires sur le lien entre la thèse et cet article sont disponibles (Annexe F).

Article 1

Child temperamental anger, mother-child interactions, and socio-emotional functioning at school entry

Sirois, M. S., Bernier, A., & Lemelin, J. P. (2019). Child temperamental anger, mother–child interactions, and socio-emotional functioning at school entry. *Early Childhood Research Quarterly*, *47*, 30–38. http://10.1016/j.ecresq.2018.10.005

Note. Les normes APA 6e édition ont été utilisées pour conserver le format de l'article tel que publié.

Abstract

This study investigated the role of temperamental anger in toddlerhood in the prediction of child socio-emotional functioning at school entry and the moderating function of mother-child interactions in these predictive associations. The sample included 86 children. To assess child temperamental anger, mothers and fathers completed the Anger proneness scale of the Toddler Behavior Assessment Questionnaire when children were aged 2 years. The quality of mother-child interactions was also assessed when children were 2 years old with the Mutually Responsive Orientation scale. Child internalizing, externalizing and prosocial behaviors were reported by parents in kindergarten and first grade with the Child Behavior Checklist and the Socio-Affective Profile. The results indicated that anger proneness predicted higher internalizing and externalizing behavior, and lower prosocial behavior. In the case of internalizing behavior, the effect of anger was qualified by an interaction with the quality of mother-child interaction: anger proneness predicted higher internalizing behavior only among children who had higher-quality interactions with their mothers. These findings suggest that simultaneous consideration of temperament and parent-child relationships early on in development may help identify children at risk for experiencing adjustment difficulties at school entry, allowing for prompt intervention before difficulties crystallize.

Keywords: child temperament, child anger proneness, mother-child interactions, internalizing behavior, externalizing behavior, prosocial behavior.

Child Temperamental Anger, Mother-Child Interactions, and Socio-Emotional Functioning at School Entry

One of the most significant developmental milestones of early childhood is school entry, which involves numerous behavioral, social, and intellectual challenges that children must handle simultaneously (Pianta, Cox, & Snow, 2007). Research shows that children vary widely in their adaptation to school entry, and these differences have lasting and significant consequences for academic, social, and behavioral outcomes in childhood (Duncan et al., 2007; Ladd & Dinella, 2009) and adolescence (Schofield, Bierman, Heinrichs, & Nix, 2008). Children's psychosocial adjustment during this period is one of the main factors influencing their school adaptation (e.g., Duncan & Magnuson, 2011). For instance, children who struggle with externalizing or internalizing behavior problems tend to have more social difficulties when they start school (Duncan et al., 2007; Masten et al., 2005). Their difficulty establishing positive social bonds with peers has a considerable negative impact on their current and subsequent academic success (Ladd, Kochenderfer, & Coleman, 1996), which in turn is predictive of school achievement in the years to come (Entwisle, Alexander, & Olson, 2005). Likewise, behavior problems identified in the early school years tend to persist throughout middle childhood and adolescence (Bosquet & Egeland, 2006; Dodge, Coie, & Lynam, 2006). Consequently, it is imperative to explain why some children arrive in school better prepared than others on a socio-emotional level.

One documented influence on child socio-emotional adjustment is temperament (Janson & Mathiesen, 2008; Rothbart, 2011). Several dimensions of children's temperament are linked to various aspects of their socio-emotional functioning, such as their social competence and the presence of internalizing and externalizing behavior problems (Engle & McElwain, 2011; Janson

& Mathiesen, 2008; Sanson, Hemphill, & Smart, 2004). Most studies focus on temperamental dimensions that are associated with negative emotionality (e.g., anger proneness; Eisenberg, Vaughan, & Hofer, 2009; Smeekens, Riksen-Walraven, & Van Bakel, 2007), likely because such dimensions are associated with poorer social-emotional adjustment (Lemerise & Dodge, 2008), and often predict child socio-emotional development better than temperamental dimensions associated with positive emotionality (e.g., pleasure, interest/persistence; Sanson et al., 2004; Slagt, Dubas, Deković, & Van Aken, 2016; Therriault, Lemelin, Tarabulsy, & Provost, 2011).

Child anger proneness, defined as a constitutionally based predisposition to the experience and expression of anger in situations likely to elicit frustration (Goldsmith & Campos, 1990), is one temperamental dimension that is associated with significant adjustment problems (Zentner & Shiner, 2015). Children who are more prone to anger tend to show poorer cognitive and emotional regulation (Eisenberg et al., 2009; Wilkowski, Robinson, & Troop-Gordon, 2010), and poor regulatory skills, in turn, are associated with child socio-emotional maladjustment including the display of externalizing behavior problems (Chaplin & Cole, 2005; Eisenberg et al., 2001). Anger-prone children are also likely to interact inappropriately with other children and thus be at risk of social withdrawal and peer rejection, which may lead to internalizing problems (Pedersen, Vitaro, Barker, & Borge, 2007). Indeed, temperamental anger in children is often found to be associated with externalizing and internalizing problems assessed concurrently (Rettew, Copeland, Stanger, & Hudziak, 2004) and subsequently (Eisenberg et al., 2009; Lehman, Steier, Guidash, & Wanna, 2002; Lengua, 2006; Smeekens et al., 2007). Moreover, children who struggle with negative emotionality such as anger proneness have been observed to be less empathic with their peers and less likely to show prosocial behavior (Eisenberg et al., 2009).

Despite convincing evidence for the link between child anger proneness and socio-emotional functioning, very few longitudinal studies have focused on temperamental anger as manifested in toddlerhood to predict different aspects of child socio-emotional functioning at school entry. Yet, it is essential to measure child temperament early on, when behavior may be easier to change in an intervention context (Bruder, 2010). Moreover, anger proneness may be a particularly salient dimension of temperament in toddlerhood when the child's struggle for autonomy, combined with increased parental expectations for behavior, elicits high levels of child anger and frustration (Brownell & Kopp, 2007). In addition, using multiple data sources (e.g., mother and father reports) to increase studies' methodological quality has been largely advocated (e.g., Kazdin, 2016), but research often uses only one source of information to measure child temperament, socio-emotional adjustment, or both (Janson & Mathiesen, 2008). Accordingly, the current study focused on the role of mother- and father-reported toddler temperamental anger in the prediction of children's socio-emotional functioning at school entry, as also reported by both parents.

In addition to temperament, research has shown that the family context is highly relevant to children's socio-emotional adjustment including their adaptation to school (Cowan, Cowan, Ablow, Johnson, & Measelle, 2005). Notably, the quality of mother-child relationships is one of the primary contexts of child socialization. For instance, mothers can help their children identify their emotions and develop their emotional and behavioral self-regulatory skills, which in turn can positively influence their adaptation (Leerkes, Blankson, & O'Brien, 2009): child emotion regulation is associated with less anxiety, depression, and aggression (e.g., Suveg & Zeman, 2004) and better peer relationships (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000). Moreover, in higher-quality relationships, mothers often promote children's self-esteem and

perceptions of competence (Grolnick, Price, Beiswenger, & Sauck, 2007), which are protective against maladjustment. Overall, research shows that higher mother-child relationship quality is consistently associated with more prosocial behavior and less internalizing and externalizing behavior problems in children (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010; Pallini, Baiocco, Schneider, Madigan, & Atkinson, 2014; Van Der Bruggen, Stams, & Bögels, 2008).

The quality of mother-child relationships can be measured in several ways. Research has often focused on either the mother's (e.g., sensitivity, autonomy support, discipline) or the child's behavior (e.g., attachment, compliance). Using dyadic measures instead to index the quality of mother-child relationships may be preferable. Such measures take into account both parent and child behavior as well as their mutual influence on each other, and thus are likely to provide a richer and more accurate picture of the relational dynamics characterizing the mother-child relationship, which is dyadic and reciprocal by nature. Furthermore, dyadic measures allow for the assessment of the cooperative, mutually binding aspect of the relationship, which has been found predictive of child socio-emotional functioning (Aksan, Kochanska, & Ortmann, 2006; Feldman, 2003; Kochanska, Forman, Aksan, & Dunbar, 2005). Accordingly, the current study examines the mutual responsiveness of mother-child dyads to index the quality of their relationship. Specifically, we were interested in the capacity of mother-child relational quality to modulate the prospective associations between child anger and subsequent adjustment, as described next.

Temperament and mother-child relationships: Toward interactive models

Child-by-environment models (Ladd, 2004) contend that a dual focus on children and their environment provides a more thorough account of child adjustment than models that test

either child or environmental influences alone (Palermo, Hanish, Martin, Fabes, & Reiser, 2007). It is assumed that child adaptation is the result of factors within children (e.g., their temperament) as well as factors characterizing their relational environment (e.g., relationships with parents). Among the different forms of interplay that could characterize the joint contributions of child and relational factors to child socio-emotional functioning, interactive models are of interest because most developmental theorists agree that the factors influencing child development interact with one another, rather than simply having independent additive contributions (Belsky & Pluess, 2009; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Hemphill & Sanson, 2001).

As the primary context in which child temperament unfolds in the early years, parent-child relationships could modulate the links between temperamental anger and child socio-emotional adjustment in several ways (Putnam, Sanson, & Rothbart, 2002; Slagt et al., 2016; Zentner & Shiner, 2015). For example, parenting can influence aspects of psychobiological development that affect the way children feel and express their emotions (Perlman & Pelphrey, 2010) such as physiological stress response and brain development (Atkinson et al., 2013; Bernier, Calkins, & Bell, 2016). Also, through parental modeling, children gradually internalize their parents' style of emotional response and impulse control (Fox, 2006), and learn to regulate negative arousal (Calkins & Hill, 2007). Individual differences in physiological stress response, brain development, impulse control, and emotion regulation could all contribute to attenuate or exacerbate the links between anger proneness and child subsequent functioning. In addition, it is proposed that some combinations of child temperament and parenting practices are more optimal than others: according to the goodness-of-fit hypothesis, optimal fit between parent and child is achieved when the caregiver's behavioral tendencies are well-suited to the child's emotional

predispositions. This fit is an important process by which child socio-emotional development is influenced (Chess & Thomas, 1991; Seifer, 2000).

Empirical research supports the general hypothesis that temperament and parenting interact in the prediction of child socio-emotional adjustment. For example, Crockenberg and Leerkes (2006) found that maternal sensitivity to infant cues modulates difficult temperament, reducing the risk of later aggression and anxiety. Penela, Henderson, Hane, Ghera, and Fox (2012) found that when infants with elevated temperamental difficulty received lower-quality maternal caregiving, they showed low social engagement and high aggression, whereas these relations were non-significant among infants who received higher-quality maternal caregiving. It has also been reported that among children high in irritable distress, higher maternal hostility was associated with more externalizing problems (Morris et al., 2002). Although those studies used different measures of child temperament, maternal behavior, or child functioning, they all suggest a protective function of high-quality mother-child interactions in the relation between negative emotionality and child emotional maladjustment.

Although less frequent, other studies found that parenting behaviors that are generally considered to be of high quality could be poorly adjusted to child temperament and, paradoxically, be detrimental to child adjustment. For example, Davis, Votruba-Drzal, and Silk (2015), using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development ($N = 881$), found that children with high negative emotionality were more likely to show elevated levels of internalizing symptoms if their mothers exhibited *high* sensitivity (see also Kiel & Buss, 2010, 2011; Mount, Crockenberg, Jó, & Wagar, 2010). Thus, despite substantial support for a protective function of maternal behavior and mother-child relationships considered to be high in quality, some studies suggest that presumably

high-quality mother-child relationships may sometimes, paradoxically, exacerbate children's difficulties in the context of a difficult temperament. Although no studies thus far have found such paradoxical results with child temperamental anger specifically, some maternal behaviors that are generally considered to be of high quality might not be optimal in the context of child anger proneness. For example, mothers who react with acceptance and warmth to their child's displays of anger could inadvertently reinforce the child's aggressive behavior. Else, mothers who are very patient with their child's anger episodes could make it more difficult for the child to adapt to new environments wherein many peers and adults may be less tolerant, such as in school.

The current study

The objective of this study was to investigate the association between child anger proneness (assessed in toddlerhood by both parents) and child socio-emotional functioning at school entry, as well as the moderating role of the observed quality of mother-child interactions in these predictive links. In both kindergarten and Grade 1, socio-emotional functioning was indexed by child internalizing, externalizing and prosocial behavior reported by both parents. Because mothers' ability to effectively report on their child's behavior may be confounded with the quality of the relationship they have developed with him or her (Meins, Fernyhough, Fradley, & Tuckey, 2001), limiting shared-method variance with the use of father reports was important. In light of the literature presented above, it was expected that child temperamental anger would predict less prosocial behavior and more behavior problems at school entry. Significant interactions between child anger proneness and mother-child interactions were also expected. Although both directions of interaction are plausible as explained above, in line with the majority

of prior studies we expected that high-quality mother-child interactions would have a protective function in the relation between temperamental anger and child maladjustment.

Material and methods

Participants

Eighty-six families (46 girls, 40 boys) were recruited from random birth lists generated by the Ministry of Health and Social Services. Criteria for participation were full-term pregnancy and the absence of known developmental delays. Socio-demographic information was gathered upon recruitment (8 months). At that time, mothers were between 20 and 45 years old (M = 32) and fathers were between 21 and 50 years old (M = 34). Mothers had 16.1 years of education on average (varying from 11 to 18 years) and fathers, 15.6 years (varying from 11 to 21 years). The families' average income fell in the CDN$60,000 to CDN$79,000 bracket. Mean family income in Canada was CDN$74,600 for the years of data collection (Government of Canada, Statistics Canada, 2005). The majority of mothers and fathers were Caucasian (92.9%; 85.9%) and French-speaking (90.8%; 83.9%).

Procedure

Data were collected at three time points. To assess child anger proneness, both mothers and fathers completed the Anger proneness scale of the Toddler Behavior Assessment Questionnaire (described below) when children were 2 years old (T1; M = 25.4 months; SD = 1.1). The quality of mother-child interactions was assessed during a home visit at the same time. Mother and child were asked to play "grocery shopping": they were given a written list of food items (banana, milk, broccoli, etc.) that they had to find together and "purchase" (i.e., place the items in a basket). Small plastic representations of the 20 food items had previously been spread throughout the room (generally the family's living room), and the dyad had to collect them in the

order prescribed on their list, which did not correspond to the items' arrangement in the room. The interactions lasted approximately 10 minutes, were videotaped, and these videotapes were later coded by trained observers with the Mutually Responsive Orientation scale (described below).

When children were in kindergarten (T2; *M* = 72 months; *SD* = 2.6) and first grade (T3; *M* = 84.8 months; *SD* = 3.0), their mothers and fathers completed the Child Behavior Checklist and the Socio-Affective Profile (described below) to assess internalizing, externalizing, and prosocial behavior. Parents were invited to fill in the questionnaires separately and to return them by mail to our laboratory with provided pre-paid envelopes.

Measures

Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996). The TBAQ, translated and validated in French by Lemelin and colleagues (2007), evaluates five dimensions of temperament in children aged between 15 and 36 months. In this study, only the anger proneness scale was considered (28 items; α = .86 mothers and .88 fathers; e.g., *when your child wanted to play outside but you said "no", how often did she/he pout, frown, sulk, or look mad?*; *when you removed something your child should not have been playing with, how often did she/he scream?*). Given that mother and father reports showed good concordance (*r* = .32), they were averaged to allow for the use of psychometrically strong indicators of children's anger proneness (varying from 1 to 7). The anger proneness scale of the TBAQ shows satisfactory convergent validity with corresponding scales of other temperament questionnaires such as the Infant Characteristics Questionnaire (Bates, Freeland, & Lounsbury, 1979) and the Infant Behavior Questionnaire (Rothbart, 1986).

Mutually Responsive Orientation scale (MRO; Aksan et al., 2006). The MRO is a rating system that assesses the quality of parent-child interactions, with an emphasis on the mutual orientation responses observed during dyadic exchanges. It consists of three subscales: Harmonious Communication, Mutual Cooperation and Emotional Ambiance. The Harmonious Communication subscale (3 items; $\alpha = .88$) refers to the level at which both verbal and nonverbal aspects of communication flow smoothly, are harmonious and promote intimacy. The Mutual Cooperation subscale (4 items; $\alpha = .73$) evaluates dyads' efficacy in resolving potential sources of conflict and the extent to which partners are open to each other's influence. The Emotional Ambiance subscale (4 items*;* $\alpha = .74$) measures how dyads enjoy an emotionally positive atmosphere, indicating clear pleasure in each other's company, and whether expressions of affection are a source of pleasure for both partners. These three subscales are averaged into a global score of mutual orientation response, varying from 1 to 5. A score of 1 represents disconnected, unresponsive, hostile, and/or affectively negative interactions. In contrast, a score of 5 suggests mutually responsive, cooperative, harmonious, and/or emotionally positive interactions between parent and child. The MRO has good reliability, with excellent internal consistency of the global score as reported by Aksan and colleagues ($\alpha = 0.90$; 2006) and in this sample ($\alpha = .88$). In the current study, 30% of dyads were independently double-coded. Excellent inter-rater reliability was observed (Intra-Class Correlation [ICC] = .93).

Child Behavior Checklist, 4-18 years version (CBCL; Achenbach, 1991; Achenbach & Edelbrock, 1983). The CBCL consists of 100 items with which parents are asked to describe their child on a 3-point scale (0 = does not apply to my child, 1 = sometimes true of my child, 2 = always or often true of my child). Scoring generates scores on six subscales, four of which are grouped into an internalizing problems dimension (36 items), that is, emotionally reactive,

anxious/depressed, somatic complaints, and withdrawn syndromes, whereas two others (aggressive behavior and attention problem syndromes) form an externalizing problems dimension (24 items). Owing to the moderate inter-parental concordance on the kindergarten (r = .40 internalizing; r = .66 externalizing) and first grade assessments (r = .48 internalizing; r = .33 externalizing), and to the moderate stability in both maternal (r = .48 internalizing; r = .49 externalizing) and paternal scores between kindergarten and first grade (r = .54 internalizing; r = .60 externalizing), the four scores were averaged, yielding two global scores for analysis: internalizing problems (α = .72) and externalizing problems (α = .77). The psychometric properties of the CBCL have been demonstrated repeatedly (Achenbach, 1991). The CBCL shows excellent test-retest reliability (average: r = .90; Achenbach & Rescorla, 2001) and its content validity is supported by its ability to discriminate clinical and non-clinical populations (Achenbach & Rescorla, 2001).

Socio-Affective Profile (SAP; LaFrenière, Dumas, Capuano, & Dubeau, 1992). The SAP assesses children's skills and difficulties in interaction with their peers or adults. In this study, the 10-item social competence subscale (a = .84; Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992), which mainly refers to child prosocial behavior (e.g., *comforts or assists another child in difficulty*) was used, rated on a 6-point Likert scale (from almost never (1) to almost always (6)). Owing to the inter-parental concordance in kindergarten (r =.56) and first grade (r = .63), and to maternal (r = .55) and paternal (r = .60) stability, the four scores were averaged into a global index of prosocial behavior (α = .82). This subscale shows satisfactory convergent validity, predictive validity, and temporal stability (Tremblay et al., 1992).

Results

Preliminary Analyses

Table 1 presents the descriptive statistics for child anger proneness, the quality of mother-child interaction, and child internalizing, externalizing, and prosocial behavior. Temperamental anger scores were comparable to those reported by Goldsmith (1996; $M = 4.10$, $SD = 0.79$) as well as by Lemelin et al. (2007; $M = 3.57$, $SD = 0.89$) in their French-Canadian validation study. In the current sample, 14% of children scored in the clinical range (T-scores > 64) for internalizing problems and 12% for externalizing problems; comparable to the rates reported by Achenbach (1991) in the non-referred sample (18% for internalizing and 17% for externalizing problems). The prosocial behavior ($M = 3.90$, $SD = 0.70$; LaFrenière et al., 1992) and mother-child interaction scores ($M = 2.97$, $SD = 0.41$; Kochanska, Kim, Boldt, & Yoon, 2013) were also comparable to those reported in previous studies. All variables showed satisfactory variability. Screening of variable distributions revealed normal or near-normal distributions.

The zero-order correlations among key study variables are presented in Table 2. In line with previous studies, the correlations among internalizing, externalizing and prosocial behavior were modest to moderate (rs = -.53 to .56, ps < .01). The predictor (anger proneness) was not associated with the moderator (the quality of mother-child interaction; $p = .46$), which made for more easily interpretable interaction terms. Consistent with other studies, child anger proneness was positively related to externalizing behavior and negatively related to prosocial behavior (Eisenberg et al., 2001; Roberts, Strayer, & Denham, 2014). However, anger was not significantly correlated with child internalizing behavior at the bivariate level.

We also examined whether sociodemographic variables (child sex, child age, family SES) were related to children's functioning. As observed in previous studies (e.g., Zimmer-Gembeck,

Geiger, & Crick, 2005), child sex was related to children's prosocial behavior (r = .22, p = .01); girls presented more prosocial behavior than boys. Child sex was unrelated to other aspects of child socio-emotional functioning or to temperamental anger. Child age and family SES were unrelated to children's functioning or anger proneness (p's > .05). However, SES was positively (albeit weakly) associated with the quality of mother-child interactions (r = .14, p = .05) and consequently was co-varied in the subsequent main analyses, along with child sex.

Main Analyses

A series of multiple regressions was used next to examine the main and interactive effects of temperamental anger and quality of mother-child interactions in the prediction of children's externalizing, internalizing, and prosocial behavior. Each predictor variable was initially mean-centered, and interaction terms were formed as the product of the two centered predictors. A hierarchical order of entry of predictors was used, in which child sex and family SES were entered first (Block 1), followed by the main effects of the predictor variables (Block 2), and their interaction term (Block 3).

Results are presented in Table 3. Main effects of anger proneness were initially observed (Block 2) on all three aspects of child functioning, net of the effects of child sex, family SES, and quality of mother-child interactions. These effects remained significant in the final models for externalizing and prosocial behavior: higher temperamental anger was associated with more externalizing behavior and less prosocial behavior (although these effects were partly qualified by marginal interactions with the quality of mother-child interaction). In the case of internalizing behavior, the initial effect of anger was subsumed under a significant interaction, and was no longer significant in the final model. This interaction was broken down following Preacher, Curran, and Bauer's (2006) guidelines, plotting fitted regression lines at high (+ 1 SD) and low (-

1 SD) values of the moderator, namely the quality of mother-child interactions. The trend-level interactions observed with externalizing and prosocial behavior were also broken down despite their marginal nature with an exploratory aim, namely to examine whether their shape revealed phenomena similar to that at play with internalizing behavior.

Figure 1 illustrates that, among dyads characterized by higher quality of mother-child interaction, more temperamental anger was related to higher levels of internalizing problems ($\beta = .40$, $p < .001$). In contrast, anger was unrelated to subsequent internalizing problems ($\beta = -.06$, $p = .59$) among children exposed to lower-quality mother-child interactions. Although the interactions themselves did not reach statistical significance (and thus are not displayed graphically), the links between temperamental anger and child externalizing and prosocial behavior under conditions of low-quality ($\beta = .09$, $p = .64$; $\beta = -.10$, $p = .53$) and high-quality mother-child interactions ($\beta = .44$, $p < .001$; $\beta = -.44$, $p < .001$) were qualitatively comparable to those involving internalizing behavior. In other words, significant associations between temperament and adjustment were observed only when quality of mother-child interactions was high.

In all cases, and in contrast with temperamental anger, the quality of mother-child interactions was not directly related to child functioning after accounting for child sex, family SES, and child anger, and thus was involved in the prediction of child adjustment only through its moderating role described above.

Discussion

This study's objective was to investigate the role of temperamental anger in toddlerhood in the prediction of child socio-emotional functioning at school entry, and the moderating role of the quality of mother-child interactions in these associations. It was expected that child

temperamental anger would predict higher behavior problems and lower prosocial behavior at school entry, and that high-quality mother-child interactions would have a protective function in the relations between anger proneness and child maladjustment. The results showed that, as expected, anger proneness predicted higher internalizing and externalizing behavior, as well as lower prosocial behavior, when children reached school four to five years later, over and above family SES and child sex. However, these effects must be interpreted in the context of a significant interaction with mother-child interactions in the case of internalizing behavior (and are qualified by marginal interactions when considering externalizing and prosocial behaviors). We discuss temperament effects first, followed by the interactions.

Although long-term predictions of school entry adaptation from early temperament are uncommon, the current findings are broadly consistent with numerous studies that found anger proneness to be associated with poorer socio-emotional functioning in children (Eisenberg et al., 2009; Lehman et al., 2002; Lengua, 2006; Smeekens et al., 2007). One of the most obvious connections between anger and maladaptive functioning is the development of physical aggression (Averill, 2012), which represents a major component of externalizing problems. Anger also tends to intensify symptoms of depression and anxiety (Perlis et al., 2009) and contributes to the etiology of internalizing disorders (Mash & Barkley, 2014). Hence, anger proneness assessed as early as the age of 2 may be an important risk marker for the development of both internalizing and externalizing behavior problems, and such problems are likely to interfere with children's peer relationships and thus with their prosocial tendencies at school entry.

As mentioned earlier, in the case of internalizing behavior, the initial effect of anger was qualified by an interaction with the quality of mother-child interaction: anger proneness

predicted higher internalizing behavior only among children who had higher-quality interactions with their mothers. In contrast, child anger was unrelated to internalizing problems among children exposed to lower-quality mother-child interactions. To a lesser extent, two marginal interactions suggested qualitatively comparable sets of findings when predicting externalizing and prosocial behavior. Overall, temperamental anger in toddlerhood predicted socio-emotional difficulties at school entry mostly in the context of a more optimal mother-child relationship.

These findings suggesting more adjustment problems in the context of higher mother-child relationship quality are at odds with the widespread idea that high-quality relationships protect children against the deleterious consequences of sub-optimal temperament, such as high anger proneness. However, the current findings are similar to those of some previous studies that reported that temperamental dimensions associated with negative emotionality were related to more behavior problems especially in the context of presumably higher-quality parental behavior (Davis et al., 2015; Degnan & Fox 2007; Kiel & Buss, 2010, 2011; Mount et al., 2010). As proposed by Davis and colleagues (2015), one explanation could be that children prone to temperamental difficulty tend to struggle with self-regulation (Rothbart & Sheese, 2007; Shiner & Caspi, 2003). Well-meaning parents may provide more frequent reassurance when their children frequently exhibit negative emotions such as anger, and shield them from situations that elicit those negative emotions. In turn, this may lead children to rely excessively on their parents to regulate their emotions (Rubin, Hastings, Stewart, Henderson, & Chen, 1997), failing to develop self-regulatory skills. Such self-regulatory deficits can then place children at risk of gradually developing more internalizing problems, and to a lesser extent (according to the current results) more externalizing problems as well as less prosocial behavior.

A different explanation is that structured parenting, entailing behavioral control and limit-setting, is sometimes required when dealing with difficult children (e.g., those prone to anger). Thus, more competent parents may often use strict limit-setting when dealing with children prone to anger, who are more likely to have anger outbursts and other behavioral manifestations requiring a firm parental response. While appropriate, such firm parenting may nonetheless generate anxiety and depression in children prone to anger, as parental control sharply confronts these children's behavioral predispositions (Morris et al., 2002). With time, the anxiety elicited by such antagonism between children's natural tendencies and parental responses may snowball into internalizing symptoms. Note that although maternal limit-setting is not captured by the MRO, previous studies have reported that higher mother-child relationship quality (as indexed in the current study by high MRO scores) is associated with more parental behavioral control and limit setting (e.g., Karavasilis, Doyle, & Markiewicz, 2003). This might explain, to some extent, the association between anger proneness and internalizing problems in the context of higher mother-child interactional quality observed here. This interpretation, based on the general notion of goodness-of-fit, is tentative and more research is needed to examine it formally.

Finally, it could be that a higher-quality mother-child relationship leaves more room for children's hereditary predispositions (in this case, temperamental anger) to be expressed. For example, Turkheimer, Haley, Waldron, D'Onofrio, and Gottesman (2003) found that the genetic and environmental contributions to child IQ varied according to family SES. In impoverished families, most of the variance in IQ was accounted for by the shared environment, with negligible genetic contribution. In higher-SES families, the result was almost exactly opposite. The authors interpreted these results as suggesting that genetic differences among individuals could be accentuated in favorable environments. Accordingly, a favorable mother-child

relationship could represent an environment that allows child temperamental difficulties to unfold and create developmental cascades that negatively influence children's socio-emotional adjustment, as observed here at school entry.

The quality of mother-child interactions was not directly predictive of child functioning after accounting for child sex, family SES, and child temperamental anger. While unexpected, this finding is consistent with some studies that found no direct contribution of parenting to the prediction of child internalizing and externalizing behavior problems (Crockenberg & Leerkes, 2006; Lengua, 2008). In fact, meta-analytic studies reveal relatively small associations between parenting and child externalizing (r = .24; Rothbaum & Weisz, 1994) and internalizing behavior (rs = .21 to .28; McLeod, Weisz, & Wood, 2007; McLeod, Wood, & Weisz, 2007). Moreover, Fraley, Roisman, and Haltigan (2013) found that effect sizes of relations between early parenting and child functioning diminish rapidly over time, which may be explained by the fact that mother-child relationship quality is only moderately stable (e.g., Meins, Bureau, & Fernyhough, 2018; Pinquart, Feußner, & Ahnert, 2013). Accordingly, given the four- to five-year delay between the assessment of mother-child interactions and that of child socio-emotional adjustment used here, this study may have failed to detect what are potentially small effects.

This study presents some methodological limitations that call for careful interpretation of the results. Given the correlational design, we cannot conclude that the associations observed are indicative of causal relations. The modest sample size (although not unusual in labor-intensive longitudinal parenting research) weakened statistical power, perhaps contributing to the fact that some interactive effects were marginally significant. The low-risk nature of the sample also limited variation in the lower-end of mother-child relationship quality and the higher-end of children’s behavior problems. More variation might have yielded other significant interaction

effects. Moreover, an observational measure of child temperamental anger would have provided a useful complement to the parent reports that we used (Lemery, Essex, & Smider, 2002). Finally, this study did not account for what is arguably a salient parental influence, namely the quality of father-child interactions. Steele and Steele (2005) argued that mother-child relationships may be particularly important for children's self-understanding and dealing with inner conflicts (akin to internalizing behavior), whereas father-child relationships may be especially salient for dealing with the outside world (e.g., interactions with peers, closely related to externalizing and prosocial behavior). Thus, a hypothesis that we could not test in this study is that the quality of father-child relationships may moderate the links between child temperament and externalizing and prosocial behaviors.

These limitations are to be considered in the context of the study's methodological strengths. The fact that child anger proneness was assessed by both parents, and with good convergence, somewhat attenuates the concern that anger was parent-reported only. The quality of mother-child interaction was assessed in the families' homes with a well-validated observational measure, which showed excellent reliability. Four and five years later, children's socio-emotional adjustment was also reported by both parents and over two consecutive years, making for psychometrically strong outcomes. Lastly, the longitudinal design is useful in suggesting that temperamental anger assessed as early as two years of age may have unique and long-lasting consequences for children's socio-emotional functioning when they enter school.

Conclusion

School entry represents an important transitional point for child development and the current results suggest that certain combinations of child temperament and mother-child relationship may adversely affect children's socio-emotional functioning in this developmental

period. These findings add to the understanding of how the complex interplay between children's affective predispositions and their family context contributes to their socio-emotional adjustment at school entry. In all likelihood, however, the associations between child temperament, quality of parent-child relationships, and child functioning are much more complex than this study could investigate. These associations probably vary according to aspects of child temperament, child functioning and parent-child relationships assessed, as well as across populations and developmental periods. Given the well-demonstrated predictive power of socio-emotional skills in the prediction of children's school trajectories (Blair & Raver, 2015), more attention should be paid to how these skills are shaped by transactions between children and their early caregiving environment.

References

Achenbach, T. (1991). *Child behavior checklist/4-18.* Burlington: University of Vermont.

Achenbach, T. M., & Edelbrock, C. (1983). *Manual for the child behavior checklist and revised child behavior profile.* Burlington: University of Vermont.

Achenbach, T. M., & Rescorla, L. (2001). *Manual for the ASEBA school-age forms & profiles.* Burlington: University of Vermont.

Aksan, N., Kochanska, G., & Ortmann, M. R. (2006). Mutually responsive orientation between parents and their young children: Toward methodological advances in the science of relationships. *Developmental Psychology*, *42*, 833-848. doi:10.1037/0012-1649.42.5.833

Atkinson, L., Gonzalez, A., Kashy, D. A., Santo Basile, V., Masellis, M., Pereira, J., ... & Levitan, R. (2013). Maternal sensitivity and infant and mother adrenocortical function across challenges. *Psychoneuroendocrinology*, *38*, 2943-2951. doi:10.1016/ j.psyneuen.2013.08.001

Averill, J. R. (2012). *Anger and aggression: An essay on emotion*. New York, NY: Springer-Verlag.

Bates, J. E., Freeland, C. A. B., & Lounsbury, M. L. (1979). Measurement of infant difficultness. *Child Development*, 794-803. doi:10.2307/1128946

Belsky, J., & Pluess, M. (2009). Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin*, *135*, 885–908. doi:10.1037/a0017376

Bernier, A., Calkins, S. D., & Bell, M. A. (2016). Longitudinal associations between the quality of mother–infant interactions and brain development across infancy. *Child Development*, *87*, 1159–1174. doi:10.1111/cdev.12518

Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual Review of Psychology*, *66*, 711–731. doi:10.1146/annurev-psych-010814-015221

Bosquet, M., & Egeland, B. (2006). The development and maintenance of anxiety symptoms from infancy through adolescence in a longitudinal sample. *Development and Psychopathology*, *18*, 517–550. doi:10.1017/s0954579406060275

Brownell, C. A., & Kopp, C. B. (Eds.). (2007). Transitions in toddler socioemotional development. *Socioemotional development in the toddler years: Transitions and transformations* (pp. 1–40). New York, NY: The Guilford Press.

Bruder, M. B. (2010). Early childhood intervention: A promise to children and families for their future. *Exceptional Children*, *76*, 339–355. doi:10.1177/001440291007600306

Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation. In J. Gross (Ed.), *Handbook of emotion regulation* (pp. 229–248). New York, NY: Guilford Press.

Chaplin, T. M., & Cole, P. M. (2005). The role of emotion regulation in the development of psychopathology. In B. L. Hankin & J. R. Z. Abela (Eds.), *Development of Psychopathology: A Vulnerability-Stress Perspective* (pp. 49–74). California, TO: Sage.

Chess, S., & Thomas, A. (1991). Temperament and the concept of goodness of fit. In J. Strelau & A. Angleitner (Eds.), *Explorations in temperament* (pp. 15–28). New York, NY: Springer US.

Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist*, *55*, 218–232. doi:10.1037//0003-066x.55.2.218

Contreras, J. M., Kerns, K. A., Weimer, B. L., Gentzler, A. L., & Tomich, P. L. (2000). Emotion regulation as a mediator of associations between mother–child attachment and peer relationships in middle childhood. *Journal of Family Psychology*, *14*, 111–124. doi:10.1037//0893-3200.14.1.111

Cowan, P. A., Cowan, C. P., Ablow, J. C., Johnson, V. K., & Measelle, J. R. (2005). *The family context of parenting in children's adaptation to elementary school*. Mahwah, NJ: Lawrence Erlbaum Associates.

Crockenberg, S. C., & Leerkes, E. M. (2006). Infant and maternal behavior moderate reactivity to novelty to predict anxious behavior at 2.5 years. *Development and Psychopathology*, *18*, 17–34. doi:10.1017/s0954579406060020

Davis, S., Votruba-Drzal, E., & Silk, J. S. (2015). Trajectories of internalizing symptoms from early childhood to adolescence: Associations with temperament and parenting. *Social Development*, *24*, 501–520. doi:10.1111/sode.12105

Degnan, K. A., & Fox, N. A. (2007). Behavioral inhibition and anxiety disorders: Multiple levels of a resilience process. *Development and Psychopathology, 19*, 729–746. doi:10.1017/s0954579407000363

Dodge, K. A., Coie, J. D., & Lynam, D. (2006). Aggression and antisocial behavior in youth. In W. Damon & R. M. Lerner (Series Ed.) and N. Eisenberg (Vol. Ed*.), Handbook of child psychology. Vol. 3. Social, emotional, and personality development* (6th ed.). New York, NY: Wiley.

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., ... & Sexton, H. (2007). School readiness and later achievement. *Developmental Psychology*, *43*, 1428–1446. doi:10.1037/0012-1649.43.6.1428

Duncan, G. J., & Magnuson, K. (2011). The nature and impact of early achievement skills, attention skills, and behavior problems. In G. J. Duncan & R.J. Murnane (Eds.), *Whither opportunity?: Rising inequality, schools, and children's life chances* (pp. 47–70). New York, NY: Russell Sage Foundation.

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., ... & Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, *72*, 1112–1134. doi:10.1111/1467-8624.00337

Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., ... & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology*, *45*, 988–1008. doi:10.1037/a0016213

Eisenberg, N., Vaughan, J., & Hofer, C. (2009). Temperament, self-regulation, and peer social competence. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook*

of Peer Interactions, Relationships, and Groups (pp. 473–489). New York, NY: Guilford Press.

Engle, J. M., & McElwain, N. L. (2011). Parental reactions to toddlers' negative emotions and child negative emotionality as correlates of problem behavior at the age of three. *Social Development*, *20*, 251-271. doi:10.1111/j.1467-9507.2010.00583.x

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2005). First grade and educational attainment by age 22: A new story. *American Journal of Sociology*, *110*, 1458–1502. doi:10.1086/428444

Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, *81*, 435–456. doi:10.1111/j.1467-8624.2009.01405.x

Feldman, R. (2003). Infant–mother and infant–father synchrony: The coregulation of positive arousal. *Infant Mental Health Journal, 24*, 1–23. doi:10.1002/imhj.10041

Fox, G. (2006). Development in family contexts. In L. Combrinck-Graham (Ed.), *Children in family contexts: Perspectives on treatment* (pp. 26–50). New York, NY: Guilford Press.

Fraley, R. C., Roisman, G. I., & Haltigan, J. D. (2013). The legacy of early experiences in development: Formalizing alternative models of how early experiences are carried forward over time. *Developmental Psychology*, *49*, 109–126. doi:10.1037/a0027852.supp

Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development*, *67*, 218–235. doi:10.2307/1131697

Goldsmith, H. H., & Campos, J. J. (1990). The structure of temperamental fear and pleasure in infants: A psychometric perspective. *Child Development*, *61*, 1944–1964. doi:10.2307/1130849

Government of Canada, Statistics Canada. (2005). *Statistics Canada*. Retrieved from https://www.statcan.gc.ca

Grolnick, W. S., Price, C. E., Beiswenger, K. L., & Sauck, C. C. (2007). Evaluative pressure in mothers: Effects of situation, maternal, and child characteristics on autonomy supportive versus controlling behavior. *Developmental Psychology*, *43*, 991–1002. doi:10.1037/0012-1649.43.4.991

Hemphill, R. A., & Sanson, A. (2001). Matching parenting to child temperament. *Family Matters, 59,* 42–47.

Janson, H., & Mathiesen, K. S. (2008). Temperament profiles from infancy to middle childhood: Development and associations with behavior problems. *Developmental Psychology*, *44*, 1314–1328. doi:10.1037/a0012713

Karavasilis, L., Doyle, A. B., & Markiewicz, D. (2003). Associations between parenting style and attachment to mother in middle childhood and adolescence. *International Journal of Behavioral Development*, *27*, 153–164. doi:10.1080/0165025024400015

Kazdin, A.E. (2016). *Methodological issues and strategies in clinical research (4th edition)*. Washington, DC: American Psychological Association.

Kiel, E. J., & Buss, K. A. (2010). Maternal accuracy and behavior in anticipating children's responses to novelty: Relations to fearful temperament and implications for anxiety development. *Social Development, 19*, 304–325. doi :10.1111/j.1467-9507.2009.00538.x

Kiel, E. J., & Buss, K. A. (2011). Prospective relations among fearful temperament, protective parenting, and social withdrawal: The role of maternal accuracy in a moderated mediation framework. *Journal of Abnormal Child Psychology*, *39*, 953–966. doi:10.1007/s10802-011-9516-4

Kochanska, G., Forman, D. R., Aksan, N., & Dunbar, S. B. (2005). Pathways to conscience: Early mother–child mutually responsive orientation and children's moral emotion, conduct, and cognition. *Journal of Child Psychology and Psychiatry*, *46*, 19–34. doi:10.1111/j.1469-7610.2004.00348.x

Kochanska, G., Kim, S., Boldt, L. J., & Yoon, J. E. (2013). Children's callous-unemotional traits moderate links between their positive relationships with parents at preschool age and externalizing behavior problems at early school age. *Journal of Child Psychology and Psychiatry*, *54*, 1251–1260. doi:10.1111/jcpp.12084

Ladd, G. W. (2004). Probing the adaptive significance of children's behavior and relationships in the school context: A child by environment perspective. *Advances in Child Development and Behavior*, *31*, 43–104. doi:10.1016/s0065-2407(03)31002-x

Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: Predictive of children's achievement trajectories from first to eighth grade? *Journal of Educational Psychology*, *101*, 190–206. doi:10.1037/a0013153

Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a predictor of young children's early school adjustment. *Child Development*, *67*, 1103–1118. doi:10.1111/j.1467-8624.1996.tb01785.x

LaFrenière, P. J., Dumas, J. E., Capuano, F., & Dubeau, D. (1992). Development and validation of the Preschool Socioaffective Profile. *Psychological Assessment*, *4*, 442–450. doi:10.1037//1040-3590.4.4.442

Leerkes, E. M., Blankson, A. N., & O'Brien, M. (2009). Differential effects of maternal sensitivity to infant distress and nondistress on social-emotional functioning. *Child Development*, *80*, 762–775. doi:10.1111/j.1467-8624.2009.01296.x

Lehman, E. B., Steier, A. J., Guidash, K. M., & Wanna, S. Y. (2002). Predictors of compliance in toddlers: Child temperament, maternal personality, and emotional availability. *Early Child Development and Care*, *172*, 301–310. doi:10.1080/03004430212124

Lemelin, J. P., Tarabulsy, G. M., Provost, M. A., Fournier, M., Robitaille, J., Hémond, I., & Tessier, R. (2007). Questionnaire d'évaluation du comportement de l'enfant: Version canadienne française du Toddler Behavior Assessment Questionnaire. *Canadian Journal of Behavioural Science*, *39*, 291–300. doi:10.1037/cjbs2007021

Lemerise, E. A., & Dodge, K. A. (2008). The development of anger and hostile interactions. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 730–741). New York, NY: The Guilford Press.

Lemery, K. S., Essex, M. J., & Smider, N. A. (2002). Revealing the relation between temperament and behavior problem symptoms by eliminating measurement confounding: Expert ratings and factor analyses. *Child Development*, *73*, 867–882. doi:10.1111/1467-8624.00444

Lengua, L. J. (2006). Growth in temperament and parenting as predictors of adjustment during children's transition to adolescence. *Developmental Psychology, 42*, 819–832. doi:10.1037/0012-1649.42.5.819

Lengua, L. J. (2008). Anxiousness, frustration, and effortful control as moderators of the relation between parenting and adjustment in middle-childhood. *Social Development*, *17*, 554–577. doi:10.1111/j.1467-9507.2007.00438.x

Mash, E. J., & Barkley, R. A. (2014). *Child psychopathology*. New York, NY: Guilford Press.

Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., ... & Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, *41*, 733–746. doi:10.1037/0012-1649.41.5.733

McLeod, B. D., Weisz, J. R., & Wood, J. J. (2007). Examining the association between parenting and childhood depression: A meta-analysis. *Clinical Psychology Review*, *27*, 986–1003. doi:10.1016/j.cpr.2007.03.001

McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review*, *27*, 155–172. doi:10.1016/j.cpr.2006.09.002

Meins, E., Bureau, J. F., & Fernyhough, C. (2018). Mother–child attachment from infancy to the preschool years: Predicting security and stability. *Child Development*, *89*, 1022–1038. doi:10.1111/cdev.12778

Morris, A. S., Silk, J. S., Steinberg, L., Sessa, F. M., Avenevoli, S., & Essex, M. J. (2002). Temperamental vulnerability and negative parenting as interacting predictors

of child adjustment. *Journal of Marriage and Family*, *64*, 461-471. doi:10.1111/j.1741-3737.2002.00461.x

Mount, K. S., Crockenberg, S. C., Jó, P. S. B., & Wagar, J. L. (2010). Maternal and child correlates of anxiety in 2½-year-old children. *Infant Behavior and Development*, *33*, 567–578. doi:10.1016/j.infbeh.2010.07.008

Palermo, F., Hanish, L. D., Martin, C. L., Fabes, R. A., & Reiser, M. (2007). Preschoolers' academic readiness: What role does the teacher–child relationship play? *Early Childhood Research Quarterly*, *22*, 407–422. doi:10.1016/j.ecresq.2007.04.002

Pallini, S., Baiocco, R., Schneider, B. H., Madigan, S., & Atkinson, L. (2014). Early child–parent attachment and peer relations: A meta-analysis of recent research. *Journal of Family Psychology*, *28*, 118–123. doi:10.1037/a0035736

Pedersen, S., Vitaro, F., Barker, E. D., & Borge, A. I. (2007). The timing of middle-childhood peer rejection and friendship: Linking early behavior to early-adolescent adjustment. *Child Development*, *78*, 1037–1051. doi:10.1111/j.1467-8624.2007.01051.x

Penela, E. C., Henderson, H. A., Hane, A. A., Ghera, M. M., & Fox, N. A. (2012). Maternal caregiving moderates the relation between temperamental fear and social behavior with peers. *Infancy*, *17*, 715–730. doi:10.1111/j.1532-7078.2012.00114.x

Perlis, R. H., Fava, M., Trivedi, M. H., Alpert, J., Luther, J. F., Wisniewski, S. R., & John Rush, A. (2009). Irritability is associated with anxiety and greater severity, but not bipolar spectrum features, in major depressive disorder. *Acta Psychiatrica Scandinavica*, *119*, 282–289. doi:10.1111/j.1600-0447.2008.01298.x

Perlman, S. B., & Pelphrey, K. A. (2010). Regulatory brain development: Balancing emotion and cognition. *Social Neuroscience*, *5*, 533–542. doi:10.1080/17470911003683219

Pianta, R. C., Cox, M. J., & Snow, K. L. (2007). *School readiness and the transition to kindergarten in the era of accountability*. Baltimore, MD: Paul H. Brookes Publishing.

Pinquart, M., Feußner, C., & Ahnert, L. (2013). Meta-analytic evidence for stability in attachments from infancy to early adulthood. *Attachment & Human Development*, *15*, 189–218. doi:10.1080/14616734.2013.746257

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*, 437–448. doi:10.3102/10769986031004437

Putnam, S. P., Sanson, A. V., & Rothbart, M. K. (2002). Child temperament and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting: Volume I: Children and parenting* (pp. 255–277). Mahwah, NJ: Lawrence Erlbaum Associates.

Rettew, D. C., Copeland, W., Stanger, C., & Hudziak, J. J. (2004). Associations between temperament and DSM-IV externalizing disorders in children and adolescents. *Journal of Developmental and Behavioral Pediatrics*, *25*, 383–391. doi:10.1097/00004703-200412000-00001

Roberts, W., Strayer, J., & Denham, S. (2014). Empathy, anger, guilt: Emotions and prosocial behaviour. *Canadian Journal of Behavioural Science, 46*, 465–474. doi:10.1037/a0035057

Rothbart, M. K. (1986). Longitudinal observation of infant temperament. *Developmental Psychology*, *22*, 356–365. doi:10.1037//0012-1649.22.3.356

Rothbart, M. K. (2011). *Becoming who we are: Temperament and personality in development*. New York, NY: Guilford Press.

Rothbart, M. K., & Sheese, B. E. (2007). Temperament and Emotion Regulation. In J. Gross (Ed.), *Handbook of emotion regulation* (pp. 331–350). New York, NY: Guilford Press.

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, *116*, 55–74. doi:10.1037//0033-2909.116.1.55

Rubin, K. H., Hastings, P. D., Stewart, S. L., Henderson, H. A., & Chen, X. (1997). The consistency and concomitants of inhibition: Some of the children, all of the time. *Child Development*, *68*, 467–483. doi:10.2307/1131672

Sanson, A., Hemphill, S. A., & Smart, D. (2004). Connections between temperament and social development: A review. *Social Development*, *13*, 142–170. doi :10.1046/j.1467-9507.2004.00261.x

Schofield, H. L. T., Bierman, K. L., Heinrichs, B., & Nix, R. L. (2008). Predicting early sexual activity with behavior problems exhibited at school entry and in early adolescence. *Journal of Abnormal Child Psychology*, *36*, 1175–1188. doi:10.1007/s10802-008-9252-6

Seifer, R. (2000). Temperament and goodness of fit. In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (pp. 257–276). New York, NY: Springer US.

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, *44*, 2–32. doi:10.1111/1469-7610.00101

Slagt, M., Dubas, J. S., Deković, M., & Van Aken, M. A. (2016). Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin*, *142*, 1068–1110. doi:10.1037/bul0000061

Smeekens, S., Riksen-Walraven, J. M., & Van Bakel, H. J. (2007). Multiple determinants of externalizing behavior in 5-year-olds: A longitudinal model. *Journal of Abnormal Child Psychology*, *35*, 347–361. doi:10.1007/s10802-006-9095-y

Steele, H., & Steele, M. (2005). The construct of coherence as an indicator of attachment security in middle childhood: The Friends and Family Interview. In K. Kerns & R. Richardson (Eds.), *Attachment in Middle Childhood*. New York, NY: The Guilford Press.

Suveg, C., & Zeman, J. (2004). Emotion regulation in children with anxiety disorders. *Journal of Clinical Child and Adolescent Psychology, 33*, 750–759. doi:10.1207/s15374424jccp3304_10

Therriault, D., Lemelin, J. P., Tarabulsy, G. M., & Provost, M. A. (2011). Direction des effets entre le tempérament de l'enfant et la sensibilité maternelle. *Canadian Journal of Behavioural Science*, *43*, 267–278. doi:10.1037/a0024309

Tremblay, R. E., Vitaro, F., Gagnon, C., Piché, C., & Royer, N. (1992). A prosocial scale for the Preschool Behaviour Questionnaire: Concurrent and predictive correlates. *International Journal of Behavioral Development, 15*, 227–245. doi:10.1177/016502549201500204

Turkheimer, E., Haley, A., Waldron, M., D'Onofrio, B., & Gottesman, I. I. (2003). Socioeconomic status modifies heritability of IQ in young children. *Psychological Science*, *14*, 623–628. doi:10.1046/j.0956-7976.2003.psci_1475.x

Van Der Bruggen, C. O., Stams, G. J. J., & Bögels, S. M. (2008). Research review: The relation between child and parent anxiety and parental control: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, *49*, 1257–1269. doi:10.1111/j.1469-7610.2008.01898.x

Wilkowski, B. M., Robinson, M. D., & Troop-Gordon, W. (2010). How does cognitive control reduce anger and aggression? The role of conflict monitoring and forgiveness processes. *Journal of Personality and Social Psychology*, *98*, 830–840. doi:10.1037/a0018962

Zentner, M., & Shiner, R. L. (2015). *Handbook of temperament*. New York, NY: Guilford Press.

Zhou, Q., Eisenberg, N., Wang, Y., & Reiser, M. (2004). Chinese children's effortful control and dispositional anger/frustration: Relations to parenting styles and children's social functioning. *Developmental Psychology*, *40*, 352–366. doi:10.1037/0012-1649.40.3.352

Zimmer-Gembeck, M. J., Geiger, T. C., & Crick, N. R. (2005). Relational and physical aggression, prosocial behavior, and peer relations: Gender moderation and bidirectional associations. *The Journal of Early Adolescence*, *25*, 421–452. doi:10.1177/027243160527984

Table 1

Range, Mean (M), and Standard Deviation (SD) for all Main Variables

Main variables	Range	*M*	*SD*
Anger proneness (composite)	2.21 - 5.70	3.83	0.69
Mother report	2.21 - 5.93	3.87	0.76
Father report	1.95 - 5.93	3.75	0.76
Mother-child interactions	1.88 - 4.83	3.64	0.61
Internalizing behavior (composite)	0 - 29	7.92	5.32
Mother report (K)	0 - 33	8.77	6.36
Mother report (G1)	0 - 34	8.23	7.04
Father report (K)	0 - 34	8.29	6.61
Father report (G1)	0 - 26	6.93	6.09
Externalizing behavior (composite)	0 - 33	8.98	5.82
Mother report (K)	0 - 34	9.40	7.02
Mother report (G1)	0 - 37	9.58	7.16
Father report (K)	0 - 38	8.41	6.80
Father report (G1)	0 - 24	7.77	5.68
Prosocial behavior (composite)	3.28 - 5.70	4.25	0.47
Mother report (K)	3.20 - 5.70	4.28	0.54
Mother report (G1)	2.80 - 5.50	4.32	0.56
Father report (K)	2.80 - 5.30	4.15	0.52
Father report (G1)	2.80 - 5.50	4.15	0.55

Note. K = kindergarten, G1 = first grade.

Table 2

Zero-Order Correlations among all Study Variables

	1	2	3	4	5	6	7	8
1. Child sex	…	-.07	.02	-.10	.12	.08	-.11	.22*
2. SES		…	.04	.11	.14*	-.07	-.02	-.07
3. Child age			…	.05	-.08	-.06	-.06	-.10
4. Anger proneness				…	-.06	.21	.29**	-.30**
5. Mother-child interactions					…	-.09	-.03	.04
6. Internalizing behavior						…	.56***	-.28**
7. Externalizing behavior							…	-.53***
8. Prosocial behavior								…

Note. Child sex: 1 = boys, 2 = girls.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$

Table 3

Regression Analyses: Anger Proneness and Mother-Child Interactions Predicting Child Functioning

	Child functioning					
	Internalizing behavior		Externalizing behavior		Prosocial behavior	
	β when first entered	β in final model	β when first entered	β in final model	β when first entered	β in final model
B1ock 1:						
Child sex	.09	.11	-.11	-.08	.27**	.26*
SES	-.13	-.10	.03	.01	-.09	-.09
B1ock 2:						
Anger	.22*	.16	.29**	.24*	-.28**	-.24*
Mother-child interactions	-.03	-.06	.03	-.00	-.04	-.02
B1ock 3 :						
Anger X Mother-child interactions		.24*		.19 t		-.19 t
Model's total R^2	.13		.13		.19	

Note. Child sex: 1 = boys, 2 = girls.
t $p < .10$. * $p < .05$. ** $p < .01$.

Figure 1

Child Anger and Mother-Child Interactions Predicting Child Internalizing Behavior

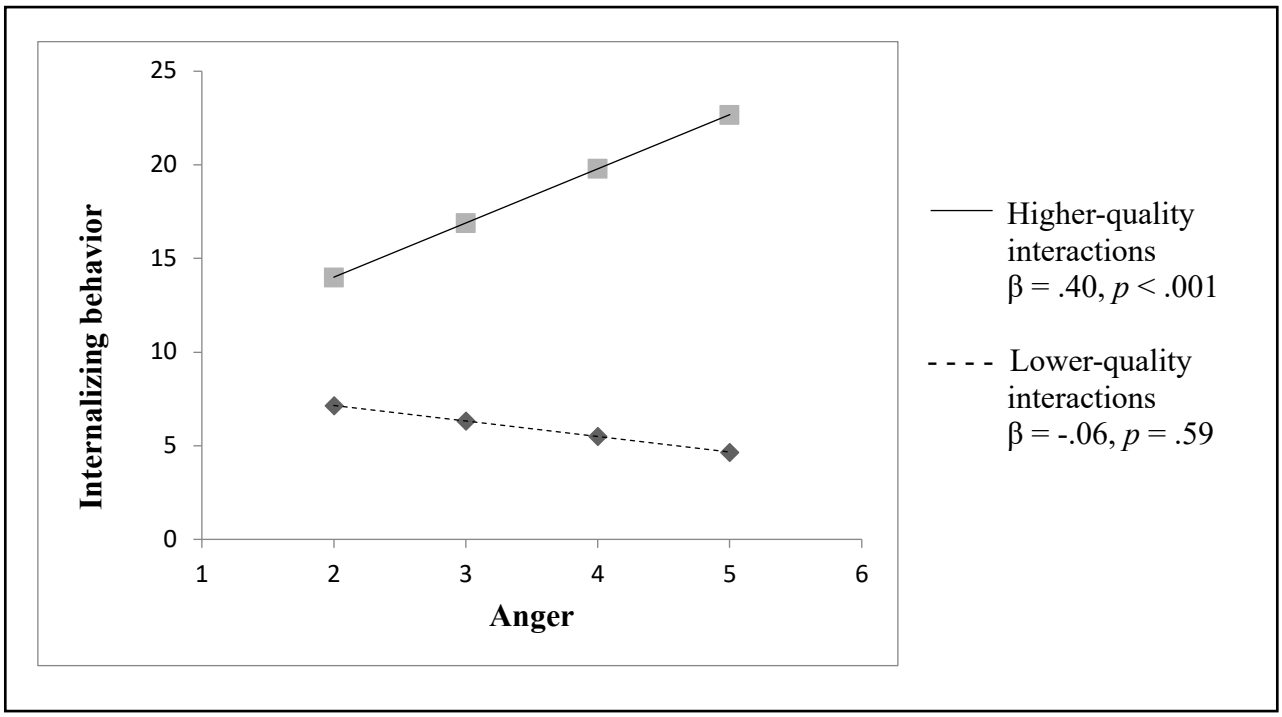

Figure 1. Child anger proneness and mother-child interactions predicting child internalizing behavior. The regression lines were plotted at high (+ 1 SD) and low (- 1 SD) values of the quality of mother-child interactions.

Article 2

Early maternal autonomy support as a predictor of child internalizing and externalizing behavior trajectories across early childhood

Sirois, M. S., Bernier, A., Gagné, C. M., & Mageau, G. A. (2021). Early maternal autonomy support as a predictor of child internalizing and externalizing behavior trajectories across early childhood. *Social Development*. http://doi.org/10.1111/sode.12575

Early Maternal Autonomy Support as a Predictor of Child Internalizing and Externalizing Behavior Trajectories across Early Childhood

Abstract

This study investigated the contribution of early maternal autonomy support in the prediction of developmental patterns of change in child internalizing and externalizing behavior problems from 2 to 7 years of age. The participants were 130 mother-child dyads drawn from a community sample. Data were collected at four time points. Maternal sensitivity and autonomy support were assessed observationally at 12 and 15 months respectively, child temperament was reported by both parents at 2 years, and child internalizing and externalizing behaviors were reported by both parents at 2, 4, and 7 years. The results indicated that, over and above child temperament and maternal sensitivity, mothers who supported their child's autonomy to a greater degree had children whose trajectories of internalizing behavior increased less, and trajectories of externalizing behavior decreased more. These findings suggest that maternal autonomy support may be an important target for prompt intervention to promote healthier child behavioral and emotional adjustment trajectories.

Early Maternal Autonomy Support as a Predictor of Child Internalizing and Externalizing Behavior Trajectories across Early Childhood

Internalizing and externalizing behavior problems in early childhood constitute central indicators of developmental difficulties (Rubin et al., 2011) and have been associated with several other important aspects of children's functioning, such as their cognitive development (Weyandt et al., 2014), school achievement (Sayal et al., 2015), sleep (Lycett et al., 2015), and social competence (Kalvin et al., 2016). Children who show more internalizing behavior, such as anxiety and depression, or externalizing behavior like aggression and attention problems, find it more difficult to make friends at school (Fanti et Henrich, 2010), have lower academic achievement (Van der Ende et al., 2016) and hold more negative perceptions of themselves (Muris et al., 2003).

The developmental trajectories of behavior problems during early childhood through the early school years is an important question, notably because that period includes a salient developmental transition, namely school entry. Developmental scientists agree that school entry may be the most significant developmental milestone of early childhood (Melhuish et al., 2015) and young children's internalizing and externalizing difficulties during this period are some of the main factors influencing their school adaptation (Duncan & Magnuson, 2011). Therefore, it is important to understand how internalizing and externalizing behavior problems develop during early childhood through the early school years as well as the factors that contribute to these developments.

To our knowledge, seven studies have assessed within-person changes in child internalizing and externalizing behavior from toddlerhood through early school years (between 18 months and 9 years). Overall, these studies found an increase in child internalizing behavior

(Capaldi et al., 2012; Gilliom & Shaw, 2004; Karevold et al., 2011; Mathiesen et al., 2009) and a decrease in externalizing behavior over time (Capaldi et al., 2012; Gilliom & Shaw, 2004; Mathiesen et al., 2009; Meunier et al., 2011; Miner & Clarke-Stewart, 2008; Yoon et al., 2017). Only one study found that internalizing behavior remained stable between 2 and 5 years of age (Yoon et al., 2017). These patterns of change could be associated with cognitive and social development. For example, increases in internalizing behavior may reflect improvements in the capacity to remember and anticipate negative events (Kaslow et al., 2000), whereas decreases in externalizing behavior could be related to growth in verbal problem-solving skills (Tremblay, 2000) and gradual integration of social norms (Maccoby, 1984).

Overall, developmental changes in child internalizing and externalizing behavior from toddlerhood through the early school years are well documented. However, the modifiable factors that predict individual differences in these developmental trends are still poorly understood. Studies have identified that parental factors such as stress, depressive symptoms, harsh discipline, and maternal sensitivity (Capaldi et al., 2012; Mathiesen et al., 2009; Miner & Clarke-Stewart, 2008) are associated with developmental changes in child internalizing and externalizing behavior. Building on this body of work, this study examines an increasingly studied aspect of maternal behavior, namely maternal autonomy support, as a predictor of individual differences in trajectories of child internalizing and externalizing behavior problems.

Maternal Autonomy Support

Mother-child interactions constitute one of the primary contexts of child socialization in early childhood and higher-quality maternal behavior is associated with less behavior problems among children (Yap & Jorm, 2015). Autonomy support is one aspect of maternal behavior that appears likely to be useful in understanding the development of child internalizing and

externalizing behavior problems. In toddlerhood, maternal autonomy support represents the degree to which mothers acknowledge children's perspective, provide guidance that is commensurate to their developmental needs to enable agency, encourage independent problem-solving, self-initiation, and choices (Joussemet et al., 2005; McCurdy et al., 2020). For example, autonomy-supportive mothers encourage their toddlers in the pursuit of problem-solving tasks, give useful hints and suggestions when children are at a loss, follow children's pace, give them the opportunity to make choices, and ensure that children play an active role in task completion.

Autonomy support is a key concept of Self-Determination Theory (Deci & Ryan, 2000), which posits that humans have a fundamental psychological need for autonomy (i.e., volition) and that if this need is satisfied, healthy emotional and social development will be facilitated. It is proposed that children who feel a sense of ownership and agency over their thoughts and actions, because their need for autonomy is supported, will more naturally integrate social norms (Joussemet et al., 2008) and autonomously engage in various activities that in turn will enable them to develop perceptions of competence and higher self-esteem (Bean & Northrup, 2009). Toddlerhood may be a sensitive period for autonomy support because self-concept, self-regulation, and the need for exploration are salient during this developmental stage (Andreadakis et al., 2020) and parental autonomy support is likely to support optimal development in these areas (Reeve, 2009; Roth & Assor, 2012; Whipple et al., 2011). Overall, parental autonomy support may provide children with a set of socioemotional resources that are likely to be instrumental in subsequent years as children mature and face increasingly complex developmental tasks. In doing so, autonomy support would promote child psychosocial adjustment. In line with these claims, meta-analytic data (based on 36 studies) show that maternal autonomy support is positively related to several aspects of child socioemotional

functioning, such as autonomous motivation, psychological health, perceived competence, and positive attitudes toward school (Vasquez et al., 2016).

There are, however, limitations to this body of work. Most saliently from a methodological and developmental perspective, the majority of relevant studies are cross-sectional, addressing concurrent associations between maternal autonomy support and child adjustment, which limits interpretation of the results and might inflate effect sizes. We could find five studies that addressed prospective links between early parental autonomy support and later child internalizing and externalizing behavior. These studies converge to suggest that higher parental autonomy support is related to a lower risk for child subsequent internalizing and externalizing behavior problems (Duineveld et al., 2017; Grolnick et al., 2000; Joussemet et al., 2005; Matte-Gagné et al., 2015; Van der Bruggen et al., 2010).

These longitudinal studies, however, also have limitations. First, only two assessed maternal autonomy support using an observational procedure (Matte-Gagné et al., 2015; Van der Bruggen et al., 2010). Observational parenting measures reduce the biases associated with subjective parental self-reports, which are often tainted by social desirability, recall bias (Locke & Prinz, 2002; Perepletchikova & Kazdin, 2004), and the general quality of the parent-child relationship (Meins et al., 2001). Second, these studies, albeit longitudinal, have used one or two assessments of child adjustment problems, which does not allow to characterize developmental growth. To our knowledge, no study has yet examined the predictive links between maternal autonomy support and developmental trajectories of child internalizing and externalizing behavior problems. Given that both internalizing and externalizing problems show significant developments in early childhood (e.g., Mathiesen et al., 2009; Miner & Clarke-Stewart, 2008), this is an important gap. Finally, no study has tested the predictive associations between maternal

autonomy support and subsequent growth in child internalizing and externalizing behavior while considering initial differences in emotional and behavioral child characteristics or while controlling for other aspects of maternal behavior.

Maternal Sensitivity

Aspects of maternal behavior other than autonomy support are associated with child behavior problems. In particular, maternal autonomy support shares some characteristics with another important parenting behavior, namely maternal sensitivity, which refers to mothers' capacity to accurately perceive and interpret their child's cues and needs (Ainsworth et al., 1974). For example, being autonomy supportive requires that mothers be sensitive to their children's need for autonomy and internal frame of reference. Empirical work supports this proposition in showing moderate positive links between sensitivity and autonomy support (Bernier et al., 2014), with both being related to children's socioemotional functioning (Kok et al., 2013; Vasquez et al., 2016). Albeit associated, these two aspects of parenting also show important conceptual distinctions. Maternal sensitivity mostly (although not uniquely) describes how mothers respond to child affect (Leerkes et al., 2012), whereas maternal autonomy support focuses on enabling child agency, for instance when confronting difficult tasks (Joussemet et al., 2005), and promoting internalization of parental demands (Koestner et al., 1984). Therefore, sensitive mothers could soothe an upset child but not necessarily support his or her autonomy while doing so. In line with this, sensitivity and autonomy support have been observed to predict unique portions of children's socioemotional functioning (Sirois & Bernier, 2018; Whipple et al., 2011). Controlling for sensitivity thus allowed us to test our predictions specific to maternal autonomy support, and ensure that any found associations did not represent a halo effect of a more competent mother in the broader sense.

Child Temperament

There is wide consensus that socialization is a bidirectional process embedded in complex transactions between children and their environments (Sameroff, 1975). Baseline child characteristics, such as temperament, may influence both parenting and later child adjustment problems, leading to statistical associations between parenting and child outcomes that are in fact explained by an underlying effect of child characteristics. Temperament is one of the most reliable predictors of child behavior problems (Krieger & Stringaris, 2016), with anger proneness and activity level usually associated with higher externalizing behavior (Lahey et al., 2008; Smeekens et al., 2007) and social fear with higher internalizing behavior (Mathiesen et al., 2009). Studies also show that similar associations between temperament and patterns of change in internalizing and externalizing behaviors are observed at the intra-individual level (Gilliom & Shaw, 2004; Karevold et al., 2011; Mathiesen et al., 2009). Controlling for child temperament thus makes for a more stringent test of the prospective links between early maternal autonomy support and later developments in child behavior problems.

The Current Study

The aim of this study was to assess the predictive associations between maternal autonomy support assessed observationally in toddlerhood and subsequent growth in child internalizing and externalizing behavior from 2 to 7 years of age, while controlling for maternal sensitivity and child temperament. Both parents' perceptions of child baseline behavioral and emotional tendencies (temperament) were assessed at the first time point of the trajectories (2 years) and covaried in all models. Both parents also reported on their child's internalizing and externalizing behavior at 2, 4 and 7 years of age. It was expected that maternal autonomy support would be uniquely associated with more positive trajectories of child adjustment over time. More

specifically, previous studies show that internalizing behavior increases while externalizing behavior decreases from toddlerhood through early school years (e.g., Mathiesen et al., 2009; Miner & Clarke-Stewart, 2008); accordingly, we expected that greater maternal autonomy support would predict a lesser increase in internalizing behavior and a greater decrease in externalizing behavior.

Method

Participants and Procedure

The 130 families (63 girls) included in this report were part of a larger study taking place in a Canadian metropolitan area (Grandir Ensemble). They were recruited from random birth lists. Criteria for participation were a full-term pregnancy and the absence of developmental delays. Sociodemographic information was reported by mothers upon recruitment (8 months). At that time, mothers were between 20 and 45 years old (M = 31.4) and fathers were between 22 and 55 years old (M = 33.7). Mothers had 16.2 years of education on average (varying from 8 to 18 years) and fathers, 15.7 years (from 11 to 19 years). The families' average income fell in the CDN$60,000 to CDN$79,000 bracket, consistent with the population average for the years of data collection (Statistics Canada, 2020). The majority of mothers and fathers were Caucasian (91.5%; 83.1%) and French-speaking (87.7%; 79.2%).

Data were collected at five time points. Maternal sensitivity was assessed during a 1.5-hour home visit when children were aged 12 months (T1; M = 12.60; SD = 1.28). The home visit consisted of a series of child-focused or mother-child tasks. Extensively trained home visitors (Pederson & Moran, 1995) observed mother-child interactions throughout and rated maternal sensitivity immediately thereafter. Maternal autonomy support was measured at 15 months (T2; M = 15.5 months; SD = 0.8) while mother-child dyads were asked to complete puzzles that were

designed to be too difficult for the toddlers, producing a challenging problem-solving task that would require some adult assistance. This interaction was videotaped and later coded for maternal autonomy-supportive behavior as described below.

When children were 2 (T3; *M* = 25.3 months; *SD* = 1.1), 4 (T4; *M* = 48.8 months; *SD* = 0.8), and 7 years old (T5; *M* = 85.1 months; *SD* = 2.8), mothers and fathers completed the Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach & Rescorla, 2000) to assess child internalizing and externalizing behavior problems. To control for parental perceptions of children's baseline behavioral and emotional tendencies (temperament) at the beginning of these trajectories, mothers and fathers also completed the Toddler Behavior Assessment Questionnaire at T3. Parents were invited to fill the questionnaires separately and to return them by mail with provided pre-paid envelopes.

Participants included in the current study had valid scores on maternal sensitivity (T1), autonomy support (T2), child temperament (T3), and at least one of the three behavior problem assessments (T3 to T5). Of the 130 children, all had valid CBCL scores at 2 years, 89 at 4 years, and 91 at 7 years. Attrition analyses suggested that families with missing data did not differ from those who participated in all assessments on family socioeconomic status (SES; obtained by averaging standardized scores of maternal and paternal education and family income) nor on any main study variable (maternal sensitivity, autonomy support, child temperament, as well as internalizing or externalizing behaviors at other time points; all *p*s > .05). Missing data were handled using the robust full-information maximum likelihood estimator, which allows for the estimation of model parameters using all available data (Enders, 2010).

Measures

Maternal Behavior Q-Sort (MBQS; Pederson & Moran, 1995).

A trained research assistant noted maternal behaviors throughout the T1 home visit described above and then sorted the 90 items of the MBQS into nine piles, ranging from "very unlike" to "very similar" to the observed mother's behaviors. The observer's sort was then correlated with a criterion sort representing the prototypically sensitive mother, which is provided by the developers of the instrument. This correlation constitutes the sensitivity score. A little over twenty percent (20.8%) of visits were conducted by two research assistants who then completed the MBQS independently. Agreement between the two raters' sorts was very good, intraclass correlation (ICC) = .85.

Maternal Autonomy Support.

Maternal autonomy support was assessed at T2, based on the videotaped mother-child problem-solving sequence described above. Maternal behavior was coded on four scales (Whipple et al., 2011) ranging from 1 = *not autonomy supportive* to 5 = *extremely autonomy supportive*. The four scales assess the extent to which the mother (1) intervenes according to the child's needs and adapts the task to create an optimal challenge for the child and facilitate agency; (2) encourages her child in the pursuit of the task, gives useful hints and suggestions, and uses verbal support; (3) takes her child's perspective and demonstrates flexibility in her attempts to keep the child on task; (4) follows her child' space, provides the child with the opportunity to make choices, and ensures that the child plays an active role in task completion. In line with Hughes et al. (2018) who found that the four subscales loaded on one latent factor, and given their inter-correlations in this sample (ranging from .53 to .85), the subscale scores were averaged to obtain a total autonomy support score (a = .89). A randomly selected 29% of videotapes were coded independently by two raters. Interrater reliability was excellent, ICC = .86.

Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996).

The French version of the TBAQ, validated by Lemelin and colleagues (2007), was used to assess mothers' and fathers' perceptions of child temperament. Using a 7-point Likert-type scale, the TBAQ evaluates five dimensions of temperament with children aged between 15 and 36 months: activity level, social fear, proneness to anger, tendency to express pleasure, and interest/persistence. Most studies focus on negative temperamental dimensions because they are better predictors of child behavior problems (e.g., Eisenberg et al., 2009; Slagt et al., 2016). Three subscales were therefore considered in the current study: activity level (locomotion in a variety of everyday situations; a = .74 and .76 for maternal and paternal reports), social fear (inhibition, distress, or withdrawal in new social situations; a = .79 and .80), and anger proneness (crying, protest, and other signs of anger in conflict situations; a = .86 and .88). Mother and father reports (rs = .34 to .58) were averaged.

Child Behavior Checklist, 1.5-5 year version **(**CBCL; Achenbach & Rescorla, 2000**)** and ***4-18 year version*** (Achenbach, 1991).

Given that children were aged 2 and 4 years at T3 and T4 and 7 years at T5, we used the age-appropriate version of the CBCL at each time point: the 1.5-5 year version at T3 and T4, and the 4-18 year version at T5. Using a 3-point scale (0 = *does not apply to my child*, 1 = *sometimes true of my child*, 2 = *always or often true of my child*), mothers and fathers thus rated their child's symptoms on 100 items at 2 and 4 years and on 113 items at age 7. To address the difference in number of items across versions while retaining the strong psychometric properties of the CBCL for each age targeted, mean (instead of total) scores were used at each time point (dividing total scores by the number of items included), as in previous longitudinal studies (e.g., Neece et al., 2012). Thus, scores range from 0 to 2, with higher scores indicating more

internalizing or externalizing problems. Responses on items referring to internalizing problems such as anxiety, depression, and social withdrawal (36 or 32 items depending on the version), and externalizing problems including aggression and opposition (24 or 35 items) were averaged into two scores for each parent at each age: child internalizing and externalizing problems. Owing to the inter-parental concordance at ages 2 (r = .57 internalizing; r = .43 externalizing), 4 (r = .50 internalizing; r = .48 externalizing), and 7 years (r = .42 internalizing; r = .45 externalizing), mother and father scores were averaged within each time point. As a result, two global scores at each age were used: internalizing problems (a = .72 to .80) and externalizing problems (a = .77 to .80). The psychometric properties of the two versions of the CBCL have been widely supported (see Achenbach & Rescorla, 2000).

Analytic Strategy

Descriptive statistics and bivariate correlations were first examined. Then, growth curves were fitted in Mplus (Muthén & Muthén, 2012) using a multilevel modeling (MLM) framework. The MLM framework was chosen because it can easily handle the conditions encountered in this study such as small samples, missing data, and unequally spaced time points (Burchinal et al., 2006; Hox & Van de Schoot, 2013). The trajectories of internalizing and externalizing problems were first modeled and described in terms of their intercept and slope. Whereas the intercept reflects the mean group value at the starting point, the slope reflects the average yearly developmental change. Note, however, that the mean scores at each age and thus, the average developmental trends, should be interpreted with caution, as they are based on two different versions of the CBCL. They are reported for completeness of information, as a preliminary step for the investigation of interindividual variations in the observed trajectories. This preliminary

step of analysis was deemed informative, as it allowed us to compare the observed trajectories to those documented in prior studies (e.g., Mathiesen et al., 2009; Miner & Clarke-Stewart, 2008).

We next fitted a series of models in which we tested the predictive effect of maternal autonomy support on the intercept and slope of internalizing and externalizing problems, over and above the contribution of temperamental dimensions and maternal sensitivity. Child sex and family SES were also added to the growth models as they are often associated with child behavior problems, temperament, or maternal behaviors. Two models were specified for each outcome variable. The first model (Model A; fixed linear model) included the fixed effect of child exact age in years. The second model (Model B; random linear model) included between-person variability in intercepts and slopes, which enabled us to test whether estimated baselines and trajectories varied across children. Random effects were retained if the pertinent *p*-value for the estimates were $p \leq .05$ or if the model's log likelihood (LL) differed significantly with the addition of the random terms, based on a chi-square difference test (Grimm et al., 2017). Maternal autonomy support, maternal sensitivity, child temperamental dimensions, and family SES were centered on their mean for ease of interpretation. Therefore, the intercept represents the estimated initial status for an individual with an average value on those predictors.

Results

Descriptive Overview

Table 1 presents the descriptive statistics for maternal autonomy support and sensitivity as well as child temperament, internalizing behavior, and externalizing behavior. All variables showed normal or near-normal distributions, although mean levels of maternal sensitivity were fairly high (0.64 on a –1 to 1 scale). Inter-correlations among the key study variables as well as correlations across time points for internalizing and externalizing behavior are also presented in

Table 1. In line with previous studies, the correlations between concurrent internalizing and externalizing behavior scores were moderate (*r*s = .55 to .62, *p*s < .001). The moderate association between child activity level and anger proneness ($r = .47$, $p < .001$) as well as the lack of significant correlations between these two dimensions and child social fear (*p*s > .05) were similar to those reported in the initial validation study (Goldsmith, 1996). As expected, maternal autonomy support and maternal sensitivity were positively related ($r = .24$, $p < .001$) and the stability of child behavior problems was stronger between closer time points (between 2 – 4 years and 4 – 7 years) than between more distant time points (2 – 7 years).

We also examined whether child sex and SES were related to the main variables. Child sex was unrelated to child behavior problems, temperamental dimensions, or maternal autonomy support and sensitivity, but was retained as a covariate in the main analyses to draw conservative predictions. Family SES was unrelated to child temperamental dimensions or maternal autonomy support. It was, however, negatively related to child externalizing behavior at 4 years ($r = - .23$, $p = .01$) and internalizing behavior at 2 and 4 years (*r*s = -.19, *p*s < .05). Therefore, SES was also entered as a covariate in the main analyses.

Describing Child Internalizing and Externalizing Behavior Growth Curves

In order to facilitate convergence of the growth models and interpretation of the results, with parameter estimates rounded to the third decimal in Mplus, the CBCL scores, which varied from 0 to 2, were multiplicated by 100 before running the models. Thus, the following results are to be interpreted on a scale from 0 to 200. The results of the unconditional growth models are presented in Table 2. For child internalizing behavior, the best-fitting model was a random linear model (Model B) indicating a global increase across time that however varied across children. On average, child internalizing behavior problems increased by 0.97 scale point (γ_{10}) per year,

starting at 21.05 (γ_{00}) at 2 years. The covariance between the slope and the intercept was not significant. The best-fitting model for child externalizing behavior was also a random linear model (Model B), indicating a global decrease across time that however varied across children. On average, child externalizing behavior problems decreased by 4.46 scale point (γ_{10}) per year, starting at 54.43 (γ_{00}) at 2 years. The significant negative covariance between the slope and the intercept indicated that children with higher initial levels of externalizing behavior displayed sharper subsequent decreases (σ_{01} = -47.07, p = .03).

Predicting Child Internalizing Behavior Growth Curves

Table 3 shows the final models predicting internalizing and externalizing behavior trajectories. The results indicated a significant relation between child social fear and the initial status of internalizing problems, where for every one-unit increase in social fear, one could expect internalizing behavior estimates at 2 years to be 7.13 scale-point higher (γ_{04}; $p < .001$). The negative and significant relation between social fear and the rate of change in internalizing behavior (γ_{14} = -1.40, p = .006) further indicates that children showing greater social fear at 2 years displayed lesser steep increases in internalizing symptoms over time. The other dimensions of child temperament (activity level and anger proneness) as well as maternal sensitivity were not associated with the initial status nor the rate of change of internalizing behavior.

There was no significant relation between maternal autonomy support and the initial status of internalizing behavior problems above and beyond the effects of child sex and temperament, maternal sensitivity, and family SES. However, there was a negative association between maternal autonomy support and the rate of change in internalizing behavior (γ_{17} = -0.83), which indicated that for every one-unit increase in autonomy support, the yearly growth in internalizing behavior could be expected to be 0.83 scale-point (p = .01) less. Therefore, the

more mothers supported their child's autonomy, the less steep were the increases in child internalizing problems over time.

Predicting Child Externalizing Behavior Growth Curves

The results indicated significant relations between both child activity level and anger proneness and the initial status of externalizing behavior problems. For every one-unit increase in activity level and in anger proneness, one could expect externalizing behavior estimates at 2 years to be 10.58 (γ_{03}; $p = .002$) and 15.02 (γ_{05}; $p < .001$) scale-point higher. Child activity level did not interact with time ($\gamma_{13} = -1.14$, $p > .05$); thus, child externalizing problems remained consistently higher across time for children with higher activity levels at 2 years. The negative and significant relation between child anger proneness and the rate of change in externalizing behavior ($\gamma_{15} = -2.54$, $p = .002$) indicated that more anger prone children tended to display sharper decreases in externalizing problems over time. Child social fear and maternal sensitivity were not associated with the initial status nor the rate of change of externalizing problems.

There was no significant relation between maternal autonomy support and the initial status of externalizing behavior problems over and above the effects of child sex and temperament, maternal sensitivity, and family SES. However, there was a negative association between maternal autonomy support and the rate of change in externalizing behavior ($\gamma_{17} = -1.29$), which indicated that for every one-unit increase in autonomy support, the yearly decline in externalizing behavior could be expected to be 1.29 scale-point ($p = .003$) greater. Therefore, the more mothers supported their child's autonomy, the more children displayed steep decreases in externalizing problems over time.

Discussion

Although developmental patterns of change in child internalizing and externalizing behavior are increasingly well characterized, the modifiable factors that predict individual differences in these trajectories are still poorly understood. This study examined the unique contribution of early maternal autonomy support to the prediction of child internalizing and externalizing behavior trajectories from 2 to 7 years of age, over and above child temperament and maternal sensitivity. Previous studies showed that internalizing behavior tends to increase and externalizing behavior tends to decrease from toddlerhood through early school years (Capaldi et al., 2012; Gilliom & Shaw, 2004; Karevold et al., 2011; Mathiesen et al., 2009; Meunier et al., 2011; Miner & Clarke-Stewart, 2008; Yoon et al., 2017) and our results showed the same patterns, despite potential variation in sample means due to our use of age-appropriate versions of the CBCL. Furthermore, temperament was linked to externalizing and internalizing behavior in ways consistent with prior findings (e.g., Karevold et al., 2011; Mathiesen et al., 2009). Confirming our hypothesis, there were unique negative associations between maternal autonomy support and the rate of change in child internalizing and externalizing behavior: the more mothers supported their child's autonomy, the less internalizing behavior increased and the more externalizing behavior decreased between ages 2 and 7. Maternal autonomy support thus seemed to increase the favorable growth of child behavioral adjustment (externalizing behavior) while acting as a protective factor against increases in emotional maladjustment (internalizing behavior).

There are different ways in which parental autonomy support may play such a developmental role. By its nature, autonomy support enables children to feel that they have control over their actions, which in turn allows them to develop intrinsic motivation and

autonomously engage in activities that promote perceptions of competence and self-esteem (Bean & Northrup, 2009). Children are also more likely to internalize values and social norms if their parents exert less pressure on them to act or think in specific ways and provide explanatory rationales for why it may be personally important to engage in certain types of behavior (Reeve, 2009). In addition, parental autonomy support is associated with better capacity for emotion self-regulation in children (Roth & Assor, 2012). Overall, early parental autonomy support provides children with a set of internal resources that are likely to be instrumental in subsequent years to support their healthy adaptation to new developmental challenges as they have to become increasingly independent from their parents. As they go through preschool and early school years, children would then be able to use these intrinsic resources to self-regulate their emotional arousal and behavior instead of constantly going to their parents for external regulation (Thompson & Goodvin, 2007). Moreover, the normative decrease in externalizing behavior problems in early childhood is thought to result from advances in verbal skills that support children's ability to inhibit impulsive responses and allow them to better communicate their needs and emotions without parental help (Tremblay, 2000). Since maternal autonomy support has been shown to relate to the development of more elaborate language skills (Matte-Gagné & Bernier, 2011), it might also accelerate the decline in externalizing behavior through the promotion of child verbal skills.

Overall, early autonomy support may equip children with a set of adaptive skills that they will carry forward to meet future developmental challenges. Such skills are likely to be increasingly needed as children must gradually distance themselves from their parents and rely on their own capacities to handle daily situations. In this way, early autonomy support would

protect children against the development of emotional and behavioral maladjustment in subsequent years, as children go through developmental transitions.

Although the current findings supported the hypothesis that higher maternal autonomy support would predict favorable growth in child socioemotional adjustment from 2 to 7 years of age, autonomy support was unrelated to the initial status of internalizing and externalizing behavior trajectories. From a methodological standpoint, one might have expected maternal autonomy support, assessed at 15 months, to predict child behavior at the most proximal time point, namely 2 years (initial status). The lack of prediction may partly be due to the role of temperament: as displayed in Table 3, temperamental dimensions explained fairly large portions of variance in the intercepts, leaving relatively little variance to be predicted by maternal autonomy support. The lack of prediction with maternal sensitivity may likewise be due to the presence of other robust predictors in the models (temperament, autonomy support), as well as to the high levels of sensitivity displayed by the mothers in this sample on average.

It has been suggested that children's intrinsic characteristics are particularly manifest in toddlerhood and could, to an extent, surpass parental effects (Baer et al., 2015). In line with this, Rothbaum and Weisz's meta-analysis (1994) that examined the links between parenting and child externalizing behavior found stronger associations among older than younger children. The pattern of findings observed here, with autonomy support predicting growth but not initial levels of child behavior problems, suggests that a true developmental process is likely to be at play, such that the tools carried forward by children exposed to early autonomy support become more needed as they have to be increasingly self-reliant in adapting to new and growingly complex environments at daycare and school. In this way, the traces left by early autonomy support may interact with children's current environment to shape their ongoing adaptation and promote

optimal developmental changes, be they a steeper decline in externalizing problems or a less pronounced rise in internalizing problems.

Limits

This study presents some methodological limitations. First, in order to retain the strong psychometric properties of the CBCL by using age-appropriate versions at each time point, we had to use two different versions of the CBCL, one with 100 items (at 2 and 4 years) and one with 113 items (at 7 years). Although we dealt with this by using mean (instead of total) scores, the mean trajectories of child behavior problems could partly reflect the slight variation between the two versions of the questionnaire. However, the mean decrease in externalizing behavior and increase in internalizing behavior trajectories in early childhood are already well documented (e.g., Mathiesen et al., 2009; Miner & Clarke-Stewart, 2008); therefore, the objective of this study was not to describe these trajectories but instead to predict between-person variability around the slope, which is not affected by this limitation. Second, the low-risk nature of the sample (mostly white middle-class families) limited variation in the lower-end of maternal autonomy-supportive and sensitive behaviors, and the higher-end of child behavior problems. Results may be different in higher risk populations. For instance, children from lower SES homes may have less autonomy-supportive mothers on average, and variation in the lower-end of maternal autonomy support may have a greater (or lesser) impact on child adjustment than that documented here (Ensminger et al., 2003). Finally, only maternal behaviors were considered. An assessment of paternal autonomy support would have provided a useful complement, especially considering that Vasquez and colleagues' meta-analysis (2016) showed that relations between parental autonomy support and child functioning were stronger when assessments reflected both parents' autonomy-supportive behavior rather than only mothers' or fathers'.

These limitations are to be considered in the context of the study's methodological strengths, notably the longitudinal design and the growth curve analyses. Maternal autonomy support was assessed in the families' homes with a well-validated observational measure. Then, over a 5-year period, child internalizing and externalizing behavior problems were assessed by both parents, and with good convergence. Moreover, both parents' perceptions of child baseline emotional and behavioral characteristics (temperament) were assessed at the first time point of the behavior problem trajectories and covaried in all models, along with early maternal sensitivity, making for stringent analyses. Overall, the results presented here are likely to represent reliable and conservative estimates of the relation between maternal autonomy support and child subsequent adjustment problems.

Conclusion

The results observed in this study suggest that maternal autonomy support assessed as early as 15 months of age may have unique and long-lasting consequences for children's adjustment problems into their early school years. These findings suggest that maternal autonomy support, which has been shown to be responsive to training (Joussemet et al., 2014; Meuwissen & Carlson, 2019), may be an important target for prompt intervention so as to promote children's optimal socioemotional development.

References

Achenbach, T. (1991). *Child behavior checklist/4-18.* University of Vermont.

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms and profiles* (vol. 30). University of Vermont.

Ainsworth, M. D. S., Bell, S. M., & Stayton, D. F. (1974). Infant-mother attachment and social development: Socialization as a product of reciprocal responsiveness to signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world* (p. 99–135). Cambridge University Press.

Andreadakis, E., Laurin, J. C., Joussemet, M., & Mageau, G. A. (2020). Toddler temperament, parent stress, and autonomy support. *Journal of Child and Family Studies, 29*, 3029–3043. https://doi.org/10.1007/s10826-020-01793-3

Baer, J., Schreck, M., Althoff, R. R., Rettew, D., Harder, V., Ayer, L., Albaugh, M., Crehan, E., Kuny-Slock, A., & Hudziak, J. J. (2015). Child temperament, maternal parenting behavior, and child social functioning. *Journal of Child and Family Studies, 24,* 1152–1162. https://doi.org/10.1007/s10826-014-9924-5

Bean, R. A., & Northrup, J. C. (2009). Parental psychological control, psychological autonomy, and acceptance as predictors of self-esteem in Latino adolescents. *Journal of Family Issues*, *30*, 1486–1504. https://doi.org/10.1177/0192513x09339149

Bernier, A., Matte-Gagné, C., Bélanger, M. È., & Whipple, N. (2014). Taking stock of two decades of attachment transmission gap: Broadening the assessment of maternal behavior. *Child Development*, *85*, 1852–1865. https://doi.org/10.1111/cdev.12236

Burchinal, M. R., Nelson, L., & Poe, M. (2006). Growth curve analysis: An introduction to various methods for analyzing longitudinal data. *Monographs of the Society for*

Research in Child Development, 71, 65–87. https://doi.org/10.1111/j.1540-5834.2006.00405.x.

Capaldi, D. M., Pears, K. C., Kerr, D. C., Owen, L. D., & Kim, H. K. (2012). Growth in externalizing and internalizing problems in childhood: A prospective study of psychopathology across three generations. *Child Development*, *83*, 1945–1959. https://doi.org/10.1111/j.1467-8624.2012.01821.x

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. https://doi.org/10.1207/ s15327965pli1104_01

Duineveld, J. J., Parker, P. D., Ryan, R. M., Ciarrochi, J., & Salmela-Aro, K. (2017). The link between perceived maternal and paternal autonomy support and adolescent well-being across three major educational transitions. *Developmental Psychology*, *53*, 1978–1994. https://doi.org/10.1037/dev0000364

Duncan, G. J. & Magnuson, K. (2011). The nature and impact of early achievement skills, attention skills, and behavior problems. In G. J. Duncan & R.J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (p. 47–70). Russell Sage Foundation.

Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., Zhou, Q., & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology*, *45*, 988–1008. https://doi.org/10.1037/a0016213

Enders, C. K. (2010). *Applied missing data analysis*. Guilford Press.

Ensminger, M. E., Fothergill, K. E., Bornstein, M. H., & Bradley, R. H. (2003). A decade of measuring SES: What it tells us and where to go from here. In M. H. Bornstein & R. H. Bradley (Eds.), *Socioeconomic status, parenting, and child development*. Routledge.

Fanti, K. A., & Henrich, C. C. (2010). Trajectories of pure and co-occurring internalizing and externalizing problems from age 2 to age 12: Findings from the National Institute of Child Health and Human Development Study of Early Child Care. *Developmental Psychology*, *46*, 1159–1175. https://doi.org/10.1037/a0020659

Gilliom, M., & Shaw, D. S. (2004). Codevelopment of externalizing and internalizing problems in early childhood. *Development and Psychopathology*, *16*, 313–333. https://doi.org/10.1017/ s0954579404044530

Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development*, *67*, 218–235. https://doi.org/10.2307/1131697

Grimm, K. J., Ram, N., & Estabrook, R. (2017). *Growth modeling: Structural equation and multilevel modeling approaches.* Guilford Press.

Grolnick, W. S., Kurowski, C. O., Dunlap, K. G., & Hevey, C. (2000). Parental resources and the transition to junior high. *Journal of Research on Adolescence*, *10*, 465–488. https://doi.org/10.1207/sjra1004_05

Hox, J., & Van de Schoot, R. (2013). Robust methods for multilevel analysis. In M. A. Scott, J. S. Simonoff, & B. D. Marx (Eds.), *The SAGE handbook of multilevel modeling*. Sage.

Hughes, C., Lindberg, A., & Devine, R. T. (2018). Autonomy support in toddlerhood: Similarities and contrasts between mothers and fathers. *Journal of Family Psychology, 32*, 915–925. https://doi.org/10.1037/fam0000450.

Joussemet, M., Koestner, R., Lekes, N., & Landry, R. (2005). A longitudinal study of the relationship of maternal autonomy support to children's adjustment and achievement in school. *Journal of Personality, 73*, 1215–1236. https://doi.org/10.1111/j.1467-6494.2005.00347.x

Joussemet, M., Landry, R., & Koestner, R. (2008). A self-determination theory perspective on parenting. *Canadian Psychology*, *49*, 194–200. https://doi.org/10.1037/a0012754

Joussemet, M., Mageau, G. A., & Koestner, R. (2014). Promoting optimal parenting and children's mental health: A preliminary evaluation of the how-to parenting program. *Journal of Child and Family Studies, 23*, 949–964. https://doi.org/10.1007/s10826-013-9751-0

Kalvin, C. B., Bierman, K. L., & Gatzke-Kopp, L. M. (2016). Emotional reactivity, behavior problems, and social adjustment at school entry in a high-risk sample. *Journal of Abnormal Child Psychology*, *44*, 1527–1541. https://doi.org/10.1007/s10802-016-0139-7

Karevold, E., Coplan, R., Stoolmiller, M., & Mathiesen, K. S. (2011). A longitudinal study of the links between temperamental shyness, activity, and trajectories of internalising problems from infancy to middle childhood. *Australian Journal of Psychology*, *63*, 36–43. https://doi.org/10.1111/j.1742-9536.2011.00005.x

Kaslow N.J., Adamson L.B., & Collins M.H. (2000). A Developmental psychopathology perspective on the cognitive components of child and adolescent depression. In A. J. Sameroff, M. Lewis & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (p. 491–510). Springer.

Koestner, R., Ryan, R. M., Bernieri, F., & Holt, K. (1984). Setting limits on children's behavior: The differential effects of controlling vs. informational styles on intrinsic motivation and creativity. *Journal of Personality, 52*, 233–248. https://doi.org/10.1111/j.1467-6494.1984.tb00879.x

Kok, R., Linting, M., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Jaddoe, V. W., Hofman, A., Verhulst, F. C., & Tiemeier, H. (2013). Maternal sensitivity and internalizing problems: Evidence from two longitudinal studies in early childhood. *Child Psychiatry et Human Development*, *44*, 751–765. https://doi.org/10.1007/s10578-013-0369-7

Krieger, F. V., & Stringaris, A. (2016). Temperament and vulnerability to externalizing behavior. In T. P. Beauchaine et S. P. Hinshaw (Eds.), *The Oxford handbook of externalizing spectrum disorders* (p. 170–183). Oxford University Press.

Lahey, B. B., Van Hulle, C. A., Keenan, K., Rathouz, P. J., D'Onofrio, B. M., Rodgers, J. L., & Waldman, I. D. (2008). Temperament and parenting during the first year of life predict future child conduct problems. *Journal of Abnormal Child Psychology, 36*, 1139–1158. https://doi.org/10.1007/s10802-008-9247-3

Leerkes, E. M., Weaver, J. M., & O'Brien, M. (2012). Differentiating maternal sensitivity to infant distress and non-distress. *Parenting*, *12*, 175–184. https://doi.org/10.1080/15295192.2012.683353

Lemelin, J. P., Tarabulsy, G. M., Provost, M. A., Fournier, M., Robitaille, J., Hémond, I., & Tessier, R. (2007). Questionnaire d'évaluation du comportement de l'enfant: Version canadienne française du Toddler Behavior Assessment Questionnaire. *Canadian Journal of Behavioural Science*, *39*, 291–300. https://doi.org/10.1037/cjbs2007021

Locke, L. M., & Prinz, R. J. (2002). Measurement of parental discipline and nurturance. *Clinical Psychology Review*, *22*, 895–929. https://doi.org/10.1016/s0272-7358(02)00133-2

Lycett, K., Sciberras, E., Mensah, F. K., & Hiscock, H. (2015). Behavioral sleep problems and internalizing and externalizing comorbidities in children with attention-deficit/hyperactivity disorder. *European Child et Adolescent Psychiatry*, *24*, 31–40. https://doi.org/10.1007/s00787-014-0530-2

Maccoby, E. E. (1984). Socialization and developmental change. *Child Development*, 317–328. https://doi.org/10.2307/1129945

Mathiesen, K. S., Sanson, A., Stoolmiller, M., & Karevold, E. (2009). The nature and predictors of undercontrolled and internalizing problem trajectories across early childhood. *Journal of Abnormal Child Psychology*, *37*, 209–222. https://doi.org/10.1007/s10802-008-9268-y

Matte-Gagné, C., & Bernier, A. (2011). Prospective relations between maternal autonomy support and child executive functioning: Investigating the mediating role of child language ability. *Journal of Experimental Child Psychology, 110*, 611–625. https://doi.org/10.1016 /j.jecp.2011.06.006

Matte-Gagné, C., Bernier, A., & Gagné, C. (2013). Stability of maternal autonomy support between infancy and preschool age. *Social Development, 22*, 427–443. https://doi.org/10.1111/j.1467-9507.2012.00667.x

Matte-Gagné, C., Harvey, B., Stack, D. M., & Serbin, L. A. (2015). Contextual specificity in the relationship between maternal autonomy support and children's socio-emotional development: A longitudinal study from preschool to preadolescence. *Journal of Youth and Adolescence*, *44*, 1528–1541. https://doi.org/10.1007/s10964-014-0247-z

McCurdy, A. L., Williams, K. N., Lee, G. Y., Benito-Gomez, M., & Fletcher, A. C. (2020). Measurement of parental autonomy support: A review of theoretical concerns and developmental considerations. *Journal of Family Theory et Review*, *12*, 382–397. https://doi.org/10.1111/jftr.12389

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry*, *42*, 637–648. https://doi.org/10.1017 /s0021963001007302

Melhuish, E., Ereky-Stevens, K., Petrogiannis, K., Ariescu, A., Penderi, E., Rentzou, K., Tawell, A., Slot, P., Broekhuizen, M., & Leseman, P. (2015). *A review of research on the effects of Early Childhood Education and Care (ECEC) upon child development*. Retrieved from: http://ecec-care.org/resources/publications.

Meunier, J. C., Roskam, I., Stievenart, M., Van de Moortele, G., Browne, D. T., & Kumar, A. (2011). Externalizing behavior trajectories: The role of parenting, sibling

relationships and child personality. *Journal of Applied Developmental Psychology, 32*, 20–33. https://doi.org/10.1016/j.appdev.2010.09.006

Meuwissen, A. S. & Carlson, S. M. (2019). An experimental study of the effects of autonomy support on preschoolers' self-regulation. *Journal of Applied Developmental Psychology, 60*, 11–23. https://doi.org/10.1016/j.appdev.2018.10.001

Miner, J. L. & Clarke-Stewart, K. A. (2008). Trajectories of externalizing behavior from age 2 to age 9: Relations with gender, temperament, ethnicity, parenting, and rater. *Developmental Psychology*, *44*, 771–786. https://doi.org/10.1037/0012-1649.44.3.771

Muris, P., Meesters, C., & Fijen, P. (2003). The self-perception profile for children: Further evidence for its factor structure, reliability, and validity. *Personality and Individual Differences*, *35*, 1791–1802. https://doi.org/10.1016/s0191-8869(03)000047

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (7th ed.). Authors.

Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities, 117,* 48–66. https://doi.org/10.1352/1944-7558-117.1.48

Pederson, D. R., & Moran, G. (1995). A categorical description of infant-mother relationships in the home and its relation to Q-sort measures of infant-mother interaction. *Monographs of the Society for Research in Child Development, 60*, 111–132. https://doi.org/10.1111/j.1540-5834.1995.tb00207.x

Perepletchikova, F., & Kazdin, A. E. (2004). Assessment of parenting practices related to conduct problems: Development and validation of the Management of Children's

Behavior Scale. *Journal of Child and Family Studies*, *13*, 385–403. https://doi.org/org/10.1023/ b:jcfs.0000044723.45902.70

Reeve, J. (2009). *Understanding motivation and emotion (5th ed.)*. John Wiley et Sons.

Roth, G., & Assor, A. (2012). The costs of parental pressure to express emotions: Conditional regard and autonomy support as predictors of emotion regulation and intimacy. *Journal of Adolescence*, *35*, 799–808. https://doi.org/org/10.1016/j.adolescence.2011.11.005

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, *116*, 55–74. https://doi.org/10.1037/0033-2909.116.1.55

Rubin, K. H., Bukowski, W. M., & Laursen, B. (2011). *Handbook of peer interactions, relationships, and groups*. Guilford Press.

Sameroff, A. (2009). *The transactional model*. American Psychological Association.

Sayal, K., Washbrook, E., & Propper, C. (2015). Childhood behavior problems and academic outcomes in adolescence: Longitudinal population-based study. *Journal of the American Academy of Child & Adolescent Psychiatry, 54*, 360–368. https://doi.org/10.1016/j.jaac.2015.02.007

Sirois, M. S., & Bernier, A. (2018). Mother–child relationships and children's psychosocial functioning: The specific roles of attachment security and maternal behavior. *Parenting, 18*, 172–189. https://doi.org/10.1080/15295192.2018.1465305

Slagt, M., Dubas, J. S., Deković, M., & Van Aken, M. A. (2016). Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin*, *142*, 1068–1110. https://doi.org/10.1037/bul0000061

Smeekens, S., Riksen-Walraven, J. M., & Van Bakel, H. J. (2007). Multiple determinants of externalizing behavior in 5-year-olds: A longitudinal model. *Journal of Abnormal Child Psychology, 35*, 347–361. https://doi.org/0.1007/s10802-006-9095-y

Statistics Canada (2020). *Distribution of total income by census family type and age of older partner, parent or individual*. Retrieved from https://www150.statcan.gc.ca/t1/tbl1/ en/tv.action?pid=1110001201

Thompson, R. A., & Goodvin, R. (2007). Taming the tempest in the teapot. In C. A. Brownell et C. B. Kopp (Eds.), *Socioemotional development in the toddler years: Transitions and transformations* (p. 320–341). Guilford Press.

Tremblay, R. E. (2000). The development of aggressive behavior during childhood: What have we learned in the past century? *International Journal of Behavioral Development, 24,* 129–141. https://doi.org/10.1080/016502500383232

Van der Ende, J., Verhulst, F. C., & Tiemeier, H. (2016). The bidirectional pathways between internalizing and externalizing problems and academic performance from 6 to 18 years. *Development and Psychopathology*, *28*, 855–867. https://doi.org/10.1017/s0954579416000353

Van der Bruggen, C. O., Stams, G. J. J., Bögels, S. M., & Paulussen-Hoogeboom, M. C. (2010). Parenting behaviour as a mediator between young children's negative emotionality and their anxiety/depression. *Infant and Child Development*, *19*, 354–365. https://doi.org/10.1002/icd.665

Vasquez, A. C., Patall, E. A., Fong, C. J., Corrigan, A. S., & Pine, L. (2016). Parent autonomy support, academic achievement, and psychosocial functioning: A meta-

analysis of research. *Educational Psychology Review*, *28*, 605–644. https://doi.org/10.1007/s10648-015-9329-z

Weyandt, L. L., Willis, W. G., Swentosky, A., Wilson, K., Janusis, G. M., Chung, H. J., Turcotte, K., & Marshall, S. (2014). A review of the use of executive function tasks in externalizing and internalizing disorders. In S. Goldstein et J. A. Naglieri (Eds.), *Handbook of executive functioning* (p. 69-87). Springer.

Whipple, N., Bernier, A., & Mageau, G. A. (2011). Broadening the study of infant security of attachment: Maternal autonomy-support in the context of infant exploration. *Social Development, 20*, 17–32. https://doi.org/10.1111/j.1467-9507.2010.00574.x

Yap, M. B. H., & Jorm, A. F. (2015). Parental factors associated with childhood anxiety, depression, and internalizing problems: A systematic review and meta-analysis. *Journal of Affective Disorders*, *175*, 424–440. https://doi.org/10.1016/j.jad.2015.01.050

Yoon, S., Yoon, D., Wang, X., Tebben, E., Lee, G., & Pei, F. (2017). Co-development of internalizing and externalizing behavior problems during early childhood among child welfare-involved children. *Children and Youth Services Review*, *82*, 455–465. https://doi.org/10.1016/j.childyouth.2017.10.016

Table 1

Descriptive Statistics, Correlations across Time Points, and Inter-Correlations among All Main Variables

	M	Range	1	2	3	4	5	6	7	8	9	10	11
1. Internalizing behavior (2 years)[a]	0.20	0 – 0.69	--	.55***	.29**	.55***	.35**	.06	.21*	.41***	.22**	-.17 [t]	-.01
2. Internalizing behavior (4 years)[a]	0.25	0 – 0.85		--	.48***	.39***	.57***	.23[*]	.25*	.35**	.21*	-.12	-.06
3. Internalizing behavior (7 years)[b]	0.26	0 – 1.19			--	.17 [t]	.39**	.62***	.13	.12	.14	-.01	-.11
4. Externalizing behavior (2 years)[a]	0.49	0 – 1.25				--	.62***	.30**	.48***	.24**	.55***	-.10	-.05
5. Externalizing behavior (4 years)[a]	0.49	0 – 1.33					--	.57***	.38***	.20 [t]	.37***	-.11	-.20*
6. Externalizing behavior (7 years)[b]	0.28	0 – 1.10						--	.16	.03	.10	-.03	-.18*
7. Activity level	3.61	2.31 – 5.63							--	.16	.47***	.02	-.14
8. Social fear	3.43	1.68 – 5.90								--	.17 [t]	.02	-.11
9. Anger proneness	3.76	2.08 – 5.72									--	-.04	-.14
10. Maternal sensitivity	0.64	-.79 – .89										--	.24***
11. Maternal autonomy support	3.22	1 – 5											--

[a] Assessed with the 1.5-5 year version of the Child Behavior Checklist. [b] Assessed with the 4-18 year version of the Child Behavior Checklist.
[t] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2

Unconditional Growth Models of Child Functioning Between Ages 2 and 7

		Child functioning			
		Internalizing behavior		Externalizing behavior	
	Par	Model A	Model B	Model A	Model B
Fixed effects					
Initial status, π_{0i}					
Intercept	γ_{00}	23.442***	21.045***	43.270***	54.426***
		(1.430)	(1.214)	(2.699)	(2.344)
Rate of change, π_{1i}					
Linear slope	γ_{10}	0.000	0.967*	0.000	-4.457***
		(0.356)	(0.383)	(0.794)	(0.501)
Variance components					
Within-person (residual)	σ_E^2	170.223***	107.048***	437.707***	301.438***
		(18.043)	(16.267)	(61.696)	(45.091)
In initial status	σ_0^2	116.645**	115.288***	334.101***	556.205***
		(37.334)	(32.366)	(90.149)	(114.688)
In rate of change	σ_1^2		9.213**		5.427
			(2.951)		(5.508)
Slope intercept covariance	σ_{01}		-7.737		-47.069*
			(8.439)		(21.603)
Goodness-of-fit	LL	-1601.551	-1584.784	-1782.962	-1744.104
	AIC	3213.102	3181.567	3575.924	3500.207
	BIC	3232.829	3205.240	3595.638	3504.827

Note. Standard errors are within parentheses. Par = parameters; LL = log likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion; Model A: fixed linear model; Model B: random linear model.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Predicting the Growth Trajectories of Child Functioning

		Child Functioning	
		Internalizing behavior	Externalizing behavior
Fixed effects			
Initial status π_{oi}			
Intercept	γ_{00}	21.397***	51.403***
		(1.153)	(1.913)
SES	γ_{01}	-3.154 [t]	-6.878*
		(1.625)	(2.687)
Child sex	γ_{02}	2.437	-1.555
		(2.379)	(3.952)
Activity level	γ_{03}	2.490	10.584**
		(2.078)	(3.450)
Social fear	γ_{04}	7.131***	3.755
		(1.524)	(2.528)
Anger proneness	γ_{05}	2.867	15.018***
		(1.824)	(3.024)
Maternal sensitivity		-7.201	-3.042
		(4.585)	(7.580)
Maternal autonomy support	γ_{06}	1.936 [t]	1.772
		(0.970)	(1.608)
Rate of change π_{1i}			
Linear slope	γ_{10}	1.282**	-3.565***
		(0.387)	(0.522)
SES	γ_{11}	-0.851	-0.073
		(0.620)	(0.822)
Child sex	γ_{12}	0.327	-0.268
		(0.792)	(1.064)
Activity level	γ_{13}	-0.431	-1.136
		(0.674)	(0.914)
Social fear	γ_{14}	-1.400**	-0.617
		(0.509)	(0.679)
Anger proneness	γ_{15}	0.223	-2.542**
		(0.605)	(0.812)
Maternal sensitivity	γ_{16}	-0.708	-1.291
		(1.597)	(2.132)
Maternal autonomy support	γ_{17}	-0.834*	-1.293**
		(0.329)	(0.441)
Variance components			
Within-person: residual	σ_E^2	115.546***	272.184***
		(20.038)	(39.239)
In initial status	σ_0^2	49.499	182.284*

		(30.422)	(77.037)
In rate of change	σ_1^2	3.000	0.699
		(2614)	(5.578)
Slope intercept covariance	σ_{01}	4.882	5.442
		(7.489)	(17.383)
Goodness-of-fit	LL	-1152.485	-1269.601
	AIC	2344.970	2579.201
	BIC	2418.090	2652.321

Note. Standard errors are within parentheses. SES = Socio-economic status; LL = log likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion.
[t] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Conclusion

Résumé des objectifs et des résultats

L'objectif général de la thèse était d'explorer les associations longitudinales entre le tempérament des enfants, la qualité des relations mère-enfant et le fonctionnement socio-émotionnel de la petite enfance à l'âge scolaire. Le premier article évaluait un modèle interactif, étudiant le rôle modérateur de la qualité des interactions mère-enfant dans le lien entre la tendance tempéramentale des enfants à la colère à 2 ans et leurs comportements intériorisés, extériorisés et prosociaux à l'entrée scolaire. Le deuxième article explorait les liens prospectifs entre le soutien maternel à l'autonomie mesuré à 15 mois et les trajectoires des comportements intériorisés et extériorisés des enfants de 2 à 7 ans, tout en contrôlant le tempérament des enfants.

Les résultats du premier article ont montré que la tendance à la colère des tout-petits prédisait des difficultés socio-émotionnelles chez ceux-ci à l'entrée scolaire, principalement dans le contexte d'une meilleure qualité d'interactions mère-enfant. Les résultats du deuxième article ont montré que le soutien maternel à l'autonomie accélérait la croissance favorable du fonctionnement socio-émotionnel des enfants en agissant comme facteur de protection : plus les mères soutenaient l'autonomie de leur enfant, plus les comportements intériorisés augmentaient lentement dans les années subséquentes et plus les comportements extériorisés diminuaient rapidement. De plus, les dimensions tempéramentales étaient associées différemment aux trajectoires des comportements intériorisés et extériorisés. Pour ce qui est des comportements intériorisés, un plus haut niveau de crainte sociale à la petite enfance était associé à plus de comportements intériorisés à 2 ans, alors que ce lien diminuait à travers le temps. Les autres dimensions du tempérament (le niveau d'activité et la tendance à la colère) n'étaient pas liées aux trajectoires des comportements intériorisés. Pour ce qui est des comportements extériorisés,

un plus haut niveau d'activité et de tendance à la colère à 2 ans étaient associés à plus de comportements extériorisés à cet âge, alors que le lien entre la tendance à la colère et les problèmes de comportements extériorisés diminuait à travers le temps. La crainte sociale n'était pas liée aux trajectoires des comportements extériorisés.

Intégration des résultats et pistes de recherche future

Les résultats des articles de cette thèse rappellent l'importance de considérer le tempérament des enfants et les relations mère-enfant conjointement dans la prédiction du fonctionnement social et émotionnel. En effet, dans les deux articles de la thèse, ces deux facteurs contribuent de façon additive ou en interaction à la prédiction des comportements intériorisés, extériorisés et prosociaux. Ces résultats viennent appuyer de nombreuses études précédentes qui montrent l'interrelation de ces influences sur le développement socio-émotionnel (Bates & Pettit, 2015). Considérer le tempérament et les relations mère-enfant conjointement durant la petite enfance est important alors que les enfants passent presque tout leur temps avec leurs parents et que leurs caractéristiques intrinsèques sont particulièrement manifestes (Baer et al., 2015).

La littérature empirique appuie sans l'ombre d'un doute que des relations mère-enfant de haute qualité agissent comme facteur de protection contre le développement de problèmes de comportement chez les enfants (Yap et al., 2016). Le deuxième article de la thèse renforce cette idée alors qu'un plus grand soutien maternel à l'autonomie est associé à une accélération de la croissance favorable du fonctionnement socio-émotionnel. Toutefois, le premier article apporte une nuance à cette notion puisque les résultats montrent qu'une qualité d'interactions dyadiques plus élevée est associée à un plus faible fonctionnement socio-émotionnel à l'école lorsque les enfants ont une plus grande tendance à la colère dans la petite enfance. Bien qu'étonnants, ces

résultats suggèrent entre autres que dans certaines circonstances, une relation mère-enfant de plus grande qualité est bénéfique pour outiller les enfants socialement et émotionnellement, mais peut possiblement les freiner dans leur ajustement aux exigences extérieures à la bulle familiale, tel l'environnement scolaire. D'ailleurs, d'autres études ont montré que certains aspects d'une meilleure qualité relationnelle mère-enfant pouvaient constituer un faible ajustement avec certaines dimensions tempéramentales (Davis et al., 2015; Muhtadie, et al., 2013). Pour les études futures, il serait intéressant de mesurer les processus qui sous-tendent ces ajustements parent-enfant de faible qualité lorsqu'une présumée meilleure qualité de relation parent-enfant ne semble pas agir comme facteur de protection. Par exemple, Davis et ses collègues (2013) suggèrent que des aspects du comportement parental présumés favorables (e.g., chaleur parentale) peuvent paradoxalement nuire au développement de l'autorégulation émotionnelle de certains enfants, par des comportements de réassurance excessifs de la part des parents. Dans le premier article de cette thèse, nous suggérons aussi qu'un environnement favorable, telle une haute qualité relationnelle mère-enfant, peut contribuer à une plus grande expression des prédispositions génétiques des enfants (dans ce cas, la tendance à la colère), ce qui pourrait nuire à leur adaptation sociale et émotionnelle plus tard dans leur développement (Turkheimer et al., 2003). Bref, il paraît nécessaire de comprendre plus en détails les processus qui sous-tendent la qualité d'ajustement parent-enfant dans la prédiction du fonctionnement socio-émotionnel. En effet, la notion de qualité d'ajustement pour prédire les problèmes de comportement des enfants est complexe et doit être nuancée selon les différentes dimensions du tempérament, les différentes facettes des relations mère-enfant (p. ex., soutien à l'autonomie, qualité des interactions dyadiques, sensibilité maternelle, discipline, etc.), ainsi que le contexte dans lequel les comportements des enfants sont évalués (p. ex., milieu familial, scolaire) et à quel âge.

Une façon d'explorer plus en détails cette question serait de considérer conjointement plusieurs dimensions du tempérament, mais aussi de la qualité des relations mère-enfant. Dans les deux articles de cette thèse, deux façons différentes de mesurer cette qualité ont été utilisées (soutien maternel à l'autonomie et qualité d'interactions dyadiques) et chacune s'est avérée associée au fonctionnement socio-émotionnel des enfants. Les résultats d'un article publié dans le cadre de mon mémoire de maîtrise (Sirois & Bernier, 2018) montrent que plusieurs dimensions de la qualité des relations mère-enfant (sécurité d'attachement mère-enfant, sensibilité maternelle et soutien à l'autonomie), considérées conjointement, prédisaient des portions comparables et uniques de la variance des comportements intériorisés des enfants. Toutefois, lorsque ces variables étaient combinées, le lien était plus fort que lorsqu'elles étaient considérées séparément, suggérant que la variance partagée par les différents indicateurs relationnels est particulièrement significative pour prédire le fonctionnement socio-émotionnel des enfants. De plus, dans le deuxième article de la thèse, différentes dimensions du tempérament (crainte sociale, niveau d'activité, tendance à la colère) ont des liens distincts avec les problèmes de comportement des enfants. Par conséquent, les chercheurs devraient envisager une approche multidimensionnelle dans l'évaluation du tempérament et de la qualité des relations mère-enfant afin d'évaluer leurs contributions uniques et leurs interactions dans la prédiction de l'ajustement social et émotionnel des enfants.

Cette thèse met en lumière la complexité de la prédiction des problèmes de comportements des enfants, alors que de nombreux paramètres sont à considérer. Bien que l'échantillon fût le même pour les deux articles de la thèse, les résultats paraissent contradictoires quant aux fonctions protectrices ou délétères de ce que la littérature considère généralement comme des éléments positifs des relations mère-enfant (qualité des interactions mère-enfant et

soutien à l'autonomie maternel). Les mesures utilisées pour évaluer les construits, l'âge des enfants, les variables de contrôle, les répondants, les analyses statistiques utilisées, le type de population, sont tous des éléments qui peuvent donner lieu à des résultats différents, voire parfois contradictoires, quant à la prédiction du fonctionnement socio-émotionnel. Les études futures devraient envisager un modèle plus complet des paramètres pouvant prédire le fonctionnement socio-émotionnel des enfants, par exemple en mesurant la qualité des autres relations significatives de l'environnement proximal des enfants, en premier lieu la relation père-enfant. En effet, dans une tentative de fournir un modèle intégré des relations significatives pour les enfants, qui sont interdépendantes, les études tendent de plus en plus à considérer les contributions maternelles et paternelles de concert dans le développement des enfants (Cabrera, 2020). Traditionnellement, l'implication paternelle a longtemps été évaluée de façon quantitative, via le nombre de tâches accomplies par le père à la maison ou la durée du temps passé avec l'enfant (Pleck, 2010). Depuis les quelques dernières décennies, les études évaluent davantage la qualité des relations père-enfant (p. ex., sensibilité paternelle, chaleur, sécurité d'attachement père-enfant, synchronie) et les résultats montrent que cette qualité relationnelle contribue de façon significative et unique au fonctionnement socio-émotionnel des enfants (Jeynes, 2016). Par exemple, les résultats de l'étude de Williams et Berthelsen (2017) montraient que l'hostilité maternelle et paternelle à 2-3 ans étaient chacune associées négativement aux comportements prosociaux des enfants à 6-7 ans. Dans l'étude de Rinaldi et Howe (2012), les styles parentaux des mères et des pères expliquaient 44% de la variance des comportements extériorisés des enfants. Le style maternel permissif et le style paternel autoritaire prédisaient de façon unique et significative les problèmes de comportement. Des études rapportent également des *interactions* entre la qualité des relations mère-enfant et père-enfant (Zhang & Chen, 2010),

de telle sorte que l'un des parents peut compenser pour une moins bonne qualité relationnelle avec l'autre (Fernandes et al., 2020; Hertz et al., 2019; Martin et al., 2010) ou nuire à la qualité relationnelle avec l'autre parent (Barnett et al., 2008). Par conséquent, en plus des contributions communes et uniques par lesquelles les deux parents favorisent l'ajustement social et émotionnel des enfants, il y a aussi des processus sous-jacents d'interactions entre les qualités relationnelles parent-enfant.

Au-delà des contributions parentales, la qualité des liens fraternels est importante pour l'adaptation des enfants (Buist et al., 2013; Jambon et al., 2019). Durant l'enfance, la majorité des enfants passent beaucoup de leur temps à interagir avec leurs frères et sœurs, avec lesquels ils vivent des expériences partagées, rivalisent et s'entraident. Les relations fraternelles forment un contexte unique dans lequel les enfants développent des compétences sociales et émotionnelles (Lamb & Sutton-Smith, 2014). D'ailleurs, la méta-analyse de Buist et ses collègues (2013) révèle qu'une plus grande chaleur fraternelle et moins de conflits entre frères et sœurs sont significativement associés à moins de problèmes de comportement extériorisés et intériorisés. C'est pourquoi, en plus du tempérament des enfants, les études futures devraient considérer la qualité des différentes relations significatives des enfants dans la prédiction de leur ajustement socio-émotionnel.

Certains modèles théoriques n'ont pas été abordés dans les articles de cette thèse, mais sont bien reconnus dans la littérature portant sur les interactions entre les relations parent-enfant et le tempérament des enfants. Le modèle de la diathèse-stress (Monroe & Simons, 1991) propose que certains enfants plus vulnérables biologiquement, par exemple en ayant des niveaux plus élevés sur les dimensions négatives du tempérament, ont plus de probabilités d'être affectés par les stresseurs environnementaux. Donc, selon ce modèle, ces enfants développeraient

davantage de problèmes de comportements en réaction aux stresseurs environnementaux tels qu'une faible qualité de relation mère-enfant (Stoltz et al., 2017). Cependant, en l'absence d'adversité, il n'y aurait pas de différence entre les enfants plus ou moins vulnérables biologiquement. Le modèle de la susceptibilité différentielle peut être vu comme une extension au modèle de la diathèse-stress. La susceptibilité différentielle réfère au fait que les enfants avec un tempérament plus difficile (par rapport à ceux avec un tempérament plus facile) seraient plus vulnérables aux comportements parentaux de faible qualité, mais profiteraient aussi davantage de comportementaux parentaux de meilleure qualité (Belsky, 2005; Pluess et al., 2013; Slagt et al., 2016). Finalement, le modèle de la sensibilité avantageuse (Pluess & Belsky, 2013), aussi basé sur le modèle de la diathèse-stress, propose que certains enfants sont plus sensibles et réagissent plus positivement aux influences positives de l'environnement auxquelles ils sont exposés (Pluess, 2017). Les études ont surtout évalué le modèle de la diathèse-stress et ses théories associées en mesurant la sensibilité maternelle (Pluess & Belsky, 2011), la sécurité d'attachement mère-enfant (Cassidy et al., 2011), le contrôle parental négatif et la chaleur maternelle (Slagt et al., 2016) pour prédire le fonctionnement socio-émotionnel des enfants. Peu d'études ont évalué le modèle de la diathèse-stress selon la qualité des interactions dyadiques mère-enfant (Kim & Kochanska, 2012; Kochanska et al., 2007) et, à notre connaissance, aucune face au soutien maternel à l'autonomie.

Les résultats des articles de cette thèse montrent que le tempérament et la qualité des relations mère-enfant durant la petite enfance sont associés aux problèmes de comportement jusqu'à 5 ans plus tard à l'âge scolaire; impliquant que la petite enfance serait une période particulièrement significative. En effet, c'est à cette période que le concept de soi des tout-petits commence à émerger, ainsi que leur exploration et leur autorégulation, qui représentent un

ensemble de ressources internes susceptibles de jouer un rôle déterminant dans leur fonctionnement à long terme (Kochanska et al., 2001). C'est également durant la petite enfance que les parents commencent à s'engager activement dans le processus de socialisation de leurs enfants, c'est-à-dire leur enseigner les valeurs, les normes et les comportements socialement appropriés qui leur permettront de fonctionner efficacement au sein de leur société (Parke & Buriel, 2007). Toutefois, une partie des résultats de cette thèse peut possiblement s'expliquer, de façon alternative, par une stabilité ou une faible fluctuation de la qualité des relations mère-enfant et du tempérament des enfants à travers le temps (Bornstein et al., 2015; Bornstein & Putnick, 2020). Pour départager le rôle des facteurs précoces et contemporains dans la trajectoire développementale des enfants, des devis longitudinaux impliquant des mesures répétées des variables centrales sont nécessaires.

Limites de la thèse

Tel que mentionné dans la section discussion de chacun des articles, les études présentent des limites méthodologiques qui méritent d'être énoncées. D'abord, les deux études ont été réalisées auprès d'une population canadienne majoritairement de race blanche et à faible risque socio-économique. En ce sens, il est difficile de généraliser les résultats de ces études à des populations à risque ou qui proviennent de minorités culturelles. Il serait important de reproduire ces études dans d'autres contextes puisque le SSE et les facteurs culturels sont associés au tempérament, à la qualité des relations mère-enfant ainsi qu'au fonctionnement social et émotionnel des enfants (Letourneau et al., 2013). De plus, les devis utilisés dans cette thèse ne permettent pas de faire d'inférence causale, on ne peut que spéculer sur la direction des relations observées. Finalement, la petite taille des échantillons a pu limiter la possibilité de détecter certains effets de magnitude modeste.

Pistes d'intervention

Étant donné l'importance de la qualité des relations mère-enfant dans le développement des problèmes de comportement des enfants, des programmes d'intervention ont été développés pour améliorer les comportements parentaux (Moss et al., 2011; Reyno & McGrath, 2006; Zhou et al., 2008) ou la qualité des interactions parent-enfant (Iverson et al., 2020; Valentino, 2017). En lien avec les dimensions relationnelles considérées dans cette thèse, l'étude de Joussemet et ses collègues (2014) a montré qu'un programme d'une durée de 8 semaines dans lequel les parents apprenaient plusieurs compétences parentales permettait d'augmenter le niveau de soutien à l'autonomie, de structure et d'affiliation chez les parents. En retour, cette augmentation prédisait une diminution des comportements intériorisés et extériorisés chez l'enfant. Une étude a aussi montré que les parents dont le niveau de soutien à l'autonomie était inférieur au départ bénéficiaient davantage d'une formation ciblant cette compétence parentale (Meuwissen & Carlson, 2019). De plus, la méta-analyse de Thomas et Zimmer-Gembeck (2007) suggère que les thérapies visant l'augmentation de la qualité des interactions parent-enfant permettent de diminuer les problèmes de comportement des enfants. Considérant que le tempérament des enfants est également associé à leur ajustement socio-émotionnel, une étude récente a évalué l'effet d'un programme ciblant cet aspect. Le programme visait à augmenter les connaissances des mères sur le tempérament de leur enfant dans le but de les aider à mieux ajuster leurs comportements envers celui-ci. Les résultats suggèrent que l'augmentation des connaissances sur le tempérament améliore la qualité des interactions mère-enfant, en augmentant la sensibilité parentale (Iverson et al., 2020). Bien que de nombreuses interventions ont été mises en place dans le but d'améliorer le fonctionnement socio-émotionnel des enfants, la plupart montrent des résultats à court ou moyen terme. Il serait intéressant que les programmes qui offrent des

interventions durant la petite enfance mesurent leurs impacts à long terme puisque la qualité des relations mère-enfant ainsi que le tempérament prédisent (dans les deux articles de la thèse) les problèmes de comportements à l'âge scolaire. De plus, les professionnels qui visent l'amélioration des interactions mère-enfant devraient considérer conjointement le tempérament des enfants dans leurs interventions étant donné que ces deux éléments sont inter-reliés et peuvent interagir.

Conclusion

Dans l'ensemble, cette thèse a permis de contribuer à l'avancement des connaissances sur le rôle du soutien maternel à l'autonomie, de la qualité des interactions mère-enfant et des dimensions du tempérament durant la petite enfance dans la prédiction du fonctionnement socio-émotionnel à l'âge scolaire. Elle montre l'importance d'utiliser une approche multidimensionnelle pour évaluer les liens entre les facteurs environnementaux et intrinsèques associés au développement social et émotionnel des enfants. De plus, une partie de cette thèse rapporte des résultats contre-intuitifs, ce qui rappelle l'importance de présenter et de publier des études qui vont à l'encontre des hypothèses de départ ou de consensus dans la littérature afin d'avoir un portrait plus nuancé des multiples influences sur le développement des enfants.

Références citées dans l'introduction et la conclusion

Aksan, N., Kochanska, G., & Ortmann, M. R. (2006). Mutually responsive orientation between parents and their young children: Toward methodological advances in the science of relationships. *Developmental Psychology*, *42*, 833–848. https://doi.org/10.1037/0012-1649.42.5.833

Arslan, İ. B., Lucassen, N., Van Lier, P. A., De Haan, A. D., & Prinzie, P. (2021). Early childhood internalizing problems, externalizing problems and their co-occurrence and (mal) adaptive functioning in emerging adulthood: A 16-year follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, *56*, 193–206. https://doi.org/10.1007/s00127-020-01959-w

Astill, R. G., Van der Heijden, K. B., Van IJzendoorn, M. H., & Van Someren, E. J. W. (2012). Sleep, cognition, and behavioral problems in school-age children: A century of research meta-analyzed. *Psychological Bulletin, 138*, 1109–1138. https://doi.org/10.1037/a0028204

Baer, J., Schreck, M., Althoff, R. R., Rettew, D., Harder, V., Ayer, L., Albaugh, M., Crehan, E., Kuny-Slock, A., & Hudziak, J. J. (2015). Child temperament, maternal parenting behavior, and child social functioning. *Journal of Child and Family Studies, 24*, 1152–1162. https://doi.org/10.1007/s10826-014-9924-5

Barnett, M. A., Deng, M., Mills-Koonce, W. R., Willoughby, M., & Cox, M. (2008). Interdependence of parenting of mothers and fathers of infants. *Journal of Family Psychology, 22*, 561–573. https://doi.org/10.1037/0893-3200.22.3.561

Bates, J. E., & Pettit, G. S. (2015). Temperament, parenting, and social development. In J. E. Grusec & P. D. Hastings (Eds.), Handbook of socialization: Theory and research (p. 372–397). The Guilford Press.

Belsky, J. (2005). Differential susceptibility to rearing influences: An evolutionary hypothesis and some evidence. In B. Ellis & D. Bjorklund (Eds.), Origins of the social mind: Evolutionary psychology and child development (p. 139–163). The Guilford Press.

Belsky, J., & Pluess, M. (2016). Differential susceptibility to environmental influences. *Developmental Psychopathology*, 1–48. https://doi.org/10.1002/9781119125556.devpsy202

Bornstein, M. H., & Putnick, D. L. (2020). Dyadic development in the family: Stability in mother–child relationship quality from infancy to adolescence. *Journal of Family Psychology, 35,* 445–456. https://doi.org/10.1037/fam0000794

Bornstein, M. H., Putnick, D. L., Gartstein, M. A., Hahn, C. S., Auestad, N., & O'Connor, D. L. (2015). Infant temperament: Stability by age, gender, birth order, term status, and socioeconomic status. *Child Development*, *86*, 844–863. https://doi.org/10.1111/cdev.12367

Bornstein, M. H., Putnick, D. L., & Suwalsky, J. T. D. (2017). Parenting cognitions → parenting practices → child adjustment? The standard model. *Development and Psychopathology, 30*, 399–416. https://doi.org/10.1017/s0954579417000931

Brooker, R. J., Kiel, E. J., & Buss, K. A. (2016). Early social fear predicts kindergarteners' socially anxious behaviors: Direct associations, moderation by inhibitory control, and differences from nonsocial fear. *Emotion, 16*, 997–1010. https://doi.org/10.1037/emo0000135

Buist, K. L., Deković, M., & Prinzie, P. (2013). Sibling relationship quality and psychopathology of children and adolescents: A meta-analysis. *Clinical Psychology Review, 33*, 97–106. https://doi.org/10.1016/j.cpr.2012.10.007

Cabrera, N. J. (2019). Father involvement, father-child relationship, and attachment in the early years. *Attachment & Human Development, 22*, 134–138. https://doi.org/10.1080/14616734.2019.1589070

Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation. In J. Gross (Ed.), *Handbook of emotion regulation* (p. 229–248). The Guilford Press.

Capaldi, D. M., Pears, K. C., Kerr, D. C. R., Owen, L. D., & Kim, H. K. (2012). Growth in externalizing and internalizing problems in childhood: A prospective study of psychopathology across three generations. *Child Development, 83*, 1945–1959. https://doi.org/10.1111/j.1467-8624.2012.01821.x

Cassidy, J., Woodhouse, S. S., Sherman, L. J., Stupica, B., & Lejuez, C. W. (2011). Enhancing infant attachment security: An examination of treatment efficacy and differential susceptibility. *Development and Psychopathology*, 23, 131–148. https://doi.org/10.1017/s0954579410000696

Crockenberg, S. C., & Leerkes, E. M. (2006). Infant and maternal behavior moderate reactivity to novelty to predict anxious behavior at 2.5 years. *Development and Psychopathology*, *18*, 17–34. https://doi.org/10.1017/s0954579406060020

Crockett, L. J., Wasserman, A. M., Rudasill, K. M., Hoffman, L., & Kalutskaya, I. (2018). Temperamental anger and effortful control, teacher–child conflict, and externalizing behavior across the elementary school years. *Child Development, 89*, 2176–2195. https://doi.org/10.1111/cdev.12910

Davis, S., Votruba-Drzal, E., & Silk, J. S. (2015). Trajectories of internalizing symptoms from early childhood to adolescence: Associations with temperament and parenting. *Social Development, 24*, 501–520. https://doi.org/10.1111/sode.12105

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19*, 109–134. https://doi.org/10.1016/0092-6566(85)90023-6

Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (p. 416–436). Sage Publications Ltd.

Duineveld, J. J., Parker, P. D., Ryan, R. M., Ciarrochi, J., & Salmela-Aro, K. (2017). The link between perceived maternal and paternal autonomy support and adolescent well-being across three major educational transitions. *Developmental Psychology, 53*, 1978–1994. https://doi.org/10.1037/dev0000364

Dyson, M. W., Klein, D. N., Olino, T. M., Dougherty, L. R., & Durbin, C. E. (2011). Social and non-social behavioral inhibition in preschool-age children: Differential associations with parent-reports of temperament and anxiety. *Child Psychiatry & Human Development, 42*, 390–405. https://doi.org/10.1007/s10578-011-0225-6

Eisenberg, N., Eggum, N. D., Sallquist, J., & Edwards, A. (2010). Relations of self-regulatory/control capacities to maladjustment, social competence, and emotionality. In R. H. Hoyle (Ed.), *Handbook of personality and self-regulation* (p. 21–46). Wiley-Blackwell.

Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., Zhou, Q., & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology, 45*, 988–1008. https://doi.org/10.1037/a0016213

Engle, J. M., & McElwain, N. L. (2011). Parental reactions to toddlers' negative emotions and child negative emotionality as correlates of problem behavior at the age of three. *Social Development, 20*, 251–271. https://doi.org/10.1111/j.1467-9507.2010.00583.x

Erola, J., Jalonen, S., & Lehti, H. (2016). Parental education, class and income over early life course and children's achievement. *Research in Social Stratification and Mobility, 44*, 33–43. https://doi.org/ 10.1016/j.rssm.2016.01.003

Evans, D. E., & Rothbart, M. K. (2007). Developing a model for adult temperament. *Journal of Research in Personality, 41*, 868–888. https://doi.org/10.1016/j.jrp.2006.11.002

Feldman, R. (2007). Parent–infant synchrony and the construction of shared timing; Physiological precursors, developmental outcomes, and risk conditions. *Journal of Child Psychology and Psychiatry, 48*, 329–354. https://doi.org/10.1111/j.1469-7610.2006.01701.x

Fernandes, C., Monteiro, L., Santos, A. J., Fernandes, M., Antunes, M., Vaughn, B. E., & Veríssimo, M. (2019). Early father–child and mother–child attachment relationships: Contributions to preschoolers' social competence. *Attachment & Human Development, 22*, 687–704. https://doi.org/10.1080/14616734.2019.1692045

Fitzgerald, H. E., von Klitzing, K., Cabrera, N. J., de Mendonça, J. S., & Skjøthaug, T. (2020). Fathers and very young Children: A developmental systems perspective. *Handbook of Fathers and Child Development*, 5–28. https://doi.org/10.1007/978-3-030-51027-5_2

Fox, G. (2006). Development in family contexts. In L. Combrinck-Graham (Ed.), *Children in family contexts: Perspectives on treatment* (p. 26–50). The Guilford Press.

Geiser, C. (2012). *Data analysis with Mplus*. The Guilford Press.

Ghassabian, A., Székely, E., Herba, C. M., Jaddoe, V. W., Hofman, A., Oldehinkel, A. J., Verhulst, F. C., & Tiemeier, H. (2014). From positive emotionality to internalizing problems: The role of executive functioning in preschoolers. *European Child & Adolescent Psychiatry, 23*, 729–741. https://doi.org/10.1007/s00787-014-0542-y

Gilliom, M., & Shaw, D. S. (2004). Codevelopment of externalizing and internalizing problems in early childhood. *Development and Psychopathology*, *16*, 313–333. https://doi.org/10.1017/s0954579404044530

Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development*, *67*, 218–235. https://doi.org/10.2307/1131697

Goldsmith, H. H., & Campos, J. J. (1990). The structure of temperamental fear and pleasure in infants: A psychometric perspective. *Child Development, 61*, 1944–1964. https://doi.org/10.1111/j.1467-8624.1990.tb03577.x

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, *60*, 549–576. https://doi.org/10.1146/annurev.psych.58.110405.085530

Grolnick, W. S., Kurowski, C. O., Dunlap, K. G., & Hevey, C. (2000). Parental resources and the transition to junior high. *Journal of Research on Adolescence, 10*, 465–488. https://doi.org/10.1207/sjra1004_05

Grolnick, W. S., Price, C. E., Beiswenger, K. L., & Sauck, C. C. (2007). Evaluative pressure in mothers: Effects of situation, maternal, and child characteristics on autonomy supportive versus controlling behavior. *Developmental Psychology, 43*, 991–1002. https://doi.org/10.1037/0012-1649.43.4.991

Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology, 81*, 143–154. https://doi.org/10.1037/0022-0663.81.2.143

Grusec, J. E., Danyliuk, T., Kil, H., & O'Neill, D. (2017). Perspectives on parent discipline and child outcomes. *International Journal of Behavioral Development, 41*, 465–471. https://doi.org/10.1177/0165025416681538

Hertz, S., Bernier, A., Cimon-Paquet, C., & Regueiro, S. (2017). Parent–child relationships and child executive functioning at school entry: The importance of fathers. *Early Child Development and Care, 189*, 718–732. https://doi.org/10.1080/03004430.2017.1342078

Hoehl, S., Fairhurst, M., & Schirmer, A. (2021). Interactional synchrony: Signals, mechanisms and benefits. *Social Cognitive and Affective Neuroscience, 16*, 5–18. https://doi.org/10.1093/scan/nsaa024

Iverson, S. L., Desmarais, E. E., Neumann, A. A., & Gartstein, M. A. (2020). New brief temperament guidance program for parents of infants: A pilot evaluation. *Journal of Child and Adolescent Psychiatric Nursing, 33*, 38–48. https://doi.org/10.1111/jcap.12263

Jambon, M., Madigan, S., Plamondon, A., Daniel, E., & Jenkins, J. M. (2019). The development of empathic concern in siblings: A reciprocal influence model. *Child Development, 90*, 1598-1613. https://doi.org/10.1111/cdev.13015

Janson, H., & Mathiesen, K. S. (2008). Temperament profiles from infancy to middle childhood: Development and associations with behavior problems. *Developmental Psychology, 44*, 1314–1328. https://doi.org/10.1037/a0012713

Jeynes, W. H. (2016). Meta-analysis on the roles of fathers in parenting: Are they unique? *Marriage & Family Review, 52*, 665–688. https://doi.org/10.1080/01494929.2016.1157121

Joussemet, M., Koestner, R., Lekes, N., & Landry, R. (2005). A longitudinal study of the relationship of maternal autonomy support to children's adjustment and achievement in

school. *Journal of Personality, 73*, 1215–1236. https://doi.org/10.1111/j.1467-6494.2005.00347.x

Joussemet, M., Mageau, G. A., & Koestner, R. (2014). Promoting optimal parenting and children's mental health: A preliminary evaluation of the how-to parenting program. *Journal of Child and Family Studies, 23*, 949–964. https://doi.org/10.1007/s10826-013-9751-0

Karevold, E., Coplan, R., Stoolmiller, M., & Mathiesen, K. S. (2011). A longitudinal study of the links between temperamental shyness, activity, and trajectories of internalising problems from infancy to middle childhood. *Australian Journal of Psychology*, *63*, 36–43. https://doi.org/10.1111/j.1742-9536.2011.00005.x

Kazdin, A.E. (2016). *Methodological issues and strategies in clinical research (4th edition)*. American Psychological Association.

Kim, S., & Kochanska, G. (2012). Child temperament moderates effects of parent–child mutuality on self-regulation: A relationship-based path for emotionally negative infants. *Child Development, 83*, 1275–1289. https://doi.org/10.1111/j.1467-8624.2012.01778.x

Kochanska, G. (1997). Mutually responsive orientation between mothers and their young children: Implications for early socialization. *Child Development*, *68*, 94–112. https://doi.org/10.2307/1131928

Kochanska, G., Askan, N., & Joy, M. E. (2007). Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology, 43*, 222–237. https://doi.org/10.1037/0012-1649.43.1.222

Kochanska, G., Aksan, N., Prisco, T. R., & Adams, E. E. (2008). Mother–child and father–child mutually responsive orientation in the first 2 years and children's outcomes at preschool age:

Mechanisms of influence. *Child Development, 79*, 30–44. https://doi.org/10.1111/j.1467-8624.2007.01109.x

Kochanska, G., Coy, K. C., & Murray, K. T. (2001). The development of self-regulation in the first four years of life. *Child Development, 72*, 1091–1111. https://doi.org/10.1111/1467-8624.00336

Kochanska, G., Gross, J. N., Lin, M.-H., & Nichols, K. E. (2002). Guilt in young children: Development, determinants, and relations with broader system standards. *Child Development, 73*, 461–482. https://10.1111/1467-8624.00418

Lahey, B. B., Van Hulle, C. A., Keenan, K., Rathouz, P. J., D'Onofrio, B. M., Rodgers, J. L., & Waldman, I. D. (2008). Temperament and parenting during the first year of life predict future child conduct problems. *Journal of Abnormal Child Psychology*, *36*, 1139–1158. https://doi.org/10.1007/s10802-008-9247-3

Lamb, M. E. (2011). The role of parent-child relationships in child development. In M. H. Bornstein & M. E. Lamb (Eds.), *Developmental science: An advanced textbook* (p. 469–517). Psychology Press.

Lamb, M. E., & Sutton-Smith, B. (Eds.). (2014). *Sibling relationships: Their nature and significance across the lifespan*. Psychology Press.

Letourneau, N. L., Duffett-Leger, L., Levac, L., Watson, B., & Young-Morris, C. (2013). Socioeconomic status and child development: A meta-analysis. *Journal of Emotional and Behavioral Disorders, 21*, 211–224. https://doi.org/10.1177/1063426611421007

Little, T. D., Jorgensen, T. D., Lang, K. M., & Moore, E. W. G. (2013). On the joys of missing data. *Journal of Pediatric Psychology*, *39*, 151–162. https://doi.org/10.1093/ jpepsy/jst048

Liu, J. (2004). Childhood externalizing behavior: Theory and implications. *Journal of Child and Adolescent Psychiatric Nursing*, *17*, 93–103. https://doi.org/10.1111/j.1744-6171.2004.tb00003.x

Liu, J., Chen, X., & Lewis, G. (2011). Childhood internalizing behaviour: Analysis and implications. *Journal of Psychiatric and Mental Health Nursing, 18*, 884–894. https://doi.org/10.1111/j.1365-2850.2011.01743.x

Locke, L. M., & Prinz, R. J. (2002). Measurement of parental discipline and nurturance. *Clinical Psychology Review*, *22*, 895–929. https://doi.org/10.1016/s0272-7358(02)00133-2

Martin, A., Ryan, R. M., & Brooks-Gunn, J. (2010). When fathers' supportiveness matters most: Maternal and paternal parenting and children's school readiness. *Journal of Family Psychology, 24*, 145–155. https://doi.org/10.1037/a0018073

Mathiesen, K. S., Sanson, A., Stoolmiller, M., & Karevold, E. (2009). The nature and predictors of undercontrolled and internalizing problem trajectories across early childhood. *Journal of Abnormal Child Psychology*, *37*, 209–222. https://doi.org/10.1007/s10802-008-9268-y

Matte-Gagné, C., Harvey, B., Stack, D. M., & Serbin, L. A. (2015). Contextual specificity in the relationship between maternal autonomy support and children's socio-emotional development: A longitudinal study from preschool to preadolescence. *Journal of Youth and Adolescence*, *44*, 1528–1541. https://doi.org/10.1007/s10964-014-0247-z

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, *42*, 637–648. https://doi.org/10.1017/s0021963001007302

Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2011). Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant-mother attachment in a socially diverse sample. *Infancy, 17*, 393–415. https://doi.org/10.1111/j.1532-7078.2011.00087.x

Mermelshtine, R. (2017). Parent–child learning interactions: A review of the literature on scaffolding. *British Journal of Educational Psychology, 87*, 241–254. https://doi.org/10.1111/bjep.12147

Meunier, J. C., Roskam, I., Stievenart, M., Van de Moortele, G., Browne, D. T., & Kumar, A. (2011). Externalizing behavior trajectories: The role of parenting, sibling relationships and child personality. *Journal of Applied Developmental Psychology, 32*, 20–33. https://doi.org/10.1016/j.appdev.2010.09.006

Meuwissen, A. S., & Carlson, S. M. (2019). An experimental study of the effects of autonomy support on preschoolers' self-regulation. *Journal of Applied Developmental Psychology, 60*, 11–23. https://doi.org/10.1016/j.appdev.2018.10.001

Miner, J. L., & Clarke-Stewart, K. A. (2008). Trajectories of externalizing behavior from age 2 to age 9: Relations with gender, temperament, ethnicity, parenting, and rater. *Developmental Psychology*, *44*, 771–786. https://doi.org/10.1037/0012-1649.44.3.771

Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: implications for the depressive disorders. *Psychological Bulletin, 110*, 406-425. https://doi.org/ 10.1037//0033-2909.110.3.406

Morris, A. S., Criss, M. M., Silk, J. S., & Houltberg, B. J. (2017). The impact of parenting on emotion regulation during childhood and adolescence. *Child Development Perspectives, 11*, 233–238. https://doi.org/10.1111/cdep.12238

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development, 16*, 361–388. https://doi.org/10.1111/j.1467-9507.2007.00389.x

Moss, E., Dubois-Comtois, K., Cyr, C., Tarabulsy, G. M., St-Laurent, D., & Bernier, A. (2011). Efficacy of a home-visiting intervention aimed at improving maternal sensitivity, child attachment, and behavioral outcomes for maltreated children: A randomized control trial. *Development and Psychopathology, 23*, 195–210. https://doi.org/10.1017/S0954579410000738

Muhtadie, L., Zhou, Q., Eisenberg, N., & Wang, Y. (2013). Predicting internalizing problems in Chinese children: The unique and interactive effects of parenting and child temperament. *Development and Psychopathology*, *25*, 653–667. https://doi.org/10.1017/S0954579413000084

Narayanan, M. K., & Nærde, A. (2016). Associations between maternal and paternal depressive symptoms and early child behavior problems: Testing a mutually adjusted prospective longitudinal model. *Journal of Affective Disorders, 196*, 181–189. https://doi.org/10.1016/j.jad.2016.02.020

Ngo, H., VanderLaan, D. P., & Aitken, M. (2020). Self-esteem, symptom severity, and treatment response in adolescents with internalizing problems. *Journal of Affective Disorders*, *273*, 183–191. https://doi.org/10.1016/j.jad.2020.04.045

Parke, R. D., & Buriel, R. (2007). Socialization in the family: Ethnic and ecological perspectives. *Handbook of Child Psychology, 3*. https://doi:10.1002/9780470147658.chpsy0308

Pedersen, S., Vitaro, F., Barker, E. D., & Borge, A. I. H. (2007). The timing of middle-childhood peer rejection and friendship: Linking early behavior to early-adolescent adjustment. *Child Development, 78*, 1037–1051. https://doi.org/10.1111/j.1467-8624.2007.01051.x

Penela, E. C., Henderson, H. A., Hane, A. A., Ghera, M. M., & Fox, N. A. (2012). Maternal caregiving moderates the relation between temperamental fear and social behavior with peers. *Infancy*, *17*, 715–730. https://doi.org/10.1111/j.1532-7078.2012.00114.x

Perepletchikova, F., & Kazdin, A. E. (2004). Assessment of parenting practices related to conduct problems: Development and validation of the Management of Children's Behavior Scale. *Journal of Child and Family Studies*, *13*, 385–403. https://doi.org/10.1023/b:jcfs.0000044723.45902.70

Perhamus, G. R., & Ostrov, J. M. (2020). Emotions and cognitions in early childhood aggression: The role of irritability and hostile attribution biases. *Research on Child and Adolescent Psychopathology, 49*, 139–139. https://doi.org/10.1007/s10802-020-00719-3

Pianta, R. C., Cox, M. J., & Snow, K. L. (Eds.). (2007). *School readiness and the transition to kindergarten in the era of accountability*. Brookes.

Pleck, J. H. (2010). Paternal involvement: Revised conceptualization and theoretical linkages with child outcomes. In M. E. Lamb (Ed.), *The role of the father in child development* (5th ed., p. 67–107). Wiley.

Pluess, M. (2017). Vantage sensitivity: Environmental sensitivity to positive experiences as a function of genetic differences. *Journal of Personality*, *85*, 38–50. https://doi.org/10.1111/jopy.12218

Pluess, M., & Belsky, J. (2013). Vantage sensitivity: individual differences in response to positive experiences. *Psychological Bulletin*, *139*, 901–916. https://doi.org/10.1037/a0030196

Pluess, M., Stevens, S. E., & Belsky, J. (2013). Differential susceptibility. In M. Legerstee, D. W. Haley, & M. H. Bornstein (Eds.), *The infant mind: Origins of the social brain* (p. 77–94). The Guilford Press.

Prinzie, P., van Harten, L. V., Deković, M., van den Akker, A. L., & Shiner, R. L. (2014). Developmental trajectories of anxious and depressive problems during the transition from childhood to adolescence: Personality × Parenting interactions. *Development and Psychopathology, 26*, 1077–1092. https://doi.org/10.1017/S0954579414000510

Putnam, S. P. (2012). Positive emotionality. In M. Zentner & R. L. Shiner (Eds.), *Handbook of temperament* (p. 105–123). The Guilford Press.

Quistberg, K. A., & Mueller, U. (2020). Prospective relations between kindergarteners' executive function skills and their externalizing and internalizing behaviors. *The Clinical Neuropsychologist, 34*, 845–862. https://doi.org/10.1080/13854046.2019.1591510

Raposa, E. B., Laws, H. B., & Ansell, E. B. (2016). Prosocial Behavior Mitigates the Negative Effects of Stress in Everyday Life. *Clinical Psychological Science, 4*, 691–698. https://doi.org/10.1177/2167702615611073

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Sage.

Reef, J., Diamantopoulou, S., Van Meurs, I., Verhulst, F. C., & Van der Ende, J. (2011). Developmental trajectories of child to adolescent externalizing behavior and adult DSM-IV

disorder: Results of a 24-year longitudinal study. *Social Psychiatry and Psychiatric Epidemiology, 46*, 1233–1241. https://doi.org/10.1007/s00127-010-0297-9

Rescorla, L., & Fechnay, T. (1996). Mother child synchrony and communicative reciprocity in late-talking toddlers. *Journal of Speech, Language, and Hearing Research, 39*, 200–208. https://doi.org/10.1044/jshr.3901.200

Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems–a meta-analytic review. *Journal of Child Psychology and Psychiatry, 47*, 99–111. https://doi.org/10.1111/j.1469-7610.2005.01544.x

Rinaldi, C. M., & Howe, N. (2012). Mothers' and fathers' parenting styles and associations with toddlers' externalizing, internalizing, and adaptive behaviors. *Early Childhood Research Quarterly*, *27*, 266–273. https://doi.org/10.1016/j.ecresq.2011.08.001

Robson, D. A., Allen, M. S., & Howard, S. J. (2020). Self-regulation in childhood as a predictor of future outcomes: A meta-analytic review. *Psychological Bulletin*, *146*, 324- 354. http://dx.doi.org/10.1037/bul0000227

Rockhill, C., Kodish, I., DiBattisto, C., Macias, M., Varley, C., & Ryan, S. (2010). Anxiety disorders in children and adolescents. *Current Problems in Pediatric and Adolescent Health Care*, 40, 66–99. https://doi.org/org/ 10.1016/j.cppeds.2010.02.002

Rothbart, M. K. (2011). *Becoming who we are: Temperament and personality in development*. The Guilford Press.

Rothbart, M. K. (2012). Advances in temperament. In M. Zentner & R. L. Shiner (Eds.), *Handbook of temperament* (p. 3–20). The Guilford Press.

Rothbart, M. K., & Derryberry, D. (1981). Theoretical Issues in Temperament. *Developmental Disabilities*, 383–400. https://doi.org/10.1007/978-94-011-6314-9_23

Rothbart, M. K., & Putnam, S. P. (2002). Temperament and socialization. In L. Pulkkien & A. Caspi (Eds.), *Paths to successful development: Personality in the life course* (p. 19–45). Cambridge University Press.

Rothbart, M. K., Derryberry, D., & Posner, M. I. (1994). A psychobiological approach to the development of temperament. In J. E. Bates & T. D. Wachs (Eds.), *Temperament: Individual differences at the interface of biology and behavior* (p. 83–116). American Psychological Association.

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin, 116*, 55–74. https://doi.org/10.1037/0033-2909.116.1.55

Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality, 74*, 1557–1586. https://doi.org/10.1111/j.1467-6494.2006.00420.x

Sanders, M. R., & Morawska, A. (Eds.). (2018). *Handbook of parenting and child development across the lifespan*. Springer.

Sanson, A., Hemphill, S. A., Yagmurlu, B., & McClowry, S. (2011). Temperament and social development. In P. K. Smith & C. H. Hart (Eds.), *The Wiley-Blackwell handbook of childhood social development* (p. 227–245). Blackwell Publishers.

Schroeder, D. A., & Graziano, W. G. (Eds.). (2017). Prosocial behavior. *Getting grounded in Social Psychology* (p. 245–285). Psychology Press.

Seifer, R. (2000). Temperament and goodness of fit. In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (p. 257–276). Springer US.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence.* Oxford University Press.

Sirois, M. S., & Bernier, A. (2018). Mother–child relationships and children's psychosocial functioning: The specific roles of attachment security and maternal behavior. *Parenting, 18*, 172–189. https://doi.org/ 10.1080/15295192.2018.1465305

Slagt, M., Dubas, J. S., Deković, M., & van Aken, M. A. (2016). Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin, 142*, 1068-1110. https://doi.org/ 10.1037/bul0000061

Smeekens, S., Riksen-Walraven, J. M., & Van Bakel, H. J. (2007). Multiple determinants of externalizing behavior in 5-year-olds: A longitudinal model. *Journal of Abnormal Child Psychology*, *35*, 347–361. https://doi.org/10.1007/s10802-006-9095-y

Sroufe, L. A., Egeland, B., Carlson, E., & Collins, W. A. (2005). Placing early attachment experiences in developmental context. In K. E. Grossmann, k. Grossmann, & E. Waters (Eds.), *Attachment from infancy to adulthood: The major longitudinal studies* (p. 48–70). The Guilford Press.

Stoltz, S., Beijers, R., Smeekens, S., & Deković, M. (2017). Diathesis stress or differential susceptibility? Testing longitudinal associations between parenting, temperament, and children's problem behavior. *Social Development, 26*, 783–796. https://doi.org/ 10.1111/sode.12237

Szabó, N., Deković, M., Van Aken, C., Verhoeven, M., Van Aken, M. A., & Junger, M. (2008). The relations among child negative interactive behavior, child temperament, and maternal behavior. *Early Childhood Research Quarterly*, *23*, 366–377. https://doi.org/10.1016/j.ecresq.2008.01.004

Thomas, R., & Zimmer-Gembeck, M. J. (2007). Behavioral outcomes of parent-child interaction therapy and Triple P–Positive Parenting Program: A review and meta-analysis. *Journal of Abnormal Child Psychology, 35*, 475–495. https://doi.org/10.1007/s10802-007-9104-9

Turkheimer, E., Haley, A., Waldron, M., D'Onofrio, B., & Gottesman, I. I. (2003). Socioeconomic status modifies heritability of IQ in young children. *Psychological Science, 14*, 623–628. https://doi.org/10.1046/j.0956-7976.2003.psci_1475.x

Valentino, K. (2017). Relational interventions for maltreated children. *Child Development, 8*8, 359–367. https://doi.org/10.1111/cdev.12735

Van der Ende, J., Verhulst, F. C., & Tiemeier, H. (2016). The bidirectional pathways between internalizing and externalizing problems and academic performance from 6 to 18 years. *Development and Psychopathology*, *28*, 855–867. https://doi.org/10.1017/s0954579416000353

Van der Bruggen, C. O., Stams, G. J. J., Bögels, S. M., & Paulussen-Hoogeboom, M. C. (2010). Parenting behaviour as a mediator between young children's negative emotionality and their anxiety/depression. *Infant and Child Development*, *19*, 354–365. https://doi.org/10.1002/icd.665

Vasquez, A. C., Patall, E. A., Fong, C. J., Corrigan, A. S., & Pine, L. (2016). Parent autonomy support, academic achievement, and psychosocial functioning: A meta-analysis of research. *Educational Psychology Review*, *28*, 605–644. https://doi.org/10.1007/s10648-015-9329-z

Whipple, N., Bernier, A., & Mageau, G. A. (2010). Broadening the study of infant security of attachment: Maternal autonomy-support in the context of infant exploration. *Social Development, 20*, 17–32. https://doi.org/10.1111/j.1467-9507.2010.00574.x

Wilkowski, B. M., Robinson, M. D., & Troop-Gordon, W. (2010). How does cognitive control reduce anger and aggression? The role of conflict monitoring and forgiveness processes. *Journal of Personality and Social Psychology, 98*, 830–840. https://doi.org/10.1037/a0018962

Williams, K. E., & Berthelsen, D. (2017). The development of prosocial behaviour in early childhood: Contributions of early parenting and self-regulation. *International Journal of Early Childhood*, 49, 73–94. https://doi.org/10.1007/s13158-017-0185-5

Yap, M. B., Morgan, A. J., Cairns, K., Jorm, A. F., Hetrick, S. E., & Merry, S. (2016). Parents in prevention: A meta-analysis of randomized controlled trials of parenting interventions to prevent internalizing problems in children from birth to age 18. *Clinical Psychology Review*, *50*, 138–158. https://doi.org/ 10.1016/j.cpr.2016.10.003

Yoon, S., Yoon, D., Wang, X., Tebben, E., Lee, G., & Pei, F. (2017). Co-development of internalizing and externalizing behavior problems during early childhood among child welfare-involved children. *Children and Youth Services Review*, *82*, 455–465. https://doi.org/10.1016/j.childyouth.2017.10.016

Zentner, M., & Shiner, R. L. (2012). Fifty years of progress in temperament research: A synthesis of major themes, findings, and challenges and a look forward. In M. Zentner & R. L. Shiner (Eds.), *Handbook of temperament* (p. 673–700). The Guilford Press.

Zhang, X., & Chen, H. (2010). Reciprocal influences between parents' perceptions of mother-child and father-child relationships: A short-term longitudinal study in Chinese preschoolers. *The Journal of Genetic Psychology*, *171*, 22–34. https://doi.org/10.1080/00221320903300387

Zhou, Q., Sandler, I. N., Millsap, R. E., Wolchik, S. A., & Dawson-McClure, S. R. (2008). Mother-child relationship quality and effective discipline as mediators of the 6-year effects of

the New Beginnings Program for children from divorced families. *Journal of Consulting and Clinical Psychology, 76*, 579–594. https://doi.org/10.1037/0022-006x.76.4.579

ANNEXE A
Formulaire de consentement
Projet GRANDIR ENSEMBLE – Suivi à 2, 3 ET 4 ans

Ce formulaire vise à recueillir votre consentement à continuer votre participation au projet GRANDIR ENSEMBLE. Cette suite du projet vise à poursuivre l'étude du développement de votre enfant dans le contexte de sa vie familiale, afin de continuer à comprendre en quoi la famille contribue au développement de l'enfant dans les sphères socio-affective, cognitive et comportementale.
Votre participation, ainsi que celle de votre enfant, implique trois visites à la maison, lorsque votre enfant aura environ 25, 36 mois et 48 mois. Lors de chacune des visites, on vous demandera comme à l'habitude de compléter des questionnaires sur vous, votre contexte de vie et votre enfant, notamment ses rythmes de sommeil. Votre enfant devra également porter pendant 3 jours à sa cheville un petit appareil ressemblant à une montre, soit un actigraphe. Cet appareil note à intervalles réguliers dans quelle mesure votre enfant est actif ou en sommeil. Le port de cet appareil ne comporte aucun danger ni inconfort pour l'enfant.

À chaque rencontre, un membre de notre équipe vous amènera l'actigraphe et les questionnaires, vous donnera les consignes et explications nécessaires, puis reviendra de 3 à 5 jours plus tard afin de récupérer le matériel et les informations. Nous sommes conscients, par ailleurs, que la participation à cette étude comporte pour vous d'y investir un peu de temps et d'attention. Afin de compenser pour cette contribution, vous serez indemnisés à raison de 20$ à chaque visite. Cette compensation vous sera remise par notre étudiant (e) lorsqu'il viendra récupérer le matériel.

En plus des mesures de sommeil, les visites se dérouleront comme les précédentes. Ainsi, les visites à la maison consisteront principalement en des jeux filmés entre vous et votre enfant, et entre l'enfant et un assistant de recherche. La durée des rencontres est d'environ une heure ou une heure 30.

Toute information obtenue dans le cadre de cette étude demeure confidentielle. Afin de protéger la confidentialité des participants, votre nom ainsi que celui de votre enfant sont remplacés par des numéros d'identification, et seule la coordonnatrice responsable a accès à la liste de correspondance entre les noms et les numéros de code. Les données obtenues ne sont accessibles qu'aux membres de l'équipe de recherche, et sont conservées sous clé à l'Université de Montréal. Ces informations sont analysées uniquement par les membres du projet de recherche. Ces résultats sont strictement confidentiels et seules des statistiques de groupe font l'objet d'interprétation. Les données seront utilisées uniquement à des fins de recherche et d'enseignement, seront conservées pendant dix (10) ans à compter de leur date de réalisation, puis seront détruite.

Votre participation, ainsi que celle de votre enfant, est entièrement volontaire et en tout temps vous êtes libre de vous retirer sans avoir à justifier votre décision, et sans préjudice.
L'équipe de recherche s'engage à continuer à vous transmettre des résumés globaux des résultats par l'intermédiaire du bulletin d'information du projet GRANDIR ENSEMBLE. De plus, si les données recueillies auprès de votre enfant suggéraient la présence d'un trouble du sommeil ou du développement, notre équipe sera heureuse de vous diriger vers les ressources appropriées. Si vous avez des questions concernant votre participation à cette étude, n'hésitez pas à contacter la coordonnatrice du projet, Nadine Marzougui, au (514) 343-2337. Par ailleurs, toute plainte relative à votre participation à cette recherche peut être adressée à l'ombudsman de l'Université de Montréal, au numéro de téléphone (514) 343-2100 (l'ombudsman accepte les appels à frais virés) ou à l'adresse courriel suivante*: ombudsman@umontreal.ca*.
Nous devons également vous informer qu'en vertu de la Loi sur la protection de la jeunesse, le chercheur qui a un motif raisonnable de croire que la sécurité ou le développement d'un enfant est compromis, parce qu'il est victime d'abus sexuels ou est soumis à des mauvais traitements physiques par suite d'excès ou de négligence, est tenu de le déclarer au Directeur de la protection de la jeunesse.
Je,_____ (parent), déclare avoir lu et compris chaque élément relatif à ma participation dans ce projet. Après réflexion et un délai raisonnable, je consens librement à prendre part à cette suite de l'étude. Je sais toutefois que je peux choisir de me retirer en tout temps, sans avoir à justifier ce choix. Je comprends que les données demeureront confidentielles.

_____ _____
Signature du parent Date

Je déclare avoir fourni toutes les informations concernant le but, la nature, les avantages, les risques et les inconvénients du projet.

_____ _____
Signature de l'assistant de recherche Date

ANNEXE B

Questionnaire d'Évaluation du Comportement de l'Enfant

(Toddler Behavior Assessment Questionnaire; Goldsmith, 1996)

Directives : Après avoir lu ci-dessous la description du comportement de l'enfant, s'il-vous-plaît indiquez combien de fois votre enfant s'est comporté de cette façon au cours du dernier mois en encerclant un des chiffres de la colonne de droite. Ces chiffres indiquent le nombre de fois où vous avez observé le comportement décrit au cours du dernier mois.

Note : La colonne « Ne s'applique pas » (NA) est utilisée si au cours du dernier mois, vous n'avez pas vu l'enfant dans la situation décrite. « Ne s'applique pas » (NA) est différent de « Jamais » (1). « Jamais » est utilisé quand vous avez vu l'enfant dans la situation décrite mais que l'enfant n'a pas accompli le comportement décrit. Par exemple, si la situation décrite est : « aller chez le médecin » et que le comportement décrit est « pleurer » :

-Encerclez « NA » si votre enfant n'est pas allé chez le médecin au cours du dernier mois-Encerclez « Jamais » si votre enfant est allé chez le médecin mais qu'il n'a pas pleuré.

Jamais = 1 Très rarement = 2 Moins que la moitié du temps = 3 Environ la moitié du temps = 4 Plus que la moitié du temps = 5 Presque toujours = 6 Toujours = 7 Ne s'applique pas = N/A

Quand votre enfant a joué dans la maison (par exemple, à cause du mauvais temps) combien de fois votre enfant a-t-il/elle :

1. Couru partout dans la maison?
2. Grimpé sur les meubles?
3. Quand votre enfant a joué avec un jouet mobile, par exemple un tricycle, combien de fois votre enfant a-t-il/elle essayé d'aller aussi vite que possible?

Quand vous étiez au parc ou au terrain de jeux avec votre enfant et qu'il/elle a vu d'autres enfants jouer, combien de fois s'est-il/elle

4. Approché(e) et a-t-il/elle commencé immédiatement à jouer?
5. Mis(e) à rire avec les autres enfants?

Quand votre enfant a joué seul(e) dans un carré de sable ou dans la neige (par exemple, creuser dans le sable ou la neige pour en remplir des contenants), combien de fois est-il/elle :

6. Demeuré(e) intéressé(e) 30 minutes ou plus?
7. Demeuré(e) intéressé(e) 10 minutes ou plus?
8. Demeuré(e) intéressé(e) moins de 10 minutes?

Quand vous avez enlevé à votre enfant quelque chose avec lequel il/elle n'aurait pas dû jouer, combien de fois a-t-il/elle :

9. Crié?
10. Essayé de reprendre l'objet brusquement?
11. Consenti à votre demande sans signe de colère?

Quand votre enfant a découvert le fonctionnement de quelque chose (comme assembler deux blocs Lego ensemble, empiler des blocs, ou apprendre à utiliser un interrupteur de lumière), combien de fois a-t-il/elle :

12. Souri?
13. Semblé satisfait(e)?

Quand votre enfant a dû partager ses jouets, combien de fois a-t-il/elle :

14. Protesté d'un ton pleurnicheur?
15. Consenti à votre demande sans signe de colère?

Quand votre enfant a colorié par lui/elle-même, combien de fois votre enfant a-t-il/elle :

16. Continué à colorier seul(e) pendant 20 minutes ou plus?
17. Continué seul(e) pendant 10 à 20 minutes?
18. Dans un centre d'achats ou un magasin, combien de fois votre enfant a-t-il/elle semblé très désireux(se) d'explorer le magasin?

Quand un autre enfant a enlevé à votre enfant un jouet préféré avec lequel il/elle jouait, combien de fois :

19. S'est-il/elle opposé(e)?
20. A-t-il/elle joué avec quelque chose d'autre?
21. A-t-il/elle essayé de frapper, donner un coup de pied ou mordre l'autre enfant?

Quand votre enfant a joué sagement avec un de ses jouets préférés, combien de fois a-t-il/elle :

22. Souri?
23. Émis des sons joyeux?

Quand votre enfant a voulu jouer dehors mais que vous avez dit « non », combien de fois a-t-il/elle :

24. Protesté en pleurant fort?
25. Protesté d'un ton pleurnichard?
26. Commencé à bouder ou froncer les sourcils?
Quand votre enfant a regardé un livre d'images tout(e) seul(e), combien de fois a-t-il/elle :
27. Regardé tout(e) seul(e) deux livres ou plus?
28. Regardé seulement une partie du livre avant de perdre intérêt?
29. Quand votre enfant s'est joint(e) à un jeu actif impliquant d'autres enfants, (par exemple, un qui comprend courir et sauter), combien de fois a-t-il/elle été capable de suivre les enfants les plus énergiques et actifs?
Combien de fois votre enfant a-t-il/elle joué tout(e) seul(e) avec son jouet préféré pour :
30. 30 minutes ou plus?
31. 10 minutes ou plus?
32. Moins de 10 minutes?
Lorsque, pour jouer, vous avez lancé votre enfant dans les airs ou que vous avez « lutté » avec lui/elle, combien de fois a-t-il/elle :
33. Souri?
34. Ri?
35. Demandé « encore »?
Quand vous avez dit à votre enfant qu'il/elle aurait à jouer seul(e) pour un court moment, combien de fois :
36. A-t-il/elle dût être encouragé(e) continuellement pour demeurer occupé(e) de façon constructive?
37. Un seul objet ou une seule activité l'a-t-il/elle gardé occupé(e)?
Combien de fois au cours du dernier mois votre enfant a-t-il/elle :
38. Joué à des jeux comme courir partout, cogner des jouets ou les lancer par terre?
39. Joué à des jeux tranquilles qui n'impliquent pas beaucoup de mouvements, comme regarder des livres ou mettre des jouets en ordre?
Quand votre enfant a joué avec un jouet compliqué (comme une grosse maison de poupées ou un garage), combien de fois :
40. A-t-il/elle exploré le jouet à fond?
41. Est-il/elle devenu(e) facilement ennuyé(e) ou agité(e)?
42. A-t-il/elle accordé au jouet un court moment d'attention?
Quand l'on a donné à votre enfant quelque chose à manger ou à boire qu'il/elle n'aimait pas, combien de fois a-t-il/elle :
43. Pleuré(e)?
44. Accepté la nourriture ou le breuvage sans signe de colère ou sans protestation?
45. Repoussé l'assiette?
Quand votre enfant a voulu manger du dessert avant d'avoir fini son assiette et qu'il/elle ne l'a pas eu, combien de fois a-t-il/elle :
46. Protesté en pleurant fort?
47. Repoussé l'assiette et refusé de manger?
Quand il/elle est allé(e) dans le bain, combien de fois a-t-il/elle :
48. Ri?
49. Babillé ou parlé de façon enjouée?
50. Été assis(e) sagement?
51. Éclaboussé ou donné des coups de pied dans l'eau?
52. Joué très énergiquement avec des jouets? (si votre enfant n'a pas de jouets dans le bain, encerclez « NA »)
Quand votre enfant s'est fait habiller ou déshabiller, combien de fois :
53. S'est-il/elle démené(e) ou a-t-il/elle tenté de s'échapper?
54. S'est-il/elle laissé(e) faire jusqu'à ce qu'il/elle soit prêt(e)?
55. Quand votre enfant s'est fait peigner les cheveux ou laver le visage, combien de fois a-t-il/elle été enjoué(e)?
Quand votre enfant s'est fait bercer ou serrer dans les bras, combien de fois votre enfant a-t-il/elle :
56. Souri?
57. Ri?
Quand c'était l'heure du coucher ou de la sieste et que votre enfant ne voulait pas y aller, combien de fois a-t-il/elle :
58. Protesté en pleurant fort?
59. Résisté physiquement ou s'est-il/elle débattu(e)?
60. Quand votre enfant a été impliqué(e) tout(e) seul(e) dans un jeu ou activité et que vous avez interrompu ce jeu parce que c'était l'heure du repas ou d'une sortie, combien de fois votre enfant a-t-il/elle d60. Quand votre enfant a été impliqué(e) tout(e) seul(e) dans un jeu ou activité et que vous avez interrompu ce jeu parce que c'était l'heure du repas ou d'une sortie, combien de fois votre enfant a-t-il/elle dirigé rapidement son attention sur la nouvelle activité?
Quand votre enfant a reçu un paquet emballé ou un nouveau jouet dans un sac, combien de fois
61. Est-il/elle resté(e) neutre (par exemple, n'a pas souri)?
62. A-t-il/elle émit un cri de joie?
63. Ri?
Quand vous avez lu une histoire de longueur normale à votre enfant, combien de fois :
64. A-t-il/elle été attentif(ve) tout au long de l'histoire?
65. Est-il/elle devenu(e) agité(e) après les premières pages?
Chez le médecin, combien de fois votre enfant :
66. S'est-il/elle accroché(e) à vous ou votre conjoint?
67. A-t-il/elle semblé confortable et non préoccupé(e) par la visite?
68. A-t-il/elle pleuré ou s'est-il/elle débattu(e) lorsque le médecin a voulu l'approcher?
Quand il/elle a dû rester assis(e) sans bouger, comme dans une église, une salle d'attente, ou un restaurant, combien de fois :

69. A-t-il/elle tenté de descendre de sa chaise?
70. A-t-il/elle joué sagement avec 1 ou 2 jouets?
71. A-t-il/elle tenté de grimper sur d'autres chaises?
72. A-t-il/elle demeuré(e) assis(e) tranquille et calme même lorsque d'autres enfants commençaient à rire?
Quand il/elle a rencontré pour la première fois un étranger à la maison, combien de fois :
73. S'est-il/elle laissé(e) prendre sans protester?
74. Vous a-t-il/elle laissé vous ou votre conjoint pour aller vers l'étranger?
75. S'est-il/elle habitué(e) à l'étranger en moins de 10 minutes?
Quand il/elle a regardé une émission de télévision comme Passe-Partout, combien de fois :
76. Est-il/elle demeuré(e) attentif(ve) pour l'émission en entier?
77. A-t-il/elle regardé seulement les premières minutes avant de montrer des signes d'agitation?
Quand il/elle a été placé dans un siège d'auto ou une poussette, combien de fois votre enfant :
78. A-t-il/elle donné des coups de pied?
79. S'est-il/elle tortillé(e)?
80. Est-il/elle demeuré(e) immobile?
Quand votre enfant a su que vous étiez sur le point de le/la laisser à la maison, combien de fois votre enfant :
81. A-t-il/elle pleuré?
82. S'est-il/elle accroché(e) à vous ou votre conjoint?
83. N'a-t-il/elle montré aucun signe de détresse?
Quand vous avez reçu la visite de l'un de vos amis qui n'a pas un contact quotidien avec votre enfant, combien de fois votre enfant :
84. S'est-il/elle tourné(e) vers vous ou votre conjoint pour se rassurer? irigé rapidement son attent85. A-t-il/elle parlé beaucoup moins qu'à l'habitude?
86. A-t-il/elle accueilli votre ami avec enthousiasme?
87. A-t-il/elle émit des cris de joie?
88. A-t-il/elle souri?
89. A-t-il/elle babillé ou parlé de façon enjouée?
Pendant le magasinage, si vous n'avez pas accepté d'acheter à votre enfant un jouet qu'il/elle voulait, combien de fois :
90. A-t-il/elle protesté d'un ton pleurnicheur?
91. S'est-il/elle débattu(e) physiquement quand vous avez tenté de le séparer de son jouet?
Quand vous êtes sortie et que votre enfant n'a pas voulu rester avec la gardienne habituelle, combien de fois a-t-il/elle :
92. Boudé ou froncé les sourcils?
93. Montré aucun signe de colère?
Combien de fois l'attention de votre enfant a été retenue par des objets intéressants à l'extérieur (tels des gicleurs, des drapeaux ou des avions) pendant :
94. 5 minutes ou plus?
95. moins de 5 minutes?
Quand vous n'avez pas permis à votre enfant de faire quelque chose tout(e) seul(e) (par exemple s'habiller ou grimper dans le siège d'auto), combien de fois votre enfant a-t-il/elle :
96. Montré des signes de colère parce qu'il/elle voulait le faire seul(e)?
97. Essayé de vous repousser?
Si vous n'avez pas été capable de donner une attention immédiate à votre enfant parce que vous étiez occupée (par exemple, vous prépariez le souper ou parliez au téléphone), combien de fois votre enfant a-t-il/elle :
98. Pleuré fort?
99. Trouvé autre chose à faire jusqu'à ce que vous soyez disponible?
Quand une histoire a été lue à l'enfant, combien de fois est-il/elle :
100. Demeuré(e) assis(e) sagement?
101. Devenu(e) agité(e)?
Lors d'une visite à la garderie ou à un centre de jour, combien de fois votre enfant :
102. A-t-il/elle pleuré quand il/elle n'était pas dans vos bras ou refusé d'être mis(e) par terre?
103. S'est-il/elle senti(e) à l'aise en moins de 10 minutes?ion sur la nouvelle activité?
104. A-t-il/elle commencé à explorer immédiatement?
Quand votre enfant a été approché(e) par un adulte étranger quand vous magasiniez ou preniez une marche, combien de fois votre enfant a-t-il/elle :
105. Babillé ou parlé?
106. Montré des signes de détresse ou pleuré?
107. Évité le danger possible en se tournant vers vous ou votre conjoint pour se rassurer?
108. Quand vous avez éteint la télévision (parce que c'était l'heure du coucher, du souper, ou d'une sortie), combien de fois votre enfant a-t-il/elle piqué une colère?
109. Quand il était le temps de quitter la maison d'un ami et que votre enfant ne voulait pas partir, combien de fois vous a-t-il/elle suivi (e) sans montrer de signe de colère?
110. Quand votre enfant a joué seul(e) et qu'un ami ou parent (pas de la famille immédiate) est venu dans la pièce, combien de fois a-t-il/elle ignoré temporairement le visiteur et continué à jouer?
111. Quand vous ou une autre personne étiez visiblement fâchée, combien de fois votre enfant a-t-il/elle souri ou ri?

Annexe C

Mutually Responsive Orientation scale

(Aksan et al., 2006)

1) Communication A. L'interaction coule doucement, est fluide et harmonieuse B. La communication se fait sans effort et est réciproque C. Les dialogues favorisent l'intimité et la complicité	 A) Qualités de l'Interaction : Harmonie et Fluidité B) Qualités de la Communication : Aisance et Réciprocité C) Qualités du Dialogue: Intimité et Complicité
2) Coopération mutuelle A. La dyade est capable d'accepter de façon tacite les rôles de chacun B. Les messages subtils ou implicites sont suffisants pour obtenir une bonne coopération OU la coopération se construit facilement C. Le mère (ou le père) et l'enfant adoptent une posture, une attitude ouverte et réceptive face aux tentatives d'influence de l'autre D. Turn-Taking	 A) Acceptation ou accord tacite des rôles de la part de E et de P B) Réponse à l'influence de l'un sur l'autre: Réceptive et Consentante C) Posture vis-à-vis de l'autre : Ouverte et Réceptive D) Imitation
3) Ambiance Émotionnelle A. L'atmosphère émotionnelle globale est positive et chaleureuse B) Reversed: La dyade s'engage dans des séquences évidente d'affects négatifs C) La dyade s'engage dans des séquences de joie évidentes D) Présences de démonstrations spontanées d'affection	 A) Qualité de l'atmosphère émotionnelle globale : Positive and chaleureuse B) Présence évidente de séquences d'affect(s) négatif(s) C) Présence évidentes de séquences joyeuses D) Démonstration spontanée d'affection

1- Very untrue dyad - Poor relationship: Adversarial, Disconnected, Unresponsive, Hostile, Affectively negative
2- Quite/rather untrue dyad - Not a very good relationship
3- Dyad fluctuates between low and high MRO OR is average
4- Quite/rather true dyad, reasonable MRO and relationship: mutual responsive, coordinated, harmonious, in sync, attuned to each other, mutually cooperative, affectively positive
5- Very true dyad: very high MRO, excellent relationship

ANNEXE D

Système de codification du soutien maternel à l'autonomie à 15 mois

(Whipple et al., 2011)

Ne soutient pas l'autonomie		Soutient moyennement l'autonomie		Soutient beaucoup l'autonomie
1	2	3	4	5

Notes générales
***Si la mère est très contrôlante à un ou plusieurs moments durant l'interaction, ne pas donner plus de 3 sur l'échelle de soutien à l'autonomie.
***Pour donner 1 ou 5, il doit n'y avoir rien à redire.

Soutien de la compétence de l'enfant (étayage)

Définition : Façon dont la mère adapte la tâche pour créer un défi optimal pour l'enfant.

5 - Soutient beaucoup l'autonomie

- Mère intervient au moment approprié (seulement lorsque la tâche devient trop difficile pour l'enfant).
  ET
- Mère adapte la tâche de façon à ce que celle-ci présente un défi optimal pour son enfant, c'est-à-dire de façon à ce que celle-ci corresponde mieux aux habiletés de l'enfant.

3 – Soutient moyennement l'autonomie

- Mère intervient au moment approprié, mais n'adapte pas la tâche pour que celle-ci corresponde aux habiletés de l'enfant.
  OU
- Mère adapte la tâche, mais elle ne le fait pas au moment approprié.

1 – Ne soutient pas l'autonomie

- Mère n'intervient pas au moment approprié et elle n'adapte pas la tâche de façon à ce que celle-ci corresponde aux habiletés de l'enfant.

Soutien verbal

Définition : indices, questions, instructions, suggestions et encouragements formulés par la mère verbalement.

5 - Soutient beaucoup l'autonomie

- Mère encourage son enfant dans la poursuite de la tâche (de façon constante).
- Mère félicite son enfant (de façon constante).
- Mère donne des instructions, indices ou suggestions adaptés aux besoins, ou suite à la demande de l'enfant.

- Mère emploie un ton qui communique qu'elle est une source d'aide pour son enfant.

4- Soutient l'autonomie

- Mère émet 3 de ces quatre sortes de verbalisations de manière constante.

3 – Soutient moyennement l'autonomie

- Mère émet une de ces quatre sortes de verbalisations.
  OU
- Mère émet 2 de ces quatre sortes de verbalisations de façon inconstante.

2 – Soutient peu l'autonomie

- Mère émet seulement une de ces quatre sortes de verbalisations de façon inconstante.

1 – Ne soutient pas l'autonomie :

- Mère n'émet aucune de ces quatre sortes de verbalisations.

<u>Flexibilité et empathie</u>

Définition : Le degré avec lequel la mère prend la perspective de son enfant et démontre de la flexibilité dans sa façon de gérer l'attention de son enfant durant la réalisation de la tâche.

5 - Soutient beaucoup l'autonomie

- Mère démontre de la flexibilité dans ses efforts pour garder l'enfant centré sur la tâche.
- Mère prend la perspective de son enfant et reconnaît ses sentiments, tout en le recadrant vers la tâche.

3 – Soutient moyennement l'autonomie

- Mère présente un de ces deux éléments.
  OU
- Mère présente les deux éléments, mais de façon inconstante.

1 – Ne soutient pas l'autonomie

- Mère ne présente aucun de ces éléments.

***Aucun score n'est donné à cette échelle si l'enfant ne dévie pas durant la tâche

Respect du rythme et des choix

Définition : Mesure dans laquelle l'enfant a l'opportunité d'être acteur plutôt qu'observateur dans la réalisation de la tâche. Mesure dans laquelle la mère guide l'enfant en lui laissant ensuite le temps de faire des essais de façon à ce que celui-ci soit actif dans la tâche. Mesure dans laquelle la mère offre des choix à l'enfant plutôt qu'imposer les siens.

5 - Soutient beaucoup l'autonomie

- Mère respecte le rythme de l'enfant. L'enfant joue un rôle d'acteur dans l'interaction.
- Mère laisse l'enfant faire des choix (ex. quel morceau de casse-tête placer en premier). Le choix peut être explicite ou implicite.

4 – Soutient l'autonomie

- Mère respecte le rythme, mais elle ne laisse pas l'enfant faire des choix.

3- Soutient moyennement l'autonomie

- Mère laisse l'enfant faire des choix, mais ne respecte pas son rythme.
  OU
- Mère laisse l'enfant faire des choix et elle respecte son rythme, mais de façon inconstante. L'enfant n'est pas toujours acteur.

1 – Ne soutient pas l'autonomie

- Mère ne respecte pas le rythme de l'enfant et elle ne lui laisse pas l'opportunité de faire des choix.

*** La mère doit être active dans l'interaction pour obtenir un score de soutien à l'autonomie. Si l'enfant établit le rythme parce que la mère est inactive, celle-ci ne doit pas obtenir un score élevé de soutien à l'autonomie.

ANNEXE E

Profil Socio-Affectif

(LaFrenière et al., 1990**)**

Voici une liste de comportements que vous pouvez observer chez votre enfant concernant ses relations avec les autres enfants. Nous vous demandons d'encercler la fréquence de chaque comportement chez votre enfant selon la règle suivante: le comportement est-il JAMAIS présent, RAREMENT, À L'OCCASION, RÉGULIÈREMENT, SOUVENT ou TOUJOURS présent?

Jamais = 1 Rarement= 2 À l'occasion = 3 Régulièrement = 4 Souvent = 5 Toujours = 6
Ne peux pas évaluer = 7

1. Se fâche lorsque je porte mon attention sur un autre enfant.
2. Est préoccupé(e) par ses intérêts et ne reconnaît pas ceux des autres enfants.
3. Coopère avec les autres enfants dans les activités de groupe.
4. Console ou aide un enfant qui a de la difficulté.
5. Doit être le premier.
6. Refuse de partager ses jouets.
7. S'excuse spontanément après avoir fait une bêtise à un autre enfant.
8. Fait en sorte que les jeux soient compétitifs.
9. Aide spontanément à ramasser des objets qu'un enfant a échappés.
10. Partage ses jouets avec les autres enfants

ANNEXE F

Associations between quality of parent-child relationships and children's gender typicality: A 4-year longitudinal study

Lemelin, E., Sirois, M. S., Bernier, A., & Martin, C. L. (2021). Associations between quality of parent–child relationships and children's gender typicality: A 4-year longitudinal study. *Infant and Child Development, 30*, e2214.

En périphérie de ma thèse, j'ai contribué à cet article en supervisant la première auteure dans le cadre de son stage d'honneur. Mon rôle était de l'accompagner sur le plan des analyses statistiques, de la rédaction de l'article et du processus de publication. Ayant comme intérêt commun les contributions de la qualité des relations parent-enfant au fonctionnement socio-émotionnel des enfants, cet article m'a permis d'approfondir mes réflexions à ce sujet. L'article est inclus ici afin de présenter d'autres travaux faits durant mon doctorat, associés à mes intérêts, bien qu'il ne soit pas directement lié à la thèse.

Abstract

Little is known about influences on gender typicality. To address this issue, the present study examined developmental antecedents of preadolescents' gender typicality. Using a longitudinal multi-method design, we investigated the prospective associations between the quality of parent-child relationships in childhood and preadolescents' subsequent gender typicality. It was hypothesized that feelings of gender typicality would be positively related to quality of relationship with the corresponding-gender parent. Sixty-eight families (40 girls) participated in two home visits. The quality of mother-child and father-child relationships was assessed by observation at age 7 and youths reported on their gender typicality at 11 years. Results indicated that girls who had higher-quality relationships with their mother at age 7 felt more similar to other girls four years later. This finding suggests that mother-child relationships might be a contributing factor in the development of girls' gender typicality.

Keywords: Gender identity, Gender typicality, Parent-child relationships, Social development, Preadolescence

Associations between quality of parent-child relationships and children's gender typicality: A 4-year longitudinal study

Gender identity is an important aspect of children's identity that is associated with their socioemotional and behavioral adjustment (Carver, Yunger, & Perry, 2003; Yunger, Perry, & Carver, 2004). Gender identity is comprised of five dimensions developing from early childhood through adolescence (Egan & Perry, 2001): (a) membership knowledge, (b) gender contentedness, (c) intergroup bias (i.e., attitudes toward gender groups), (d) felt pressure for gender conformity, and (e) gender typicality. Gender typicality is considered to be an especially central aspect of preadolescents' gender identity (Carver et al., 2003; Egan & Perry, 2001; Martin, Andrews, England, Zosuls, & Ruble, 2017; Ruble, Martin, & Berenbaum, 2006).

Originally, gender typicality was conceptualized as the degree to which youth feel typical of others of their own gender and a typicality scale was developed to assess this construct (Egan & Perry, 2001). More recently, Martin and colleagues (2017) expanded on this view and proposed that children define their gender typicality by comparing themselves to both own- and other-gender groups. Using this new measure of gender typicality in which children were asked how similar they feel to girls and to boys, Martin and colleagues (2017) found that even very young children are able to make these judgments. The authors argue that some distinctions between individuals are obscured when only considering typicality in relation to one's own gender. For example, children who feel similar to their own gender may, at the same time, feel quite similar to the other gender, while others do not. Thus, to reach a better comprehension of children's gender typicality, it is important to consider their perceived similarity to both genders (Andrews, Martin, & Gallagher, 2016; Martin et al., 2017; Nielson, Schroeder, Martin, & Cook, 2020; Pauletti, Menon, Cooper, Aults, & Perry, 2017) and indeed the authors of the original

typicality scale (Egan & Perry, 2001) have also recently expanded their approach to use comparisons to both gender groups (Perry, Pauletti, & Cooper, 2019). Accordingly, here we define and measure gender typicality in terms of self-perceived similarity to own- and other-gender groups.

Studies show that children who appraise themselves as more gender typical (i.e., higher perceived similarity to own gender and/or lower perceived similarity to other gender; Zosuls, Andrews, Martin, England, & Field, 2016) have higher self-esteem, feel more included by their same-gender friends, are more popular among their peers, and experience less internalizing behavior problems (Carver et al., 2003; Jewell & Brown, 2014; Martin et al., 2017; Yunger et al., 2004). However, these children also appear to feel the most pressure to conform to gender norms (Nielson et al., 2020). In contrast, children who feel less typical or who only feel typical of the other gender experience less positive outcomes, for example lower self-esteem, peer exclusion and peer victimization, loneliness, depressive symptoms, social anxiety, and are reported by their parents as being more asocial (Jewell & Brown, 2014; Martin et al., 2017; Smith & Juvonen, 2017; Smith & Leaper, 2006; Smith, Schacter, Enders, & Juvonen, 2018; Yunger et al., 2004; Zosuls et al., 2016). However, children who have socially transitioned (i.e., who present themselves as a member of the opposite gender from their natal sex) show normative levels of depression and self-worth and marginally higher anxiety (Durwood, McLaughlin, & Oslon, 2017; Olson, Durwood, DeMeules, & Madeleine, 2016). These children also experience greater acceptance of cross-gender behaviors from other children (Olson & Enright, 2016). Finally, children who appraise themselves as similar to their own and to the other gender, that is, children who are both typical and atypical in some ways, also have advantages, such as having girls and boys as friends and showing less in-group bias (Martin et al, 2017).

Minority stress theory can explain why some gender atypical children experience more negative psychosocial adjustment than their gender typical peers (Meyer, 1995; 2003). This theory posits that minority groups such as gender atypical children experience more stressors than the general population because of their minority status (Meyer, 2003). These stressors include expected, perceived, and experienced discrimination, as well as rejection and stigmatization. Thus, stressors experienced by gender atypical children can contribute to the negative psychosocial outcomes that they may be more likely to experience (Meyer, 1995; 2003).

Despite the documented role of gender typicality in child socioemotional functioning, surprisingly few studies have investigated its predictors (Perry et al., 2019). In fact, there remains an important debate about the determinants of gender identity, including about the relative importance of genetic, hormonal, and environmental factors (Eagly & Wood, 2013; Hines, 2014). How children determine their typicality and the relative contributions of biological, cognitive, and environmental factors to these appraisals is yet to be determined. Most studies have focused on factors contributing to gender-typed behaviors. Twin studies (Iervolino, Hines, Golombok, Rust, & Plomin, 2005; Knafo, Iervolino, & Plomin, 2005) suggest that both genetic inheritance and environmental influences play a meaningful role in shaping individual differences in gender typical behavior. For instance, Knafo and colleagues (2005) found that genetic factors accounted for 17% of boys' feminine behaviors (i.e., gender atypicality) whereas 83% was explained by environmental influences. In girls, they reported that genetic factors accounted for 40% of masculine behaviors, while 60% was explained by environmental influences. Hormonal exposure also appears to influence the likelihood of adoption of gender-typed behaviors (Hines, 2014). Overall, although genetic inheritance and hormonal factors do

explain some variation in both boys' and girls' gender typical behaviors, there is no doubt that environmental factors play a meaningful role as well.

Among the numerous potential environmental factors in children's lives, for example, media, peers, or siblings (Leaper & Friedman, 2007; Perry & Pauletti, 2011), parents are recognized as crucial socialization forces (Crouter, Whiteman, McHale, & Osgood, 2007; McHale, Crouter, & Tucker, 1999; Tobin et al., 2010). Yet, surprisingly little is known of the association between parent-child relationships and youth's gender typicality (Leaper, 2014). Most studies (e.g., Crouter et al., 2007; McHale et al., 1999; McHale, Crouter, & Whiteman, 2003) have investigated the links between parental factors and child gender roles, namely the extent to which children express stereotypical feminine (e.g., playing with dolls) or masculine (e.g., playing with trucks) behaviors. McHale and colleagues (2003) reported that children whose parents had more traditional gender roles displayed more traditional gender roles themselves. Another study (Lin & Billingham, 2014) found links between parenting styles and college students' gender role identity (undifferentiated, feminine, masculine, and androgynous). Students who perceived their parents to be more authoritative (i.e., showing sensitivity, support, and affection while establishing clear and reasonable discipline; Baumrind, 1991) reported to be more feminine (i.e., more compassionate, sensitive, and empathic; Bem, 1993). However, gender typicality, as now defined, does not refer to gender-typed behaviors and stereotypes as determined by researchers, but instead to the way youth perceive and identify themselves, which the above studies did not examine.

Three recent studies (Cooper et al., 2013; Menon et al., 2017; Menon, 2017) examined the link between parent-child relationships and children's self-perception of their gender typicality. These studies specifically assessed child-perceived attachment security to mother,

which is one recognized way to qualify the emotional quality of the relationship between child and mother. These studies were based on the early conceptualization and assessment of gender typicality proposed by Egan and Perry (2001) and thus relied on own-gender similarity to evaluate gender typicality. They used self-report questionnaires to evaluate both attachment to mother and own-gender typicality in preadolescents. Cooper and his colleagues (2013) found that self-reported avoidant and preoccupied attachment, two forms of insecure attachment, were negatively associated with concurrent self-reported own-gender typicality. Menon and colleagues (2017) aimed to investigate a different question, namely the moderating role of attachment security in the links between gender typicality and well-being; however, their preliminary analyses are relevant to our purposes. The authors found that self-reported attachment security to mother at age 10 was unrelated to either concurrent or subsequent (one year later) self-reported gender typicality. However, concurrent measures of attachment security and own-gender typicality at age 11 were modestly correlated ($r = .17$, $p < .05$). Finally, in a short-term longitudinal study, Menon (2017) examined the links between attachment styles to mother and friends and different dimensions of gender identity including own-gender typicality. She found that among girls, reporting an avoidant attachment style to mother negatively predicted self-reported own-gender typicality several months later. For boys, a preoccupied attachment style to mother negatively predicted gender contentedness but not own-gender typicality.

Thus, emerging evidence suggests that the quality of parent-child relationships may relate to children's gender typicality (Cooper et al., 2013; Menon et al., 2017; Menon, 2017). Yet, this literature is very meager still and based exclusively on self-reported and concurrent or short-term longitudinal measures. Aiming to contribute to this increasing literature, the current study examined the quality of parent-child interactions, as assessed with a well-validated dyadic

observational measure at age 7 (Aksan, Kochanska, & Ortmann, 2006), as a predictor of children's perceived gender typicality four years later — at age 11. Dyadic observational measures are especially well suited to index the quality of parent-child relationships. Indeed, such measures take into account both parent and child behavior as well as their mutual influence on each other, thereby providing an especially rich picture of the relational dynamics characterizing the parent-child relationship, which is dyadic and reciprocal by nature. Furthermore, dyadic measures allow for the assessment of the cooperative, mutually binding aspect of the relationship, which has repeatedly been found predictive of child socioemotional functioning (Aksan et al., 2006; Biringen, Derscheid, Vliegen, Closson, & Easterbrooks, 2014; Feldman, 2003).

A different issue apparent in the current literature on parent-child relationships and children's gender typicality is its almost exclusive focus on mothers. There is evidence that both parents can play a role in the development of their children's gender typicality (Lin & Billingham, 2014; Tenenbaum & Leaper, 2002) and in fact, because fathers generally have a greater desire than mothers to see their child conform to their own-gender group (McHale et al., 1999; McHale et al., 2003), father-child relationships may play an especially salient role. Accordingly, the current study investigated both mother-child and father-child relationships as potential antecedents of child gender typicality.

In line with Smith et al. (2018) and Zosuls et al. (2016), we conducted analyses separately for boys and girls for the following reasons. First, child gender is frequently found to be a moderator of developmental processes (Maccoby, 1998; Poulin & Pedersen, 2007; Rose & Rudolph, 2006). Second, there is evidence that child gender influences parenting (see Leaper, 2002) and plays a role in the links between both mother-child (Etzion-Carasso & Oppenheim,

2000; Farrar, Fasig, & Welch-Ross, 1997; Laranjo, Bernier, Meins, & Carlson, 2010) and father-child relationships (Bronte-Tinkew, Moore, & Carrano, 2006; Ramchandani et al., 2013) and child outcomes. Third, sex differences in children's gender typicality are documented, with boys being generally more gender typical than girls (Carver et al., 2003; Martin et al., 2017), whereas girls are more flexible (McHale et al., 2001). Thus, although the modest sample size of the current small-scale preliminary study did not allow formal moderation analyses to be performed, we conducted the main analyses separately for boys and girls, which also allowed us to disentangle same- and opposite-sex dyads so as to test our hypotheses (presented below).

Objective and hypotheses

The current multi-year longitudinal study aimed to investigate the prospective links between the observed quality of both mother-child and father-child relationships in middle childhood and preadolescents' gender typicality in a normative sample. In line with Martin et al. (2017), we considered both own- and other-gender similarity to measure gender typicality. Given the dearth of directly relevant previous studies, hypotheses were formulated tentatively, based on the literature on identification processes, notably the finding that children often identify with the gender of the people with whom they have close and warm relationships. For example, children tend to adopt gender-stereotyped behaviors corresponding to their older siblings' gender (e.g., boys with older sisters are more feminine; McHale et al., 2003; Rust et al., 2000). A similar process is also suggested in peers, such that children's gender identification is concordant with their friends' gender, that is, children who have more same-gender friends show greater own-gender similarity, whereas children who have more other-gender friends show greater other-gender similarity (Martin et al., 2017). Based on these results, we expected a similar pattern with parents, such that children's gender typicality would be more concordant with the gender of the

parent(s) with whom they had high-quality relationships over and above the alternative gender similarity, the quality of the relationship with the other parent, and standard demographic controls (child age and parental education). More precisely, among girls, it was hypothesized that (1) relationship quality with mother would be associated with felt similarity to other girls and (2) relationship quality with father would be associated with felt similarity to boys. Among boys, it was hypothesized that (3) relationship quality with father would be associated with felt similarity to other boys, and (4) relationship quality with mother would be associated with felt similarity to girls.

Method

Participants

Sixty-eight families (40 girls; all heterosexual biparental dyads) were recruited from random birth lists of the city of Montreal generated by the Ministry of Health and Social Services of Quebec (Canada). Criteria for participation were full-term pregnancy and the absence of known developmental delays. The current study is part of a larger ongoing longitudinal research project that was approved by our institution's research ethics committee. The data that support the findings of this study are available from the corresponding author upon request. Socio-demographic information was gathered upon initial recruitment in that larger project, when children were 8 months old. At that time, mothers were between 20 and 45 years old (M = 31.3) and had between 10 and 18 years of education (M = 15.3). Fathers were between 22 and 44 years old (M = 33.4) and had between 10 and 21 years of education (M = 15.4). Family income varied from less than $20,000 to more than $100,000, with an average in the $60,000 to $79,000 income bracket. The mean family income in Canada was $74,175 for the years of data collection

(Statistics Canada, 2020). The majority of the families were White (82.5% for mothers; 83.3% for fathers) and French-speaking (87.7%).

Procedure

Data were collected during two visits that took place in the families' homes. The first visit (T1) was conducted when children were 7 years old (M = 7.1; SD = 0.3). Each parent was invited to create a story with his or her child using paper characters (2 adults and 2 kids) and various setting images (e.g., farm, park, school). They were allowed to use all the characters and images they wished, in the order of their preference, to create their story. The only instruction given was that the story needed to have a beginning, a middle, and an end. Each parent was alone with his or her child during the activity while the other parent was in a separate room with the research assistant. This interaction was video-recorded and when the parent and child had finished preparing their story (around 6-7 minutes), they were invited to tell it together to the camera. In total, the interactions lasted about 10 minutes with each parent. The child did the two stories one after the other, always starting with his or her mother. We chose to proceed like so because counterbalancing the order of father-child and mother-child interactions would have created a bias, given that not all fathers participated (see Preliminary Analyses section). Hence, all families in which father-child interactions would have been recorded first would necessarily have been families with fathers involved in the study, whereas families with mother-child interactions recorded first would have included a larger proportion of families with fathers not involved in the study (and perhaps in child care). The second visit (T2) took place when children were 11 years old (M = 10.9; SD = 0.3). At that time, children were asked to complete the gender typicality questionnaire described below, with the help of the research assistant (all women) who read the questions aloud while pointing to the corresponding pictures.

Measures

Quality of parent-child relationships. The quality of mother-child and father-child relationships was assessed when children were 7 years old (T1) with the *Mutually Responsive Orientation* scale (MRO; Aksan et al., 2006), based on video recordings of the parent-child story creation sequences described above. The MRO is an observational measure of the quality of parent–child interactions that focuses on the dyadic nature of exchanges and includes three subscales: (a) harmonious communication (i.e., the extent to which both verbal and non-verbal aspects of communication flow smoothly; 4 items), (b) mutual cooperation (i.e., the extent to which the dyad effectively resolves potential sources of conflict and to which the parent and child are open to each other's influence; 4 items), and (c) emotional ambiance (i.e., the extent to which the dyad enjoys an emotionally positive atmosphere indicating pleasure in each other's company; 4 items). As in other studies, the subscales of the MRO are highly correlated in this sample (rs = .53 - .80, ps < .05). Thus, following Aksan et al. (2006), these three subscales were averaged into a global score varying from 1 to 5. A score of 1 indicates a disconnected, unresponsive, hostile, and affectively negative interaction, and a score of 5 indicates a mutually responsive, harmonious, cooperative, and affectively positive interaction between the parent and child.

The MRO has strong psychometric properties. Internal consistency is excellent (α = .90; Aksan et al., 2006) and inter-rater reliability is good (kappa = .72; Aksan et al., 2006). In the current sample, internal consistency was α = .78 for mothers and α = .90 for fathers. Inter-rater reliability was excellent on about 30% of independently double-coded interactions (intra-class correlation = .97 for mothers and .94 for fathers). The MRO also shows excellent predictive validity (Kochanska & Murray, 2000; Kochanska, Aksan, Prisco, & Adams, 2008) and

discriminant validity (Lalonde, Bernier, Beaudoin, Gravel, & Beauchamp, 2016). In addition to these convincing psychometric properties, the MRO was used in the present study because it is one of few coding systems that was not developed primarily for mothers and subsequently adapted for fathers, a frequent assessment issue when studying father–child relationships (Cabrera, Volling, & Barr, 2018).

Gender typicality. Gender typicality was assessed when children were 11 years old (T2) with an adaptation of the *Perceived Similarity to Gender Groups* measure (PSGG; Martin et al., 2017). This scale has been used successfully to measure gender typicality in several studies (Andrews, Martin, Cook, Field, & England, 2019; Andrews, Martin, & Gallagher, 2016; Endendijk, Andrews, England, & Martin, 2019; Martin et al., 2017). The PSGG is a graphic and visual measure adapted to young children's comprehension, which assesses gender typicality in terms of how similar children feel to both boys and girls. For each question, children are asked to select one of five pairs of colored circles (one circle representing them and the other representing one of the two gender groups) that are spaced at varying degrees of proximity, thus representing different degrees of perceived similarity to own gender and to the other gender. Responses range from 1 (circles farthest apart) that represents low similarity to the gender group to 5 (overlapping circles) that represents high similarity. Children answered three questions for own-gender similarity and three questions for other-gender similarity (e.g., "Show me the bubbles that show how much you feel like/act like/do the same things as girls/boys"). Child responses to the three questions for each gender were averaged into two global scores: perceived similarity to own and to other gender. The PSGG has good internal consistency (a = .72 - .82 for own-gender similarity and a = .73 - .80 for other-gender similarity; Martin et al., 2017). In the current sample, internal consistency was good as well (α = .78 for own-gender and α =. 81 for other-gender).

Results

Preliminary Analyses

Of the 68 participant families, 36 families had complete data on all main variables (gender typicality and parent-child interactions). One data point was missing on mother-child interactions (1 boy), 22 were missing on father-child interactions (7 boys and 14 girls) and 21 were missing for gender typicality (6 boys and 15 girls). Of those 21 families with missing data for gender typicality, 11 children were lost to attrition and 10 were not administered the questionnaire because it was introduced in the larger study after that assessment time point had begun. Consequently, we first examined the patterns of missing data with Little's test, which revealed that data were missing completely at random, $X^2 = 66.49$, $p = .183$. Given, though, that Little's test has low power (Enders, 2010), we also examined whether complete and incomplete cases differed on any of the available data. Families with incomplete data did not differ from those with complete data on socio-demographic characteristics (maternal and paternal age and education, child gender, and family income) or central study variables (all ps > .098). Accordingly, to preserve the sample size ($N = 68$) and minimize bias (Enders, 2010), cases with missing values were included in the analyses by estimating the missing data. In line with recommendations for best practices for handling missing data, multiple imputation was employed to estimate the missing values (Enders, 2010) using the Markov Chain Monte Carlo procedure (Geyer, 1992) implemented in SPSS 24. Multiple imputation yields stable and reliable estimates even on smaller samples ($N = 50$) and when as much as 50% of the data are missing (Graham, 2009). As per recommendations, 10 imputations were used, with data imputed from all other data available (namely socio-demographic characteristics as well as mother-child interactions, father-child interactions and gender typicality when available) to maximize the

precision of the imputation algorithm (Enders, 2010; Graham, 2009). All following analyses were computed on each imputed data set and results subsequently pooled (Schafer, 1997).

Table 1 presents the descriptive statistics for the main study variables. All variables showed satisfactory variability. Screening of variable distributions revealed normal or near-normal distributions (skewness between -0.40 and 1.02; kurtosis between -0.76 and 0.86). Data were next screened for extreme scores. Only one univariate outlier was found, specifically on other-gender similarity. This child had a score that was 3.48 standard deviations above the mean. This score was transformed into the next highest score observed in the current sample that fell within 3.29 standard deviations from the mean, which was 2.47 (Tabachnick & Fidell, 2013). No multivariate outliers were found.

Next, we tested child gender differences on own-gender similarity, other-gender similarity, mother-child interactions, and father-child interactions. T-tests did not reveal any gender difference for the quality of mother-child or father-child interactions (ps > .19) but revealed one difference in gender typicality: girls felt more similar to the other-gender group than boys ($t(66) = -2.02$, $p = .045$, $\eta^2 = .06$). T-tests were also conducted to examine if there were mean-level differences between the quality of mother-child and father-child interactions or between own-gender similarity and other-gender similarity. No significant differences were found between mother-child and father-child interactions for either boys or girls (ps > .39). However, boys and girls both felt more similar to their own-gender group than to the other-gender group ($t(27) = 7.40$, $p < .001$, $\eta^2 = .65$ for boys and $t(39) = 6.68$, $p < .001$, $\eta^2 = .53$ for girls). These results are concordant with those reported by Martin and colleagues (2017) and reiterate the importance of separating boys and girls in the main analyses.

Table 2 presents the zero-order correlations among all study variables and Table 3 presents the zero-order correlations split by child sex. The quality of mother-child and father-child interactions was unrelated to gender typicality at the bivariate level. Gender typicality was also unrelated to socio-demographic variables (child age at T2, maternal education and paternal education). We nonetheless adjusted for these factors in the main analyses, because they showed some non-negligible (albeit generally non-significant) relations to one of the predictors (quality of mother-child interactions) and are often found to relate to gender typicality in the literature (Crouter et al., 2007; McHale, Kim, Whiteman, & Crouter, 2004).

Main Analyses

Hierarchical regressions were conducted next for boys and girls separately to predict own- and other-gender similarity. To account for the theoretical inter-dependence between these two scores (Martin et al., 2017) and take advantage of our typicality measure, we controlled for own-gender similarity when predicting other-gender similarity, and vice-versa. This allowed for the dependent variables to reflect relative predominance of perceived similarity to one gender group over the other – in other words, how similar children felt to one gender group specifically, not to other children generally. Thus, in each regression equation, the alternative gender similarity variable was entered in a first block, followed by the demographic covariates (child age and parental education) in a second block and finally by the focal predictors (quality of mother-child and father-child interactions, entered simultaneously to account for their shared variance; $r = .42$, $p < .05$ – Table 2) in a third block. Entering both mother-child and father-child interactions in one block also allowed us to test specific predictions, namely identifying links with mother-child interactions at equal levels of father-child interaction quality, and vice-versa,

which is important given the inherently non-independent nature of mother-child and father-child relationships that can produce halo effects and hence inflated predictions if not controlled.

Table 4 presents the results of these analyses. The models predicted between 10% and 41% of the variance in children's gender typicality. In line with hypothesis 1, the quality of mother-child interactions predicted own-gender similarity for girls, over and above other-gender similarity, father-child interactions, child age, as well as maternal and paternal education (ß = .52, p = .019): at equal levels of father-child interaction quality and felt similarity to boys, girls who had higher-quality relationships with their mother felt more similar to other girls. No other significant results were found, whether among boys or when considering father-child interactions (ßs between .04 and .26). Note that the pattern of results was very similar when analyzing the original, non-imputed data: the quality of mother-child interactions predicted own-gender similarity for girls (ß = .58, p = .027), but no other effect was significant (ps ≥ .21)

Discussion

Although gender typicality is a well-documented correlate of youth's socioemotional functioning (e.g., Jewell & Brown, 2014; Yunger et al., 2004), very little is known about the antecedents of individual differences in this important aspect of children's and adolescents' identity (Perry et al., 2019). Only a handful of studies have attempted to identify predictors of gender typicality, and these previous results are limited by the sole consideration of own-gender similarity or stereotyped gender roles or behaviors, the failure to consider father-child relationships, and/or the use of self-reported parent-child relationships and gender typicality measures, generally assessed concurrently. Aiming to expand upon this literature and to address these gaps, this preliminary small-scale study used a multi-year longitudinal design and a sample that was carefully characterized in terms of observed quality of mother-child and father-child

interactions in middle childhood to predict preadolescents' gender typicality four years later, considering both own- and other-gender similarity. It was hypothesized that preadolescents' own- and other-gender similarity would be predicted by the quality of their relationship with the parent of the relevant gender. The analyses confirmed one of the four sub-hypotheses: after accounting for father-child interaction, other-gender similarity, child age, and parental education, the quality of mother-child interactions predicted own-gender similarity for girls: girls who had better relationships with their mother at age 7 years felt more similar to other girls at 11 years. This finding is concordant with Menon's results (2017) who found a negative association between attachment insecurity to mother and own-gender similarity, only for girls.

Interestingly, the zero-order correlation between the quality of mother-child interactions and own-gender similarity in girls, although sizable in magnitude (r = .33; Table 3), was not significant statistically. This may be due to the relatively small sample size but also highlights the meaning of the multivariate findings more fully. That is, in the multivariate analyses, we were able to control for other factors that may blur certain relations. Most importantly, father-child interactions were controlled, and in doing so illuminated more clearly the role of relationship quality with mother, rather than general quality of parent-child interactions. Likewise, other-gender similarity was controlled, allowing for a focus on own-gender similarity specifically rather than similarity to others more generally. Overall, the findings suggest that whereas girls who have a better relationship with their mother do not necessarily show greater own-gender similarity, they do when considered at equal levels of other-gender similarity and quality of father-child interactions. Given that own- and other-gender similarity are not independent, as mother-child and father-child relationships are not, the multivariate results are important in suggesting that the core finding of the current study is not due to a combined

influence of mothers and fathers on girls' perceived similarity to other children broadly speaking. Instead, the results point to a specific relation between what is unique to the quality of mother-daughter interactions and daughters' own-gender similarity, all other (assessed) things being equal.

One explanation for this association may be that parents tend to spend more time with their same-gender child (McHale et al., 2003) and children are more likely to engage in gender-typed behaviors when they are with same-gender partners (Martin & Fabes, 2001). Consequently, by spending more time with their mother than father, girls may be more likely to increasingly adopt their mother's gender-typed behaviors, thereby gradually becoming "more like other girls" and subsequently perceiving themselves as more gender typical. Importantly, however, the current results suggest that this is more than a purely quantitative phenomenon of time spent together, and that this process is also dependent upon the quality of the mother-daughter relationship. Given a positive relationship with their mothers, girls may feel more comfortable with females and thus identify more strongly with them. In fact, given the continuous approach to measurement and analysis adopted here, the results may also be taken to suggest that when girls have lower-quality relationships with their mother in middle childhood, they actually feel less similar to their same-gender peers in preadolescence.

In addition to making them *feel* more like other girls, a putative tendency of girls who have better relationships with their mothers to *act* in more typically feminine ways or even to feel more positively about females (have more efficacy in interaction with them) may also make them more attractive to their same-gender peers. By having more same-gender friends and better relationships with these friends, girls may become (and feel) increasingly more gender-typical. Given the newness of the literature, the exact developmental mechanisms linking mother-child

relationships and girls' gender typicality are speculative at this point and require empirical investigation.

However, and contrary to our hypothesis, neither mother-child nor father-child interactions predicted either aspect of boys' gender typicality, although the quality of parent-child interactions (nor variation therein) did not differ between boys and girls. The modest sample size (although not unusual in multi-year longitudinal parenting research) and especially the smaller number of boys (28 boys vs. 40 girls) weakened statistical power; thus, it may be that meaningful yet smaller links between parent-child relationships and boys' gender typicality were not detected by the analyses. Though, the lack of statistically significant results may also be meaningful conceptually, especially considering that Menon (2017) also did not find significant associations between boys' reported attachment styles to their mother and their gender typicality (but did for girls). Boys feel more pressure to conform to their own gender than girls (Egan & Perry, 2001; Martin et al., 2017). More precisely, social pressure notably from peers constrains some children, particularly boys, to avoid cross-gender behaviors (Carver et al., 2003; Egan & Perry, 2001). Moreover, boys who feel more similar to other boys tend to pressure themselves to conform to gender norms (Nielson et al., 2020). These pressures may exert an important influence on boys' gender typicality, leaving less variance to be explained by other factors such as the mutual responsiveness of parent-child interactions. In addition, girls tend to be more sensitive than boys to familial influences in various domains (e.g., depression, division of household chores, body satisfaction; Perry & Paulleti, 2011). Overall, one might speculate that familial and especially maternal influences may be more salient for girls' gender typicality, and peer pressure for boys. This interpretation, however, needs further empirical scrutiny. A further

albeit very speculative possibility (due to the dearth of relevant research) is that hormonal or other biological factors may be more influential among boys.

Contrary to our hypothesis, father-child interactions did not predict preadolescents' gender typicality, whether in boys or girls. As mentioned above, the lack of findings with boys may have to do with other influences, such as peer pressure or biological factors, exerting a stronger influence. When considering maternal versus paternal influences though, mothers are still often primary caregivers for their young children (Craig & Mullan, 2011; Schoppe-Sullivan, Kotila, Jia, Lang, & Bower, 2013) and remain generally more involved with their children until adolescence (Collins & Russell, 1991; William & Kelly, 2005), thus through the age period covered by the current study. Furthermore, meta-analytic data suggest that mother-child relationships produce larger effect sizes than father-child relationships when predicting child functioning (Rothbaum & Weisz, 1994). Thus, mother-child relationships may, simply, be more central to the development of youth gender typicality than father-child relationships. However, one needs to bear in mind that more missing data had to be estimated for father-child (n = 22) than mother-child interactions (n = 1). Although multiple imputation yields far less biased estimates than older methods of handling missing data such as listwise deletion (Enders, 2010), the greater uncertainty involved in imputed data leads to lower-power analyses, which may have contributed to the inconclusive results with father-child relationships. Indeed, the quality of father-child relationships did show non-negligible, albeit non-significant, theoretically expected associations with both own-gender similarity in boys and other-gender similarity in girls (Table 4), and should therefore be considered in future larger-scale studies.

Limitations and future studies

As already mentioned, a first limitation of this study is the modest sample size, especially with boys, and the amount of missing data, particularly for father-child interactions, both of which limited statistical power. Thus, our findings pertaining to mother-daughter relationships can be considered more robust, whereas the other analyses, pertaining to boys and/or father-child relationships, may have underestimated the real links to gender typicality.

The small sample also precluded the use of the most contemporary conceptualization of gender typicality, namely the cluster approach that combines children's perceived similarity to both gender groups (Martin et al., 2017; Perry et al., 2019). Using this approach, Martin et al. (2017) identified four clusters of gender typicality: (a) own-gender similarity (i.e., children with strong identification to their own gender and lower identification to the other), (b) cross-gender similarity (i.e., strong identification to other gender and low identification to own), (c) both-gender similarity (i.e., strong identification to both genders), and (d) low-gender similarity (i.e., low identification to both genders). Our small sample did not allow us to differentiate these four clusters, given that some would have yielded very small cell sizes. Since each cluster is associated with different socioemotional outcomes (Martin et al., 2017), it is possible that they are also differentially related to quality of parent-child relationships, a hypothesis which we were unable to examine. Although we, as others (Fast & Olson, 2018; Gulgoz et al., 2019; Zosuls et al., 2016), did not differentiate these four clusters, measuring the similarity to both gender groups and controlling for the alternative gender similarity variable in the final analyses allowed us to obtain a finer assessment of children's gender typicality, which constitutes an improvement over previous research that assessed own-gender group similarity only.

All participating families were made of two-parent and heterosexual couples. The gender composition of the parental dyad might have important implications, at least for some aspects of children's gender identity (Bos & Sandfort, 2010; Fedewa, Black, & Ahn, 2015; Sumontha, Farr, & Patterson, 2017). For example, Bos and Sandfort (2010) reported that children of same-sex parents felt less parental pressure to conform to gender stereotypes and held more flexible attitudes about gender; however, these children did not differ from their peers on gender typicality or gender contentedness. To date, though, research on this topic remains meager and thus, the impact of family type on children's gender identity is unclear. Therefore, one should be careful before generalizing the current results to different family types and future studies should include participants from different family types (e.g., same-sex and opposite-sex parents, single-parent families). In addition, it may be relevant to assess parents' beliefs and expectations about gender, given that parents with more stereotyped beliefs might accept less cross-gender behaviors from their child (Leaper, 2014), which could have an effect on the quality of parent-child relationships and child gender development.

Lastly, the design was multi-method and longitudinal, but not cross-lagged nor experimental. Thus, while the finding pertaining to mother-daughter relationships and girls' own-gender similarity is very unlikely to be due to shared method variance and is suggestive of a directional process from mother-daughter relationships to girls' gender typicality, the directionality and causal nature of this link cannot be demonstrated. Since we did not control for gender typicality at T1, we cannot exclude the possibility of reverse causality, such that children's gender typicality might have an impact on their relationships with their parents. For example, a young girl who generally feels and acts in typically feminine ways might draw her mother's positive attention and feel closer to her mother, leading to more emotional proximity

between mother and daughter. It may also be easier for parents to interact with their child if they view him or her as gender typical, especially if the parent has gender-stereotyped beliefs and expectations (Hill & Menvielle, 2009). In fact, these associations are likely part of a transactional process involving reciprocal influences between parents and their children. Further longitudinal research exploring these patterns should provide additional insights into the transactional nature of the association between quality of parent-child relationships and gender development.

In addition to using larger samples to differentiate the four gender typicality clusters, future studies should evaluate more than one dimension of gender identity (membership knowledge, gender contentedness, intergroup bias, felt pressure for gender conformity, and gender typicality), as each may be under different social influences (see Bos & Sandfort, 2010; Menon, 2017; Perry et al., 2019). Research should also go beyond bivariate links and tend toward the examination of more complex developmental models, for instance concerning the links among the quality of parent-child relationships (or other familial influences), child gender typicality, and socioemotional outcomes. Although the bivariate links between these constructs are increasingly documented, the exact nature of their interplay remains unknown. We have conceptualized parent-child relationships as antecedents to child gender typicality, which itself is generally considered a predictor of child socioemotional adjustment in the literature. Consequently, one possibility is that gender typicality may be one of the mediators of the robust links between parent-child relationships and child outcomes. Other models are also plausible though, for instance that parent-child relationships underlie both child gender typicality and socioemotional adjustment, or moderate the links between the two (Menon et al., 2017). It is also possible that the associations between parent-child relationships and child gender typicality are

mediated by child or parental emotional distress. All in all, this is a very young literature still, and much exciting research remains to be conducted.

Conclusion

Despite its limitations, this study contributes to the field of gender identity research by being one of the first to examine some of the antecedents of gender typicality. To our knowledge, this is the first multi-year study to assess the longitudinal links between the quality of parent-child relationships and preadolescents' gender typicality, or to use an observational assessment of parent-child relationships in relation to gender typicality. The findings suggest that girls who have better relationships with their mothers in middle childhood feel more similar to other girls relative to their feelings of similarity to boys four years later in preadolescence. The current study is a first step in understanding the role that parents play in their children's gender typicality development. Many more studies are needed to reach a thorough understanding of the numerous factors influencing children's gender development.

References

Aksan, N., Kochanska, G., & Ortmann, M. R. (2006). Mutually responsive orientation between parents and their young children: Toward methodological advances in the science of relationships. *Developmental Psychology, 42*, 833-848. https://doi.org/10.1037/0012-1649.42.5.833

Andrews, N. C., Martin, C. L., Cook, R. E., Field, R. D., & England, D. E. (2019). Exploring dual gender typicality among young adults in the United States. *International Journal of Behavioral Development, 43*, 314-321. https://doi.org/10.1177/0165025418811125

Andrews, N. C., Martin, C. L., & Gallagher, A. M. (2016). On the association between self-reported own- and other-gender similarity and the use of physical and relational aggression in sixth grade children. *Archives of Sexual Behavior, 45*, 1817-1826. http://dx.doi.org/10.1007/s10508-015-0685-z

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence*, *11*, 56-95. http://dx.doi.org/10.1177/0272431691111004

Bem, S. L. (1993). *The lenses of gender: Transforming the debate on sexual inequality*. New Haven, CT: Yale University Press.

Biringen, Z., Derscheid, D., Vliegen, N., Closson, L., & Easterbrooks, M. A. (2014). Emotional availability (EA): Theoretical background, empirical research using the EA scales, and clinical applications. *Developmental Review, 34*, 114-167. doi: 0.1016/j.dr.2014.01.002

Bos, H., & Sandfort, T. G. (2010). Children's gender identity in lesbian and heterosexual two-parent families. *Sex Roles, 62*, 114-126. Doi: 10.1007/s11199-009-9704-7

Bronte-Tinkew, J., Moore, K. A., & Carrano, J. (2006). The father-child relationship, parenting styles, and adolescent risk behaviors in intact families. *Journal of Family Issues, 27*, 850-881. http://dx.doi.org/10.1177/0192513X05285296

Bugental, D.B., & Goodnow, J.J. (1998). *Socialization processes*. In N. Eisenberg (Ed.), Handbook of child psychology: Social, emotional, and personality development (5th Ed., vol. 3, pp. 389– 462). New York: Wiley.

Cabrera, N. J., Volling, B. L., & Barr, R. (2018). Fathers are parents, too! Widening the lens on parenting for children's development. *Child Development Perspectives, 12*, 152-157. doi:10.1111/ cdep.12275.

Carver, P. R., Yunger, J. L., & Perry, D. G. (2003). Gender identity and adjustment in middle childhood. *Sex Roles*, *49*, 95-109. http://dx.doi.org/10.1023/A:1024423012063

Collins, W. A., & Russell, G. (1991). Mother-child and father-child relationships in middle childhood and adolescence: A developmental analysis. *Developmental Review*, *11*, 99-136. http://dx.doi.org/10.1016/0273-2297(91)90004-8

Cook, R. E., Nielson, M. G., Martin, C. L., & DeLay, D. (2019). Early adolescent gender development: The differential effects of felt pressure from parents, peers, and the self. *Journal of Youth and Adolescence, 48*, 1912–1923. https://doi.org/10.1007/s10964-019-01122-y

Cooper, P. J., Pauletti, R. E., Tobin, D. D., Menon, M., Menon, M., Spatta, B. C.,… Perry, D. G. (2013). Mother-child attachment and gender identity in preadolescence. *Sex Roles*, *69*, 618-631. https://doi.org/10.1007/s11199-013-0310-3

Craig, L., & Mullan, K. (2011). How mothers and fathers share childcare: A cross-national time-use comparison. *American Sociological Review*, *76*, 834-861. http://dx.doi.org/10.1177/0003122411427673

Crouter, A. C., Whiteman, S. D., McHale, S. M., & Osgood, D. W. (2007). Development of gender attitude traditionality across middle childhood and adolescence. *Child Development*, *78*, 911-926. http://dx.doi.org/10.1111/j.1467-8624.2007.01040.x

Durwood, L., McLaughlin, K. A., & Olson, K. R. (2017). Mental health and self-worth in socially transitioned transgender youth. *Journal of the American Academy of Child & Adolescent Psychiatry, 56*, 116–123. http://dx.doi.org/10.1016/j.jaac.2016.10.016

Eagly, A. H., & Wood, W. (2013). The nature–nurture debates: 25 years of challenges in understanding the psychology of gender. *Perspectives on Psychological Science*, *8*, 340-357. http://dx.doi.org/10.1177/1745691613484767

Egan, S. K., & Perry, D. G. (2001). Gender identity: A multidimensional analysis with implications for psychosocial adjustment. *Developmental Psychology*, *37*, 451-463. http://dx.doi.org/10.1037/0012-1649.37.4.451

Endendijk, J. J., Andrews, N. C., England, D. E., & Martin, C. L. (2019). Gender-identity typologies are related to gender-typing, friendships, and social-emotional adjustment in Dutch emerging adults. *International Journal of Behavioral Development, 43*, 322-333. https://doi.org/10.1177/0165025418820686

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Press.

Etzion-Carasso, A., & Oppenheim, D. (2000). Open mother–pre-schooler communication: Relations with early secure attachment. *Attachment and Human Development, 2*, 347–370. doi: 10.1080/14616730010007914

Farrar, M. J., Fasig, L. G., & Welch-Ross, M. K. (1997). Attachment and emotion in autobiographical memory development. *Journal of Experimental Child Psychology, 67*, 389–408. doi: 10.1006/jecp.1997.2414

Fast, A. A., & Olson, K. R. (2018). Gender development in transgender preschool children. *Child development, 89*, 620-637. DOI: 10.1111/cdev.12758

Fedewa, A. L., Black, W. W., & Ahn, S. (2015). Children and adolescents with same-gender parents: A meta-analytic approach in assessing outcomes. *Journal of GLBT Family Studies, 11*, 1-34. http://dx.doi.org/10.1080/1550428X.2013.869486

Feldman, R. (2003). Infant–mother and infant–father synchrony: The coregulation of positive arousal. *Infant Mental Health Journal, 24*, 1–23. http://dx.doi.org/10.1002/imhj.10041

Geyer, C.J. (1992). Practical markov chain monte carlo. *Statistical Science, 7*, 473-483. doi:10.2307/2246094

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*, 549-576. doi:10.1146/annurev.psych.58.110405.085530

Gülgöz, S., Glazier, J. J., Enright, E. A., Alonso, D. J., Durwood, L. J., Fast, A. A., ... & Olson, K. R. (2019). Similarity in transgender and cisgender children's gender development. *Proceedings of the National Academy of Sciences, 116*, 24480-24485.https://doi.org/10.1073/pnas.1909367116

Hill, D. B., & Menvielle, E. (2009). "You have to give them a place where they feel protected and safe and loved": The views of parents who have gender-variant children and adolescents. *Journal of LGBT Youth, 6*, 243-271.

Hines, M. (2014) Gendered development, In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of Child Psychology*, (pp 842-887). New York: Wiley.

Iervolino, A. C., Hines, M., Golombok, S. E., Rust, J., & Plomin, R. (2005). Genetic and environmental influences on sex-typed behavior during the preschool years. *Child Development*, *76*, 826-840. http://dx.doi.org/10.1111/j.1467-8624.2005.00880.x

Jewell, J. A., & Brown, C. S. (2014). Relations among gender typicality, peer relations, and mental health during early adolescence. *Social Development, 23*, 137-156. http://dx.doi.org/10.1111/sode.12042

Knafo, A., Iervolino, A. C., & Plomin, R. (2005). Masculine girls and feminine boys: genetic and environmental contributions to atypical gender development in early childhood. *Journal of Personality and Social Psychology*, *88*, 400-412. http://dx.doi.org/10.1037/0022-3514.88.2.400

Kochanska, G., Aksan, N., Prisco, T. R., & Adams, E. E. (2008). Mother-child and father-child mutually responsive orientation in the first 2 years and children's outcomes at preschool age: Mechanisms of influence. *Child Development, 79*, 30-44. http://dx.doi.org/10.1111/j.1467-8624.2007.01109.x

Kochanska, G., & Murray, K. T. (2000). Mother–child mutually responsive orientation and conscience development: From toddler to early school age. *Child Development, 71*(2), 417-431. http://dx.doi.org/10.1111/1467-8624.00154

Lalonde, G., Bernier, A., Beaudoin, C., Gravel, J., & Beauchamp M. H. (2016). Investigating social functioning after early mild TBI: The quality of parent–child interactions. *Journal of Neuropsychology, 12*, 1-22. http://dx.doi.org/10.1111/jnp.12104

Laranjo, J., Bernier, A., Meins, E., & Carlson, S. M. (2010). Early manifestations of children's theory of mind: The roles of maternal mind-mindedness and infant security of attachment. *Infancy, 15*, 300-323. http://dx.doi.org/10.1111/j.1532-7078.2009.00014.x

Leaper, C., & Friedman, C. K. (2007). The socialization of gender. In J. E. Grusec & P. D. Hastings (Eds), *The handbook of socialization: Theory and research* (pp. 561-587). New York: Guilford.

Leaper, C. (2002). Parenting girls and boys. In M. H. Bornstein (Ed.), *Handbook of parenting: Children and parenting* (2nd ed., Vol. 1, pp. 189–225). Mahwah, NJ: Erlbaum.

Leaper, C. (2014). Parents' socialization of gender in children. *Encyclopedia on Early Childhood Development.* Retrieved from http://www.child-encyclopedia. com/gender-early-socialization/according-experts/parents-socialization-gender-children

Lin, Y.-C., & Billingham, R. E. (2014). Relationship between parenting styles and gender role identity in college students. *Psychological Reports*, 114, 250-271. http://dx.doi.org/10.2466/21.09.PR0.114k13w4

Maccoby, E. E. (1998). *The two sexes: Growing up apart, coming together*. Cambridge, MA: Belknap Press/Harvard University Press.

Martin, C. L., Andrews, N. C., England, D. E., Zosuls, K., & Ruble, D. N. (2017). A dual identity approach for conceptualizing and measuring children's gender identity. *Child Development*, *88*, 167-182. http://dx.doi.org/10.1111/cdev.12568

Martin, C. L., & Fabes, R. A. (2001). The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology, 37*, 431-446. http://dx.doi.org/10.1037/0012-1649.37.3.431

McHale, S. M., Crouter, A. C., & Tucker, C. J. (1999). Family context and gender role socialization in middle childhood: Comparing girls to boys and sisters to brothers. *Child Development*, *70*, 990-1004. http://dx.doi.org/10.1111/1467-8624.00072

McHale, S. M., Crouter, A. C., & Whiteman, S. D. (2003). The family contexts of gender development in childhood and adolescence. *Social Development, 12*, 125-148. http://dx.doi.org/10.1111/1467-9507.00225

McHale, S. M., Kim, J.-Y., Whiteman, S., & Crouter, A. C. (2004). Links between sex-typed time use in middle childhood and gender development in early adolescence. *Developmental Psychology*, *40*, 868-881. doi:10.1037/0012-1649.40.5.868

McHale, S. M., Updegraff, K. A., Helms-Erikson, H., & Crouter, A. C. (2001). Sibling influences on gender development in middle childhood and early adolescence: A longitudinal study. *Developmental Psychology*, *37*, 115-125. http://dx.doi.org/10.1037/0012-1649.37.1.115

Menon, M. (2017). Multidimensional gender identity and gender -typed relationship styles in adolescence. *Sex Roles, 76*, 579-591. http://dx.doi.org/10.1007/s11199-016-0589-y

Menon, M., Menon, M., Cooper, P. J., Pauletti, R. E., Tobin, D. D., Spatta, B. C., . . . Perry, D. G. (2017). Do securely and insecurely attached children derive well-being from different forms of gender identity? *Social Development, 26*, 91-108. http://dx.doi.org/10.1111/sode.12191

Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior, 36*, 38–56. http://dx.doi.org/10.2307/ 2137286

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin, 129*, 674–697. http://dx.doi.org/10.1037/00332909.129.5.674

Nielson, M. G., Schroeder, K. M., Martin, C. L., & Cook, R. E. (2020). Investigating the relation between gender typicality and pressure to conform to gender norms. *Sex Roles.* Advanced online publication. https://doi.org/10.1007/s11199-020-01136-y

Olson, K. R., Durwood, L., DeMeules, M., & McLaughlin, K. A. (2016). Mental health of transgender children who are supported in their identities. *Pediatrics, 137*, 1–8. https://doi.org/10.1542/peds.2015-3223

Olson, K. R., & Enright, E. A. (2018). Do transgender children (gender) stereotype less than their peers and siblings? *Developmental science, 21*, e12606. https://doi.org/10.1111/desc.12606

Pauletti, R. E., Menon, M., Cooper, P. J., Aults, C. D., & Perry, D. G. (2017). Psychological androgyny and children's mental health: A new look with new measures. *Sex Roles, 76*, 705-718. http://dx.doi.org/10.1007/s11199-016-0627-9

Perry, D. G., & Pauletti, R. E. (2011). Gender and adolescent development. *Journal of Research on Adolescence, 21*, 61-74. http://dx.doi.org/10.1111/j.1532-7795.2010.00715.x

Perry, D. G., Pauletti, R. E., & Cooper, P. J. (2019). Gender identity in childhood: A review of the literature. *International Journal of Behavioral Development, 43*, 289-304. https://doi.org/10.1177/0165025418811129

Poulin, F., & Pedersen, S. (2007). Developmental changes in gender composition of friendship networks in adolescent girls and boys. *Developmental Psychology, 43*, 1484–1496. http://dx.doi.org/10.1037/0012-1649.43.6.1484

Ramchandani, P. G., Domoney, J., Sethna, V., Psychogiou, L., Vlachos, H., & Murray, L. (2013). Do early father–infant interactions predict the onset of externalising behaviours in

young children? Findings from a longitudinal cohort study. *Journal of Child Psychology and Psychiatry, 54*, 56-64. http://dx.doi.org/10.1111/j.1469-7610.2012.02583.x

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioural development of girls and boys. *Psychological Bulletin, 132*, 98–131. doi:10.1037/0033-2909.132.1.98

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, 116, 55-74. doi:10.1037/0033-2909.116.1.55

Ruble, D. N., Martin, C. L., & Berenbaum, S. (2006). Gender development. In N. Eisenberg, W. Damon, & R. Lerner (Eds.), *Handbook of child psychology* (pp. 858-932). New York: Wiley.

Rust, J., Golombok, S., Hines, M., Johnston, K., Golding, J., & ALSPAC Study Team. (2000). The role of brothers and sisters in the gender development of preschool children. *Journal of Experimental Child Psychology*, *77*, 292-303. http://dx.doi.org/10.1006/jecp.2000.2596

Schafer, J. L. (1997). *Analysis of incomplete multivariate data*. Thousand Oaks, CA: SAGE.

Schoppe-Sullivan, S. J., Kotila, L. E., Jia, R., Lang, S. N., & Bower, D. J. (2013). Comparisons of levels and predictors of mothers' and fathers' engagement with their preschool-aged children. *Early Child Development and Care, 183*, 498-514. http://dx.doi.org/10.1080/03004430.2012.711596

Smith, D. S., & Juvonen, J. (2017). Do I fit in? Psychosocial ramifications of low gender typicality in early adolescence. *Journal of Adolescence, 60*, 161-170. http://dx.doi.org/10.1016/j.adolescence.2017.07.014

Smith, T. E., & Leaper, C. (2006). Self-perceived gender typicality and the peer context during adolescence. *Journal of Research on Adolescence, 16*, 91-103. http://dx.doi.org/10.1111/j.1532-7795.2006.00123.x

Smith, D. S., Schacter, H. L., Enders, C., & Juvonen, J. (2018). Gender norm salience across middle schools: Contextual variations in associations between gender typicality and socioemotional distress. *Journal of Youth and Adolescence, 47*, 947-960. http://dx.doi.org/10.1007/s10964-017-0732-2

Statistics Canada (2020). *Table 11-10-0012-01 - Distribution of total income by census family type and age of older partner, parent or individual*. https://doi.org/10.25318/1110001201-eng

Sumontha, J., Farr, R. H., & Patterson, C. J. (2017). Children's gender development: Associations with parental sexual orientation, division of labor, and gender ideology. *Psychology of Sexual Orientation and Gender Diversity, 4*, 438-450. http://dx.doi.org/10.1037/sgd0000242

Tabachnick, B. G. & Fidell, L. S., (2013). *Using multivariate statistics* (6th ed). Boston, MA: Pearson.

Tenenbaum, H. R., & Leaper, C. (2002). Are parents' gender schemas related to their children's gender-related cognitions? A meta-analysis. *Developmental Psychology*, *38*, 615-630. http://dx.doi.org/10.1037/0012-1649.38.4.615

Tobin, D. D., Menon, M., Menon, M., Spatta, B. C., Hodges, E. V. E., & Perry, D. G. (2010). The intrapsychics of gender: A model of self-socialization. *Psychological Review, 117*, 601-622. http://dx.doi.org/10.1037/a0018936

Williams, S. K., & Kelly, F. D. (2005). Relationships among involvement, attachment, and behavioral problems in adolescence: Examining father's influence. *The Journal of Early Adolescence, 25*, 168-196. http://dx.doi.org/10.1177/0272431604274178

Yunger, J. L., Carver, P. R., & Perry, D. G. (2004). Does gender identity influence children's psychological well-being? *Developmental Psychology*, *40*, 572-582. http://dx.doi.org/10.1037/0012-1649.40.4.572

Zosuls, K. M., Andrews, N. C., Martin, C. L., England, D. E., & Field, R. D. (2016). Developmental changes in the link between gender typicality and peer victimization and exclusion. *Sex Roles, 75*, 243-256. http://dx.doi.org/10.1007/s11199-016-0608-z

Table 1

Ranges, Means (M), and Standard Deviations (SD) for All Main Variables

	Total		Boys		Girls	
Main variables	Range	*M (SD)*	Range	*M (SD)*	Range	*M (SD)*
Own-gender similarity	1.11 – 5.00	3.60[a] (.14)	1.19 – 5.00	3.60[b] (.21)	1.11 – 5.00	3.60[c] (.18)
Other-gender similarity	1.00 – 4.70	1.85[a] (.10)	1.00 – 4.24	1.62[b,d] (.13)	1.00 – 4.70	2.01[c,d] (.14)
Mother-child interactions	1.56 – 4.68	3.21 (.09)	1.56 – 4.60	3.10 (.14)	1.86 – 4.68	3.27 (.11)
Father-child interactions	1.16 – 5.00	3.12 (.11)	1.20 – 5.00	2.93 (.18)	1.16 – 4.95	3.25 (.15)

[a,b,c,d] Means with the same letter superscript differ significantly from each other ($p < .05$)

Table 2

Zero-Order Correlations for Total Sample

	1	2	3	4	5	6	7	8
1. Child sex	…							
2. Child age	-.06	…						
3. Maternal education	-.07	-.02	…					
4. Paternal education	.03	-.01	.59**	…				
5. Mother-child interactions	.12	-.21	.27*	.23^{t}	…			
6. Father-child interactions	.21	-.01	-.08	.01	.42*	…		
7. Own-gender similarity	.00	.04	.08	.01	.21	.11	…	
8. Other-gender similarity	.26*	.02	-.02	.02	.07	.19	-.14	…

Note. Child sex: 1 = boys, 2 = girls.
$^{t}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

Table 3

Zero-Order Correlations Split by Child Sex

	1	2	3	4	5	6	7
1. Child age	…	-.14	-.07	-.47*	-.13	-.26	-.01
2. Maternal education	.06	…	.63**	.20	-.22	.21	-.09
3. Paternal education	.03	.59**	…	.09	-.27	-.05	-.11
4. Mother-child interactions	.01	.30*	.32^{t}	…	.32	.10	.06
5. Father-child interactions	.11	.02	.14	.47*	…	.15	.08
6. Own-gender similarity	.35	-.03	.05	.33	.09	…	-.23
7. Other-gender similarity	.08	.06	.08	.02	.18	-.08	…

Note. Above the diagonal = boys; below = girls.
$^{t}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

Table 4

Regression Analysis: Parent-child interactions predicting child gender typicality

Models and blocks	β when first entered	β in final model
Predicting own-gender similarity for girls		
1. Other-gender similarity	-.05	-.03
2. Child age	.40 [t]	.41*
Maternal education	-.03	-.22
Paternal education	.04	-.02
3. Mother-child interactions		.52*
Father-child interactions		-.12
R^2	.41	
Predicting other-gender similarity for girls		
1. Own-gender similarity	-.05	-.04
2. Child age	.08	.04
Maternal education	.09	.11
Paternal education	.11	.08
3. Mother-child interactions		-.13
Father-child interactions		.26
R^2	.13	
Predicting own-gender similarity for boys		
1. Other-gender similarity	-.20	-.20
2. Child age	-.25	-.30
Maternal education	.29	.30
Paternal education	-.29	-.27
3. Mother-child interactions		-.12
Father-child interactions		.21
R^2	.29	
Predicting other-gender similarity for boys		
1. Own-gender similarity	-.20	-.26
2. Child age	-.05	.00
Maternal education	.09	.09
Paternal education	-.11	-.09
3. Mother-child interactions		.04
Father-child interactions		.12
R^2	.10	

[t] $p < .10$. [*] $p < .05$.