

Université de Montréal

**Le soutien maternel à l'autonomie : Stabilité et relation
avec le développement des fonctions exécutives à l'âge
préscolaire**

Par

Célia Matte-Gagné

Département de psychologie

Faculté des arts et des sciences

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Résumé

Bien qu'il y ait de plus en plus d'études sur le soutien maternel à l'autonomie, de nombreuses questions restent à éclaircir dans le domaine. Notamment, on en sait très peu sur ses relations avec le développement cognitif de l'enfant, sa stabilité temporelle et les antécédents de celle-ci.

La thèse est composée de trois articles empiriques. Le premier explore le rôle médiateur du langage dans la relation entre le soutien maternel à l'autonomie et les fonctions exécutives de l'enfant. Le deuxième examine la stabilité relative et absolue du soutien maternel à l'autonomie entre la petite enfance et l'âge préscolaire en fonction des représentations d'attachement de la mère, des événements de vie stressants et du sexe de l'enfant. Le troisième article se penche sur le rôle du soutien maternel à l'autonomie mesuré à la petite enfance et à l'âge préscolaire dans la prédiction des fonctions exécutives de l'enfant, ainsi que sur l'impact de différents patrons de stabilité du soutien maternel à l'autonomie sur les fonctions exécutives.

70 dyades mère-enfant ont participé à 5 visites à domicile. Lorsque l'enfant était âgé de 7-8 mois, les représentations d'attachement de la mère ont été mesurées à l'aide de l'entrevue d'attachement à l'âge adulte (George, Kaplan, & Main, 1996). Le soutien maternel à l'autonomie a été mesuré à 15 mois et à 3 ans à l'aide du système de codification de Whipple, Bernier, et Mageau (2011). Les événements de vie stressants ont été mesurés à 3 reprises entre l'âge de 15 mois et 3 ans à l'aide de l'inventaire des expériences de vie (Sarason, Johnson, & Siegel, 1978). À 2 ans, le langage de l'enfant a été évalué à l'aide des inventaires MacArthur du développement de la communication (Dionne, Tremblay, Boivin, Laplante, & Pérusse,

2003). Les fonctions exécutives de l'enfant ont quant à elles été mesurées à l'âge de 3 ans à l'aide d'une batterie de tâches (Carlson, 2005).

Les résultats du premier article indiquent que le langage de l'enfant joue un rôle médiateur dans la relation entre le soutien maternel à l'autonomie et une composante des fonctions exécutives de l'enfant, l'inhibition volontaire. Les résultats du deuxième article démontrent que le soutien maternel à l'autonomie est stable de façon relative, mais non absolue. Les résultats démontrent aussi que les mères qui ont une fille, qui ont vécu peu d'évènements de vie stressants ou qui ont des représentations d'attachement sécurisées sont plus stables dans leur degré de soutien à l'autonomie. Le troisième article démontre d'abord que la moyenne de soutien maternel à l'autonomie entre 15 mois et 3 ans est un prédicteur plus efficace des fonctions exécutives de l'enfant que ne l'est le soutien à l'autonomie à 15 mois ou à 3 ans pris séparément. De plus, les enfants dont les mères conservent un degré élevé de soutien à l'autonomie entre 15 mois et 3 ans performant mieux aux tâches d'inhibition que les enfants dont les mères conservent un faible degré de soutien à l'autonomie.

Les résultats présentés dans les articles sont discutés ainsi que leurs implications.

Mots-Clés : soutien maternel à l'autonomie, stabilité temporelle, fonctions exécutives, langage, sexe de l'enfant, représentations d'attachement, évènements de vie stressants.

Abstract

Despite growing empirical support for the idea that maternal autonomy support plays an important role in child development, many questions remained to be investigated. Especially, little is known about its temporal stability, its antecedents, and its relations with child cognitive development.

The first article aims to examine the potential mediating role of child language in the prospective relation between maternal autonomy support and child executive functioning (EF). The second article aims to examine (a) the relative and absolute stability of maternal autonomy support between infancy and preschool age and (b) the moderating role of child gender, maternal attachment state of mind, and stressful life events. The goal of the third article is to examine the role of early and ongoing maternal autonomy support, and of its stability over time, in predicting child EF.

70 mother-infant dyads took part in five assessments. At 7-8 months, the Adult Attachment Interview (George, Kaplan, & Main, 1996) was administered to assess mothers' state of mind with respect to attachment. Maternal autonomy support was rated at 15 months and 3 years with Whipple, Bernier, and Mageau's (2011) coding scheme, based on observations performed during a mother-child problem-solving task (15 months) and a clean-up task (3 years). Stressful life events were measured at 18 months, 2 and 3 years with the Life Experiences Survey (Sarason, Johnson, & Siegel, 1978) completed by mothers. At 2 years, mothers were asked to complete the MacArthur Communicative Development Inventory (Dionne, Tremblay, Boivin, Laplante, & Pérusse, 2003) to measure child language ability. Finally, child EF was assessed with a battery of tasks chosen based on Carlson's (2005) measurement guidelines.

The results of the first paper suggested that child language played a mediating role in the relation between maternal autonomy support and child performance on EF tasks entailing a strong impulse control component. The results of the second article revealed that maternal autonomy support is stable in relative terms, but that its mean level decreases over time. Moreover, there was significant relative stability only for mothers of girls, mothers who showed greater coherence of mind with respect to attachment, and mothers who experienced fewer stressful life events. The results of the last article showed that the average level of autonomy support displayed by mothers between infancy and preschool years was a more consistent predictor of child Impulse Control and Conflict-EF (two aspects of EF) than either early or current autonomy support in isolation, and that children of mothers who displayed high autonomy support at both 15 months and 3 years performed the best on impulse control.

The results presented in the articles are discussed, along with their implications.

Keywords: maternal autonomy support; stability; executive functions; language; child gender; maternal attachment state of mind; stressful life events.

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Liste des abréviations

AAI	Adult Attachment Interview
CI	Confidence intervals
DCCS	Dimensional Change Card Sort
E	Expérimentateur
EF	Executive functioning
ICC	Intraclass correlation
LES	Life Experiences Survey
MCDI	MacArthur Communicative Development Inventory
POPS	The Perceptions of Parents Scales
SES	Socioeconomic status

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Introduction

L'enfance est une période d'apprentissages accélérés au cours de laquelle les tout-petits vont développer une panoplie d'habiletés qui leur permettront de maîtriser peu à peu leur environnement de façon à devenir autonomes. Selon la théorie de l'autodétermination, le besoin d'autonomie fait partie des besoins psychologiques fondamentaux dont la satisfaction est essentielle à la croissance, au bien-être et au développement optimal. Le besoin d'autonomie fait référence au besoin de sentir que l'on est à l'origine de ses propres comportements, qu'on est l'agent de ses choix et que ceux-ci émanent de ses valeurs et intérêts personnels (Deci & Ryan, 1985). Selon la théorie de l'autodétermination, l'autonomie implique l'appropriation personnelle de l'action que l'on pose mais ne suppose pas nécessairement une indépendance vis-à-vis des influences extérieures (Ryan & Deci, 2006). Ainsi, une action peut être considérée comme autonome même si elle a été influencée par l'environnement, dans la mesure où elle est congruente avec les valeurs de la personne qui la pose.

De plus en plus d'études démontrent que l'autonomie telle que définie par la théorie de l'autodétermination est essentielle au développement et au fonctionnement optimaux des individus (pour une recension des écrits voir : Ryan & Deci, 2011; Ryan, Deci, Grolnick, & LaGuardia, 2006). Les études démontrent entre autres que le sentiment d'autonomie est associé à l'estime de soi et à la santé (Ilardi, Leone, Kasser, & Ryan, 1993), au bien-être (Patrick, Knee, Canevello, & Lonsbary, 2007; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon & Niemiec, 2006), à la performance dans la réalisation de différentes tâches (Utman, 1997) et à la qualité des relations interpersonnelles (Knee, Lonsbary, Canevello, & Patrick,

2005; Patrick et al., 2007). Lorsque l'environnement soutient la satisfaction du besoin d'autonomie d'une personne, il favorise donc son développement.

Soutenir l'autonomie de l'enfant

Durant l'enfance, c'est à travers les interactions avec leurs parents que les enfants vont chercher à satisfaire leur besoin d'autonomie. En permettant ou non la satisfaction de ce besoin fondamental, les parents vont jouer un rôle crucial dans le développement social, affectif et cognitif de l'enfant. Par leurs comportements, les parents peuvent soutenir la satisfaction du besoin d'autonomie de l'enfant et par le fait même, favoriser son bien-être et son développement. Les comportements parentaux qui permettent de satisfaire ce besoin se regroupent sous le terme *soutien parental à l'autonomie*. Ce dernier réfère au degré avec lequel les parents utilisent des techniques éducatives qui encouragent l'enfant à résoudre par lui-même les problèmes, à effectuer ses propres choix et à participer aux décisions. Le soutien parental à l'autonomie s'oppose au contrôle parental, qui réfère à l'utilisation de techniques éducatives visant à exercer une pression externe sur l'enfant afin de contrôler son comportement (Grolnick & Ryan, 1989). Selon la théorie de l'autodétermination, les comportements de soutien à l'autonomie ont pour but de soutenir les valeurs, les intérêts et la volition de l'enfant. À l'opposé, les comportements contrôlants ont pour but d'exercer une pression sur l'enfant pour qu'il pense, se sente ou se comporte d'une certaine façon, en ignorant les besoins ou les sentiments de l'enfant (Mageau & Vallerand, 2003). Lorsque l'enfant est en train d'effectuer une tâche difficile ou désagréable, le contrôle parental peut se manifester par le fait de donner des ordres à l'enfant, de le reprendre, le chicaner ou le punir, de lui donner la réponse ou de faire à sa place. Le soutien à l'autonomie peut, quant à lui, se manifester par des mots d'encouragement, des conseils, et de la rétroaction, mais aussi par le

fait de prendre la perspective de l'enfant, de lui donner des choix, d'attendre qu'il sollicite de l'aide avant d'intervenir, et de lui offrir un rationnel pour effectuer la tâche demandée (Grolnick, Gurland, DeCoursey, & Jacob, 2002; Joussemet, Landry, & Koestner, 2008). Selon la théorie de l'autodétermination, en favorisant la satisfaction du besoin d'autonomie, le soutien parental à l'autonomie tel que défini ci-dessus procure à l'enfant une fondation solide qui facilitera son développement.

Les bénéfices du soutien parental à l'autonomie

Le soutien tel que perçu par l'enfant. Plusieurs études ont été réalisées dans le but d'explorer l'influence du soutien parental à l'autonomie sur différentes sphères du développement de l'enfant. La majorité d'entre elles ont été conduites auprès d'enfants de plus de six ans. Cela peut être expliqué par le fait que les instruments utilisés pour mesurer le soutien à l'autonomie sont pour la plupart des questionnaires qui doivent être remplis par l'enfant. Ce dernier doit donc être capable de lire et d'écrire pour compléter le questionnaire. Grolnick, Ryan et Deci (1991) ont développé le premier questionnaire visant à mesurer la perception que l'enfant a du degré de soutien à l'autonomie que manifestent ses parents : *The Perceptions of Parents Scales* (POPS). Le POPS a été conçu pour les enfants d'âge primaire, mais une version pour les adolescents et les adultes a été développée ultérieurement (Robbins, 1994). À l'aide de ce questionnaire, plusieurs études ont été réalisées dans le but d'explorer l'influence du soutien parental à l'autonomie perçu sur différentes sphères du développement de l'enfant. Grolnick et ses collègues (1991) ont réalisé une étude auprès d'enfants fréquentant l'école primaire portant sur la relation entre le soutien parental à l'autonomie tel que perçu par l'enfant et la performance scolaire. Les résultats de leur étude ont démontré que le soutien parental à l'autonomie perçu est associé positivement au sentiment de compétence et

d'autonomie de l'enfant, qui, à leur tour, prédisent la performance scolaire de l'enfant. Des recherches ont aussi démontré les bienfaits du soutien parental à l'autonomie perçue pour le bien-être psychologique, l'autorégulation, la motivation, l'adaptation et la performance scolaire durant l'adolescence et au début de l'âge adulte (Gagné, 2003; Guay, Ratelle, & Chanal, 2008; Niemiec et al., 2006; Ratelle, Guay, Larose, & Sénécal, 2004; Ratelle, Larose, Guay, & Sénécal, 2005; Robbins, 1994; Soenens & Vansteenkiste, 2005; Vallerand, Fortier, & Guay, 1997; Williams, Cox, Hedberg, & Deci, 2000). Le soutien parental à l'autonomie perçue serait particulièrement bénéfique durant les périodes stressantes telles que la transition de l'école secondaire au collège (Grolnick, Kurowski, Dunlap, & Hevey, 2000; Ratelle et al., 2004; Ratelle et al., 2005).

L'impact du soutien parental à l'autonomie perçue a aussi été étudié auprès d'individus provenant de différentes cultures. Des études réalisées auprès d'étudiants chinois et russes ont entre autres démontré que les étudiants qui perçoivent que leurs parents soutiennent leur besoin d'autonomie ont une meilleure capacité d'auto-régulation, ressentent un plus grand bien-être psychologique et sont plus performants à l'école (Chirkov & Ryan, 2001; Vansteenkiste, Zhou, Lens, & Soenens, 2005). Une étude récente effectuée auprès d'immigrants et de résidents de différentes cultures demeurant au Canada a aussi démontré que le soutien parental à l'autonomie perçue favorise l'intériorisation des valeurs et des normes du pays d'origine ainsi que du pays d'accueil (Downie et al., 2007). Ces études revêtent une importance particulière compte tenu de la controverse entourant l'existence d'un besoin fondamental d'autonomie dans des cultures non-occidentales où l'autonomie n'est pas aussi fortement valorisée. Selon Ryan et Deci (2000), cette controverse peut être en partie attribuable au fait qu'*autonomie* est souvent confondue avec *indépendance* ou *individualisme*.

Tel que mentionné auparavant, l'autonomie implique l'appropriation personnelle de l'action que l'on pose mais ne suppose pas une indépendance vis-à-vis des influences extérieures (Ryan & Deci, 2006). Les études transculturelles soulignent l'importance de soutenir le besoin d'autonomie de l'enfant (tel que défini par la théorie de l'autodétermination) peu importe ses origines culturelles.

Le soutien auto-rapporté. Certains chercheurs se sont plutôt intéressés au degré de soutien à l'autonomie rapporté par le parent lui-même. Grolnick et Ryan (1989) ont développé une entrevue structurée visant à mesurer le soutien parental à l'autonomie dans laquelle les parents doivent décrire ce qu'ils font pour motiver leur enfant à faire différentes tâches domestiques et scolaires et comment ils répondent aux comportements de leur enfant. À l'aide de cette entrevue structurée, Grolnick et Ryan (1989) ont interviewé des parents d'enfants d'âge primaire afin d'examiner la relation entre leurs comportements de soutien à l'autonomie et l'adaptation et la compétence scolaire de leur enfant. Les résultats de cette étude ont démontré que le soutien parental à l'autonomie est inversement associé aux passages à l'acte et aux difficultés d'apprentissage de l'enfant et est positivement associé à sa capacité d'autorégulation, à ses résultats scolaires et à son adaptation scolaire. Joussemet, Koestner, Lekes et Landry (2005) ont réalisé une étude longitudinale auprès de mères d'enfants d'âge scolaire à l'aide d'une entrevue similaire afin d'explorer la relation entre le soutien maternel à l'autonomie et l'adaptation sociale et scolaire de l'enfant. Les résultats de cette étude indiquent que le soutien maternel à l'autonomie mesuré à l'âge de cinq ans est positivement associé à l'adaptation sociale et scolaire rapportée par le professeur ainsi qu'aux résultats scolaires en lecture de l'enfant à l'âge de huit ans.

Le soutien tel qu’observé. Quelques études ont quant à elles mesuré le soutien parental à l’autonomie de façon observationnelle. Parmi ces études, on retrouve celle de Grolnick, Frodi et Bridges (1984). Ces auteurs ont été les premiers à développer un système de codification comportemental du soutien à l’autonomie. Les résultats de leur étude ont démontré que le degré de soutien maternel à l’autonomie observé en laboratoire était davantage associé aux comportements d’exploration de l’enfant âgé d’un an que le degré de soutien maternel à l’autonomie rapporté par la mère elle-même. Frodi, Bridges et Grolnick (1985) ont réalisé une étude comparable huit mois plus tard auprès des mêmes participants. Les résultats ont permis de démontrer que les enfants dont les mères soutiennent leur besoin d’autonomie manifestent plus de persistance et de compétence dans les jeux que les enfants dont les mères sont plus contrôlantes. Cleveland et Reese (2005) ont employé une méthodologie semblable auprès d’enfants âgés de 40 mois. Les résultats de leur étude ont démontré que le soutien maternel à l’autonomie favorise l’échange lors de discussions d’évènements passés, amenant l’enfant à donner davantage de détails sur des situations vécues lorsqu’il était plus jeune. Plus récemment, Whipple, Bernier et Mageau (2011) ont développé un système de codification permettant de mesurer le soutien à l’autonomie à la petite enfance durant une tâche de résolution de problème. Les conclusions des études qui ont utilisé ce système de codification démontrent que le soutien maternel à l’autonomie est associé à la sécurité d’attachement, au sommeil et aux fonctions exécutives de l’enfant d’âge préscolaire (Bernier, Carlson, & Whipple, 2010; Bordeleau, Bernier, & Carrier, 2012; Whipple et al., 2011).

Synthèse

La recherche empirique ne laisse aucun doute à l'effet que le soutien parental à l'autonomie est associé à plusieurs sphères du fonctionnement de l'enfant, et ce, à différents stades de développement, dans différentes cultures et selon différentes méthodes d'évaluation. Toutefois, peu d'études portent sur l'influence du soutien parental à l'autonomie à la petite enfance, en dépit de l'importance maintes fois démontrée des comportements parentaux à l'égard de l'enfant dès ses premières années de vie. De plus, malgré le fait que certaines mesures observationnelles aient été développées, les études dans le domaine ont principalement utilisé des questionnaires de type papier-crayon. Bien que ce type d'instruments permette de mesurer les perceptions que les participants ont de leur environnement, il introduit certains biais, notamment de désirabilité sociale. Les études observationnelles effectuées jusqu'à maintenant ont, pour la plupart, mesuré le soutien parental à l'autonomie et les variables dépendantes de façon concomitante, ce qui soulève de façon aiguë la question de la direction des relations observées. Il serait donc profitable, pour les recherches futures, de maximiser l'utilisation de mesures observationnelles et de devis longitudinaux afin de confirmer le rôle du soutien à l'autonomie.

Les questions qui demeurent

Malgré le nombre croissant d'études sur le soutien à l'autonomie, plusieurs questions restent à explorer. Notamment, bien qu'il y ait de plus en plus d'appuis empiriques à l'idée que le soutien maternel à l'autonomie joue un rôle important dans le développement de l'enfant, les mécanismes par lesquels il exerce son influence demeurent à clarifier.

Le langage en tant que mécanisme. Une étude récente a démontré que le soutien à l'autonomie est le prédicteur le plus important des fonctions exécutives de l'enfant parmi plusieurs autres comportements parentaux (Bernier et al., 2010). Le terme « fonctions

exécutives » réfère à un ensemble de fonctions cognitives supérieures servant au contrôle de la pensée et de l'action. Il s'agit donc d'un « terme parapluie » désignant un ensemble de processus qui sous-tendent le comportement intentionnel visant la réalisation d'un objectif, tels l'inhibition volontaire, la mémoire de travail et la flexibilité attentionnelle (Garon, Bryson, & Smith, 2008; Hughes, 2002; Miyake, Friedman, Emerson, Witzki, & Howerter, 2000; Zelazo, Carter, Reznick, & Frye, 1997). Les fonctions exécutives sont associées à plusieurs sphères du développement ultérieur de l'enfant. Elles sont notamment impliquées dans le développement de la compétence sociale et morale (e.g., Clark, Prior, & Kinsella, 2002; Kochanska, Murray, & Harlan, 2000), la réussite scolaire (Biederman et al., 2004) et la régulation émotionnelle (Carlson & Wang, 2007; Simonds, Kieras, Rueda, & Rothbart, 2007). D'un autre côté, des déficits au niveau des fonctions exécutives sont associés à plusieurs problèmes psychologiques et développementaux tels que les comportements agressifs (Séguin, 2004), le trouble déficitaire de l'attention avec ou sans hyperactivité (Clark et al., 2002) et l'autisme (Pennington & Ozonoff, 1996). L'étude des mécanismes qui mènent au développement des fonctions exécutives constitue donc une importante avenue de recherche. Même si une étude récente a démontré que le soutien à l'autonomie est un prédicteur important des fonctions exécutives (Bernier et al., 2010), les mécanismes par lesquels il exerce une influence sur les fonctions exécutives demeurent à clarifier.

Selon certains auteurs, les comportements parentaux pourraient exercer leur influence sur le développement des fonctions exécutives par le biais du langage (Fernyhough, 2010; Hughes & Ensor, 2009; Lewis & Carpendale, 2009). Les échanges verbaux sont une des premières formes d'interaction à travers lesquelles les parents peuvent transmettre leurs connaissances et leurs stratégies d'apprentissage à leurs enfants. Ces connaissances et

stratégies peuvent être très utiles pour la résolution de problèmes qui sollicitent les fonctions exécutives de l'enfant. En expliquant les règles, en donnant des conseils pratiques et des rationnels ou en guidant verbalement l'enfant dans l'exploration de son environnement, les parents offrent à l'enfant le vocabulaire nécessaire pour médiatiser verbalement son comportement et pour résoudre les problèmes qu'il rencontre (Carlson, 2003; Wood, Bruner, & Ross, 1976). Le langage pourrait donc être un véhicule à travers lequel les comportements parentaux tels que le soutien à l'autonomie exerceraient une influence sur le développement des fonctions exécutives de l'enfant. Le rôle médiateur du langage dans la relation entre le soutien à l'autonomie et les fonctions exécutives demeure toutefois à explorer.

La stabilité du soutien à l'autonomie. En plus de ne pas connaître les mécanismes par lesquels le soutien parental à l'autonomie exerce une influence sur le développement de l'enfant, on en sait encore très peu sur ses propriétés de base, notamment sa stabilité temporelle. À notre connaissance, aucune étude n'a examiné la stabilité du soutien à l'autonomie, les antécédents de celle-ci et ses conséquences pour le développement de l'enfant. Dans la littérature, on distingue deux types de stabilité, la stabilité relative qui fait référence au maintien de la position d'un individu par rapport aux autres personnes de son groupe à travers le temps, et la stabilité absolue qui représente le maintien du niveau absolu d'un construit à travers le temps (i.e., le maintien de la moyenne d'un groupe). Rares sont les études qui examinent les deux types de stabilité en même temps, pourtant le fait de démontrer que les individus maintiennent leur position par rapport aux autres personnes de leur groupe sur un construit ne veut pas dire que la moyenne du groupe sur ce construit demeure stable dans le temps, et inversement. De plus, Holden et Miller (1999) soulignent le fait qu'on en sait encore très peu sur les facteurs susceptibles d'influencer la stabilité des comportements

parentaux. Plus de 30 variables ont été identifiées comme exerçant une influence sur les comportements parentaux, telles que les événements de vie stressants, les représentations d'attachement et le sexe de l'enfant (Holden, 2010), mais peu d'études ont testé leur influence sur la stabilité des comportements parentaux.

Par ailleurs, on ne connaît pas les conséquences de la stabilité du soutien à l'autonomie sur le développement de l'enfant. Tel que mentionné plus tôt, le soutien à l'autonomie est identifié comme l'un des prédicteurs les plus importants des fonctions exécutives de l'enfant. Une étude récente réalisée par Hammond, Müller, Carpendale, Bibok et Liebermann-Finestone (2012) suggère toutefois que la façon dont l'étayage maternel (opérationnalisé comme le soutien à l'autonomie) influence les fonctions exécutives change à travers le temps, et que ces changements peuvent être attribuables à des changements dans l'étayage maternel lui-même. Il serait donc judicieux d'examiner l'impact de la stabilité du soutien maternel à l'autonomie sur les différences individuelles dans les fonctions exécutives de l'enfant afin de mieux comprendre comment son influence se manifeste à travers le temps.

Les objectifs de la thèse

La thèse vise à contribuer à l'avancement des connaissances de trois façons : (1) en explorant les mécanismes par lesquels le soutien maternel à l'autonomie influence les fonctions exécutives de l'enfant, (2) en examinant la stabilité relative et absolue du soutien maternel à l'autonomie et les facteurs associés, (3) en se penchant sur l'influence de la stabilité du soutien maternel à l'autonomie sur les fonctions exécutives de l'enfant. Le premier article de cette thèse explore le rôle médiateur du langage de l'enfant dans la relation entre le soutien maternel à l'autonomie et les fonctions exécutives de l'enfant. Cet article est publié dans le *Journal of Experimental Child Psychology*. Le deuxième article examine la stabilité relative et

absolue du soutien maternel à l'autonomie entre la petite enfance et l'âge préscolaire en fonction des représentations d'attachement de la mère, des événements de vie stressants et du sexe de l'enfant. Cet article est accepté pour publication dans la revue *Social Development*. Le troisième article examine les relations entre les fonctions exécutives de l'enfant et le soutien maternel à l'autonomie mesuré antérieurement (à 15 mois) et de façon concomitante (à 3 ans), ainsi que l'impact de différents patrons de stabilité de soutien à l'autonomie sur les fonctions exécutives. Il sera soumis pour publication après le dépôt de la thèse.

Article 1

Prospective relations between maternal autonomy support and child executive functioning:
Investigating the mediating role of child language ability

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Running head: PARENTING, EXECUTIVE FUNCTIONS AND LANGUAGE

Prospective Relations Between Maternal Autonomy Support and Child Executive
Functioning: Investigating the Mediating Role of Child Language Ability

Célia Matte-Gagné and Annie Bernier

University of Montreal, Canada

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Abstract

Although emerging evidence suggests that parental behavior is related to the development of child executive functioning (EF), the mechanisms through which parenting impacts on child EF have yet to be investigated. The goal of this paper is to examine the potential mediating role of child language in the prospective relation between maternal autonomy support and child EF. 53 mother-infant dyads took part in three home visits, at 15 months, 2 and 3 years, allowing for the assessment of maternal autonomy support (T1), child expressive vocabulary (T2) and child EF (T3). The results suggested that child language played a mediating role in the relation between maternal autonomy support and child performance on EF tasks entailing a strong impulse control component, above and beyond child previous EF and family SES. In contrast, no such mediating role of language was found with EF tasks tapping mostly into working memory and set-shifting. This study thus highlights one pathway through which parenting can affect child executive control.

Keywords: parenting, autonomy support, child language, executive function, mediation, impulse control.

Prospective Relations Between Maternal Autonomy Support and Child Executive
Functioning: Investigating the Mediating Role of Child Language Ability

Initially introduced by clinical neuropsychologists, the notion of executive functioning (EF) has sparked a great deal of interest in developmental psychology in recent years. The term executive functioning refers to a set of higher-order cognitive processes, such as inhibitory control, working memory and set-shifting, which govern goal-directed action (e.g., Garon, Bryson, & Smith, 2008; Hughes & Ensor, 2009). While there is convincing evidence demonstrating that child EF has important implications for several aspects of child functioning, research on the mechanisms that underlie the development of individual differences in EF lags far behind. Several authors recently proposed that social interaction should impact child EF, through the mediating role of child language ability (Fernyhough, 2010; Hughes & Ensor, 2009; Lewis & Carpendale, 2009). While empirical research has begun to confirm the proposed importance of social interaction in child EF development, the potential mediating role of language in this relation has yet to be investigated. Accordingly, the purpose of this report is to examine the mediating role of child language in the longitudinal associations between maternal interactive behavior and child EF.

Structure of Child EF

Although EF is often depicted as a homogeneous construct, several studies have demonstrated that child performance on EF tasks clusters in factors (Garon et al., 2008). Among toddlers and preschoolers, a two-factor structure is often reported (e.g., Bernier, Carlson, & Whipple, 2010; Carlson, Mandell, & Williams, 2004; Carlson & Moses, 2001). The first factor, called “Impulse Control”, refers to children’s ability to delay or suppress an impulsive response (e.g., Kochanska, Murray, Jacques, Koenig, & Vandegest, 1996; Reed, Pien, & Rothbart, 1984).

The second factor, named “Conflict-EF”, consists of children’s ability to respond appropriately in the face of a salient conflicting response option (Carlson & Moses, 2001; Gerstadt, Hong, & Diamond, 1994; Reed et al., 1984). On these “conflict” tasks, the child is not only to suppress a dominant response, but also to provide a novel response that is incompatible with the prepotent one (Carlson & Beck, 2009). Carlson, Moses, and Breton (2002) found that conflict tasks were significantly correlated with working memory capacity whereas impulse control tasks were not, and suggested that conflict tasks involve a combination of inhibition and working memory, while impulse control tasks involve inhibition but relatively low working memory demands. Thus, both EF dimensions are required to govern goal-directed action that permits to solve novel problems, particularly those calling for the inhibition of automatic or established thoughts and responses (Carlson & Beck, 2009).

Relevance of Child EF

Normative variation in these dimensions of EF is reliably related to several aspects of child concurrent and subsequent functioning, for instance social and moral competence (e.g., Clark, Prior, & Kinsella, 2002; Kochanska, Murray, & Harlan, 2000), academic achievement (Biederman et al., 2004; Kinsella et al., 1997), theory of mind (e.g., Carlson et al., 2004; Hughes & Ensor, 2005; 2007; Müller, Zelazo, & Imrisek, 2005) and emotion regulation (Carlson & Wang, 2007; Simonds, Kieras, Rueda, & Rothbart, 2007). In contrast, deficits in EF are associated with several psychological and developmental problems such as aggression (Séguin, 2004), ADHD (Clark et al., 2002) and autism (Pennington & Ozonoff, 1996). The identification of the factors that underlie the development of individual differences in child EF thus constitutes an important target for developmental research.

Antecedents of Child EF

Research into the early development of EF is still in its infancy and consequently, little is currently known on the antecedents and mechanisms that underlie this development. Typically, EF is conceptualized within a psychobiological framework, in which the development of EF is a consequence of prefrontal cortex maturation (Bunge & Zelazo, 2006). However, in light of the increasingly documented impact of environmental input on children's brain development (Chugani et al., 2001; Marshall & Fox, 2004) and the protracted post-natal development of prefrontal areas especially (Duncan, 2001; Paus et al., 1999), some authors have suggested that the study of environmental influences, particularly early parent-child relationships, is likely to be useful in understanding individual differences in children's EF (Carlson, 2003; Fonagy & Target, 2002; Glaser, 2000) and related higher mental functions (Ferryhough, 1996; 2008). Indirect support for the putative role of parent-child relationships in EF development stems from studies that have found parenting to relate to constructs bearing many similarities to some components of EF, labelled for instance as self-regulation (Jennings et al., 2008; Lecuyer & Houck, 2006) or effortful control (Kochanska et al., 2000; Poehlmann et al., 2010), or referring to child performance on cognitive tasks similar to those used to measure EF (Diaz, Neal, & Vachio, 1991). In addition, a very recent body of research is beginning to provide direct support for the idea that parenting plays an important role in the development of child EF per se (e.g., Bernier et al., 2010; Bernier, Carlson, Deschênes, & Matte-Gagné, in press; Bibok, Carpendale, & Müller, 2009; Hughes & Ensor, 2009; Landry, Miller-Loncar, Smith, & Swank, 2002).

More specifically, autonomy support is one aspect of maternal interactive behavior that appears likely to be useful in understanding the development of child EF. Maternal autonomy support refers to parenting behaviors aimed at supporting children's goals, choices, and sense

of volition (Grolnick & Ryan, 1989). One of its central components is scaffolding, which refers to the ways in which parental guidance enables children to achieve levels of problem-solving that they could not reach on their own. Scaffolding offers children age-appropriate problem-solving strategies, and is thus presumed to enhance their motivation for self-regulation by providing them with successful experiences of mastery of the physical world (Carlson, 2003). Autonomy support also consists of taking the child's perspective and respecting his or her rhythm, and ensuring that the child plays an active role in successful completion of the task. One can easily see how this set of behaviors is likely to provide the child with numerous experiences of successful problem-based learning. In fact, maternal scaffolding has been found to be associated with child EF in two independent samples (Bibok et al., 2009; Hughes & Ensor, 2009), and a third study with the current sample when children were younger found that maternal autonomy support was the strongest predictor of child EF among several dimensions of parenting (Bernier et al., 2010). Hence, autonomy support is one aspect of maternal behavior that holds promise for the identification of parenting antecedents of child EF. The mechanisms through which parenting might impact on child EF, however, have yet to be investigated.

Language as a Developmental Mechanism

Based on the theorizing of Luria and Vygotsky, EF researchers have recently proposed that child language is a likely vehicle to account for the relation between family factors, such as parenting, and child EF (Fernyhough, 2010; Hughes & Ensor, 2009; Lewis & Carpendale, 2009). According to Luria (1966) and Vygotsky (1934/1987), language and related symbol systems, learned through social interaction, are central to the process of gaining self-control via higher-order cognitive processes. Verbal exchange is a primary form of interaction through

which adults transmit to the child a rich body of knowledge and strategies that can be used to develop executive control. By explaining rules, providing verbal rationales as part of inductive discipline, and thinking through problems aloud, caregivers supply children with the vocabulary to verbally mediate their behavior and solve problems (Carlson, 2003). As learning progresses, the child's own language comes to serve as his or her primary tool of intellectual adaptation and problem solving. Children with more elaborate verbal skills are better equipped both to understand and internalize adults' rules, rationales, knowledge or problem-solving strategies, and to develop other mental tools such as self-directed speech to manipulate and regulate their own thoughts, emotions and behavior (Valloton & Ayoub, 2011). Verbal skills thus appear likely to play a central role in the transmission of knowledge and the development of self-control strategies for solving problems. These claims are supported by abundant research documenting significant relations between children's expressive or receptive verbal ability at varying ages and their performance on EF tasks entailing different degrees of inhibition, set-shifting, and/or working-memory (e.g., Carlson & Beck, 2009; Carlson & Meltzoff, 2008; Carlson et al., 2004; Fuhs & Day, 2011; Hughes & Ensor, 2005; Jacques & Zelazo, 2005; Landry et al., 2002; Sarsour et al., 2011).

Hence, both theorizing and empirical evidence suggest that children with better verbal skills are more equipped to solve executive problems. Given that such EF-relevant verbal skills are likely to stem in part from parent-child interactions as explained above, there is strong ground to expect child language to act as a developmental mechanism carrying the influence of parent-child interactions on children's EF skills. The potential mediating role of language in the relations between family factors and child EF is supported broadly by research demonstrating that child verbal ability mediates the association between a distal environmental

factor, that is, family socio-economic status, and child EF (e.g., Noble, McCandliss, & Farah, 2007; Noble, Norman, & Farah, 2005). Thus, global family factors that contribute to child EF appear to exert their influence through their impact on child language ability. Whether or not parenting similarly transits through child language in impacting child EF is, however, unknown.

Several authors have suggested that the quality of parent-child relationships plays a formative role in the development of language (Kelly, Morisset, Barnard, Hammond, & Booth, 1996; Meins, 1998; Plomin & Dale, 2000). The theorizing of Bruner (1983) and Vygotsky (1934/1987) stresses that language learning occurs in a sociocultural context in which adults, especially parents, support or scaffold children in the development of cognitive skills (Tamis-LeMonda & Rodriguez, 2008). According to this, children who live in a cognitively stimulating family environment are advantaged in their learning process. Thus, parental behavior that is cognitively stimulating is proposed to provide a structure or a foundation for the development of important cognitive skills such as language. While parental autonomy support has been found to relate to several infant and child outcomes (e.g., Joussemet, Koestner, Lekes, & Landry, 2005; Soenens & Vansteenkiste, 2005; Whipple, Bernier, & Mageau, 2011), it has never been investigated in relation to child language. However, a very large body of literature has demonstrated that parenting behaviors such as sensitivity, mind-mindedness, scaffolding, responsiveness and stimulation are related to child language development (e.g., Hirsh-Pasek & Burchinal, 2006; Landry, Smith, Swank, & Miller-Loncar, 2000; Masur, Flynn, & Eichorst, 2005; Meins, 1998; Raviv, Kessenich, & Morrison, 2004; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Given its documented connections to both parenting behavior and child EF, child language appears to be a promising

candidate to account for the links between maternal autonomy support and child subsequent EF.

The Present Study

The goals of this article are to examine (a) the longitudinal relations between maternal autonomy support, child expressive language and child EF performance, and (b) the potential mediating role of child language ability in the prospective relation between maternal autonomy support and subsequent child EF. In order to decrease shared method variance and hence the probabilities of inflated relations, a longitudinal design with three time points was used. Children's earlier EF performance was also controlled for in testing the hypothesized relations. It was expected that greater maternal autonomy support during mother-infant interactions (15 months) would relate to better child performance on EF tasks at 3 years, controlling for earlier EF, and that this link would be accounted for by the mediating role of child language ability at 2 years of age.

Method

Participants

Fifty-three middle-class mother-infant dyads (34 girls and 19 boys) living in a large Canadian metropolitan area participated in this study. Families were recruited from birth lists provided by the Ministry of Health and Social Services. Criteria for participation were full-term pregnancy and the absence of any known physical or mental disability in the infant. Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average of \$70,000 CDN. Mothers were predominantly Caucasian (86% of the sample) and French-speaking (79% of the sample). They were between 24 and 45 years old ($M = 31.2$).

They had between 10 and 18 years of formal education ($M = 15$) and 55.8 % had a college degree.

Procedure

The dyads took part in three home visits, when children were 15 months (T1; $M = 15.5$, $SD = 1.0$, Range = 13.5-18), 2 years (T2; $M = 26.3$, $SD = 1.1$, Range = 22-28) and 3 years of age (T3; $M = 35.47$, $SD = 1.0$, Range = 35.5-39.0). All visits lasted between 60 and 90 minutes. During the first home visit, mothers were asked to help their children complete two puzzles that were designed to be slightly too difficult for the infants, such that they would require some adult assistance to complete them. This interaction was videotaped and later coded for maternal autonomy-supportive behaviors (see below). At T2, EF tasks described below were administered and mothers were asked to complete the *MacArthur Communicative Development Inventory* to measure child language ability. At T3, most of the visit consisted of the administration of the EF tasks described below, along with other child and dyadic activities not included in this report.

Measures

Maternal autonomy support. Mother-infant dyads were asked to complete a challenging problem-solving task (two puzzles) together when the child was 15 months of age (T1). Following Whipple et al.'s (2011) rating system, maternal behaviors were rated on four Likert scales assessing the extent (1-5) to which the mother (1) intervenes according to the infant's needs and adapts the task to create an optimal challenge (equivalent to scaffolding); (2) encourages her child in the pursuit of the task, gives useful hints and suggestions, and uses a positive tone of voice (verbally-supportive behaviors); (3) takes her child's perspective and demonstrates flexibility in her attempts to keep the child on task; (4) follows her child's pace,

provides the child with the opportunity to make choices, and ensures that the child plays an active role in the completion of the task. Given the inter-correlations between the four scales (ranging from .53 to .87), they were averaged into a total autonomy support score ($\alpha = .88$). A randomly selected 58.3% ($n = 35$) of videotapes were coded independently by two raters. Inter-rater reliability was satisfactory, $ICC = .86$.

Child expressive vocabulary. At T2, mothers completed the *MacArthur Communicative Development Inventory* (MCDI; Fenson et al., 1993), a parental report on children's expressive vocabulary. Parents are asked to identify from a list which words they have heard their child say. Fenson et al. (1994) report excellent reliability indices for the instrument. The original 688-item MCDI was initially validated in French for a Canadian population by Frank, Trudeau, and Poulin-Dubois (1996). Based on these two longer versions, Dionne, Tremblay, Boivin, Laplante, and Pérusse (2003) developed brief 99-item versions for French- and English-speaking Canadian populations. The authors report excellent and equivalent properties for both versions. In the current study, we thus used Dionne et al.'s brief French or English version, according to the language used in the family's home.

Child executive functioning: 2-year assessment (control variables). When children were 2 years of age, the following battery of EF tasks was used. (i) Spin the Pots (Hughes & Ensor, 2005). Children were asked to search for stickers that were hidden in opaque pots, subsequently covered and rotated. Six stickers and eight pots of very different visual appearances were used. (ii) Delay of Gratification (Kochanska et al., 2000). The experimenter placed a present under a transparent cup and asked children to wait until she rang a bell before retrieving it. Four trials were conducted, where children had to wait 5, 10, 15 and 20 seconds. (iii) Shape Stroop (Kochanska et al., 2000). Children were shown three cards, each depicting

one small fruit embedded in a larger one, and asked to point to each of the small fruits in turn (e.g., “Show me the *small* banana”). (iv) Baby Stroop (adapted from Hughes & Ensor, 2005). Children learned a rule for feeding two dolls, feeding the “mommy” doll with a larger spoon and the baby doll with a smaller spoon. As soon as the child clearly understood the rule, it was reversed such that the larger doll had to be fed with the smaller spoon, and vice-versa. These tasks loaded on two factors, with Spin the Pots, Shape Stroop and Baby Stroop loading on a first factor (Conflict-EF), while the four Delay of Gratification trials loaded on a second factor (Impulse Control). Two averaged standardized scores were therefore computed, representing Conflict-EF and Impulse Control (Bernier et al., 2010), and are used here to control for prior child EF performance when predicting 3-year EF.

Child executive functioning: 3-year assessment. The 3-year EF tasks were chosen based on Carlson’s (2005) measurement guidelines with the aim of maximizing detection of individual differences in three dimensions of EF: working memory, inhibitory control and set-shifting. Psychometric research indicates that these tasks provide reliable measurement of individual differences and that these differences are stable across time (Carlson, 2005).

(i) *Delay of Gratification* (Kochanska et al., 2000). The experimenter placed snack treats in a bowl in front of the child and asked him or her to wait 5, 15, 30 and then 45 seconds before taking the treat. Scores consist of the four waiting times.

(ii) *Day/Night* (Gerstad et al., 1994). The experimenter asked the child to say “day” when shown black cards displaying stars and a moon, and to say “night” for white cards displaying a sun. The task consists of 16 trials, yielding the percentage of correct answers as final score.

(iii) *Dimensional Change Card Sort* (DCCS; Zelazo, 2006). Children were introduced to two boxes with target cards (i.e., a red truck and a blue star) affixed to the front. The experimenter presented a series of cards (red and blue trucks and stars) and instructed children to sort cards by shape. After six trials, the rule was changed and the child had to sort the same cards by color. The score consisted of the number of cards correctly sorted on the six post-switch trials.

(iv) *Bear/Dragon* (Reed et al., 1984). The experimenter introduced children to a “nice” bear puppet and a “naughty” dragon puppet. Children were asked to follow the bear’s requests (e.g., touch your nose) but to refrain from following the dragon’s requests. After practice trials, there were 10 test trials, alternating in a pseudo-random order commands by the bear and the dragon. Scores corresponded to the number of correct responses (0-10).

Results

Preliminary Analyses

Table 1 presents descriptive statistics for all main variables used in this study: maternal autonomy support, child expressive vocabulary and 3-year EF task performance. All variables showed satisfactory variability, although scores on the Delay of Gratification trials and the DCCS were negatively skewed.

Reduction of EF data. Table 2 presents the inter-correlations among 3-year EF task scores. These scores were submitted to a principal component analysis, in order to reduce the probability of Type-I errors and compute reliable aggregate estimates. This analysis yielded a two-factor solution (*Eigen* values > 1.0), representing 61.7% of the total variance. These two factors were then submitted to a principal axis rotation (oblimin). Factor loadings for the 15-second Delay (.93), 30-second Delay (.92), 5-second Delay (.81) and 45-second Delay (.65)

trials suggest that the first factor taps impulse control, whereas the second factor appears to represent working memory, set-shifting and inhibitory control (Conflict-EF): Bear/Dragon (.82), Day/Night (.65) and DCCS (.62). No cross loadings (above .35) were observed and the correlation between the two factors was .31. This two-factor structure has been observed in independent samples (e.g., Carlson et al., 2004; Carlson & Moses, 2001) and on the current sample when children were 2 years-old (Bernier et al., 2010). Accordingly, two averaged standardized scores representing Impulse Control and Conflict-EF were computed and used in further analyses. The internal consistency of these composite scores was .86 for Impulse Control and .43 for Conflict-EF (Cronbach's alpha). The correlation between the Impulse Control and Conflict-EF composite scores was $r = .33, p < .05$. We examined the relation between these 3-year EF composite scores and previous child performance on the same EF dimension. The correlations between 2 and 3-year Impulse Control and Conflict-EF were respectively $r = .32, p < .05$ and $r = .34, p < .05$.

Links to socio-demographics. Next, we examined the extent to which socio-demographic variables (child gender and precise age, number of siblings, maternal and paternal age and education, and family income) were related to EF performance at 3 years. Given the high correlations (ranging from .52 to .62) between maternal and paternal education and family income, these three variables were standardized and averaged into a composite index of SES. This SES index was related to both impulse control ($r = .38, p < .01$) and conflict-EF ($r = .41, p < .01$). We thus co-varied family SES when predicting 3-year EF in subsequent regression analyses. No other relations were found between child EF and socio-demographics.

Main Analyses

Correlations. Table 3 presents the zero-order correlations between maternal autonomy support, child expressive vocabulary and the two dimensions of EF at 3 years. All correlations were positive and significant, indicating that higher maternal autonomy support was related to greater child expressive vocabulary, conflict-EF and impulse control. Greater expressive vocabulary was also related to enhanced conflict-EF and impulse control in children.

Regression analyses. In order to verify whether the data were consistent with statistical mediation, we used Baron and Kenny's (1986) procedure. The data were thus submitted to regression equations, controlling for family SES as mentioned above. Mediation models were estimated independently for each EF dimension (impulse control and conflict-EF). The results of the first model, examining the mediating role of child expressive vocabulary in the relation between maternal autonomy support and child impulse control, are presented in Table 4. The first equation revealed that maternal autonomy support was related to child impulse control ($\beta = .29, p < .05$), thus substantiating the first condition for mediation. The second equation (Condition 2) indicated that maternal autonomy support was related to child expressive vocabulary ($\beta = .42, p < .001$). The third equation showed that family SES, child expressive vocabulary and maternal autonomy support jointly accounted for 26.3% of the variance in child impulse control. While expressive vocabulary remained significantly related to impulse control when controlling for autonomy support ($\beta = .40, p < .01$; Condition 3), autonomy support did not relate to impulse control ($\beta = .12, ns$) when controlling for expressive vocabulary (Condition 4). The regression coefficient for maternal autonomy support was thus reduced from $.29$ ($p < .05$; first equation) to $.12$ (ns) when child expressive vocabulary was controlled for (third equation). The data are therefore consistent with Baron and Kenny's requirements for statistical mediation. Sobel's test confirmed that child

expressive vocabulary was a significant mediator of the common variance between maternal autonomy support and child impulse control, $Z = 2.11, p < .05$.

In order to put these relations to a more stringent test accounting for stability in EF performance, a residual score was computed by regressing 3-year impulse control on 2-year impulse control. The residual, representing changes in impulse control performance between 2 and 3 years, was saved and retained as a dependent variable, submitted to the same regression equations as above (except that family SES was not included, as it was not related to the impulse control residual). The results are very similar to those presented above: while expressive vocabulary remained significantly related to the impulse control residual when controlling for autonomy support ($\beta = .39, p < .01$), autonomy support did not relate to the impulse control residual ($\beta = .10, ns$) when controlling for expressive vocabulary. The regression coefficient for maternal autonomy support was reduced from $.29 (p < .05)$ to $.10 (ns)$ when child expressive vocabulary was controlled for. Sobel's test confirmed that child expressive vocabulary was a significant mediator of the relation between maternal autonomy support and improvement in child impulse control between 2 and 3 years ($Z = 2.13, p < .05$). Therefore, these data are also consistent with statistical mediation.

Conflict-EF was submitted to similar regression analyses. In sharp contrast to the results presented above, maternal autonomy support remained significantly related both to 3-year conflict-EF ($\beta = .35, p < .05$), and to the residual score representing improvements in conflict-EF between 2 and 3 years ($\beta = .34, p < .05$), when controlling for child expressive vocabulary. Thus, the data are not consistent with statistical mediation. Furthermore, expressive vocabulary did not relate to conflict-EF ($\beta = .07, ns$) nor to its residual score ($\beta = .14, ns$) when controlling for maternal autonomy support. Hence, child expressive vocabulary

did not explain an additional portion of the variance in child conflict-EF after accounting for maternal autonomy support. Conflict-EF was therefore not considered in subsequent mediation analyses.

Mediation analyses. To formally test our mediation hypotheses, we conducted path analyses using the EQS program. Family SES was not included in these analyses because it was not related to impulse control when accounting for autonomy support in the prior regression analyses. Structural models were fitted independently for 3-year impulse control and the impulse control residual. The two models are presented in Figures 1 and 2. Because the number of estimated parameters equalled the number of free variances and covariances, the models were saturated. Thus, there were no degrees of freedom and the χ^2 tests of fit equalled zero. According to Mackinnon (2008), one can set the direct effect of the independent variable on the dependent variable to zero in order for the χ^2 test to have 1 degree of freedom. This allows for the use of the χ^2 test of significance to examine whether the complete mediation model is an adequate representation of the data. Hence, in order to obtain model fit statistics for the complete mediation models, we omitted the paths between autonomy support and impulse control or the impulse control residual. To evaluate model fit, we relied on the model chi-square (χ^2 ; non-significant p value), the comparative fit index (CFI; $>.90$), the normed fit index (NFI; $>.90$), the standardized root mean square residual (SRMR; $<.10$) and the root mean square error of approximation (RMSEA; $\leq .06$). The full mediation models pertaining to impulse control ($\chi^2(1) = .79, p = .37, CFI = 1.00, NFI = .97, SRMR = .04, RMSEA = .00$) and to the impulse control residual ($\chi^2(1) = .51, p = .37, CFI = 1.00, NFI = .98, SRMR = .03, RMSEA = .00$) both fitted the data very well.

In addition, statistical tests of complete mediation can be conducted by comparing the chi-square statistics of the mediated and non-mediated models linking maternal autonomy support to child impulse control or the impulse control residual (Mackinnon, 2008). Because the non-mediated models were saturated, their χ^2 statistics equalled 0, and therefore the differences between the non-mediated models' and the complete mediation models' χ^2 were equivalent to the model χ^2 for the complete mediation models. Hence, the differences between the χ^2 values of mediated and non-mediated models were 0.79 and 0.51 (for impulse control and the impulse control residual respectively), non-significant with 1 degree of freedom. This indicates that the non-mediated models do not present significantly better fit to the data, and hence that the more parsimonious complete mediation models cannot be rejected. Overall then, the path analysis results support the mediating role of child expressive vocabulary in the relation between maternal autonomy support and child impulse control (accounting or not for stability in impulse control performance).

Resampling method. Because the current small sample size can make the path estimates presented above unstable, we also employed a resampling method known as bias-corrected bootstrapping for testing the mediation models (see Preacher & Hayes, 2008, for detail). Resampling handles small sample sizes better than alternative tests and provides more accurate results than traditional tests in such situations (Dearing & Hamilton, 2006; Mackinnon, 2008; Preacher & Hayes, 2004; 2008; Shrout & Bolger, 2002). Bias-corrected bootstrapping is a nonparametric resampling approach to effect-size estimation and hypothesis testing that is increasingly recommended for mediation. Bootstrapping generates an empirical approximation of the sampling distribution of a statistic by repeated random resampling from the available data, and uses this distribution to calculate p-values and construct confidence

intervals (CI). Bias-corrected bootstrapping supplies superior CI's that are bias-corrected and accelerated. Whenever zero is not contained within the bootstrap CI, one can conclude that the mediation effect is significant.

The bias-corrected bootstrapping method indicated that the indirect effect of maternal autonomy support on child impulse control through language ability was .15 ($SE = .08$), 95% CI = .03 to .39, indicating significant mediation. Likewise, the indirect effect of maternal autonomy support on changes in child impulse control through language ability was .13 ($SE = .08$), 95% CI = .02 to .39. Therefore, consistent with all analyses above, the bootstrapping method supports the mediating role of child language between maternal autonomy support and child impulse control (controlling or not for prior child impulse control performance).

Discussion

The purpose of this study was to examine the mediating role of child language ability in the prospective relation between maternal autonomy support and child EF. It was expected that children who experienced greater maternal autonomy support at 15 months would have better verbal ability at 2 years, explaining their increased EF performance at 3 years. The results lend support to this hypothesis, however only in the case of the impulse control aspect of EF.

The results first suggested that child language mediated the association between maternal autonomy support and child impulse control. This is consistent with the Vygotskian-Lurian approach that stipulates that language, learned through interactions with a more competent social partner, permits humans to control their behavior with the aid of extrinsic stimuli. According to this, children who experience more competent parenting develop more elaborate language skills, which in turn provide them with verbal tools supporting their ability

to inhibit impulsive responses and gain self-control. Consistent with this, we found that children who benefited from greater maternal autonomy support at 15 months had greater verbal expressive ability at 2 years, which explained their increased ability to inhibit impulsive responses at 3 years. Some could argue that language at 2 years of age is simply an early indicator of cognitive development, which would explain its relation to subsequent cognitive performance, that is, EF at 3 years. The fact that findings were the same when controlling for EF performance concurrent to the language assessment (2 years), however, argues against this hypothesis. Hence, the prospective longitudinal design and the focus on growth in EF performance provide confidence in the nature and directionality of the developmental process that is suggested by the current results. Furthermore, given the modest sample size and related risk of unstable results, the replication of findings across traditional and more recently proposed statistical methods is important in suggesting the robustness of the results.

The links between language ability and cognitive control are well established theoretically and empirically (e.g., Carlson, 2003; Cragg & Nation, 2010; Fernyhough, 2010; Fuhs & Day, 2011; Jacques & Zelazo, 2005; Schneider, Lockl, & Fernandez, 2004; Wolfe & Bell, 2004), and research provides some indication of the underlying explanatory mechanisms. In particular, language is thought to be the medium for learning how to regulate one's behavior. Beyond the ability to comprehend verbal directives, language may facilitate reflection and awareness of one's own thoughts and response tendencies, which in turn assist in top-down control (Carlson & Beck, 2009). In a recent study, Carlson and Beck found that child verbal ability, as indexed by receptive vocabulary, was related to the strategies used by children to wait in a delay of gratification task. Children who had relatively low verbal ability were less likely to employ any strategies, exhibited a smaller variety of strategies, and

consequently had greater difficulty waiting the full time of the task. Likewise, earlier studies reported that producing a verbal self-instruction while waiting for a better reward or while refraining to look at an attractive toy led children to greater resistance to temptation than remaining silent (Hartig & Kanfer, 1973; Karniol & Miller, 1981). Hence, verbal skills seem to be critical in the development of language-mediated top-down strategies for the inhibition of impulsive responses, or the “conscious control of action” that defines EF (Zelazo & Müller, 2002). The results of the current study thus suggest that higher-quality parenting enhances the development of child impulse control through the provision of verbal tools allowing the child to inhibit impulsive responses deliberately.

It is worthy of note, however, that this study cannot (and did not aim to) test the Vygotskian-Lurian propositions directly. These propositions rather provide post-hoc explanatory hypotheses for the mediational process found here. Vygotsky (1934/1987) highlighted the mediating role of language in general, and private speech in particular, stressing the importance of self-regulatory private speech for children's performance on cognitive tasks. This is supported by research demonstrating a link between private speech and task performance (Al-Namlah, Fernyhough, & Meins, 2006; Behrend, Rosengren, & Perlmutter, 1992; Fernyhough & Fradley, 2005; Winsler, Diaz, McCarthy, Atencio, & Chabay, 1999). However, the current study relied on maternal reports of children's expressive vocabulary, which are unlikely to capture children's on-line use of private speech to regulate their behavior. Hence, while it is quite plausible that children who are more proficient verbally are better equipped to use self-regulatory private speech during EF tasks, children's on-line behavior during the EF tasks was not tested here. Then, the exact mechanisms through which global language ability supports child EF performance require further investigation.

In contrast to the clear mediation found for impulse control, the analyses with conflict-EF suggested that child language ability does not mediate the association between parenting and child performance on EF tasks with strong working memory or set-shifting requirements. While one might wonder whether this has to do with the lower reliability observed for this EF dimension, this hypothesis appears unlikely given that conflict-EF did show expected relations to both autonomy support and child language. In fact, maternal autonomy support remained significantly related to conflict-EF when controlling for child expressive vocabulary. In line with these results, a study by Noble and colleagues (2007) demonstrated that child language ability mediated the association between family SES and child cognitive control, although not the association between SES and other cognitive processes. Cognitive control was defined as the ability to suppress competing attentional or behavioral responses, and thus refers to processes very similar to those involved in impulse control as assessed here. Taken together, these two studies suggest that the influence of distal and proximal family factors on child EF can transit through child language ability, however mainly for executive functions involving mostly the voluntary inhibition of a prepotent response.

The analyses showed that although child expressive vocabulary at 2 years had direct links to conflict-EF at 3 years, these links did not hold when accounting for prior maternal autonomy support. This suggests that maternal autonomy support may be more relevant for the development of the problem-solving skills involved in conflict-EF than child language ability. This presumably special role of autonomy support seems sensible when considering how it was measured here: we assessed mothers' strategies for helping their children succeed on a task that was too challenging for them. This may have created a context wherein mothers could teach their children problem-solving skills somewhat resembling those later called upon

by the conflict-EF tasks. Therefore, one explanation for the lack of mediation by language is that maternal autonomy support during dyadic problem-solving had a direct, non-mediated influence on the development of those skills required to succeed on conflict-EF tasks. However, future research should also consider other mediating routes, for instance child private speech while performing EF tasks, which was not assessed here. It is conceivable that mothers' autonomy support might relate to their children's private speech used during the conflict-EF tasks, which in turn would support children's EF performance. Such a process from external regulation to self-regulation would be consistent with the Vygotskian-Lurian approach and with studies that have documented the interrelation between maternal scaffolding, child private speech and task performance (Behrend et al., 1992; Winsler, Diaz, & Montero, 1997). Developmental considerations may also be at play. Our impulse control factor involved basic delay of gratification, which can be mediated by simple forms of language, such as that acquired by 2 or 3 years of age. In contrast, Conflict-EF is more complex and involves rule-monitoring and rule-switching, which require more sophisticated self-regulatory language. It is conceivable, then, that the children in the current study had not yet acquired the type of sophisticated private speech likely to support conflict-EF, which would have obscured any linguistic mediation of the relation between maternal autonomy support and conflict-EF. Finally, other promising factors that have been neglected by research include different forms of symbolic mediation like pretense (Carlson & Beck, 2009), and mediation through receptive vocabulary and nonverbal skills like memory and attention, implicated in problem solving. These skills are potential early prerequisites of EF processing, can provide another channel by which children understand and perform task demands, and are

potential mediators of the relation between parenting and child performance on EF tasks entailing strong working memory and set-shifting components.

This study adds to a recent body of research that has begun to investigate social precursors of child EF (Lewis & Carpendale, 2009), and suggests one pathway through which parenting can affect child impulse control. Overall, the results are consistent with recent claims by EF researchers, however only when trying to understand children's capacity to inhibit an impulsive response. The executive skills involved in conflict-EF showed less expected relations to parenting and child language, reiterating that the exact nature of the relation between language and child EF deserves further empirical attention (Zelazo, Müller, Frye, & Markovitch, 2003). Research with larger samples investigating more dimensions of parenting and other aspects of child language (e.g., receptive vocabulary, self-directed speech), following up children over the years, appears necessary to further examine the interrelationships among parenting, child language and EF development at different ages.

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Table 1

Mean, standard deviation (SD) and range for all variables

Variable	Mean	SD	Range
Maternal autonomy support	3.51	1.02	1.50 - 5
Child expressive vocabulary	65.23	21.14	4 - 96
Child EF task performance			
Delay of Gratification			
5 seconds	4.77	0.85	1 - 5
15 seconds	14.13	3.14	1 - 15
30 seconds	27.92	6.25	0 - 30
45 seconds	39.71	13.23	4 - 45
DCCS	5.42	1.24	0 - 6
Day/Night	55.64	33.15	0 - 100
Bear/Dragon	6.64	1.98	4 - 10

Table 2

Zero-order correlations between EF tasks

	Delay of Gratification				DCCS	Day/ Night
	5	15	30	45		
Delay of Gratification						
5 seconds						
15 seconds	.86***					
30 seconds	.53***	.73***				
45 seconds	.32*	.50***	.61***			
DCCS	.11	.24	.20	.31*		
Day/Night	.30*	.25	.30*	.09	.11	
Bear/Dragon	.20	.21	.16	.09	.26	.35**

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

Table 3

Zero-order correlations between maternal autonomy support, child expressive vocabulary and performance on the two EF dimensions at 3 years

	Autonomy Support	Expressive Vocabulary	Conflict-EF	Impulse Control
Autonomy Support	1.00	.45***	.46***	.32*
Expressive Vocabulary		1.00	.37*	.49***
Conflict-EF			1.00	.33*
Impulse Control				1.00

* $p < .05$; *** $p < .001$

Table 4

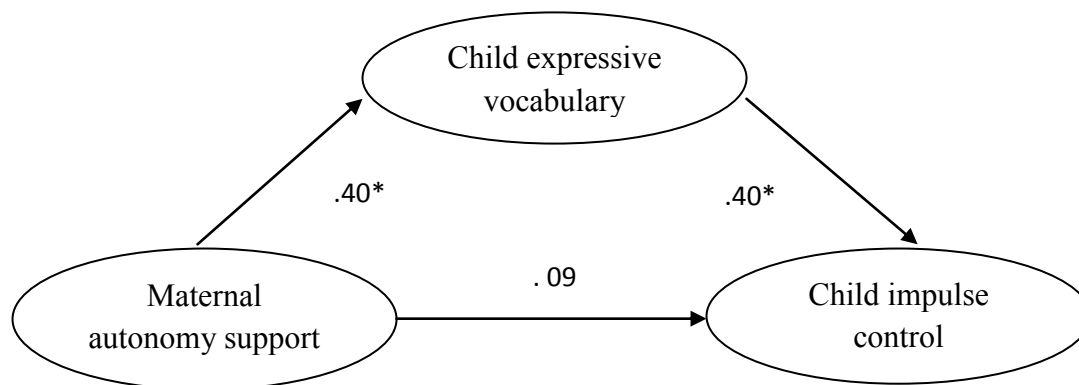
Regression analyses of child expressive vocabulary mediating the relation between maternal autonomy support and child performance on impulse control at 3 years when controlling for SES

Equation	Dependent Variables	Predictors	R ²	β
1.	Impulse Control	SES	14.8%	.22
		Autonomy Support		.29*
2.	Expressive Vocabulary	SES	27.5%	.26*
		Autonomy Support		.42***
3.	Impulse Control	SES	26.3%	.11
		Autonomy Support		.12
		Expressive Vocabulary		.40**

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

Figure 1

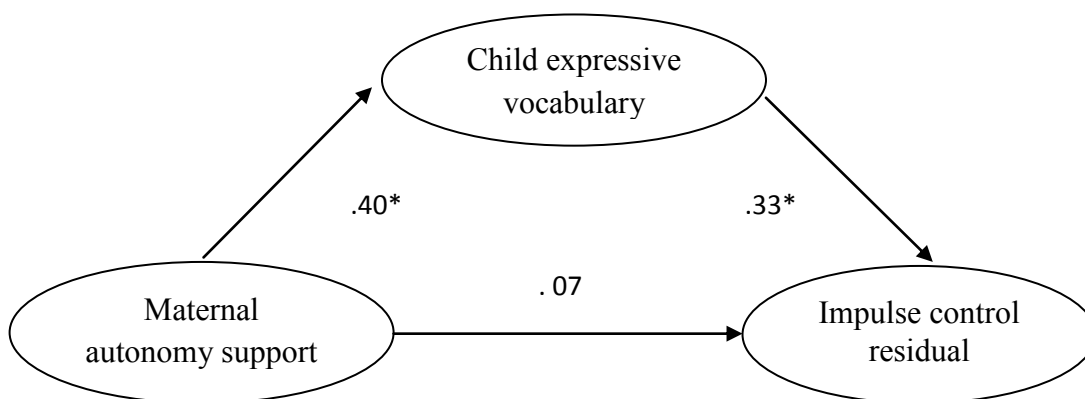
Structural equation modeling results: Mediation model linking maternal autonomy support to child impulse control through child expressive vocabulary



* $p < .05$

Figure 2

Structural equation modeling results: Mediation model linking maternal autonomy support to changes in child impulse control performance between 2 and 3 years through child expressive vocabulary



* $p < .05$

Article 2

Stability of maternal autonomy support between infancy and preschool age

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Running head: STABILITY OF MATERNAL AUTONOMY SUPPORT

Stability of Maternal Autonomy Support between Infancy and Preschool Age

Célia Matte-Gagné, Annie Bernier, and Christine Gagné

University of Montreal, Canada

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Abstract

The goals of this paper were to examine (a) the relative and absolute stability of maternal autonomy support between infancy and preschool age and (b) the moderating role of child gender, maternal attachment state of mind, and stressful life events. 69 mother-child dyads participated in five visits when the child was 8, 15, and 18 months, as well as 2 and 3 years. The results suggested that maternal autonomy support is stable in relative terms, but that its mean level decreases over time. Moreover, there was significant relative stability only for mothers of girls, mothers who showed greater coherence of mind with respect to attachment, and mothers who experienced fewer stressful life events. These results speak to the relevance of investigating parent, child, and contextual factors when examining the conditions that promote or hinder stability in parenting behaviors.

Keywords: stability, autonomy support, adult attachment, stress, child gender

Stability of Maternal Autonomy Support between Infancy and Preschool Age

Studies on the stability of parenting behaviors are necessary to better understand the nature and course of parenting and, in turn, parental influences on child development. In fact, the stability of parenting behaviors is believed to exert an important influence on child development (Bornstein, 2002). Some empirical studies provide support for this idea, reporting that greater stability in parenting behaviors is related to better child outcomes (Beckwith, Rodning, & Cohen, 1992; Landry, Smith, Swank, Assel, & Vellet, 2001) and greater variability to poorer child outcomes (Lindhiem, Bernard, & Dozier, 2010). Despite such evidence that stability in parenting behaviors has important implications for child functioning, much remains to be investigated about stability in parenting (Dallaire & Weinraub, 2005). In particular, it has been highlighted that a thorough understanding of stability in parenting requires that empirical studies examine absolute as well as relative types of stability, and test moderating variables systematically (Holden & Miller, 1999). The present study addresses these questions with respect to maternal autonomy support, a dimension of parenting with documented connections to several aspects of children's social and cognitive functioning (see Joussemet, Landry, & Koestner, 2008 for a review), but whose stability is yet uninvestigated. Using a time span of almost two years of life, the relative and absolute stability of maternal autonomy support was examined, along with the potential roles of child gender, maternal attachment state of mind, and stressful life events in promoting or hindering stability.

Relative and Absolute Stability

When examining behavioral patterns over time, two different types of stability can be measured: relative and absolute stability (Holden & Miller 1999). Relative stability, typically

represented by a test-retest correlation, refers to the consistency of an individual's rank order within a group on some measure. Absolute stability, typically addressed by comparing the mean values of a particular group at two times, refers to consistency in a particular construct's absolute level. Alder and Scher (1994) highlight that determining that individuals display stability relative to each other does not mean that the whole sample does not collectively change over time, and finding that the mean level of a behavior remains stable over time does not indicate that there is no change at the individual level. Therefore, a comprehensive assessment of the stability or change of a construct requires a multifaceted approach considering interindividual (relative) as well as group (absolute) consistency.

Proceeding from this angle, Holden and Miller (1999) concluded from a meta-analysis of over 50 studies that there is moderate relative stability over time in parenting behaviors, but no absolute stability. In other words, parents tend to maintain their position relative to other parents on quantitative indicators of parenting over time, but the amount of particular parenting behaviors tends to change. However, less than one-third of the studies listed in the meta-analysis examined both types of stability and according to Holden and Miller, thorough understanding of parenting stability requires examination of both types. Since publication of this meta-analysis, some studies have followed this recommendation and supported the conclusions of Holden and Miller: parenting behaviors are stable in relative but not absolute terms (e.g., Dallaire & Weinraub, 2005; Forehand & Jones, 2002, Loeber et al., 2000; Shannon, Tamis-LeMonda, & Cabrera, 2006). Mean levels are found to decrease or increase over time, depending on factors such as the exact aspect of parenting under investigation or children's age. In fact, changes in mean levels of parenting behaviors are often explained by developmental change in children. For example, Shannon et al. (2006) explained the change in

fathers' behaviors that they observed between 6 and 16 months by the fact that infants were beginning to communicate verbally by 16 months, and fathers met these changes with increased attentiveness to infants' vocalizations and less attentiveness to nonverbal forms of infant communication. This is consistent with Teti and Huang's (2005) developmental emic approach of parenting competency, which proposes that successful parenting is characterized by adaptation and change as children grow older.

In addition to the need for studies that address both types of stability, Holden and Miller (1999) highlight that little is known of the factors that can promote parenting stability. They underscore that a complete and balanced analysis of parenting stability requires a greater number of studies that systematically examine factors that moderate relative and absolute stability. These were the aims of the present study.

Factors that Can Influence Stability in Parenting Behaviors

The issue of stability in parenting behaviors is directly related to that of the determinants of parenting. Over 30 variables have been shown empirically to influence parenting (Holden, 2010) but research is lacking in documenting the factors that promote stability or change in parenting behaviors (Holden & Hawk, 2003). Following Holden and Miller's (1999) recommendations, we chose to examine whether the relative and absolute stability of parenting differed depending on child gender, maternal attachment state of mind, and the occurrence of stressful life events. These three factors are identified determinants of parenting behaviors, and represent the three types of possible influences on parenting: child, parent, and contextual characteristics (Holden, 2010).

Child gender. A large body of literature has demonstrated that child gender influences parenting in a variety of ways (see Leaper, 2002 for a review). However, according to Holden

and Miller (1999), very few studies computed relative or absolute stability scores separately for boys versus girls. Among studies that did, results are mixed (e.g., Barber, Maughan, & Olsen, 2005; Carrasco, Rodriguez, del Barrio, & Holgado, 2011; Forehand & Jones, 2002; McGue, Elkins, Walden, & Iacono, 2005; McNally, Eisenberg, & Harris, 1991). Inconsistent findings have made it difficult to draw definitive conclusions about the differences in absolute or relative stability of parenting behavior attributable to children's gender (Carrasco et al., 2011). However, when a gender effect is detected, parenting is more stable toward girls than boys.

Maternal attachment state of mind. The nature of internal representations of self and others is also supposed to be a potential agent of stability or change in parenting practices (Holden & Miller, 1999). Previous studies (e.g., Tarabulsky et al., 2005; Whipple, Bernier, & Mageau, 2011a) and meta-analytic data (van IJzendoorn, 1995) converge in suggesting that mothers' attachment state of mind, assessed with the *Adult Attachment Interview* (AAI), possesses a robust capacity to predict maternal behaviors during mother-child interactions. These studies highlight that mothers classified as secure/autonomous (i.e., showing greater coherence of discourse during the interview) are more sensitive and autonomy supportive than mothers showing lower coherence of discourse. If a secure attachment state of mind is associated with greater parenting competency, it may also promote more parenting consistency across time. In line with this, a recent study found that mothers with a secure/autonomous state of mind showed more consistency in their level of maternal sensitivity across multiple assessments (Lindhiem et al., 2010). This finding is in line with the notion that secure attachment working models provide children and adults with a set of stable and well-organized mental structures for the processing of interpersonal information, especially that pertaining to

attachment and caregiving relationships (Bretherton & Munholland, 1999; Main, Kaplan, & Cassidy, 1985). Such stable and organized mental representations could make parents less vulnerable to fluctuations in caregiving behavior due to external factors. Parents' attachment state of mind therefore appears to be a potentially useful factor for understanding stability in parenting behaviors.

Stressful life events. Stressful events have also been suggested to be a potent agent for change in child-rearing practices (Holden & Hawk, 2003). In reaction to life changes such as a divorce or the birth of another child, or contextual changes such as new employment or a move, a parent is susceptible to modify his or her behavior. Changes in life circumstances are often associated with increases in stress, which in turn is suggested to be a potent agent for change (Holden & Miller, 1999). A recent study by Waylen and Stewart-Brown (2009) showed that change in parenting practices was predicted by changes in parental health and socio-economic circumstances. Previous studies have also demonstrated that changes in life circumstances lead to instability in parent-child attachment relationships (e.g., Moss, Cyr, & Dubois-Comtois, 2004; Thompson, Lamb, & Estes, 1982). The impact of life events on the stability of attachment relationships is presumed to occur through their impact on parenting behaviors or the caregiving environment (Waters, Weinfield, & Hamilton, 2000). Stressful life events could therefore impact the stability of parenting behaviors, but this has yet to be investigated.

The Case of Maternal Autonomy Support

The aim of this study was to examine the potential moderating role of child gender, maternal attachment state of mind, and stressful life events on the relative and absolute stability of a particular parenting behavior, namely autonomy support, between infancy and

preschool years. Parental autonomy support refers to parenting behaviors aimed at supporting children's choices, goals, and sense of volition (Grolnick & Ryan, 1989). While children are performing a difficult or unpleasant task, autonomy-supportive behaviors may take the form of encouraging initiative, providing rationale for behavioral requests, recognizing the child's feelings, and offering choices (Joussemet et al., 2008). This set of behaviors has been found to relate to several socio-affective and cognitive outcomes among children (e.g., Joussemet et al., 2008; Leyva, Reese, Grolnick, & Price, 2008; Matte-Gagné & Bernier, 2011; Whipple, Bernier, & Mageau, 2011b), however, its stability has never been investigated.

Based on previous work on other dimensions of parenting (Holden & Miller, 1999), it was expected that maternal autonomy support would show relative but not absolute stability. Changes in mean levels of specific parenting behaviors are often explained by developmental change in children (e.g., Shannon et al., 2006; Teti & Huang, 2005). One can therefore expect that mothers adapt to changes that occur between infancy and preschool years by adjusting their level of autonomy support to their child's developmental needs. At this developmental period, where autonomy and initiative become increasingly salient developmental tasks (Sroufe & Rutter, 1984), mothers could show flexibility and developmental sensitivity by stepping back and offering less support during a structured task, thus giving way to their child's autonomy. Furthermore, one indication of a child's growing autonomy is the ability and willingness to assert him or herself, to say "no" to parents (Crockenberg & Litman, 1990). This new behavioral tendency may be challenging for some parents, making it difficult to remain supportive of children's volition, and perhaps pulling for some controlling behaviors to elicit child compliance (which are often conceptualized as the opposite of autonomy support:

Soenens, Vansteenkiste, & Sierens, 2009). In both cases, a decrease in the mean level of autonomy support could be expected.

The Present Study

The goals of this paper were to examine (a) the relative and absolute stability of maternal autonomy support over a period of almost two years and (b) the potential role of child gender, maternal attachment state of mind and stressful life events on the relative and absolute stability of maternal autonomy support. It was expected that maternal autonomy support would show relative but not absolute stability, such that mean levels of autonomy support would decrease between 15 months and 3 years. Based on previous findings and theory, greater stability of maternal autonomy support was expected for mothers of girls, mothers with a more secure attachment state of mind (i.e., greater coherence of discourse in the AAI), and mothers experiencing fewer stressful life events between the two time points.

Method

Participants

Participants in this study were 69 middle-class mother-child dyads (41 girls and 28 boys) living in a large Canadian metropolitan area (Montreal, Quebec). Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average of \$70,000 CDN. Mothers were predominantly Caucasian (83% of the sample) and French-speaking (81% of the sample). They were between 20 and 45 years old ($M = 30.9$). They had between 10 and 18 years of formal education ($M = 15$) and 58 % had a college degree.

Procedure

The participating dyads were part of a larger sample of 89 families that were recruited from randomly generated birth lists provided by the Quebec Ministry of Health and Social

Services. When children were approximately 6-7 months old, families received a letter describing the project and were then contacted by phone; 39% of contacted families agreed to participate. Criteria for participation were full-term pregnancy and the absence of severe developmental delays. Measures included in this report were collected during five home visits that took place when the child was 7-8 months (T1; $M = 7.5$, $SD = 1.6$, range = 6.0-10.6), 15 months (T2; $M = 15.5$, $SD = .9$, range = 13.5-18.0), 18 months (T3; $M = 18.2$, $SD = 0.9$, range = 16.0-21.0), 2 years (T4; $M = 26.1$ months, $SD = 1.1$, range = 22.0-28.0), and 3 years (T5; $M = 36.9$ months, $SD = .8$, range = 35.5-38.5).

Between recruitment and the 3-year assessment, 20 subjects (22% of the original sample) were lost to attrition (17 said they lacked the time and 3 moved to another city). Only the 69 families who participated in all assessments were included in the current study. This sample did not differ from the original one on any socio-demographic or background measures. All home visits lasted between 60 and 90 minutes and were performed by trained graduate students. Incoming research assistants first observed several visits performed by an experienced graduate student, and when deemed ready to lead home visits, were accompanied and given feedback by an experienced student for the next few visits. They then became autonomous home visitors.

During the first home visit, the AAI (George, Kaplan, & Main, 1996) was administered to assess mothers' state of mind with respect to attachment, and mothers were asked to complete a questionnaire to provide socio-demographic information such as their level of education and their family income. At T2, mothers were asked to help their children complete two puzzles that were designed to be slightly too difficult for the infants, such that they would require some adult assistance. This interaction was videotaped and later coded for maternal

autonomy-supportive behaviors (see below). At T3, T4, and T5, mothers were asked to complete the Life Experiences Survey (Sarason, Johnson, & Siegel, 1978). At T5, mothers were asked to help their children complete a clean-up task that necessitated some adult assistance, allowing for the second assessment of maternal autonomy support (see below).

Measures

Maternal attachment state of mind. The AAI (George et al., 1996; French version by Larose & Bernier, 2001) was administered to assess mothers' state of mind with respect to attachment when infants were 7-8 months of age. The AAI is a semi-structured interview pertaining to participants' childhood attachment experiences. Mothers were asked to describe their relationships with their parents when they were young, to recount specific childhood memories to support their descriptions, and to reflect upon the ways in which their childhood attachment experiences might have influenced their development, their personality, or their parenting. The original version of the AAI shows excellent reliability, discriminant validity, stability, and predictive validity (Bakermans-Kranenburg & Van IJzendoorn, 1993; Crowell et al., 1996; Sagi et al., 1994 - see Hesse, 2008). The French version has been found to relate in theoretically-consistent ways to several outcomes such as child security of attachment, maternal sensitivity, and personal adjustment (e.g., Bernier, Larose, Boivin, & Soucy, 2004; Bernier & Matte-Gagné, 2011; Whipple et al., 2011a).

Interviews were audio taped, transcribed verbatim, and rated according to Main and Goldwyn's (1998) classification system. The participants' relationship with each parent was rated on five 9-point scales: Love, Rejection, Role-Reversal, Pressure to Achieve and Neglect. Their state of mind with regards to these experiences was rated next on nine scales: Idealization, Lack of Recall, Anger, Derogation, Metacognitive Monitoring, Passivity, Fear of

Loss, Coherence of Transcript, and Coherence of Mind. Given recent psychometric work suggesting that a continuous approach is more coherent with the underlying structure of individual differences in attachment (e.g., Fraley & Spieker, 2003; Roisman, Fraley, & Belsky, 2007), we chose to use a continuous variable to operationalize attachment state of mind. The choice of a quantitative indicator was based on both theoretical claims (Main & Goldwyn, 1998; Main, Hesse, & Goldwyn, 2008) and meta-analytic work (Van IJzendoorn, 1995) suggesting that coherence of discourse in the AAI reflects the core of an individual's attachment state of mind, as it is the single most powerful predictor of infant attachment security. AAI coherence has also been found to relate to the quality of maternal behavior during mother-child interactions (Bernier & Matte-Gagné, 2011; Biringen et al., 2000). Accordingly, we selected the coherence of mind subscale of the AAI as an indicator of mothers' attachment state of mind. The coherence of mind subscale refers to the degree to which interviewees discuss and evaluate their attachment-related experiences in a reasonably consistent, clear, and relevant manner (Hesse, 2008). Higher scores are given to participants who provide specific and appropriate examples to support their global descriptions of their attachment experiences.

AAI data were not available for four participants due to technical difficulties with the recording equipment. Analyses pertaining to attachment state of mind are therefore run on 65 participants. Twenty-one (32.8%) of the transcripts were independently coded by a second rater. Both raters were certified as reliable with Main and Hesse. Intra-class correlation (*ICC*) between the two coders' scores for this scale was .86.

Maternal autonomy support at 15 months. Mother-infant dyads were asked to complete a challenging problem-solving task together when the child was 15 months of age

(T2). The task consisted of completing two puzzles of different levels of difficulty. Following Whipple et al.'s (2011a) rating system, maternal behaviors were rated for each puzzle on four Likert scales assessing the extent (1-5) to which the mother (1) encourages her child in the pursuit of the task, gives positive feedback, and uses a positive tone of voice; (2) takes her child's perspective and demonstrates flexibility in her attempts to keep the child on task; (3) follows her child's pace, provides the child with the opportunity to make choices, and ensures that the child plays an active role in the completion of the task; (4) intervenes according to the infant's needs, adapts the task to create an optimal challenge and minimizes the use of controlling techniques. A high score of autonomy support requires that mothers *adjust* their behaviors according to child needs, abilities, rhythm, and emotional state. Therefore, although the measure focuses on maternal behavior, child behaviors and reactions are considered in the rating. Given the inter-correlations between the four scales (ranging from .46 to .90), they were averaged into a total autonomy support score for each puzzle. The average score for the two puzzles was used in all analyses ($\alpha = .89$). A randomly selected 58% ($n = 40$) of videotapes were coded independently by two raters. Inter-rater reliability was satisfactory, $ICC = .86$.

Prior research has found that this measure of maternal autonomy support is associated with theoretically-related outcomes such as maternal attachment state of mind and maternal sensitivity, as well as child security of attachment, verbal ability, and executive functioning (Bernier et al., 2010; Matte-Gagné et al., 2011; Whipple et al., 2011a, 2011b).

Maternal autonomy support at 3 years. Mother-infant dyads were asked to complete a clean-up task together when the child was 3 years of age (T5). Following a 10-minute free-play sequence using blocks of seven different colors, mothers were asked to have their child

pick up and sort the blocks by color in different bags (i.e., all green blocks in one bag, all red blocks in a different bag, etc.). This task necessitates some adult assistance and is considered as not inherently enjoyable (Joussemet et al., 2008). Mothers need to motivate their children to clean up and help them sort blocks by color in different bags (e.g., recognize the colors and find the right bag). Such “do” contexts, in which the mother requests that her child sustain unpleasant activities such as clean-up, are thought to be particularly relevant for measuring maternal autonomy support (Joussemet et al., 2008; Whipple et al., 2011b). These contexts are used for measuring many proxies of maternal autonomy support such as guidance, control strategies, and scaffolding (Grunzeweig, Stack, Serbin, Ledingham, & Schwartzman, 2009; Kochanska, Coy, & Murray, 2001; Taylor, Donovan, Miles, & Leavitt, 2009).

Using an adaptation of Whipple et al.’s (2011a) rating system, maternal behaviors were rated on four Likert scales (1-5). The first three scales are the same as those used at 15 months (above). The fourth scale assesses the extent to which the mother intervenes according to the child’s needs in using different motivational strategies (provides help, gives rationale, makes the task fun by turning it into a game or singing an accompanying song) and minimizes the use of controlling strategies (giving orders, using punishments or physical restrictions). Given the inter-correlations between the four scales (ranging from .41 to .72), they were averaged into a total autonomy support score ($\alpha = .84$). A randomly selected 60.9% ($n = 42$) of videotapes were coded independently by two raters. Inter-rater reliability was satisfactory, $ICC = .93$.

Stressful life events between 15 months and 3 years. Mothers were asked to complete an adaptation of the Life Experiences Survey (LES; Sarason et al., 1978) at T3, T4, and T5. This inventory includes 16 possible life events likely to have a stressful impact on the family such as parental separation, hospitalization or death of a significant person, newborn in

the family, or parental job loss. Mothers were asked to indicate which of these events were experienced by the family since our last visit with them. They were also asked if any other events not included in the instrument had happened, which they felt were stressful for them or their family. The total score corresponds to the number of stressful events experienced in the family between 15 months and 3 years, obtained by summing up the number of events endorsed by mothers at T3, T4, and T5. The LES shows good test–retest reliability and significant associations with stress-related dependent variables (Sarason et al., 1978).

Results

Preliminary Analyses

Table 1 presents descriptive statistics for all continuous variables used in this study: maternal autonomy support at 15 months and 3 years, stressful life events, and maternal coherence of mind. All variables showed satisfactory variability. Univariate values of kurtosis and skewness were adequate, with values ranging from $-.91$ to $+.38$, with a mean skewness of $-.02$ and a mean kurtosis of $-.72$.

We also examined the extent to which socio-demographic variables (child precise age, number of siblings, maternal and paternal age and education, and family income) were related to maternal autonomy support. Given the high correlations (ranging from $.52$ to $.62$) between maternal and paternal education and family income, these three variables were standardized and averaged into a composite index of SES. This SES index was related to maternal autonomy support at both 15 months ($r = .26, p < .05$) and 3 years ($r = .22, p < .05$). We thus co-varied family SES in subsequent analyses. No other relations were found between either assessment of maternal autonomy support and socio-demographics.

Main Analyses

Relative stability of maternal autonomy support. Table 2 presents the zero-order correlations between all study variables. The correlation between the two assessments of autonomy support was moderate, $r = .41, p < .001$, indicating that mothers' rank orders on autonomy support assessments remained moderately stable between 15 months and 3 years.

The hypothesis that the relative stability of maternal autonomy support varies according to child gender, stressful life events, and maternal coherence of mind is statistically equivalent to the hypothesis that these three factors moderate the relation between the two assessments of autonomy support. We thus followed Dearing and Hamilton's (2006) recommendations to test whether each of these three factors, in turn, interacted with 15-month autonomy support in predicting autonomy support at 3 years. The variables were first centered, and submitted to three distinct hierarchical regression equations. In the first block, we entered family SES (control variable). In the second block, we entered maternal autonomy support at 15 months and the potential moderator (i.e., child gender, stressful life events or coherence of mind). In the third block, the interaction term between maternal autonomy support at 15 months and the moderator was entered. Following the procedure of Preacher, Curran, and Bauer (2006), significant interactions were decomposed and then graphed by computing predicted values of maternal autonomy support at 3 years according to maternal autonomy support at 15 months for each level of the dichotomous moderator (i.e., gender) or at high (+ 1 SD) and low (- 1SD) values of continuous moderators (i.e., stressful life events and coherence of mind).

The regression equations revealed that all potential moderators interacted significantly or marginally with maternal autonomy support at 15 months in the prediction of maternal autonomy support at 3 years (see Table 3). First, there was a significant interaction between

maternal autonomy support and child gender ($\beta = 0.85, p < .05$). Post-hoc analyses, presented in Figure 1a, indicated that maternal autonomy support showed relative stability between 15 months and 3 years among mothers of girls ($\beta = 0.60, p < .001$), but not mothers of boys ($\beta = 0.07, ns$).

The analyses also revealed a moderating effect of stressful life events ($\beta = -0.31, p < .01$) on the relative stability of maternal autonomy support. Post-hoc analyses (Figure 1b) indicated that the association between the two assessments of autonomy support was significant only for mothers who experienced relatively fewer stressful events between the 15-month and the 3-year assessments ($\beta = 0.64, p < .001$). In contrast, autonomy support did not show relative stability among mothers who experienced a greater number of stressful life events ($\beta = -0.06, ns$).

Lastly, the analyses pointed to a trend-level interaction effect with maternal coherence of mind ($\beta = 0.22, p = .06$). Post-hoc analyses (see Figure 1c) showed that the association between maternal autonomy support at 15 months and at 3 years was significant for mothers who showed greater coherence of mind ($\beta = 0.60, p < .001$), although not for mothers showing lower coherence of mind ($\beta = 0.16, ns$).

Absolute stability of maternal autonomy support. A paired *t*-test was conducted to examine mean differences between the 15-month and 3-year assessments of maternal autonomy support. This test revealed that there was a significant difference in mean levels of maternal autonomy support between the two assessments ($t = 5.79, p < .001, \eta^2 = .33$), thereby indicating absence of absolute stability. Mothers' mean levels of autonomy support was significantly lower at 3 years ($M = 2.78$) than at 15 months ($M = 3.56$).

In order to examine the potential role of child gender, stressful life events, and maternal state of mind on the absolute stability of maternal autonomy support, mixed ANCOVAs were performed. All potential moderating variables thus needed to be categorical and therefore, maternal coherence of mind and number of stressful life events had to be dichotomized. We divided participants into two groups with a median-split for coherence of mind and number of life events (group 1: participants with values below or at the median, group 2: participants with values above the median). Group sizes as well as means and standard deviations at each assessment are presented in Table 4. These data were submitted to a series of three 2 (assessment point, within-subject) x 2 (groups of each moderator, between-subject) mixed design ANCOVAs controlling for family SES (one ANCOVA per potential moderator). In line with the *t*-test presented above, the analyses revealed a significant time effect, such that mean levels of maternal autonomy support decreased significantly between 15 months and 3 years, $F(1,67) = 32.06, p < .001$. This main effect was not qualified by any interaction effect with child gender, stressful life events or maternal state of mind, which also did not have main effects on autonomy support overall.

Discussion

The purpose of this study was to examine the relative and absolute stability of maternal autonomy support between infancy and early preschool age, and the moderating role of child gender, stressful life events, and maternal attachment state of mind. The results suggested that maternal autonomy support shows relative but not absolute stability across time and that child gender, stressful life events, and maternal coherence of mind with respect to attachment moderate the relative but not the absolute stability of maternal autonomy support.

Relative and Absolute Stability

Consistent with Holden and Miller's (1999) meta-analytic findings, this study first found that maternal autonomy support is stable in relative but not in absolute terms. Individual differences appear to be moderately stable across time, suggesting that mothers maintained their position relative to other mothers on autonomy support measures (to a moderate degree, $r = .41$), but the mean level of the group decreased significantly. The effect size of the relation between the two assessments is consistent with Holden and Miller's estimated effect sizes based on previous studies assessing the stability of parenting behaviors in toddlerhood (.44), based on assessment sequences of less than 30 minutes (.41), and across a time period of more than 12 months (.46).

With respect to the absence of absolute stability, the decrease in autonomy support could reflect flexibility and effective parenting, or rather be a sign of instability and decrease in parenting competency. On the one hand, the mere fact that a 3 year-old child is more autonomous and needs less support than a 15 month-old infant could partly explain the decrease in maternal autonomy support. In this age period where autonomy becomes an important developmental task (Sroufe & Rutter, 1984), mothers could show flexibility by stepping back and offering their children less support. On the other hand, children's struggle for autonomy in this period may be challenging for some parents, making it difficult to remain supportive. The task of parenting becomes more complicated as the child moves out of infancy (Teti & Huang, 2005). Parents must adapt to the increasingly sophisticated skills and broader behavioral repertoire of their preschooler, while socializing the child to control impulses and internalize standards of conduct. Parents of preschoolers become more concerned with discipline and control than they did when their children were infants, while at the same time striving to maintain positive relationships with their children (Teti & Huang, 2005). It may be

difficult for parents to cope effectively with the increasing challenges brought to bear by a developmentally more complex and demanding child. Then, the specific timing of this transition from infancy to preschool could explain the decrease in the level of autonomy support observed here.

The difference in the mean level of autonomy support across ages could also be attributable to the different nature of the tasks. At 15 months, maternal autonomy support was measured during a problem-solving task and at 3 years, during a clean-up task. Children's autonomy could be easier to support during the first task, which is more stimulating and interesting (puzzles), than in the second task. One of the challenges inherent to a clean-up task is that it is not inherently enjoyable to most children, thereby representing a regulatory challenge (Kochanska & Aksan, 1995). The clean-up situation may lead to more mother-child conflicts and maternal controlling behaviors aimed at eliciting compliance, and hence fewer opportunities for maternal autonomy-supportive behaviors. In fact, research indicates that child noncompliance during clean-up tasks is a strong elicitor of maternal negative control (Campbell, 1991). Hence, the task used at 3 years appears more likely to generate maternal control (and hence lower maternal autonomy support) than the problem-solving task used at 15 months. Was the lower level of autonomy support at 3 years the result of a decrease in maternal support over time in response to developmental changes in the child or the result of a different situational demand? Only a cross-lagged design entailing assessments of maternal autonomy support in both contexts and at both ages, while controlling for child compliance in each context, could allow one to isolate the relative contributions of context and age in the decline in mean levels of autonomy support that was observed in this study. Using

comparable, developmentally-appropriate tasks and situational demands may help to isolate the time effect.

Despite the different contexts used, this study replicated meta-analytic results by finding moderate relative stability in maternal autonomy support across time, suggesting that the use of different contexts did not blur the expected phenomenon. The results indicated that the group decline proceeds in an orderly and predictable manner: while mothers' scores decrease across time, mothers tend to maintain their position relative to the group. As Holden and Miller (1999) highlighted, an analysis of interindividual consistency, centered on the relative placement of an individual within a group, better takes into account developmental change in the child than an analysis of mean level differences. If the time span between two assessments is long enough, it is unrealistic to expect the same behavioral manifestation of a particular construct. Parents must modify their behavior in response to contextual circumstances and ontogenetic changes in their children. Consequently, at certain ages where developmental change in the child is marked, measures of interindividual consistency may represent a more appropriate approach for assessing stability in parenting behaviors and absolute stability may be less relevant when examining a similar construct across developmental periods.

Moderators of Relative Stability

Another set of findings of this study was the identification of three factors that moderate the relative stability of maternal autonomy support: child gender, maternal attachment state of mind, and stressful life events.

Gender. This study suggested that child gender was a significant moderator of the relation between maternal autonomy support at 15 months and 3 years, which was relatively

stable for mothers of girls, but not for mothers of boys. This is consistent with the fact that when a gender effect was detected in previous studies, parenting behaviors were more stable toward girls than boys (Carrasco et al., 2011; Forehand & Jones, 2002; McNally et al., 1991). A large body of literature has demonstrated that child gender influences the caregiving environment in several ways (Leaper, 2002). This influence depends on the particular parenting behavior under investigation, children's developmental level, and the developmental and behavioral differences between boys and girls at this period. The present findings suggest that boys elicit less stability than girls in their mothers' autonomy-supportive behaviors between infancy and preschool age. Boys tend to be higher than girls in negative emotionality during infancy and have more difficulty regulating their emotions (Leaper, 2002). Previous studies also showed the emergence of gender differences in the amount of oppositional-defiant behaviors between 29 and 41 months of age, with boys being more likely to start and girls being more likely to stop exhibiting these behaviors during this period (Baillargeon, Sward, Keenan, & Cao, 2011). Additionally, a recent meta-analysis examining gender differences in temperament traits found that girls demonstrated increased inhibitory control and greater ability to regulate their attention (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Owing to these gender differences, mothers of girls may experience less parenting stress during this period than mothers of boys, and thereby may exhibit more parenting stability.

Maternal attachment state of mind. The current study also showed that maternal coherence of mind with respect to attachment is a marginally significant moderator of the relative stability of maternal autonomy support. The association between maternal autonomy support at 15 months and 3 years was found to be significant for mothers who showed greater coherence of mind in the AAI, but not for mothers with lower coherence of mind. This finding

is in line with the notion that secure attachment working models lead to stable and organized mental representations of close relationships (Bretherton & Munholland, 1999; Main et al., 1985) that could make parents less vulnerable to fluctuations in caregiving behavior. These results are also consistent with those of a recent study, which found that mothers with a secure/autonomous state of mind (i.e., presenting higher coherence of mind in the AAI) showed lower within-person variability in maternal sensitivity across 10 weeks (Lindhiem et al., 2010). Taken together, the findings of these two studies suggest that a secure attachment state of mind may promote not only more competent parenting, as observed in numerous studies (see Whipple et al., 2011b for a review), but also protect against short-term and longer-term inconsistency in parenting. Given the documented benefits of parenting stability for child functioning, this suggests one more avenue through which a parental secure attachment state of mind can promote healthy child development.

Stressful life events. The present results also suggest that stressful life events play a moderating role in the relative stability of maternal autonomy support. In demonstrating that mothers who experienced a greater number of stressful life events were not stable in their autonomy-supportive behaviors, the present study complements previous research that found that changes in parental health and socio-economic circumstances were related to change in parenting practices (Waylen & Stewart-Brown, 2009) and that changes in life circumstances led to instability in the quality of attachment relationships (e.g., Moss et al., 2004; Thompson et al., 1982).

Moderators of Absolute Stability

Finally, this study found that child gender, stressful life events, and maternal coherence of mind with respect to attachment do not bear on the absolute stability of maternal autonomy

support. Given the paucity of previous research identifying factors responsible for instability in mean levels of parenting behaviors, further research is needed to better understand the process underlying the decrease in maternal autonomy support observed here, and whether it is more marked among some parents. Factors such as the child's level of autonomy should be examined, along with other contextual or parental characteristics. Different developmental stages should be examined as well, with the aim of understanding whether the mean decline observed here is specific to the infancy-preschool period.

Limitations

This study presents methodological limitations that require consideration. First, the modest sample size represents a limit to statistical power and generalizability, and it will be important to replicate the current findings with larger samples. The replication in different cultures and in low-income or at-risk samples would also be rich theoretically. Furthermore, only gender was considered as element of the "child effect", and future studies should extend to other characteristics of children such as temperament, autonomy and attachment security. Other environmental and parental variables such as parent mental health or social support need to be considered to better understand parental and contextual effects on the stability of parenting behaviors. Moreover, as mentioned above, using comparable, developmentally-appropriate tasks and situational demands for assessing parenting behaviors would be necessary to isolate the effect of time. Finally, further studies examining stability and moderation effects with other dimensions of parenting behavior, across longer delays, other developmental periods and using different measurement contexts appear necessary to further the understanding of the mechanisms underlying the stability of parenting and the conditions that favor or hinder it.

Implications

Studies on the stability of parenting behaviors are necessary to better understand the nature of parenting and parental influences on children's development. The current results speak to the relevance of investigating parent, child, and contextual factors when examining the conditions that promote or hinder the stability of parenting behaviors. The present study is the first to investigate the stability of maternal autonomy support and the role of child, maternal, and contextual factors in enhancing or diminishing stability. It is also one of few studies to examine both relative and absolute stability, especially in relation to potentially moderating factors.

The findings highlight the importance of using more than one assessment point when examining parenting behaviors, and support the importance of distinguishing relative and absolute stability of parenting. The findings also point to the fact that having a boy, experiencing more stressful events, and having an insecure attachment state of mind increase the probability of behaving in an inconsistent manner with their children. Given that inconsistency in parenting behaviors is related to poor child outcomes, this study presents implications for intervention. The findings suggest that parents of boys, who experience a great deal of change in their life, and who have an insecure attachment state of mind, are likely to need more help to remain consistent in their autonomy-supportive behaviors toward their child. In addition, the findings suggest that parental autonomy-supportive behaviors may be more difficult to change later in life, because these behaviors are relatively stable across time. Interventions aiming to increase parental autonomy support should therefore start early in the child's life, especially for children whose parents are at risk of being low autonomy-supportive.

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Table 1

Mean, standard deviation and range for all continuous variables

Variable	Mean	SD	Range
Maternal autonomy support			
15 months	3.56	1.04	1.3 - 5
3 years	2.78	1.02	1 - 5
Stressful life events	4.39	2.77	0 - 11
Maternal coherence of mind	4.68	1.75	1 - 8.5

Table 2

Zero-order correlations between all study variables

	Autonomy Support		Child gender	Stress	Coherence of mind
	15 months	3 years			
Autonomy Support					
15 months		.41***	.04	.04	.13
3 years			.04	.25*	.09
Child gender				.00	.22
Stressful life events					-.10

*** $p < .001$; * $p < .05$ *Note.* Gender was coded 1 for a boy and 2 for a girl.

Table 3

Summary of hierarchical regression analyses predicting maternal autonomy support at 3 years

Predictor variables	B	SE B	β
Step 1			
SES	0.29	0.16	0.22*
Step 2			
Child gender	0.11	0.23	0.19
Autonomy support at 15 months	0.37	0.11	0.40**
Step 3			
Child gender X autonomy support at 15 months	0.51	0.22	0.85*
Step 2			
Stressful events	0.08	0.03	0.34**
Autonomy support at 15 months	0.35	0.11	0.36**
Step 3			
Stressful events X autonomy support at 15 months	-0.09	0.03	-0.31**
Step 2			
Maternal coherence of mind	0.01	0.07	0.02
Autonomy support at 15 months	0.40	0.12	0.41**
Step 3			
Maternal coherence of mind X autonomy support at 15 months	0.13	0.07	0.22 ^t

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

Table 4

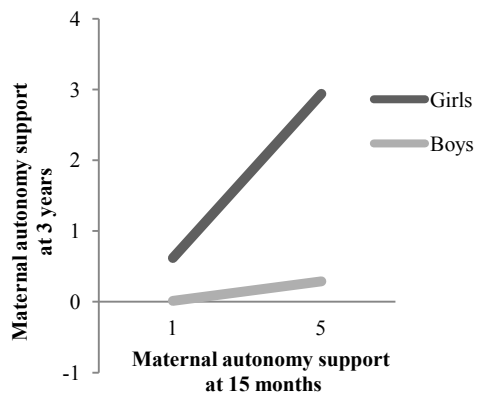
Mean and standard deviation values of maternal autonomy support for all groups of potential moderating variables

Variable	N	Autonomy support at 15 months		Autonomy support at 36 months	
		Mean	SD	Mean	SD
Gender					
Girls	41	3.52	1.01	2.81	1.05
Boys	28	3.61	1.10	2.73	1.98
Stressful life events					
Low group	38	3.43	1.15	2.53	0.92
High group	31	3.72	0.89	3.09	1.05
Maternal coherence of mind					
Low group	29	3.50	1.02	2.77	1.09
High group	36	3.60	1.08	2.81	1.96

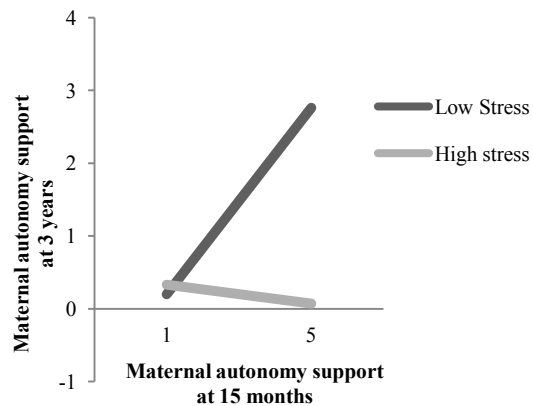
Figure 1

Interactions moderating the relative stability of maternal autonomy support between 15 months and 3 years

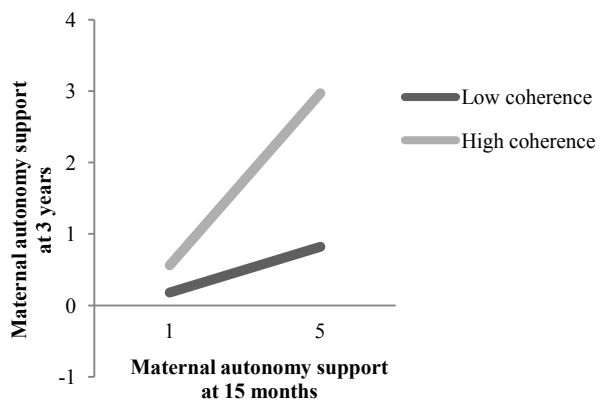
a) *Child gender*



b) *Stressful life events*



c) *Maternal coherence of mind*



Article 3

The role of maternal autonomy support across infancy and preschool years in predicting child executive functioning

Running head: THE ROLE OF MATERNAL AUTONOMY SUPPORT

The role of Maternal Autonomy Support Across Infancy and Preschool Years in Predicting
Child Executive Functioning

Célia Matte-Gagné and Annie Bernier

University of Montreal, Canada

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Abstract

The purpose of this study was to examine the role of early and ongoing maternal autonomy support, and of its stability over time, in predicting child executive functioning (EF). 74 mother-child dyads participated in two visits when children were aged 15 months (T1) and 3 years (T2), allowing for the assessment of maternal autonomy support (T1 and T2) and child EF (T2). The results showed that the average level of autonomy support displayed by the mother between infancy and preschool years was a more consistent predictor of child Impulse Control and Conflict-EF (two aspects of EF) than either early or current autonomy support in isolation, and that children of mothers who displayed high autonomy support at both 15 months and 3 years performed the best on Impulse Control. These results speak to the relevance of using multiple assessments of parenting behavior when examining its impact on child development.

Keywords: stability of parenting, maternal autonomy support, child executive functioning.

The Role of Maternal Autonomy Support across Infancy and Preschool Years in Predicting Child Executive Functioning

Despite growing evidence that early and ongoing parenting behavior as well as its stability over time have important implications for child functioning (Fraley, Roisman, & Haltigan, in press; Landry, Smith, Swank, Assel, & Vellet, 2001), much remains to be investigated to understand the course of parental influences on child development over time. In fact, parenting behavior is often assessed only once and assumed to have an enduring influence on children's development. Autonomy support is one aspect of maternal behavior with increasingly documented predictive value of important aspects of child functioning (e.g., Bernier, Carlson, & Whipple, 2010; Joussemet, Koestner, Lekes, & Landry, 2005). One of its best documented outcomes is child executive functioning (EF). However, maternal autonomy support is typically assessed once only and thus, the role of early versus ongoing maternal autonomy support and of its stability over time in predicting child functioning in general, and EF in particular, has never been investigated. Accordingly, the purpose of this report is to examine the role of early and ongoing maternal autonomy support, and of its stability over time, in predicting child EF.

Parenting Behaviors Over Time

Early versus ongoing parenting. The role of early versus ongoing experience in shaping human development is one of the central questions tackled by developmental research. All developmental theories assume that early experience plays some role in shaping later adaptation. What is usually debated is whether early experience plays a unique and enduring role in the developmental process beyond the influence of concurrent or subsequent experience. Some authors have suggested that few, if any, effects on later development are

attributable to early experience (Clarke & Clarke, 1976, 2000; Kagan, 1996; Kagan & Moss, 1962; Lamb, Thompson, Gardner, Charnov, & Estes, 1984; Lewis, 1997). Associations between early experience and later outcomes are said to persist because the experience is relatively stable and can have ongoing effects on the outcomes (e.g., Lamb et al., 1984; Lewis, 1997). However, other researchers have provided evidence that early interpersonal experiences persist in their influence on later adaptation (Sroufe, Egeland, & Kreutzer, 1990; Vandell, Belsky, Burchinal, Steinberg, Vandergrift, & the NICHD ECCRN, 2010), even after accounting for current circumstances (Fraley et al., in press; Roisman, Collins, Sroufe, & Egeland, 2005; Sroufe, Egeland, Carlson, & Collins, 2005). One of the most important aspects of early interpersonal experience is parenting. Consequently, a great deal of debate about the enduring significance of early experience directly or indirectly concerns the impact of parenting. Numerous studies have demonstrated that parenting plays a central role in many aspects of child functioning, but few studies have examined simultaneously the contributions of early and concurrent parenting behaviors on child development. While high levels of early parental competence may establish a positive developmental course for children's development, later parenting behaviors may change this developmental course. Then, studies on the relative contribution of early versus ongoing parenting behaviors are necessary to better understand the unfolding of parental influences on child development.

Moreover, research shows that using multiple observations of parenting behavior is sound on psychometric as well as developmental levels, as it allows for more reliable measurement while providing an arguably more accurate view of the overall experience of the child with this parent (Bernier, Carlson, Deschênes, & Matte-Gagné, 2012; Ellenbogen & Hodgins, 2004; Grossmann et al., 2002; Kochanska & Murray, 2000; Tarabulsky et al., 2005).

Indeed, having more than one assessment of the same parenting behavior across time can reduce measurement error and give a more accurate view of the average level of the behavior as displayed by the parent in everyday life. This is illustrated well by the results of Lindhiem, Bernard, and Dozier (2011), who found incremental increases in effect sizes of relations between maternal sensitivity and child outcomes with increasing numbers of observations of maternal sensitivity.

The stability of parenting. Closely related to the issue of early and current parenting is that of the stability of parental behavior, which is believed to exert an important influence on children's developmental trajectories (e.g., Bornstein, 2002; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Some empirical studies provide support for this idea, reporting variations in child outcomes depending on the pattern of consistency or change in parenting behaviors (Beckwith, Rodning, & Cohen, 1992; Bradley, Caldwell, & Rock, 1988; Landry et al., 2001). Some studies reported that children of mothers who were consistently more responsive during infancy and early toddlerhood (Landry et al., 2001) or infancy and adolescence (Beckwith et al., 1992) had more positive outcomes than did children who experienced consistently lower responsiveness across these time periods. Beckwith et al. (1992) found that children of mothers who became more responsive over time were almost equally successful as those who had experienced stable levels of responsiveness, suggesting that current experience was especially pivotal in fostering development. Landry et al. (2001) reported that children of mothers who were highly responsive only during infancy showed slower rates of growth in cognitive development, but comparable level of social development, compared to those whose mothers were consistently highly responsive. This suggests that the issue of whether or not early input is sufficient may vary according to sphere of development

considered. A study by Bradley et al. (1988) also suggested that different developmental outcomes were related to somewhat different patterns of environmental experiences. For example, parental responsiveness at 6 months was related to child classroom behaviors at 10 years after accounting for concurrent parental responsiveness, but 10-year responsiveness was not related to classroom behaviors when earlier scores of responsiveness were controlled, supporting the predominance of early experience. In contrast, parental involvement at 10 years was related to child concurrent academic achievement after accounting for earlier parental involvement, but earlier involvement was not related to achievement when later scores of involvement were controlled, supporting a role of ongoing experience. Finally, Landry, Smith, Swank, and Miller-Loncar (2000) reported that later child social outcomes were best facilitated by the provision of higher levels of early structure that decreased as children took more active social roles, a finding supporting an ongoing role for responsive parenting.

Overall, these studies suggested important roles for both early and later parenting behaviors that depended, in part, on the developmental domain studied and the patterns of change in parenting behaviors. Remarkably however, nearly all these results have emanated from a focus of maternal sensitivity/responsiveness, while it is increasingly well-documented that parenting is multidimensional and that other aspects of parental behavior have unique contributions to child functioning, over and above those of maternal sensitivity (e.g., Meins, Fernyhough, Fradley, & Tuckey, 2001; Moran, Forbes, Evans, Tarabulsy, & Madigan, 2008; Whipple, Bernier, & Mageau, 2011). In addition, prior research on parenting stability has seldom examined child cognition, one of the central pillars of child development. One aspect of child cognition that has sparked a great deal of interest in recent years is executive functioning (EF).

Child Executive Functioning and Maternal Autonomy Support

EF consists of a set of higher-order cognitive processes, such as impulse control, set-shifting, planning, and working memory, which govern goal-directed action (Garon, Bryson, & Smith, 2008). EF thus underlies several abilities that are critical for problem-solving and learning (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008). Maternal autonomy support is currently the aspect of parental behavior that shows the clearest connections to child EF (Bernier et al., 2010; Bibok, Carpendale, & Müller, 2009; Hammond, Müller, Carpendale, Bibok, & Liebermann-Finestone, 2012; Hughes & Ensor, 2009). This parenting behavior refers to the degree to which the parent supports children's goals, choices, and sense of volition (Grolnick & Ryan, 1989). One of its central components is scaffolding, which refers to the ways in which parental guidance enables children to achieve levels of problem-solving that they could not reach on their own. Autonomy support also consists of taking the child's perspective and respecting his or her rhythm, and ensuring that the child plays an active role in successful completion of the task. One can easily see how this set of behaviors is likely to provide the child with numerous experiences of successful problem-based learning, hence fostering his or her executive development. While emerging evidence suggests that maternal autonomy support is moderately stable between infancy and the preschool years (Matte-Gagné, Bernier, & Gagné, accepted), the role of early versus ongoing maternal autonomy support and of its stability over time in predicting child EF development has never been investigated.

A recent study by Hammond and his colleagues (2012) suggested that the nature of the relations between scaffolding (operationalized in the same way as autonomy support) and EF changed over time, which has led the authors to propose that these changes may be due to modifications in parental scaffolding itself. The authors therefore recommended that future

research examine how stability and change in scaffolding relate to individual differences in child EF. Accordingly, the current study set out to examine the role of early and current maternal autonomy support, and its stability over time, in the prediction of child EF.

The Present Study

The present study aimed to examine the role of early (15 months) and ongoing maternal autonomy support, and of its stability, in child EF performance at 3 years of age. The first objective was to examine the respective relations of early and current maternal autonomy support with child EF. Given previous studies that supported important roles for either early or later parenting behaviors that depended, in part, on the developmental domain studied, no *a priori* hypotheses could be formulated. The second objective was to examine the relation of a composite average score of autonomy support at 15 months and 3 years with child EF performance at 3 years. Based on prior research showing increased predictive power with more assessments of the same parenting behavior (Lindhiem et al., 2011), it was expected that the average level of autonomy support between infancy and preschool years would be a clearer predictor of child EF than early or current autonomy support in isolation. The third objective was to examine different patterns of change and stability in maternal autonomy support between 15 months and 3 years in relation to child EF performance. Based on previous literature, it was expected that children of mothers who were consistently highly autonomy supportive would be more successful on EF tasks than children experiencing consistently low maternal autonomy support. However, given that previous studies have supported important roles for early as well as later parenting behaviors, no difference in EF task performance were expected between children of mothers high on autonomy support at one time point only and children of mothers consistently high on autonomy support at both time points.

Method

Participants

Seventy-four middle-class mother-infant dyads (44 girls and 30 boys) living in a large Canadian metropolitan area participated in this study. Families were recruited from birth lists provided by the Ministry of Health and Social Services. Criteria for participation were full-term pregnancy and the absence of any known physical or mental disability in the infant. Family income varied from less than \$20,000 CDN to more than \$100,000 CDN, with an average of \$70,000 CDN. Mothers were predominantly Caucasian (82% of the sample) and French-speaking (81% of the sample). They were between 20 and 45 years old ($M = 31$). They had between 9 and 18 years of formal education ($M = 15$) and 67 % had a college degree.

Procedure

The dyads took part in two home visits, when children were 15 months (T1; $M = 15.5$, $SD = 0.9$, Range = 13.5-18.0) and 3 years of age (T2; $M = 36.9$ months, $SD = 0.8$, Range = 35.4-38.6). Both visits lasted between 60 and 90 minutes. During the first home visit, mothers were asked to help their children complete three tasks (a tower of blocks and two puzzles) that were designed to be slightly too difficult for the infants, such that they would require some adult assistance to complete them. This interaction was videotaped and later coded for maternal autonomy-supportive behaviors (see below). At T2, mothers were asked to help their children complete a clean-up task that also necessitated some adult assistance, allowing for the second assessment of maternal autonomy support (see below). During this home visit, EF tasks described below were also administered.

Measures

Maternal autonomy support at 15 months. Mother-infant dyads were asked to complete a challenging problem-solving task together when infants were 15 months of age (T1). Following Whipple et al.'s (2011) rating system, maternal behaviors were rated on four Likert scales assessing the extent (1-5) to which the mother (1) encourages her child in the pursuit of the task, gives positive feedback, and uses a positive tone of voice (verbally-supportive behaviors); (2) takes her child's perspective and demonstrates flexibility in her attempts to keep the child on task; (3) follows her child's pace, provides the child with the opportunity to make choices, and ensures that the child plays an active role in the completion of the task; (4) intervenes according to the infant's needs, adapts the task to create an optimal challenge, and minimizes the use of controlling techniques. Given the inter-correlations between the four scales (ranging from .47 to .90), they were averaged into a total autonomy support score ($\alpha = .89$). A randomly selected 54% ($n = 40$) of videotapes were coded independently by two raters. Inter-rater reliability was satisfactory, $ICC = .86$.

Maternal autonomy support at 3 years. Mother-child dyads were asked to complete a clean-up task together when children were 3 years of age (T2). Following a 10-minute free-play sequence using blocks of seven different colors, mothers were asked to have their child pick up and sort the blocks by color in different bags (i.e., all green blocks in one bag, all red blocks in a different bag, etc.). Using an adaptation of Whipple et al.'s (2011) rating system, maternal behaviors were rated on four Likert scales (1-5). The first three scales are the same as those used at 15 months (above). The fourth scale assesses the extent to which the mother intervenes according to the child's needs in using different motivational strategies (provides help, gives rationale, makes the task fun by turning it into a game or singing an accompanying song) and minimizes the use of controlling strategies (giving orders, using punishments or

physical restrictions). Given the inter-correlations between the four scales (ranging from .43 to .71), they were averaged into a total autonomy support score ($\alpha = .84$). A randomly selected 56 % ($n = 42$) of videotapes were coded independently by two raters. Inter-rater reliability was high, $ICC = .93$.

Child executive functioning. EF was measured at 3 years with several tasks chosen based on Carlson's (2005) measurement guidelines with the aim of maximizing detection of individual differences in three dimensions of EF: working memory, inhibitory control, and set-shifting. Psychometric research indicates that these tasks provide reliable measurement of individual differences and that these differences are stable across time (Beck, Schaefer, Pang, & Carlson, 2011; Carlson, 2005).

Delay of Gratification (Kochanska, Murray, & Harlan, 2000). The experimenter placed snack treats in a bowl in front of the child and asked him or her to wait 5, 15, 30 and then 45 seconds before taking the treat. Scores consisted of the four waiting times.

Day/Night (Gerstad, Hong, & Diamond, 1994). The experimenter asked the child to say "day" when shown black cards displaying stars and a moon, and to say "night" for white cards displaying a sun. The task consists of 16 trials, yielding the percentage of correct answers as final score.

Dimensional Change Card Sort (DCCS; Zelazo, 2006). Children were introduced to two boxes with target cards (i.e., a red truck and a blue star) affixed to the front. The experimenter presented a series of cards (red and blue trucks and stars) and instructed children to sort cards by shape. After six trials, the rule was changed and the child had to sort the same cards by color. The score consisted of the number of cards correctly sorted on the six post-switch trials.

Bear/Dragon (Reed, Pien, & Rothbart, 1984). The experimenter introduced children to a “nice” bear puppet and a “naughty” dragon puppet. Children were asked to follow the bear’s requests (e.g., touch your nose) but to refrain from following the dragon’s requests. After practice trials, there were 10 test trials, alternating in a pseudo-random order commands by the bear and the dragon. Scores corresponded to the number of correct responses (0-10).

Results

Preliminary Analyses

First, we created a composite score of maternal autonomy support by averaging the 15-month and 3-year total autonomy support scores ($r = .38, p < .001$). Table 1 presents descriptive statistics for all main variables used in this study: maternal autonomy support at 15 months and 3 years, the composite score of maternal autonomy support, and child 3-year EF task performance. All variables showed satisfactory variability, although children’s performance on the Delay of Gratification trials and the DCCS was excellent.

Reduction of EF data. The EF task scores were submitted to a principal component analysis, in order to reduce the probability of Type-I errors and compute reliable aggregate estimates. This analysis yielded a two-factor solution (*Eigen* values > 1.0), representing 59.06% of the total variance. These two factors were then submitted to a principal axis rotation (oblimin). Factor loadings for the 15-second Delay (.93), 30-second Delay (.92), 5-second Delay (.81), and 45-second Delay (.65) trials suggest that the first factor taps impulse control, whereas the second factor appears to represent working memory, set-shifting, and inhibitory control (Conflict-EF): Bear/Dragon (.83), Day/Night (.77), and DCCS (.44). No cross loadings (above .35) were observed and the correlation between the two factors was .32. This two-factor structure has been observed in independent samples (e.g., Carlson, Mandell, &

Williams, 2004; Carlson & Moses, 2001) and on the current sample when children were 2 years-old (Bernier et al., 2010). Accordingly, two averaged standardized scores were computed and used in further analyses. The correlation between Impulse Control and Conflict-EF was $r = .27, p < .05$.

Links to socio-demographics. Next, we examined the extent to which socio-demographic variables (child gender and precise age, number of siblings, and maternal education) were related to EF performance at 3 years. Maternal education was related to both Impulse Control ($r = .26, p < .05$) and Conflict-EF ($r = .30, p < .01$). Thus, we covaried maternal education when predicting 3-year EF in subsequent analyses. No other relations were found between child EF and sociodemographics.

Main Analyses

Table 2 presents the partial correlations among maternal autonomy support at 15 months and 3 years, the composite of maternal autonomy support, and the two dimensions of EF at 3 years, when accounting for maternal education. Supporting the value of taking multiple measures of parenting, only the composite of maternal autonomy support was associated with both Conflict-EF and Impulse Control. Maternal autonomy support at 15 months was associated with subsequent Conflict-EF but not Impulse Control, whereas concurrent autonomy support was unrelated to child EF.

In order to examine the outcomes of different patterns of maternal autonomy support across infancy and the preschool years, three groups were created: mothers who were consistently high (group 1) or low (group 2) on autonomy support at 15 months and 3 years, and those who were high at one time point, low at the other (group 3). We were unable to separate mothers who were high during infancy and low during preschool years from those

who were low during infancy but high during preschool years due to insufficient sample size. High and low autonomy support status was determined by median splits on the autonomy support scores at 15 months and 3 years: mothers who were above or at the median were considered to be high, and mothers below the median were considered to be low. Group sizes and related means and standard deviations for child EF are presented in Table 3. Given that analysis of covariance (ANCOVA) is not recommended when the groups differ on the covariate (Miller & Chapman, 2001), while our groups of autonomy support were marginally different on maternal education ($F(2, 71) = 2.50, p = .08$), maternal education was excluded from further analysis.

To test the hypotheses, EF scores were submitted to univariate analyses of variance (ANOVAs) with two planned contrasts comparing the Impulse Control and Conflict-EF performance of children whose mothers were consistently high-autonomy-supportive to that of children whose mothers were consistently low-autonomy-supportive (contrast 1: comparison of groups 1 and 2), and performance of children whose mothers were consistently high-autonomy-supportive to that of children whose mothers were high on autonomy support at only one of the two times (contrast 2: comparison of groups 1 and 3).

The ANOVA pertaining to Impulse Control showed that children of mothers who were consistently highly autonomy-supportive showed greater Impulse Control performance compared to their counterparts whose mothers were consistently low on autonomy support (Contrast 1: $t(71) = 2.01, p < .05, \eta^2 = .05$). No differences were found in Impulse Control between the children of mothers who were consistently highly autonomy-supportive and those of mothers who were highly autonomy-supportive at only one time point (Contrast 2: $t(71) = 1.14, ns, \eta^2 = .02$).

The ANOVA pertaining to Conflict-EF indicated no significant differences on either contrast (Contrast 1: $t(69) = .95$, *ns*, $\eta^2 = .01$ and Contrast 2: $t(69) = 1.00$, *ns*, $\eta^2 = .01$).

Discussion

The purpose of this study was to examine the role of early and ongoing maternal autonomy support and its stability over time in predicting child EF performance. We first examined the relations between child EF performance at 3 years and maternal autonomy support at 15 months, at 3 years, and the average level of autonomy support between these two measurement times. The results showed that the average level of autonomy support displayed by the mother between infancy and preschool years was a more consistent predictor of child EF than either early or current autonomy support in isolation. Maternal autonomy support at 15 months was associated with subsequent Conflict-EF but not Impulse Control, whereas concurrent autonomy support was unrelated to either Impulse Control or Conflict-EF when controlling for maternal education. However, the composite score of maternal autonomy support was significantly related to both Impulse Control and Conflict-EF, even when maternal education was covaried. This is in line with prior research suggesting the value of multiple assessments of parenting (Bernier et al., 2011; Ellenbogen & Hodgins, 2004; Grossmann et al., 2002; Kochanska & Murray, 2000; Tarabulsky et al., 2005), and especially consistent with the study of Lindhiem and colleagues (2011) who observed that repeated assessments of the same parenting behavior (over a short period of time) increased the predictive power. Taken together, these results suggest that multiple assessments of parenting over both the short- and longer-terms provide an arguably more accurate view of the overall experience of the child with his or her caregiver, thereby increasing predictive power.

In contrast, the non-significant relation between ongoing maternal autonomy support and child EF is inconsistent with the results of a recent study demonstrating a relation between scaffolding and concurrent child EF (Bibok et al., 2009). However, that study measured maternal scaffolding during a problem-solving task calling upon some abilities also implied in EF, making for a more direct link between the two assessments. It is unclear whether similar results could have been found here if we had assessed 3-year maternal autonomy support during a problem-solving task instead of a clean-up task.

It may also be that the potential impact of autonomy support on child conflict-EF unfolds over time, as the child gradually practices, applies, and integrates the strategies taught by the autonomy-supportive caregiver. In light of the moderate stability that we found in autonomy support, it stands to reason that some mothers who were observed to be highly autonomy-supportive at 3 years had not consistently been so in preceding months, and hence a same-day EF assessment may have been too soon to observe putative effects of potentially recent autonomy-supportive parenting. In fact, we did find that maternal autonomy support was associated with subsequent but not concurrent Conflict-EF. This is consistent with recent findings (Gutman & Feinstein, 2010) demonstrating that the quality of maternal behavior during mother-child interactions had no concurrent but only later associations with children's social and motor development, suggesting that some types of parenting may take time before they impact certain spheres of child functioning.

The current results are also consistent with prior findings showing that the way scaffolding affects EF changes over time (Hammond et al., 2012). In fact, previous studies have found the relation between scaffolding and child EF to be significant at some ages and not significant at others (Hammond et al., 2012; Landry, Miller-Loncar, Smith, & Swank,

2002). This suggests that timing may be an important factor in the relationship between parenting and children's EF. For instance, given that infancy is a period of accelerated brain and cognitive development, it may be a particularly sensitive stage for maternal autonomy support to foster the development of child problem-solving skills involved in conflict-EF. However, a clear finding of the current study is that the composite score of maternal autonomy support is the most consistent predictor of child EF. Therefore, the average of autonomy support experienced by the child may be more significant for EF development than that experienced at any one particular period of development.

Based on prior results showing that maternal autonomy support can change over time (Matte-Gagné et al., accepted), another objective of the present study was to examine different patterns of change and stability in maternal autonomy support between 15 months and 3 years in relation to child EF performance. First, the results showed that children of mothers who displayed high autonomy support at both 15 months and 3 years performed better on Impulse Control than children of mothers who displayed low autonomy support at both measurement times. This result is consistent with others studies demonstrating that children of mothers who were consistently more responsive during both infancy and other developmental periods (Beckwith et al., 1992; Landry et al., 2001) had more positive outcomes than children who experienced consistently lower responsiveness across time. This is also consistent with the fact that only the composite score of maternal autonomy support was related to Impulse Control. Along with the unconvincing relations between parenting and child impulse control found in previous research (Bernier et al., 2010, 2011), this tentatively suggests that impulse control may require not only high-quality parenting, but also consistency in this quality.

In contrast, no significant difference in Conflict-EF performance was found between children whose mothers were consistently highly autonomy-supportive and children whose mothers were consistently lowly autonomy-supportive, suggesting that consistency is less important for this EF dimension. The diverging results regarding Impulse Control and Conflict-EF is consistent with previous studies showing that different developmental outcomes are related to different patterns of environmental experiences (Bradley et al., 1988). For some developmental spheres, early or later parenting competency may be sufficient, but for other spheres, the stability of parenting competency may be more important. Maternal autonomy support at 15 months was associated with Conflict-EF but not Impulse Control, whereas stability of autonomy support was related to child Impulse Control but not Conflict-EF. This raises the possibility that early parenting may be particularly relevant for the development of conflict-EF, while impulse control may rather need stability in parenting competency. This is speculative however, and further research is necessary to shed further light on the possibly diverging mechanisms underlying the development of impulse control and conflict-EF.

Finally, no significant difference, on either EF dimension, was found between children of mothers who were high on autonomy support at one time point only versus both time points. The comparable EF performance of these children suggests that children may be able to benefit from a high degree of autonomy support at one time point in their development, even if this parenting quality was not consistently available to them. In fact, previous studies have sometimes supported the important role of early parenting, sometimes of later parenting (Beckwith et al., 1992; Bradley et al., 1988; Landry et al., 2001). It should be noted, however, that even if those differences were not significant, children whose mothers were consistently highly autonomy-supportive appeared qualitatively better on Impulse Control ($M = .24$) and

Conflict-EF ($M = .11$) tasks than those whose mothers were highly autonomy supportive at one time point only ($M = -.01$ for Impulse Control and $M = -.06$ for Conflict-EF). Given our small sample size and related diminished statistical power, the possibility cannot be ruled out that these apparent differences are in fact meaningful and could be detected as significant in larger-scale studies.

Limitations

This study presents methodological limitations that require consideration. First, the modest sample size represents a limit to statistical power and generalizability, and it will be important to replicate the current findings with larger samples. For the same reason, we were unable to separate mothers who were high on autonomy support during infancy and low during preschool years from those who showed the opposite pattern of change. Breaking down this group into subgroups of mothers increasingly or decreasingly autonomy supportive would allow one to address theoretically rich questions with implications for intervention. Moreover, the different measurement contexts of maternal autonomy support could constitute a limit of the present study. At 15 months, maternal autonomy support was measured during a problem-solving task and at 3 years, it was measured during a clean-up task. Using comparable tasks for assessing parenting behaviors at different ages would be necessary to isolate the effect of early and current parenting behavior. However, a recent study using the same measurement contexts replicated meta-analytic results (Holden & Miller, 1999) by finding moderate relative stability in maternal autonomy support across time, suggesting that the use of different contexts did not blur the expected phenomenon (Matte-Gagné et al., accepted).

Conclusion

Studies on the stability of parenting behaviors are necessary to better understand the nature of parenting and parental influences on children's development. The present study is the first to investigate the stability of maternal autonomy support and its relation to child EF. It is also one of very few studies to examine simultaneously the influence of both early and current parenting and of its stability on early child cognitive development. The current results speak to the relevance of using multiple assessments of parenting when examining its impact on child development, and the importance of giving careful consideration to when parenting is assessed. This study also supports the importance of distinguishing the impulse control and conflict-EF dimensions of EF, and suggests that parenting consistency may be more relevant for child impulse control than for conflict-EF. Other studies examining the stability of other dimensions of parenting behavior and its impact on other child outcomes, across longer delays, other developmental periods, in different cultures, and in low-income or at-risk samples appear necessary to further the understanding of the mechanisms underlying the relation between stability of parenting and child development.

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Table 1

Mean, standard deviation (SD) and range for all variables

Variable	Mean	SD	Range
Maternal autonomy support			
15 months	3.58	1.03	1.33 - 5
3 years	2.77	1.03	1 - 5
Average	3.18	0.86	1.25 - 4.7
Child EF task performance			
Delay of Gratification			
5 seconds	4.8	0.75	1 - 5
15 seconds	13.74	3.59	1 - 15
30 seconds	26.94	7.73	0 - 30
45 seconds	39.62	13.67	2 - 45
DCCS	5.50	1.11	0 - 6
Day/Night	55.93	35.75	0 - 100
Bear/Dragon	6.40	1.85	2 - 10

Table 2

Partial correlations between maternal autonomy support and performance on the two EF dimensions controlling for maternal education

	Autonomy Support		Conflict- EF	Impulse Control
	3 years	Composite		
Autonomy Support				
15 months	.36**	.83***	.30*	.18
3 years		.82***	.11	.19
Composite			.25*	.23*
Conflict-EF				
				.21*

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

Table 3

Mean and standard deviation values of child EF performance for all groups of maternal autonomy support

Patterns of Autonomy Support	N	Impulse Control		Conflict-EF	
		Mean	SD	Mean	SD
High-High	23	.24	.31	.11	.61
Low-Low	22	-.23	1.14	-.07	.70
Unstable: High-Low and Low-High	29	-.01	.73	-.06	.59

Conclusion

Résumé des objectifs et des résultats

L'objectif principal de la thèse et des trois articles qui la composent était de contribuer à l'avancement des connaissances sur le soutien maternel à l'autonomie de trois façons. Dans un premier temps, en explorant le rôle médiateur du langage dans sa relation avec les fonctions exécutives de l'enfant. En examinant ensuite sa stabilité temporelle en fonction de différents facteurs. Finalement, en explorant son rôle dans la prédiction des fonctions exécutives de l'enfant en fonction de sa stabilité temporelle et de la période développementale durant laquelle il est mesuré.

Les résultats de la thèse ont d'abord permis de démontrer que le langage de l'enfant joue un rôle médiateur dans la relation entre le soutien maternel à l'autonomie et les fonctions exécutives de l'enfant qui font essentiellement appel à l'inhibition volontaire d'un comportement, et ce, au-delà de l'inhibition mesurée antérieurement et du statut socioéconomique. Ces résultats sont congruents avec l'approche de Vygotsky (1934/1987) stipulant que le langage, acquis à travers nos interactions avec des partenaires plus compétents, nous permet de mieux contrôler notre comportement. Selon cette approche, le langage facilite la réflexion et nous aide à prendre conscience de notre processus de pensée et de nos tendances comportementales, ce qui nous permet de mieux contrôler notre comportement. Les résultats de la thèse suggèrent donc qu'en facilitant le développement du langage, le soutien maternel à l'autonomie permet à l'enfant d'acquérir des outils pour mieux inhiber ses impulsions. Les résultats ont toutefois démontré que le langage ne médiatise pas la relation entre le soutien maternel à l'autonomie et les fonctions exécutives impliquant essentiellement la mémoire de travail et la flexibilité attentionnelle. Une explication possible

pour l'absence de médiation est que le soutien maternel à l'autonomie durant une tâche de résolution de problèmes exerce une influence directe et non médiatisée sur le développement des habiletés nécessaires à la réussite des tâches impliquant la mémoire de travail et la flexibilité attentionnelle. Cela demeure toutefois à examiner, car il est possible que d'autres médiateurs que le langage entrent en jeu dans cette relation. Il est aussi possible que les tâches de mémoire de travail et de flexibilité attentionnelle, qui sont plus complexes que les tâches d'inhibition simple, exigent un langage plus sophistiqué que l'enfant n'aurait pas encore développé à deux ans ou qui n'aurait pas été mesuré dans cette étude.

La thèse avait aussi pour objectif d'examiner la stabilité relative et absolue du soutien maternel à l'autonomie entre la petite enfance et l'âge préscolaire en fonction des représentations d'attachement de la mère, des événements de vie stressants et du sexe de l'enfant. En accord avec des données méta-analytiques (Holden & Miller, 1999), les résultats ont d'abord démontré que le soutien maternel à l'autonomie est stable de façon relative (les mères conservent leur position par rapport aux autres) mais non absolue (la moyenne du groupe diminue à travers le temps). La diminution du soutien maternel à l'autonomie peut être interprétée comme un signe de flexibilité et de compétence, la mère réduisant son degré de soutien à l'autonomie à mesure que l'enfant vieillit pour lui laisser plus de place et mieux répondre à son besoin d'autonomie. Cette diminution peut aussi être interprétée comme un signe d'instabilité et de diminution de la compétence parentale, la mère ayant de plus en plus de difficultés à soutenir adéquatement l'autonomie de son enfant à mesure qu'il devient plus complexe et demandant.

La thèse a aussi permis d'identifier trois modérateurs de la stabilité relative du soutien maternel à l'autonomie : les représentations d'attachement de la mère, le sexe de l'enfant et les

événements de vie stressants. Les résultats ont révélé plus précisément que les mères qui ont un attachement plus sécurisé, qui ont une fille ou qui ont vécu moins d'événements de vie stressants sont plus stables dans leur degré de soutien à l'autonomie entre la petite enfance et l'âge préscolaire. Cela est d'abord en phase avec le fait qu'avoir des représentations d'attachement sécurisées pourrait entraîner moins de fluctuations dans nos comportements (Bretherton & Munholland, 1999; Main, Kaplan, & Cassidy, 1985). Cela est aussi cohérent avec les résultats d'études précédentes qui démontrent que les comportements parentaux sont généralement plus stables à l'endroit des filles (Carrasco, Rodriguez, del Barrio, & Holgado, 2011; Forehand & Jones, 2002; McNally, Eisenberg, & Harris, 1991) et que des changements dans la vie des parents sont associés à des variations dans leurs pratiques parentales (Waylen & Stewart-Brown, 2009).

La thèse avait aussi pour mandat d'examiner les relations entre les fonctions exécutives de l'enfant d'âge préscolaire et le soutien maternel à l'autonomie mesuré antérieurement (à la petite enfance) et de façon concomitante. Les résultats ont démontré que le degré moyen de soutien à l'autonomie démontré par la mère à travers le temps est le prédicteur le plus important des fonctions exécutives. Étant donné les fluctuations possibles et normales dans les comportements maternels, le degré moyen de soutien maternel à l'autonomie constituerait un indice plus valable de l'expérience des enfants avec leur mère au quotidien. Cela souligne l'importance d'utiliser plusieurs points de mesure du comportement parental quand on évalue son impact sur le développement de l'enfant.

En terminant, la thèse avait comme objectif d'examiner l'impact de différents patrons de stabilité du soutien maternel à l'autonomie sur les fonctions exécutives de l'enfant. Les résultats ont démontré que les enfants qui vivent un degré constamment élevé de soutien

maternel à l'autonomie performant mieux aux tâches qui impliquent l'inhibition volontaire d'un comportement que les enfants qui expérimentent un degré constamment bas de soutien à l'autonomie. Les résultats n'ont toutefois pas révélé de différence significative aux tâches impliquant davantage la mémoire de travail et la flexibilité attentionnelle. Cela est cohérent avec les résultats des études antérieures qui démontrent que différentes sphères du développement de l'enfant sont associées à différents patrons de variations ou de stabilité dans les comportements parentaux (Bradley, Caldwell, & Rock, 1988; Landry, Smith, Swank, Assel, & Vellet, 2001). Ainsi, la stabilité du soutien maternel à l'autonomie semble plus importante pour l'inhibition que pour la mémoire de travail et la flexibilité. D'autres études sont toutefois nécessaires pour bien comprendre cette divergence.

Intégration des résultats et pistes de recherche futures

Le développement de l'enfant est le produit d'un amalgame complexe de facteurs individuels et environnementaux qui interagissent entre eux à travers le temps (Bronfenbrenner & Ceci, 1994; Douglas, 2010; Sameroff & Mackenzie, 2003). Il en est de même pour les comportements parentaux qui sont déterminés par une panoplie de facteurs propres à l'enfant, à l'environnement et au parent (Belsky, 1984; Bornstein, 2002; Holden, 2010). Ainsi, il est difficile d'étudier les comportements parentaux et le développement de l'enfant sans tenir compte de plusieurs facteurs et de leurs interactions. Plusieurs facteurs ont été pris en considération dans la thèse afin de mieux comprendre le soutien maternel à l'autonomie, sa stabilité temporelle et ses relations avec les fonctions exécutives de l'enfant à l'âge préscolaire. Le modèle représenté à la Figure 1 (voir p.144) regroupe les résultats des trois articles de la thèse afin de mieux comprendre les interactions possibles entre le soutien à l'autonomie, les caractéristiques de l'enfant, du parent et de l'environnement, et le

développement cognitif de l'enfant. Le modèle illustre d'abord que le soutien maternel à l'autonomie précoce exerce une influence sur le développement ultérieur des fonctions exécutives de l'enfant par le biais de certains facteurs tels que le langage (Article 1). Le modèle suggère toutefois que le soutien maternel à l'autonomie peut changer à travers le temps en fonction de facteurs propres au parent, à l'environnement et à l'enfant (Article 2) et que ces changements ont un impact sur le développement des fonctions exécutives de l'enfant (Article 3). D'autre part, comme les mères varient dans leur degré de soutien à l'autonomie à travers le temps en fonction de différents facteurs (Article 2), le modèle illustre que ce n'est pas le soutien à l'autonomie de la mère à un moment précis dans le temps qui est le plus susceptible d'influencer le développement des fonctions exécutives de l'enfant, mais plutôt le soutien à l'autonomie moyen de la mère à travers le temps (Article 3).

Il faut toutefois noter que la thèse n'offre qu'un appui partiel au modèle intégrateur proposé. Premièrement, la thèse s'est concentrée sur les trois premières années de vie de l'enfant. Chaque étape développementale présente ses propres défis pour les enfants, mais aussi pour les parents. À mesure que les enfants vieillissent leurs besoins changent et se complexifient. Les parents doivent s'ajuster à ces changements en modifiant leurs pratiques parentales. Ces modifications auront à leur tour un impact sur le développement des enfants. La thèse a permis d'examiner la stabilité du soutien maternel à l'autonomie durant la transition petite enfance/âge préscolaire. Il serait toutefois important d'examiner sa stabilité durant d'autres transitions importantes du développement de l'enfant afin de vérifier si la stabilité modérée des différences individuelles et la diminution du degré moyen de soutien à l'autonomie observée dans la thèse est propre à cette période développementale. Une des transitions les plus stressantes et importantes de la vie est celle qui marque le passage de

l'enfance à l'âge adulte : l'adolescence. À l'adolescence, les enfants sont à la recherche de leur identité et luttent pour leur indépendance et leur autonomie. Les recherches démontrent que le soutien parental à l'autonomie est particulièrement bénéfique durant cette transition (Grolnick et al., 2000; Ratelle et al., 2004; Ratelle et al., 2005). On ne sait toutefois pas si les parents demeurent stables dans leur degré de soutien à l'autonomie durant cette période et on ne sait pas non plus quel impact a la stabilité du soutien parental à l'autonomie sur le développement de l'adolescent. Il serait important que les recherches futures se penchent sur ces questions afin de mieux comprendre le rôle du soutien à l'autonomie et de sa stabilité sur le développement de l'enfant à travers le temps.

Afin de valider le modèle proposé, il faudrait également explorer si d'autres facteurs parentaux, environnementaux et propres à l'enfant jouent un rôle dans la stabilité du soutien à l'autonomie. Les recherches dans le domaine du soutien à l'autonomie se sont surtout intéressées à l'impact du soutien à l'autonomie sur le développement de l'enfant. Ainsi, on en connaît très peu sur les facteurs susceptibles d'influencer le soutien maternel à l'autonomie à travers le temps. La thèse a permis d'en identifier trois. Étant donné l'impact du soutien à l'autonomie et de sa stabilité sur certaines sphères du développement de l'enfant, il est important de continuer à mettre en lumière ces différents facteurs. Tous les antécédents documentés des comportements parentaux (pour une recension des écrits voir Belsky & Jaffe, 2006) sont susceptibles d'influencer le soutien à l'autonomie et sa stabilité. Parmi les plus documentés, on retrouve le tempérament de l'enfant. De nombreuses études ont démontré que les enfants qui sont plus irritables, moins bien régulés ou plus difficiles présentent un plus grand défi pour les parents et suscitent plus de réponses négatives de leur part (Braungart-Rieker, Murphy Garwood, & Stifter, 1997; Calkins, Hungerford, & Dedmon, 2004; Erath, &

Tu, 2011; Owens, Shaw, & Vondra, 1998, Susman-Stillman, Kalkoske, Egeland, & Waldman, 1996). Comme le tempérament de l'enfant est associé à plusieurs comportements parentaux, il est susceptible d'influencer le soutien à l'autonomie. Cela demeure toutefois à explorer.

D'autre part, une étude récente indique que plus un enfant a un tempérament difficile, plus ses parents ont tendance à adopter une discipline incohérente (Lengua & Kovacs, 2005). On peut donc penser qu'il serait difficile pour un parent de demeurer stable dans ses comportements de soutien à l'autonomie face à un enfant qui aurait un tempérament plus difficile, mais cela n'a jamais fait l'objet d'une étude. Un autre facteur à prendre en considération serait la santé physique et mentale du parent. La douleur, la souffrance et le manque d'énergie associés à la maladie physique ou mentale peuvent faire en sorte qu'il est difficile pour un parent de prendre soin adéquatement de son enfant. De nombreuses études ont démontré que la maladie entrave la capacité d'un parent à interagir positivement avec son enfant, à être disponible pour lui et à répondre adéquatement à ses besoins (Downey & Coyne, 1990; Evans, Shipton, & Keenan, 2005, 2006; Murphy, Johnston Roberts, & Herbeck, 2011; Vondra, Sisco, & Belsky, 1993). Il est aussi démontré que les parents qui souffrent d'une maladie mentale ou physique sont plus susceptibles d'infliger des mauvais traitements à leurs enfants (Pears & Capaldi, 2001; Stith et al., 2009). De plus, selon une étude récente, une détérioration de la santé physique ou mentale du parent serait associée à une diminution de la compétence parentale à travers le temps (Waylen & Stewart-Brown, 2009). On pourrait donc penser que plus une mère serait en bonne santé physique et mentale plus elle serait susceptible de conserver un degré élevé de soutien maternel à l'autonomie à travers le temps. Cela demeure toutefois à examiner.

Il serait également nécessaire d'explorer si d'autres facteurs que le langage de l'enfant expliquent la relation entre le soutien maternel à l'autonomie et le développement des

fonctions exécutives de l'enfant. Outre le langage, il est entre autres possible que la satisfaction du besoin d'autonomie de l'enfant joue un rôle important dans cette relation. En effet, selon la théorie de l'autodétermination, en satisfaisant le besoin d'autonomie de l'enfant, le soutien à l'autonomie favorise son développement dans plusieurs domaines. On peut donc penser que la satisfaction du besoin d'autonomie de l'enfant est un médiateur potentiel dans la relation entre le soutien maternel à l'autonomie et le développement des fonctions exécutives de l'enfant. Les résultats d'une étude réalisée par Grolnick et ses collègues (1991) ont d'ailleurs démontré que le soutien parental à l'autonomie perçu par l'enfant est associé à la performance scolaire de l'enfant par le biais du sentiment d'autonomie de ce dernier. Comme les fonctions exécutives sont fortement associées à la performance scolaire (Willoughby, Kupersmidt, Voegler-Lee, & Bryant, 2011), leur développement pourrait être influencé par le même processus. Selon la théorie de l'autodétermination (Deci & Ryan, 2002), plus l'environnement satisfait le besoin d'autonomie d'un enfant, plus il aura tendance à s'engager dans des activités spontanément et par choix (motivation autodéterminée) et plus il performera dans ces activités. La motivation autodéterminée (issue de la satisfaction du besoin d'autonomie) pousserait l'enfant à exercer ses habiletés, à fournir des efforts et à persévérer face à la difficulté, ce qui entraînerait une meilleure performance. Plusieurs recherches appuient cette hypothèse et démontrent que la motivation autodéterminée est liée à la performance dans plusieurs domaines (e.g., Fortier, Vallerand, & Guay, 1995; Gottfried, Fleming, & Gottfried, 1994; Grolnik et al., 1991; Guay & Vallerand, 1997). Il est donc possible qu'en satisfaisant le besoin d'autonomie de l'enfant, le soutien maternel à l'autonomie motive l'enfant à résoudre des problèmes qui impliquent les fonctions exécutives

et favorise, par le fait même, le développement de ces fonctions, mais cela demande une confirmation scientifique.

En terminant, le modèle présenté fait référence aux fonctions exécutives en général, tandis que les articles de thèse suggèrent la pertinence de distinguer les fonctions impliquant l'inhibition simple d'un comportement de celles qui impliquent davantage la mémoire de travail et la flexibilité attentionnelle. Cette approche en deux dimensions s'inspire des résultats de certaines études antérieures (Bernier, Carlson, & Whipple, 2010, Carlson, Mandell, & Williams, 2004; Carlson & Moses, 2001) et suggère que certains processus peuvent être différents selon l'aspect particulier des fonctions exécutives qui est à l'étude. Il n'y a toutefois pas de consensus dans la littérature quant à la structure des fonctions exécutives et des processus impliqués (Welsh, Friedman, & Spieker, 2006). Les fonctions exécutives ont longtemps été considérées comme un construit unitaire et indivisible (Anderson, 2002). De plus en plus d'études démontrent toutefois qu'elles impliquent plusieurs processus cognitifs distincts et complémentaires (Welsh et al., 2006). Plusieurs modèles ont été proposés pour mieux comprendre les diverses composantes des fonctions exécutives (pour une recension des écrits voir : Jurado & Rosselli, 2007) mais aucun ne semble faire l'unanimité. De plus, il n'existe pas de consensus quant à la façon de les mesurer en bas âge (Garon, Bryson, & Smith, 2008). La plupart des tâches exécutives utilisées auprès d'enfants ont été conçues pour mesurer les fonctions exécutives à l'âge adulte et ont ensuite été simplifiées et adaptées pour tenter de les mesurer durant l'enfance (Garon et al., 2008). Ces tâches impliquent généralement plusieurs processus cognitifs, ce qui rend difficile la distinction de ceux-ci (Jurado & Rosseli, 2007). De plus, très peu d'études utilisent les mêmes batteries de tâches ce qui rend difficile l'établissement d'un modèle valable des fonctions exécutives et de leurs

composantes (Garon et al., 2008). Les résultats de la thèse suggèrent une structure des fonctions exécutives en deux dimensions à l'âge préscolaire, il est toutefois possible que d'autres processus qui n'ont pas été mesurés à l'aide des tâches sélectionnées soient impliqués dans les fonctions exécutives durant cette période. C'est pourquoi le terme générique « fonctions exécutives » est utilisé dans le modèle. La poursuite des études dans le domaine est essentielle pour mieux comprendre la structure des fonctions exécutives et les divers processus impliqués. Cela permettrait de raffiner le modèle proposé dans la thèse.

Contributions principales

Dans l'ensemble, les trois articles de la thèse ont permis de contribuer à l'avancement des connaissances sur le soutien maternel à l'autonomie, sa stabilité à travers le temps et ses relations avec le développement cognitif de l'enfant. En plus de permettre d'en savoir plus sur les facteurs susceptibles d'influencer la stabilité du soutien à l'autonomie, la thèse a permis de mieux comprendre les mécanismes par lesquels il exerce une influence sur le développement des fonctions exécutives de l'enfant d'âge préscolaire. Comme les fonctions exécutives sont associées à plusieurs sphères du fonctionnement ultérieur de l'enfant, il s'agit d'une contribution significative. D'autre part, les trois études de la thèse ont répondu au besoin criant d'étudier les relations entre le soutien à l'autonomie et le développement de l'enfant dès les premières années de vie. En effet, malgré l'importance des premières années de vie pour le développement de l'enfant, il existe peu d'études sur le rôle du soutien à l'autonomie en bas âge. Les trois études ont également répondu à la nécessité de mesurer le soutien à l'autonomie de façon observationnelle, évitant ainsi les biais qu'engendrent les questionnaires de type papier-crayon qui ont souvent été utilisés dans les études antérieures. Elles ont aussi répondu

au besoin de maximiser l'utilisation de devis longitudinaux afin de confirmer le rôle du soutien à l'autonomie dans le développement de l'enfant.

Limites de la thèse

Tel que mentionné dans la section discussion de chacun des articles, les études qui constituent le cœur de la thèse présentent des limites méthodologiques qui méritent d'être énoncées. D'abord, les trois études ont été réalisées auprès d'une population canadienne majoritairement de race blanche et à faible risque socioéconomique. En ce sens, il est difficile de généraliser les résultats de ces études à des populations à risque ou qui proviennent d'autres cultures. Ensuite, il est important de souligner que les devis utilisés ne permettent pas de faire d'inférences causales. On ne peut que spéculer sur la direction des relations observées. De plus, la petite taille des échantillons a pu limiter la possibilité de détecter certains effets. Il est aussi important de mentionner qu'en examinant la stabilité du soutien à l'autonomie, il n'a pas été possible d'isoler la variable « temps » de l'influence possible des différents contextes utilisés pour mesurer ce comportement. Il serait nécessaire d'utiliser des contextes de mesure comparables pour examiner plus précisément la stabilité temporelle du soutien à l'autonomie dans les recherches futures. D'autre part, bien que l'utilisation de mesures observationnelles constitue une force de la thèse, le langage de l'enfant a été mesuré à l'aide d'un questionnaire complété par la mère. Étant donné que la mère est susceptible de surestimer ou de sous-estimer le nombre de mots que son enfant dit (Marjanovic-Umek, Fekonja, Podlesek, & Kranjc, 2011), cela constitue une limite importante. L'utilisation d'une mesure plus objective du langage de l'enfant permettrait de confirmer plus rigoureusement son rôle dans la relation entre le soutien maternel à l'autonomie et les fonctions exécutives de l'enfant. Mentionnons également que la première étude qui compose la thèse a mesuré le soutien maternel à

l'autonomie seulement une fois, tandis que les deux autres études de la thèse démontrent l'importance d'utiliser plusieurs points de mesure de ce comportement étant donné les changements dans celui-ci à travers le temps.

En terminant, la thèse a été réalisée auprès des mères seulement. Elle n'a donc pas examiné le soutien paternel à l'autonomie. Étant donné le rôle important que le père joue auprès de l'enfant dès ses premières années de vie, il s'agit d'une lacune importante. Le fait d'inclure les pères dans la thèse aurait entre autres permis de mieux comprendre comment les mères et les pères travaillent ensemble pour soutenir le besoin d'autonomie de l'enfant à travers le temps. Certains auteurs parlent de la complémentarité des rôles parentaux, le père et la mère agissant de façons différentes mais complémentaires afin de favoriser le développement de l'enfant (Paquette, 2004). D'autres auteurs soulignent le rôle complémentaire mais aussi compensateur des parents: les forces d'un parent compensant les lacunes de l'autre parent (Martin, Ryan, & Brooks-Gunn, 2007; Simons & Conger, 2007). Certaines études démontrent d'ailleurs que les pères ont tendance à s'investir davantage auprès de leurs enfants lorsque la mère n'est pas disponible physiquement ou psychologiquement (Katz & Gottman, 1996; Winking et al., 2009). Sachant que l'implication des pères augmente considérablement après la première année de vie (Tamis-LeMonda & Cabrera, 2002) et que les pères jouent un rôle particulièrement important dans l'autonomisation de l'enfant (Le Camus, 1995; Yogman, 1994), il est possible que la diminution du soutien maternel à l'autonomie observée soit liée à l'augmentation du soutien paternel, la mère diminuant son degré de soutien à mesure que le père s'implique davantage à ce niveau. Cela demeure toutefois à explorer.

Pistes d'interventions

Étant donné l'importance maintes fois démontrée du soutien à l'autonomie pour le développement de l'enfant, il serait judicieux de développer des programmes d'intervention visant à aider les parents à agir de façon à soutenir davantage l'autonomie de leurs enfants. Il est maintenant démontré que l'on peut enseigner à des gestionnaires, des enseignants et des professionnels de la santé à soutenir davantage l'autonomie des employés, des étudiants ou des patients, et que cela a des effets positifs sur ceux-ci (pour une recension des écrits voir : Su & Reeve, 2011). De récentes études démontrent également que l'on peut bonifier plusieurs aspects des comportements parentaux à l'endroit des enfants à l'aide de brèves interventions comportementales (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Landry et al., 2012). À notre connaissance, il n'existe toutefois pas de programmes d'intervention permettant d'augmenter efficacement le degré de soutien à l'autonomie des parents. Les résultats de la thèse ont certaines implications pour le développement de ce type de programme. Dans un premier temps, les résultats démontrent que le soutien parental à l'autonomie est relativement stable à travers le temps. Il serait donc important d'intervenir très tôt auprès des parents pour leur enseigner des techniques éducatives visant à soutenir l'autonomie de leurs enfants. D'autre part, comme la thèse démontre que la stabilité du soutien à l'autonomie est bénéfique pour certaines sphères du développement de l'enfant, l'enseignement de la constance devrait être un ingrédient essentiel au sein des programmes d'intervention. La thèse suggère également que les parents qui vivent beaucoup d'évènements de vie stressants, qui ont des représentations d'attachement insécurisées et qui ont un garçon, sont plus susceptibles d'avoir besoin d'aide pour demeurer stable dans leur degré de soutien à l'autonomie. Les interventions devraient donc tenir compte de ces personnes.

Les résultats de la thèse soulignent également qu'en favorisant le développement du langage, le soutien maternel à l'autonomie favorise le développement des fonctions exécutives. Le langage permettrait à l'enfant de développer des outils pour mieux inhiber ses impulsions. Ainsi, les interventions visant à favoriser le développement des fonctions exécutives de l'enfant devraient tenir compte du langage et favoriser son acquisition et son développement. Il existe d'ailleurs un programme d'intervention issu des idées théoriques de Vygotsky incluant un volet sur l'utilisation du langage comme outil de réflexion durant l'exécution des tâches impliquant les fonctions exécutives (Bodrova & Leong, 2007). Après avoir suivi ce programme, les enfants performeraient mieux aux tâches impliquant les fonctions exécutives (Diamond, Barnett, Thomas, & Munroe, 2007). En plus de favoriser l'utilisation du langage comme outil de réflexion, il pourrait être pertinent d'inclure un volet visant à favoriser plus directement le développement du langage expressif général de l'enfant, puisque le premier article de la thèse démontre qu'il joue un rôle dans le développement des fonctions exécutives.

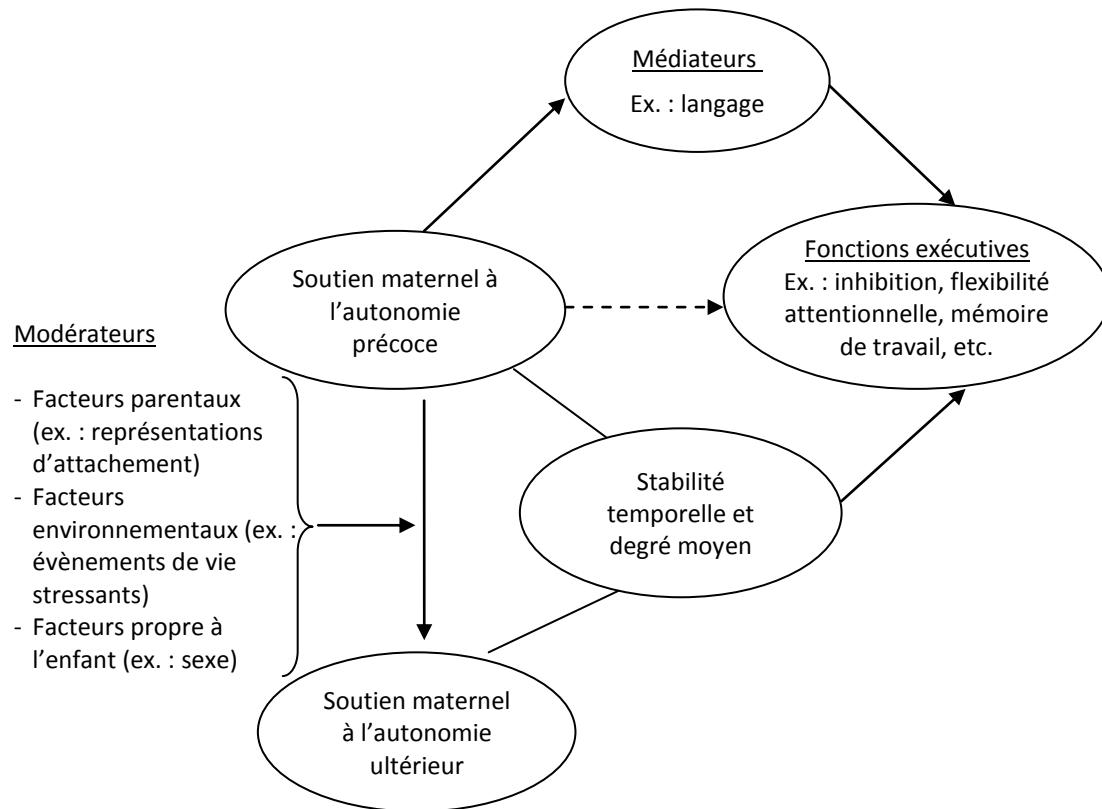
Conclusion

Malgré ses limites méthodologiques, la thèse a permis de mieux comprendre la stabilité du soutien maternel à l'autonomie et ses relations avec le développement des fonctions exécutives de l'enfant à travers les premières années de vie. Elle a également permis de développer un modèle qui illustre les interactions possibles entre le soutien maternel à l'autonomie, les caractéristiques de l'enfant, de la mère et de l'environnement, et le développement cognitif de l'enfant. De plus, elle a permis de cibler certaines pistes d'intervention et de recherches futures. En somme, la thèse démontre que l'étude du soutien

parental à l'autonomie dès les premières années de vie est porteuse d'implications à la fois scientifiques et pratiques, et que la poursuite des recherches dans le domaine est importante.

Figure 1

Modèle – Intégration des résultats de la thèse



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Annexe A

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

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*(1), 17-32.

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

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 : Tous les 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.

Flexibilité et empathie

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 B

Systeme de codification du soutien maternel à l'autonomie à 3 ans

Système de codification du soutien à l'autonomie à 3 ans

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 un 1 ou un 5, il doit n'y avoir rien à redire.

Soutien verbal

Définition : Mesure dans laquelle la mère soutient verbalement l'enfant.

5 - Soutient beaucoup l'autonomie (mère utilise toutes ces verbalisations de façon constante)

- Mère **encourage** son enfant dans la poursuite de la tâche.
- Mère **félicite** son enfant.
- Mère emploie un ton qui communique qu'elle est une **source d'aide** pour son enfant.
ET/OU
- Mère démontre de l'**enthousiasme**, elle est énergique et motivée.

3 – Soutient moyennement l'autonomie :

- Mère émet des verbalisations de façon **inconstante** (la moitié du temps).

OU

- Mère émet 2 de ces quatre sortes de verbalisations, de façon constante.

1 – Ne soutient pas l'autonomie :

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

Flexibilité et empathie

*****Non applicable si l'enfant ne dévie pas de la tâche**

Définition : Mesure dans laquelle la mère démontre de la flexibilité dans la façon dont elle gère l'attention de son enfant à la tâche et mesure dans laquelle elle prend la perspective de son enfant.

5 - Soutient beaucoup l'autonomie

- *Mère démontre de la **flexibilité** dans ses efforts pour garder l'enfant centré sur la tâche.*

ET

- *Elle **prend la perspective** de son enfant et reconnaît ses sentiments (empathie).*

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.*

Respect du rythme et des choix

Définition : Mesure dans laquelle la mère suit et respecte le rythme de l'enfant et lui offre des choix. L'enfant joue un rôle d'acteur (et non d'observateur).

**** 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 désinvestie de l'interaction, on donne un score faible de soutien à l'autonomie.*

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. quelle couleur ranger en premier). Le **choix** est **implicite**.
- La mère offre **explicitement des choix** à l'enfant, elle l'encourage à prendre des décisions (ex. : « Qu'elle couleur est-ce que tu aimerais faire maintenant?»).

3- Soutient moyennement l'autonomie

- Mère laisse l'enfant faire des choix, mais ne l'encourage pas ouvertement à en faire ou ne respecte pas son rythme.

OU

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

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.

Soutien motivationnel

Définition : Mesure dans laquelle la mère favorise la réalisation et la poursuite de la tâche par l'enfant lui-même en utilisant aux moments appropriés des stratégies motivationnelles adaptées au besoin de l'enfant.

5 - Soutient beaucoup l'autonomie

➤ *Mère utilise des stratégies adaptées au besoin de l'enfant pour favoriser la complétion de la tâche par ce dernier telles que :*

- ✓ *Expliquer à l'enfant ce qu'il doit faire (ex. : « Il faut ranger les blocs par couleur dans les sacs »).*

ET/OU

- ✓ *Guider l'enfant dans la complétion de la tâche en fonction de ses besoins (ex. : lui faire des suggestions pratiques, adapter la tâche pour que l'enfant soit en mesure de l'effectuer, etc.).*

ET/OU

- ✓ *Offrir un **rationnel** (ex. : « Il faut ranger parce que la madame doit partir et elle a besoin des jouets » ou « parce que tu as joué avec eux et c'est à toi de les ranger »).*

ET/OU

- ✓ *Rendre la tâche **agréable** (ex. : invente un jeu, utilise de l'humour, chante une chanson, etc.).*

3- Soutient moyennement l'autonomie

➤ *Les stratégies motivationnelles que la mère utilise ne répondent pas complètement au besoin de l'enfant (stratégies partiellement efficaces ou partiellement appropriées).*

OU

➤ *Mère utilise des stratégies motivationnelles adaptées au besoin de l'enfant, mais elle ne le fait pas au moment approprié (trop tôt, trop tard ou de façon inconstante (la moitié du temps)).*

1 – Ne soutient pas l'autonomie

Annexe C

Tâches de fonctions exécutives à 3 ans :

Carlson, S. M. (2005). Developmentally sensitive measures of executive function in preschool children. *Developmental Neuropsychology*, 28(2), 561-729.

Procédure pour les tâches des fonctions exécutives à 3 ans

1. Tâche de l'ourson et du dragon (Bear/Dragon; Reed et al., 1984)

Étape 1 :

Expérimentateur (E) : « Je vais te demander de faire des choses drôles avec moi avant qu'on commence le prochain jeu »

(E est le modèle pendant l'exercice. Il fait donc les gestes en même temps que l'enfant)

- Sors ta langue
- Touche tes oreilles
- Touche tes dents
- Touche tes yeux
- Tape tes mains ensemble
- Touche tes pieds
- Touche ta tête
- Touche ton bedon
- Touche ton nez
- Lève tes bras en l'air

Étape 2 :

(E sort les deux marionnettes)

E : « Maintenant, on va jouer avec deux marionnettes. Cette marionnette-ci est un gentil ourson. Quand il va nous parler, on va faire ce qu'il dit. Cette autre marionnette est un dragon et il n'est pas vraiment gentil. Quand le dragon nous demande de faire quelque chose, il ne faut pas l'écouter, on ne le fait pas! »

Essais de pratique :

E : « On va pratiquer une fois »

L'OURSON : « Bonjour, je suis le gentil ourson, touche ton nez! » *(prendre une voix gentille, douce)*

Si l'enfant ne touche pas son nez, l'E lui dit : « Rappelle-toi bien, l'ourson il est gentil, alors quand il nous demande de faire quelque chose, on doit le faire »

E répète la directive et peut servir de modèle jusqu'à ce que l'enfant réussisse.

Si l'enfant touche son nez E dit : « C'est beau! Maintenant, on essaie avec le méchant dragon. Rappelle-toi, quand il dit quelque chose on ne le fait pas »

LE DRAGON : « Touche ton bedon » (*avec une voix plus basse, plus épeurante*)

Si l'enfant touche son bedon : « Rappelle-toi bien, on ne fait pas ce que le dragon dit, parce qu'il n'est pas gentil »

On répète l'essai avec le dragon jusqu'à ce que l'enfant réussisse.

Étape 3 :

Maintenant, on vérifie si l'enfant a bien compris les deux règles :

E : « Donc, quand l'ourson te dit de faire quelque chose, est-ce que tu le fais? » (*corriger l'enfant s'il n'a pas la bonne réponse*)

E : « Et si le dragon te demande de faire quelque chose est-ce que tu le fais? » (*corriger l'enfant s'il n'a pas la bonne réponse*)

Étape 4 :

Alors, on joue !

Essais (pour les essais, E ne fait pas les gestes avec l'enfant) :

1. OURSON: Sort ta langue

2. DRAGON: Touche tes oreilles

3. OURSON: Touche tes dents

4. DRAGON: Touche tes yeux

5. OURSON: Tape des mains

Si l'enfant réussit 2 essais ou moins, on répète la consigne : « Rappelle-toi la façon dont on joue. On écoute l'ourson parce qu'il est gentil et on n'écoute pas le dragon parce qu'il n'est pas gentil. »

6. DRAGON: Touche tes pieds

7. OURSON: Touche ta tête

8. DRAGON: Touche ton bedon

9. OURSON: Touche ton nez

10. DRAGON: Lève tes bras dans les airs

2. Tâche du jour et de la nuit (Day/Night, Gerstad et al., 1994) :

Étape 1 :

E : « Maintenant, nous allons jouer à un jeu avec ces cartes »

E : « Est-ce que tu sais quand le soleil se lève? Le jour ou la nuit? Est-ce que tu sais quand la lune et les étoiles apparaissent? Le jour ou la nuit? »

Féliciter les bonnes réponses et corriger les réponses erronées.

Étape 2 :

E : « Maintenant, on va jouer à un drôle de jeu »

(montrer la carte avec la lune noire)

E : « Pour ce jeu, quand tu vois cette carte, je veux que tu dises « jour ». Est-ce que tu peux dire ce mot ? »

Féliciter si l'enfant dit le mot, mais s'il ne le dit pas, il faut lui faire répéter le mot.

(enlever la carte de la lune noire et montrer la carte du soleil blanc)

E : « Quand tu vois cette carte, je veux que tu dises « nuit ». Est-ce que tu peux dire ce mot? »

Féliciter si l'enfant dit le mot. S'il ne le dit pas, il faut lui faire répéter le mot.

Étape 3 :

Essais de pratique :

Montrer la carte avec le soleil blanc et attendre la réponse de l'enfant, si l'enfant hésite, il faut lui dire : « Qu'est-ce qu'on dit quand on voit cette carte? ».

Féliciter l'enfant s'il donne une bonne réponse. Sinon, répéter les consignes et la pratique jusqu'à ce que l'enfant donne la bonne réponse.

Montrer la carte de la lune noire, attendre la réponse de l'enfant et s'il hésite lui demander : « Qu'est-ce qu'on dit quand on voit cette carte? ».

Féliciter l'enfant s'il donne une bonne réponse. Sinon, répéter les consignes et la pratique de la lune noire jusqu'à ce que l'enfant donne la bonne réponse.

Étape 4 :

Essais :

Montrer en alternance le soleil blanc et la lune noire pour un total de 16 essais.

À chaque fois que l'enfant hésite en voyant une carte, il faut lui demander : « Qu'est-ce qu'on dit quand on voit cette carte », mais ne pas utiliser le mot « jour » ou le mot « nuit » et ne pas corriger l'enfant s'il donne une réponse erronée.

3. Tâche de tri de cartes (Dimension Change Card Sort, Zelazo, 2006) :

Étape 1 : jeu des formes

(E place une boîte sur laquelle on retrouve une étoile bleue et une boîte sur laquelle se trouve un camion rouge devant l'enfant. Le camion est à gauche et l'étoile à droite selon la perspective de l'enfant)

E : « Voici une étoile bleue et un camion rouge. Maintenant, on va jouer à un jeu de cartes ensemble. On va commencer avec le jeu des formes. Dans le jeu des formes, toutes les étoiles vont ici (pointer avec le doigt la boîte avec l'étoile bleue) et tous les camions vont ici (pointer avec le doigt la boîte avec le camion rouge) »

- Essais de pratique :

E : « Voici une carte avec une étoile. Je vais la placer dans cette boîte (placer la carte exemple dans la boîte appropriée) et voici un camion, je vais le placer là (placer la carte exemple dans la boîte appropriée) »

E : « Donc, si c'est une étoile, tu la mets ici (pointer la bonne boîte) et si c'est un camion (pointer la bonne boîte), tu le mets ici. Voici un camion, où est-ce que tu le places? »

- On félicite une bonne réponse.
- On corrige une mauvaise réponse : « Non. Celui là, c'est un camion, il va avec les camions qui ont la même forme. Est-ce que tu m'aides à mettre le camion au bon endroit ? »

(ramasser les cartes que nous avons placées en exemple pour l'enfant et le coup de pratique)

- Essais :

E : « Maintenant, je vais te donner des cartes et je veux que tu les mettes dans la bonne boîte. Rappelle-toi bien, les étoiles vont ici (pointer du doigt) et les camions ici (pointer du doigt) »

(l'E donne les cartes une-à-une à l'enfant pour un total de 6 essais)

Pour chaque essai, E dit : « Si c'est une étoile tu la mets ici et si c'est un camion tu le mets ici. Voici _____ (une étoile ou un camion) ».

Étape 2 : jeu des couleurs

E : « Maintenant, on arrête le jeu des formes et on va jouer au jeu des couleurs ensemble. Pour le jeu des couleurs, toutes les cartes bleues vont ici (pointer avec le doigt vis-à-vis l'étoile bleue) et toutes les cartes rouges vont ici (pointer avec le doigt vis-à-vis le camion rouge) »

- Essais de pratique :

E : « Voici une carte bleue. Cette carte va ici (placer la carte exemple dans la boîte de l'étoile bleue) et voici une carte rouge. Celle-ci va ici (placer la carte exemple dans la boîte du camion rouge) »

E : « Rappelle-toi bien, si c'est une carte rouge, tu la places ici et si c'est une carte bleue, tu la places ici. Voici une carte rouge, où est-ce que tu la places? »

- On félicite une bonne réponse.
- On corrige une mauvaise réponse.

(ramasser les cartes placées en exemple pour l'enfant et le coup de pratique)

E : « Maintenant, c'est ton tour. Rappelle-toi bien, les cartes rouges vont ici et les cartes bleues ici (en pointant du doigt) »

- Essais :

Pour chaque essai, E dit : « Si c'est une carte bleue, tu la mets ici. Si c'est une carte rouge, tu la mets ici. Voici une carte _____ (rouge ou bleue) ».

4. Délai de gratification (Kochanska et al., 2000) :

E sort la cloche du sac et dit : « Regarde, une cloche! »

E sort les sacs de frootloops, goldfishs et raisins secs.

E : « Regarde je t'ai amené des petits cadeaux à manger! Il y a en a trois sortes, quel est celui que tu aimes le plus ? »

Une fois que l'enfant a fait son choix, on place un plat sur la table avec quelques récompenses dedans (raisins, goldfishs ou frootloops).

E : « On va jouer à un jeu ensemble, tu as le droit de manger un _____ seulement quand je sonne la cloche. Ok ? »

Essais de pratique :

E: « Tu peux en manger un juste quand je sonne la cloche (*E sonne la cloche*). Vas-y, prends-en un! » (2X)

Pour les deux essais de pratique, l'E doit corriger l'enfant s'il prend une récompense avant que la cloche sonne.

Essais :

E : « Maintenant, on va en faire d'autres. N'oublie pas! Tu as le droit de prendre un _____ seulement lorsque je sonne la cloche » (*E attend 5, 15, 30 et 45 secondes avant de sonner la cloche*)

Annexe D

Adaptation du Life Experiences Survey :

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology, 46*(5), 932-946.

ÉVÉNEMENTS PARTICULIERS

Il arrive souvent que certains événements, qu'ils soient temporaires ou définitifs, affectent notre rythme de vie. En voici quelques uns. Veuillez indiquer si vous avez vécu ces événements depuis les _____ derniers mois.

NON	OUI	Maladie ayant nécessité l'hospitalisation de
		L'enfant participant à l'étude
		Un frère ou une sœur de cet enfant
		Vous, le père de l'enfant ou votre conjoint (si différent du père)
		Autre parent proche. Précisez :
NON	OUI	Changements dans le rythme de vie
		Naissance ou arrivée d'un nouvel enfant
		Grossesse
		Emploi père/mère (perte ou changement) : Précisez :
		Déménagement
		Séparation des parents
		Autre (nouveau conjoint, partage de la garde, etc.). Précisez :
NON	OUI	Changement au niveau de la garde de l'enfant
		Garde régulière. Précisez le changement :
		Garde occasionnelle. Précisez :
S'il y a lieu, identifiez d'autres événements pouvant perturber le rythme de vie de la famille (ex.: décès de quelqu'un, visite prolongée, séparation de l'enfant et des parents pour des vacances, maladies, etc.).		

Annexe E

Inventaire MacArthur du développement de la communication :

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

Langage

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