

Université de Montréal

**L'évolution des comportements d'agressivité physique de
la petite enfance à l'âge scolaire : Le rôle des relations
d'amitié en début de scolarisation**

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Cette thèse intitulée :
L'évolution des comportements d'agressivité physique de la petite enfance à l'âge scolaire :
Le rôle des relations d'amitié en début de scolarisation

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Résumé

Cette thèse avait pour objectif d'examiner les liens longitudinaux entre les relations d'amitié et l'évolution des comportements d'agressivité physique en début de scolarisation. Guidé par les principes énoncés par les théoriciens de l'apprentissage social, de l'attachement, du développement de la personnalité et de la théorie du jugement moral, le rôle principal et modérateur de certaines dimensions spécifiques à la qualité de la relation d'amitié, ainsi que des attributs comportementaux des amis et des caractéristiques personnelles de l'enfant a été évalué. Des données provenant de l'Étude Longitudinale du Développement des Enfants du Québec (ELDEQ), de l'Étude des Jumeaux nouveau-nés du Québec (EJNQ) et de l'évaluation des effets d'un programme d'intervention dyadique ont été analysées. Les mesures utilisées dans cette thèse ont été collectées entre la maternelle et la 2^e année du primaire, soit de 5 à 8 ans, directement auprès des enfants, de leurs amis, leurs pairs, leurs parents et leurs enseignants par le biais de questionnaires, d'entrevues sociométriques et de mises en situation hypothétiques.

En lien avec la perspective de l'apprentissage social, les résultats ont montré que l'association à des amis agressifs en maternelle est liée à une augmentation des comportements d'agressivité physique chez l'enfant. Cependant, en lien avec les théories du développement de la personnalité et la perspective de l'attachement, le fait d'établir une relation d'amitié de bonne qualité est reliée à une diminution des comportements agressifs à travers le temps. De plus, une interaction entre la qualité de la relation et les attributs comportementaux des amis a indiqué que le risque lié à l'association à des amis agressifs est atténué dans le contexte d'une relation d'amitié de bonne qualité. Les résultats indiquent également que chez les garçons, la présence de conflits entre amis à la maternelle est associée de façon linéaire à de plus hauts niveaux de comportements agressifs, indépendamment du risque génétique de l'enfant face à cette problématique. Une interaction triple a par ailleurs révélé que le conflit n'était pas lié à une augmentation de l'agressivité physique dans le contexte d'une relation d'amitié caractérisée par l'affect positif et une bonne capacité à régler les conflits. Enfin, les résultats ont montré un effet indirect d'une intervention dyadique sur la diminution des comportements d'agressivité physique, qui opère à travers l'amélioration de la capacité des amis à régler leurs conflits. Ces résultats appuient le rôle bénéfique de la qualité

de la relation d'amitié sur l'évolution des manifestations de comportements d'agressivité physique et suggèrent que cet aspect relationnel soit pris en compte dans les programmes de prévention des conduites agressives.

En somme, la mise en évidence d'associations et d'interactions significatives entre la qualité des relations d'amitié, les attributs comportementaux des amis et les manifestations de comportements d'agressivité physique en début de scolarisation suggère que certains aspects et dimensions relationnelles positives peuvent être bénéfiques au développement des enfants agressifs. La prévention du maintien et de l'aggravation des conduites agressives par l'entremise de l'amélioration de la qualité des relations d'amitié représente une avenue prometteuse.

Mots-clés : agressivité physique, qualité de la relation d'amitié, caractéristiques des amis, conflit, stratégies de résolution de conflits, affect positif, vulnérabilité génétique, début de la scolarisation, prévention, pairs

Abstract

The aim of the present dissertation was to investigate the prospective links between friendship relationships and physical aggression development during the early school years. Within a theoretical framework based on social learning, personality, attachment and socioconstructivist theories, we examined the unique and combined role of various dimensions of friendship quality, friends' behavioral characteristics and child's pre-existing vulnerabilities in regard to the persistence of young children's physical aggression. Data from the Quebec Longitudinal Study of Child Development (QLSCD), from the Quebec Newborn Twin Study (QNTS) and from an efficacy test through a dyadic intervention program were used. Measures in this dissertation were collected from kindergarten to grade 2, when the children were aged from 5 to 8 years old, with the children themselves, their friends, their classmates, their parents, as well as their teachers, through various questionnaires, a peer evaluation procedure and hypothetical scenarios.

In line with the social learning perspective, friends' aggression was linked to a significant increase in children's physical aggression. However, in line with the social bonding perspective, a good friendship quality played both a compensatory and a protective role, by respectively reducing children's initial level of physical aggression and by mitigating the associations between friends' and children's physical aggression. Results also show that friendship conflict was associated to a linear increase with boys' but not with girls' physical aggression over time. Shared positive affect and conflict resolution skills were found to mitigate the prospective association between friendship conflict and children's physical aggression. These results were independent of children's sex and genetic risk for physical aggression. No interaction effects were found between the friendship dimensions and genetic risk for aggression, suggesting that children are equally affected independently from their genetic liability. Results showed an indirect effect of the dyadic intervention on decreasing levels of physical aggression through the improvement of one specific feature of friendship quality: conflict resolution. These results support the causal role of friendship quality on the developmental course of physical aggression and point to the inclusion of this relational aspect in prevention programs targeting young aggressive children.

Overall, the main and moderating effect found between friendship quality, friend's aggression and child personal characteristics bring both theoretical and practical implications. Indeed, these results suggest that fostering a positive relationship between friends in the early school years may decrease physical aggression even if the friends are aggressive. Besides, high friendship quality may also buffer against the risk associated with experiencing conflict. These findings underscored the importance of taking into account the relational characteristics, such as conflict resolution and positive affect, in order to better understand the impact of friendship relationships on children's physical aggression development.

Keywords : physical aggression, friendship quality, friends' characteristics, conflict, resolution skills, positive affect, genetic liability, early school years, prevention, peers

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Chapitre I : Introduction

Introduction générale

L'agressivité physique est une forme de comportement qui implique un contact physique, tel que frapper, pousser ou batailler, et qui peut engendrer des émotions, des blessures ou des souffrances (Harré & Lamb, 1983). En bas âge, ces comportements sont observés si fréquemment qu'ils sont considérés comme faisant partie d'un processus développemental normatif se déroulant, partiellement à tout le moins, sous le contrôle de facteurs génétiques et biologiques (Hicks, Krueger, Iacono, McGue, & Patrick, 2004). Le délaissement des comportements d'agression physique au profit de comportements et de formes d'affirmation de soi plus socialement acceptables s'inscrit toutefois dans des trajectoires individuelles de développement et n'est pas indépendant des contextes sociaux dans lesquels il se produit. Les jeunes enfants qui continuent à montrer un niveau élevé d'agressivité physique à l'âge préscolaire et scolaire sont à risque de manifester des formes graves de comportement agressif et menant à diverses conséquences négatives (Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Nagin & Tremblay, 1999). Il semble donc important de considérer le développement des conduites agressives dans le cadre d'un modèle développemental qui tient compte à la fois des différents aspects génétiques et contextuels de ce phénomène.

Divers facteurs environnementaux liés aux manifestations fréquentes et intenses d'agressivité physique à l'enfance, telles les expériences familiales négatives et les difficultés liées au rejet par les pairs, ont d'ailleurs été mis en évidence dans les études antérieures et ciblés dans plusieurs programmes de prévention du maintien et de l'aggravation de cette problématique (Bierman, Greenberg, & Conduct Problems Prevention Research Group, 1996). Si les relations familiales et les liens avec le groupe de pairs forment des contextes sociaux qui ont suscité beaucoup d'intérêt en termes de recherche et de prévention, il ne semble pas, par contre, en être ainsi pour les expériences liées aux relations d'amitié dyadique et ce, particulièrement à la petite enfance. Certains des premiers théoriciens des relations entre pairs ont pourtant mis particulièrement l'accent sur le rôle potentiellement bénéfique et protecteur

des relations d'amitié dyadique dans leurs conceptions du développement social et de la personnalité (Piaget, 1965, Sullivan, 1953). D'autres les ont envisagées comme un contexte à travers lequel pouvait se manifester les mécanismes de base de l'apprentissage social, qui sont liés au changement comportemental (Bandura & Huston, 1961). Néanmoins, il est encore relativement peu fréquent que les relations d'amitié et les différents aspects qui s'y rattachent fassent l'objet de travaux systématiques ou bien, qu'elles soient considérées comme une cible d'intervention dans les programmes visant à prévenir les conséquences négatives associées aux manifestations d'agressivité physique à l'enfance (Bagwell & Schmidt, 2011).

Les travaux portant sur les relations d'amitié se sont principalement centrés sur trois aspects; la présence ou l'absence de relations d'amitié, la qualité de ces relations et les attributs comportementaux des partenaires en relation (Hartup & Stevens, 1997). Ces trois facettes utilisées pour examiner l'influence des relations d'amitié ont par ailleurs été associées avec le pire et le meilleur (Bukowski, Buhrmester, & Underwood, 2011), mais peu d'études se sont penchées sur leur rôle spécifique face au développement de l'agressivité en bas âge. Plus particulièrement, si certaines dimensions reliées à la qualité des relations d'amitié semblent affecter positivement le développement de l'enfant, au plan de l'estime de soi et de la réussite scolaire par exemple, il n'est pas clair que ces liens entre les relations d'amitié à la petite enfance et l'adaptation personnelle et scolaire puissent être généralisés à la problématique de l'agressivité physique, compte tenu du peu d'études empiriques en ce sens. De plus, comme la qualité des relations d'amitié est définie par la combinaison de dimensions positives et négatives, et que certaines caractéristiques personnelles chez les partenaires en relation semblent conditionner la façon dont elles sont associées au développement, il est possible d'envisager des interactions complexes entre ces dimensions et caractéristiques. Dans cette perspective, le but de cette thèse est d'examiner le rôle des différents aspects liés aux relations d'amitié en regard de l'évolution des comportements d'agressivité physique de la petite enfance aux cours des premières années d'école primaire. Plus particulièrement, elle vise à identifier dans quels contextes personnels et relationnels ces liens se manifestent.

Présentation des chapitres de la thèse

Le premier chapitre de la thèse introduit les modèles théoriques qui expliquent comment les relations d'amitié peuvent affecter le développement social et affectif et plus

particulièrement, le développement des problèmes d'agressivité physique et de comportement extériorisé à l'enfance. Ce chapitre présente également une synthèse générale des résultats des études empiriques qui ont examiné le lien entre différents aspects des relations d'amitié et le développement des conduites agressives à l'enfance.

Le deuxième chapitre de la thèse est constitué d'un article empirique qui examine les associations longitudinales entre la qualité des relations d'amitié, les comportements agressifs des amis à la maternelle, et le développement des comportements d'agressivité physique en début de scolarisation (i.e. de la maternelle à la 2^e année du primaire). Les effets principaux de ces deux aspects, ainsi que l'effet modérateur du sexe de l'enfant, seront examinés. L'interaction entre la qualité de la relation d'amitié et les comportements agressifs des amis sera également évaluée.

Le troisième chapitre de la thèse est composé d'un article empirique qui analyse les liens longitudinaux entre trois dimensions spécifiques de la qualité de la relation d'amitié en maternelle, soit la présence de conflits entre amis, le niveau d'affect positif et la capacité à résoudre les conflits, et les manifestations de comportements d'agressivité physique chez l'enfant en 1^{ère} année. Seront également examinés les effets modérateurs du niveau d'affect positif, du style de résolution de conflits de la dyade, du sexe de l'enfant, ainsi que de sa vulnérabilité génétique face à l'agressivité en lien avec la présence de conflits et l'agressivité.

Le quatrième chapitre de la thèse est constitué d'un article empirique qui rapporte les résultats de l'évaluation des effets à court terme d'un programme d'intervention dyadique expérimental visant à améliorer la qualité de la relation d'amitié chez des enfants présentant un haut niveau d'agressivité physique à la maternelle ou lors de la 1^{ère} année du primaire. Les processus relationnels liés à la capacité à coopérer, à résoudre adéquatement les conflits et à manifester des affects positifs seront examinés afin d'expliquer l'association entre la participation au programme et le changement dans le niveau de comportements d'agressivité physique au cours d'une année scolaire.

Le cinquième chapitre conclut la thèse en proposant une discussion générale sur les résultats obtenus. Les forces et les limites méthodologiques sont présentées, de même qu'une réflexion sur des pistes de recherches futures.

Contexte théorique

La transition de la petite enfance à l'âge scolaire représente une période développementale importante pour l'étude des changements comportementaux, compte tenu que les enfants intègrent l'école dans un nouveau contexte social et doivent, par le fait même, composer avec de nouvelles expériences relationnelles susceptibles de les influencer tant aux plans personnel que social et scolaire (Ladd, Kochenderfer, & Coleman, 1996). Même si la plupart des enfants parviennent à s'intégrer à l'école avec succès et sans problèmes majeurs, cette transition semble plus difficile pour les enfants qui manifestent un haut niveau de comportements d'agressivité physique (Bukowski *et al.*, 2011). À cet effet, les relations avec les pairs chez les enfants agressifs, et plus particulièrement les expériences d'acceptation et de rejet par le groupe de pairs, ont reçu une attention considérable dans la littérature scientifique (Gifford-Smith & Brownell, 2003). Toutefois, plusieurs questions demeurent ouvertes à savoir s'il est également important de s'attarder au potentiel d'influence des relations d'amitié dyadique à l'enfance, et non pas uniquement ou principalement aux expériences avec le groupe de pairs. En fait, peu d'études se sont penchées sur le rôle de la qualité des relations d'amitié établies par l'enfant en début de scolarisation afin de mieux comprendre l'étiologie des problèmes d'agressivité physique et dans quelles conditions les effets potentiellement associés aux différentes dimensions positives et négatives des relations d'amitié peuvent-ils être observés. Dans cette optique, la présente thèse adopte une perspective développementale et interactionnelle afin d'examiner l'effet des relations d'amitié dyadique sur le développement des conduites agressives en début de scolarisation, et en association avec certains aspects relationnels et caractéristiques individuelles.

Dans un premier temps, ce chapitre définit sommairement la problématique de l'agressivité physique et les diverses manifestations qui y ont été associées à travers le temps chez les filles et les garçons. Deuxièmement, une synthèse générale des études empiriques, qui ont documenté l'étiologie des problèmes d'agressivité physique de la petite enfance à l'enfance, est effectuée, en portant une attention particulière aux études sur les aspects liés aux relations d'amitié. Troisièmement, les modèles théoriques, qui ont guidé l'étude du lien entre les relations d'amitié et le maintien et l'aggravation des conduites agressives, sont présentés.

Enfin, les objectifs des articles qui composent la thèse, de même que la méthodologie et la stratégie analytique utilisées sont brièvement exposés.

La problématique de l'agressivité

L'agression est un comportement répréhensible qui prend souvent racine dans un sentiment de colère ou d'injustice (Underwood, 2003). Quand un enfant ressent la frustration ou qu'il poursuit un but social précis, il est susceptible, dans certains cas, de recourir à l'agression, tentant ainsi de s'affirmer ou de parvenir à ses fins. La plupart des définitions utilisées pour décrire ce type de comportement réfèrent à la notion d'intention et de souffrance, ce qui implique que l'individu posant un geste agressif le fait en ayant l'intention de blesser autrui et que la victime se sent blessée (Harré & Lamb, 1983). Ces critères s'appliquent autant aux comportements qui entraînent des blessures physiques que des blessures sociales. En fait, de nombreux sous-types liés au vaste construit que représente l'agressivité ont été proposés dans la littérature et dans certains cas, ont permis de décrire des trajectoires développementales distinctes (Vitaro & Brendgen, 2012). L'agressivité peut donc être à la fois définie par des gestes physiques (e.g. frapper, pousser, mordre, se bagarrer) ou des actions sociales (e.g. porter atteinte aux relations d'autrui ou à leur statut social par l'entremise de pratiques d'exclusion, de commérages ou de manipulation), un caractère réactif (e.g. l'agressivité est caractérisée par la colère, l'impulsivité et motivée par la frustration) ou proactif (e.g. l'agressivité est délibérée et orientée vers un but précis) (Crick, Bigbee, & Howes, 1996; Galen & Underwood, 1997).

Au niveau psychométrique, des différences significatives émergent entre les mesures des sous-types d'agressivité (Frick, Lahey, Loeber, Tannenbaum, Vanhorn, Christ *et al.*, 1993). L'agrégation des différentes formes d'agressivité peut, par ailleurs, masquer le moment d'apparition et le patron d'évolution distinct de comportements d'agressivité spécifiques, ainsi que voiler les différences entre les sexes (Tremblay, 2012). Dans ce contexte, la présente thèse met l'accent sur l'agressivité dans sa forme physique, puisque plusieurs études empiriques suggèrent que cette forme d'agressivité entraîne des conséquences négatives au plan développemental (e.g. Dodge, Coie, & Lynam, 2006) afin de raconter une histoire précise et cohérente. Certains auteurs font, néanmoins, un rapprochement conceptuel entre les manifestations de comportements d'agressivité physique et les problèmes de comportement

extériorisé ou les comportements perturbateurs en fonction de leur aspect « manifeste », par opposition aux comportements désignés en fonction de leur aspect « caché », tels que l'agressivité sociale ou certains comportements de défiance et d'opposition, comme enfreindre les règles, mentir ou voler (Lahey, Loeber, Burke, & Applegate, 2005; Loeber & Schmaling, 1985). Les études portant sur le lien entre les relations d'amitié et diverses formes de problèmes de comportement dits « manifestes » seront considérées dans la présente thèse dans la mesure où elles offrent un éclairage sur les liens possibles avec le développement de l'agressivité physique, là où les études ayant spécifiquement mesuré l'agressivité physique font défaut.

Premières manifestations et évolution de l'agressivité physique, différences selon les sexes et conséquences associées

Les manifestations de comportements d'agressivité physique sont à leur apogée vers l'âge de 18 mois et continuent à être fréquemment observées au début de la période préscolaire (Tremblay, Japel, Perusse, McDuff, Boivin, Zoccolillo, *et al.*, 1999). Le recours à l'agressivité physique tend, par contre, à décroître au cours de cette même période (Dodge *et al.*, 2006). Ainsi, certaines études longitudinales ont montré que la vaste majorité des enfants manifestent des comportements d'agressivité physique en bas âge (e.g. Côté *et al.*, 2006; Tremblay, Nagin, Séguin, Zoccolillo, Zelazo, Boivin *et al.*, 2004), mais que tel n'est plus le cas à l'âge scolaire (e.g. Hay, Castle, & Davies, 2000; Keenan & Wakschlag, 2000). Il semblerait donc qu'à l'âge scolaire la plupart des enfants aient appris à utiliser des stratégies autres que l'agression physique pour interagir et entrer en contact avec autrui (Côté, Tremblay, & Vitaro, 2003; Eddy, Leve, & Fagot, 2001). Les études longitudinales portant sur les trajectoires distinctes d'agressivité physique à travers le temps montrent en fait que seul un petit groupe d'enfants continue à manifester un niveau élevé et stable d'agressivité physique tout au long des années d'école primaire (Broidy *et al.*, 2003; Nagin & Tremblay, 1999).

La problématique de l'agressivité physique nécessite qu'on s'attarde aux différences entre les sexes et à la façon dont ces différences évoluent à travers le temps afin de décrire ses manifestations et son évolution. La plupart des études indiquent que les garçons sont surreprésentés dans les trajectoires chroniques d'agressivité physique (Côté *et al.*, 2006; Tremblay *et al.*, 2004). Les différences entre les sexes ont par ailleurs tendance à augmenter

avec l'âge et ce, toujours en faveur des garçons (Côté, 2007). Les comportements d'agressivité physique chez les filles adolescentes sont considérés comme si rares, qu'il est difficile de modéliser leurs trajectoires (Barker, Séguin, White, Bates, Lacourse, Carbonneau *et al.*, 2007). Les différences entre les garçons et les filles à ce niveau sont donc considérées à leur apogée vers la fin de l'adolescence et au début de l'âge adulte (Archer & Côté, 2005). Bien que les garçons manifestent davantage d'agressivité physique que les filles et ce, à tout âge, les filles peuvent également être agressives physiquement (Dodge *et al.*, 2006). Ces filles, malgré leur petit nombre, semblent autant à risque que les garçons physiquement agressifs de subir différentes conséquences développementales négatives (Underwood & Coie, 2004).

Lorsque persistantes, les manifestations d'agressivité physique observées chez les jeunes enfants représentent un prédicteur robuste de divers problèmes d'adaptation à l'adolescence et à l'âge adulte, allant des expériences de victimisation et d'intimidation, aux troubles oppositionnels et de la conduite, à l'abandon scolaire, à la délinquance, à la consommation abusive d'alcool et de drogues et à la criminalité (Nagin & Tremblay, 2001; Underwood, Beron, & Rosen, 2011). L'agressivité physique est un comportement répréhensible qui est habituellement sanctionné par l'entourage, de sorte que les enfants qui manifestent une agressivité chronique sont aussi susceptibles d'être socialement rejetés, risquant par le fait même d'être privés de plusieurs expériences positives et normatives avec les pairs (Vitaro, Pederson, & Brendgen, 2007). La recherche indique que ces manifestations précoces et chroniques d'agressivité physique puisent leurs racines dans diverses sources d'influence au cours du développement. Des études longitudinales ont en fait montré que les enfants à risque de maintenir un niveau élevé d'agressivité physique lors de l'entrée à l'école se distinguent, dans un premier temps, au niveau de certaines caractéristiques d'ordre familial et personnel.

Influence des vulnérabilités personnelles et des expériences familiales

Les premières années de vie représentent une période clé pour l'apprentissage de l'auto-contrôle des comportements d'agressivité physique (Tremblay, 2000). Dans l'optique du développement normal, les jeunes enfants apprendraient à réguler leur comportement agressif grâce à l'influence combinée des expériences de socialisation et de la maturation du cerveau (Tremblay, 2012). Dans ce contexte, la famille est considérée par plusieurs auteurs

comme un des plus importants foyers de socialisation à la petite enfance (Maccoby, 1992). Il semble, également, de plus en plus clair que l'impact des expériences familiales sur l'apprentissage de la régulation des comportements agressifs se produise via des mécanismes à la fois environnementaux et génétiques (Repetti, Taylor, & Seeman, 2002).

Les premières différences individuelles pouvant être observées au niveau de l'agressivité physique semblent liées à des facteurs génétiques et au tempérament de l'enfant. En fait, les études ayant recours à des devis génétiquement informatifs et les études de familles suggèrent une part d'héritabilité importante dans le développement de la problématique de l'agressivité physique (Brendgen, Dionne, Girard, Boivin, Vitaro, & Pérusse, 2005; Hicks *et al.*, 2004; Scourfield, Van den Bree, Martin, & McGuffin, 2004). L'influence de facteurs génétiques n'exclut pas que d'autres facteurs environnementaux soient impliqués dans l'étiologie des problèmes de comportements agressifs, mais suggèrent plutôt la présence d'une vulnérabilité chez l'enfant face à cette problématique. Les facteurs génétiques peuvent être envisagés comme une source d'influence au niveau comportemental via leur impact sur la structuration du cerveau (Raine, 2008). Les gènes peuvent également affecter le tempérament de l'enfant, une caractéristique héritée de la personnalité qui s'observe tôt dans le développement et dont certaines dimensions, telles un faible niveau d'autorégulation, l'absence de peur et l'irritabilité, ont été liées à l'agressivité physique (Buss & Plomin, 1984). Vers l'âge de 2 ans, l'inattention et l'impulsivité chez l'enfant ont également été associées aux manifestations de problèmes de comportement externalisés à l'enfance (Bates, Bayles, Bennett, Ridge, & Brown, 1991; Campbell, Breaux, Ewing, & Szumowski, 1986).

Les enfants présentant ces caractéristiques de risque évoluent fréquemment dans un contexte familial difficile, où la présence d'événements de vie stressants (e.g. insécurité financière, instabilité, violence conjugale) est fréquente (Dodge, Bates, & Pettit, 1990; Maziade, Cote, Bernier, Boutin, & Thivierge, 1989). Ces enfants risquent également d'être issus de mères présentant elles-mêmes certaines caractéristiques de risque, comme d'avoir donné naissance à un jeune âge, avoir manifesté des comportements antisociaux à l'adolescence, posséder un faible niveau d'éducation, avoir fumé pendant la grossesse, ainsi que de présenter des symptômes dépressifs (NICHD Early Child Care Research Network, 2004; Tremblay *et al.*, 2004).

Plusieurs études ont également souligné que le recours à des pratiques parentales coercitives peut engendrer des perturbations au sein de la relation parent-enfant (Johnson, Cohen, Kasen, Smailes, & Brook, 2001; Patterson, DeBaryshe, & Ramsey, 1989). Par conséquent, ces pratiques parentales ont souvent été associées à des niveaux élevés de comportements agressifs chez l'enfant (Campbell, Shaw, & Gilliom 2000; Gershoff, 2002). Un des modèles développementaux utilisés pour décrire la dynamique familiale sous-jacente à l'apparition précoce de problèmes de comportement est celui de Patterson et collègues (1989). Selon ce modèle, le stress vécu par l'enfant au sein de l'environnement familial nuit à l'établissement de règles claires pour le discipliner, particulièrement lorsque ce dernier est irritable ou impulsif. L'absence d'un cadre cohérent exacerbe les difficultés de l'enfant et il s'en suit un cycle continu d'interactions négatives entre l'enfant et son parent. Cette dynamique familiale est aussi souvent caractérisée par un faible niveau de stimulation parentale à l'égard de l'enfant quant à l'apprentissage du contrôle des émotions (Cook, Greenberg, & Kusche, 1992; Greenberg, Kusche, & Speltz, 1991), ainsi que le développement des habiletés sociales et cognitives (Campbell, 1991; Dodge, Pettit, McClaskey, & Brown, 1986).

Moffitt (1993) a, quant à elle, proposé une taxonomie des comportements antisociaux qui permet de les classer selon le moment de leur apparition, soit avant ou après la puberté, et ainsi de les distinguer au plan étiologique et développemental. Les comportements antisociaux qui se manifestent dès l'enfance (e.g. agression envers un pair) refléteraient un niveau de dysfonctionnement sévère et susceptible de perdurer à travers le temps, alors que les comportements antisociaux apparaissant seulement à l'adolescence (e.g. menus larcins) seraient généralement considérés comme moins sérieux et transitoires. Les études menées à l'aide de ce cadre conceptuel ont montré que l'apparition précoce de comportements antisociaux est associée à des déficits au plan neuropsychologique, possiblement liés à des facteurs génétiques, et à l'utilisation tôt à l'enfance de pratiques parentales coercitives (Moffitt & Caspi, 2001; Raine, Brennan, & Mednick, 1995). N'ayant pas été réalisées dans le contexte de devis génétiquement informatifs, ces études ne permettent pas cependant de déterminer dans quelle mesure les facteurs environnementaux sont corrélés ou interagissent avec les facteurs génétiques (Szyf, Weaver, Provençal, McGowan, Tremblay, & Meaney, 2009).

Il demeure que ce ne sont pas tous les enfants exposés à ces facteurs de risque ou présentant des vulnérabilités individuelles face à l'agressivité qui développent et maintiennent des problèmes de comportement agressif à long terme. En fait, dans un second temps, d'autres formes d'expériences sociales plus tardives, prenant forme à l'extérieur de la famille, sont présentées, puisqu'elles sont aussi susceptibles de venir renforcer ou modifier les trajectoires précoces d'agressivité physique (Sroufe & Jacobvitz, 1989).

Influence des expériences avec les pairs

Une source d'influence environnementale importante au niveau du développement des conduites agressives provient du groupe de pairs (Boivin, Vitaro, & Poulin, 2005). Bien avant de pouvoir utiliser le langage verbal, les jeunes enfants sont en mesure d'établir des relations avec les pairs qui les entourent (Howes, 1983). Au cours de la période préscolaire, même si l'agression tend à être considérée comme normative, un haut niveau de comportements agressifs est associé à des difficultés avec les pairs. En effet, des études d'observation suggèrent que les manifestations d'agressivité physique engendrent souvent un comportement de rejet de la part des pairs impliqués (Arnold, Hanrock, Ortiz, & Stowe, 1999). Les études ayant recours aux nominations sociométriques ont également montré que l'agressivité physique est reliée au rejet par les pairs chez les enfants d'âge préscolaire et de maternelle (Bukowski *et al.*, 2011), ainsi qu'à des relations conflictuelles avec leurs enseignants (Ladd & Burgess, 1999). Au plan de l'adaptation scolaire, le rejet par les pairs à la maternelle est associé à une perception plus négative chez l'enfant face à l'école, à l'évitement de ce milieu et à l'obtention de résultats scolaires plus faibles au cours de la même année scolaire (Ladd, 1990). Sous l'influence combinée de facteurs neurologiques (e.g. impulsivité) et environnementaux (e.g. pratiques parentales coercitives et rejet par les pairs), certains enfants développent également des biais d'attribution d'intention hostile en réponse à des provocations perçues de la part des pairs (Dodge, 2006). Le recours fréquent à ces attributions hostiles a été lié au maintien et à l'aggravation des conduites physiquement agressives (Dodge, Pettit, Bates, & Valente, 1995). Les expériences liées au rejet par les pairs chez les enfants qui manifestent des comportements d'agressivité physique semblent par contre moins susceptibles de se produire chez les enfants qui présentent également certains attributs personnels positifs,

telles que des qualités athlétiques et une attitude plaisante (Rodkin, Farmer, Pearl, Van Acker, 2000).

Si on s'attarde aux hypothèses formulées par différents théoriciens des relations entre pairs (Bandura & Warters, 1959; Hartup & Stevens, 1997; Piaget, 1965, Sullivan, 1953), l'étude de l'influence de ces expériences en lien avec le développement des comportements sociaux et plus particulièrement, des manifestations d'agressivité physique, ne devrait pas porter uniquement sur la capacité de l'enfant à intégrer et à faire partie du groupe de pairs. En effet, la possibilité pour l'enfant d'interagir avec un ami dans un contexte de relation dyadique est également envisagée par certains auteurs comme une forme d'expérience susceptible de moduler la trajectoire des enfants agressifs.

Relations d'amitié dyadique

Trois aspects relatifs à l'étude des relations d'amitié dyadique ont été identifiés dans la littérature et ont fait l'objet d'une certaine attention : le fait d'être en relation d'amitié, la qualité de cette relation et les caractéristiques comportementales des partenaires de la relation (Hartup, 1996). Ces aspects sont présentés dans les prochains paragraphes afin de mieux cerner les conditions à travers lesquelles les relations d'amitié peuvent influencer, de manière bénéfique ou bien néfaste, le développement des comportements agressifs chez l'enfant en début de scolarisation.

Présence de relations d'amitié

Le fait d'avoir des amis est logiquement un des premiers aspects à considérer lorsqu'il est question d'examiner l'influence des relations d'amitié sur le développement des comportements d'agressivité physique. Tel que mentionné par Hartup (1996), la signification développementale de ces expériences relationnelles devrait d'abord être examinée en tenant compte du niveau de réciprocité dans la relation d'amitié. La réciprocité témoigne du fait que chacun des partenaires impliqués dans la relation considère l'autre comme son ou un de ses amis préférés. Certains enfants peuvent ainsi être impliqués dans des relations d'amitié dites réciproques, à travers lesquelles chacun des partenaires identifie l'autre comme son meilleur ami, ou des relations d'amitié dites unilatérales. Ces relations unilatérales réfèrent aux liens d'amitié qui sont identifiés par les enfants, mais qui ne sont pas confirmés en retour par les

partenaires ciblés. En raison de contraintes méthodologiques ou de considérations conceptuelles, la réciprocité dans la relation n'est pas toujours établie dans les études qui portent sur les liens entre les relations d'amitié et le développement. Par exemple, il n'est pas toujours possible d'avoir recours aux nominations sociométriques pour confirmer le statut des relations d'amitié. Certains auteurs suggèrent par ailleurs que la perception chez l'enfant d'être en relation soit également associée à des changements au plan comportemental (Adams, Bukowski, & Bagwell, 2005).

D'une façon générale, des études ont montré que les enfants agressifs sont aussi susceptibles d'établir des relations d'amitié réciproques que les enfants non agressifs (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Brendgen, Vitaro, Turgeon, & Poulin, 2002; Poulin & Boivin, 2000 ; Ray, Cohen, Secrist, & Duncan, 1997). Les relations d'amitié des enfants qui présentent un niveau élevé d'agressivité physique semblent par contre durer moins longtemps et varier en terme de qualité (Bowker, Rubin, Rose-Krasnor, & Booth-Laforce, 2007; Hektner, August, & Realmuto, 2000; Poulin, Dishion, & Haas, 1999).

Qualité de la relation d'amitié

La qualité de la relation d'amitié est un concept qui possède une nature changeante selon les manifestations attendues en fonction de l'âge de l'enfant, mais également selon les définitions et les mesures utilisées (Gifford-Smith & Brownell, 2003). Différentes méthodes ont été proposées pour évaluer les dimensions liées à la qualité de la relation d'amitié chez les jeunes enfants. Ces méthodes incluent des mesures d'observation qui mettent en lumière la fréquence, la stabilité et la nature affective de la qualité des interactions entre amis (e.g. Park & Waters, 1989; Youngblade & Belsky, 1992). Les parents et les enseignants ont aussi été mis à profit pour identifier et évaluer les dimensions liées à la qualité de la relation d'amitié (e.g. Howes, Hamilton, & Philipsen, 1998; Sebanc, 2003). Les enfants eux-mêmes ont également été sollicités pour décrire et rapporter leur perception face à la qualité de leurs relations d'amitié (e.g. Ladd *et al.*, 1996). Les définitions utilisées dans la littérature pour référer au concept de qualité de l'amitié varient également énormément, ce qui complexifie la possibilité de comparer les sources d'évaluation entre elles, ainsi que les résultats des études empiriques (Bagwell & Schmidt, 2011). Ainsi, certains auteurs envisagent la qualité de la relation d'amitié comme un construit global, tandis que d'autres s'y réfèrent en sous-divisant ce

construit en fonction de dimensions positives et négatives ou encore, en n'incluant que des dimensions positives. Bien qu'on observe une certaine variation entre les définitions et les construits mesurés à travers les études, le concept de qualité de la relation d'amitié fait généralement référence à des dimensions positives comme la présence de coopération, de soutien, de compagnonnage, d'affect positif, d'intimité, de sécurité, de proximité, de valorisation, et de résolution de conflits (Berndt, 2004; Bukowski, Newcomb, & Hartup, 1996). Les dimensions négatives de la qualité de la relation comprennent habituellement le conflit entre amis, la jalousie et la rivalité (Bukowski & Hoza, 1989).

De façon générale, les études ont montré que la qualité de la relation d'amitié contribue à renforcer le sentiment de compétence et l'estime de soi (Connell & Wellborn, 1991), favorise la sécurité émotionnelle et encourage l'enfant à explorer son environnement (Birch & Ladd, 1996). Une relation d'amitié de bonne qualité représenterait pour l'enfant une source importante de soutien et de confiance (Bukowski & Hoza, 1989; Ladd *et al.*, 1996), éléments qui contribueraient de façon bénéfique à son développement socio-affectif (Buhrmester, 1996; Bukowski *et al.*, 1996). Les appuis empiriques montrant des liens spécifiques entre les qualités positives de la relation d'amitié et le développement des conduites agressives ne sont pas aussi abondants que ceux qui soutiennent les associations entre les qualités négatives et l'agressivité. En effet, certains auteurs ont montré que les interactions conflictuelles entre amis sont associées à une amplification des problèmes de comportements agressifs (Coie, Cillessen, Dodge, Hubbard, Schwartz, Lemerise, *et al.*, 1999). Certaines études ont aussi montré que les relations d'amitié des enfants agressifs tendent à être moins intimes, ainsi que moins caractérisées par la sécurité et la proximité (Bagwell & Coie, 2004; Cillessen, Jiang, West, & Laszkowski, 2005). Néanmoins, nous en savons très peu sur les liens longitudinaux et le potentiel d'influence de ces dimensions positives sur le maintien ou l'aggravation des problèmes de comportement agressif.

Caractéristiques comportementales des amis

Dès un très jeune âge, les enfants montrent une tendance à s'associer avec des pairs qui leur ressemblent au plan comportemental et qui approuvent leurs comportements, conventionnels ou non (Snyder, Horsh, & Childs, 1997). Tel que proposé par Kandel (1978), cette tendance à l'homophilie comportementale rejoint l'idée que les enfants sélectionnent

leurs partenaires d'interaction en se basant sur les similitudes perçues entre leurs comportements et ceux de leurs amis, comme la tendance à être agressif. Ainsi, les enfants agressifs physiquement semblent davantage susceptibles d'initier et de maintenir des relations d'amitié avec des pairs qui sont également agressifs, tandis que les enfants qui s'associent à des amis présentant un niveau discordant d'agression sont plus susceptibles de voir la relation se terminer (Poulin & Boivin, 2000). Il n'est pas toujours possible, par contre, de distinguer si l'association à des amis semblables contribue à leur ressemblance, via des mécanismes de socialisation ou bien, si cette association est plutôt conditionnée par des ressemblances déjà présentes, par l'entremise des effets de sélection.

Cet aspect spécifique semble néanmoins favoriser la persistance de l'agressivité physique chez certains enfants agressifs de la maternelle (Estell, Cairns, Farmer, & Cairns, 2002; Farver, 1996). En fait, des études empiriques ont montré que l'affiliation à des amis agressifs prédit une augmentation des comportements agressifs et ce, même chez les jeunes enfants (e.g. Boivin *et al.*, 2005). Par exemple, Snyder, et ses collègues (1997) rapportent que le temps qu'un enfant d'âge préscolaire passe à interagir avec des pairs agressifs est associé à une augmentation de l'agressivité sur une période de trois mois. Snyder, Schrepferman, Oeser, Patterson, Stoolmiller, Johnson *et al.* (2005) ont également montré que l'association à des pairs agressifs et perturbateurs à la maternelle prédit une augmentation des problèmes de comportements deux ans plus tard. Cependant, peu de recherches à ce jour se sont penchées sur l'influence des relations d'amitié en début de scolarisation, et plus particulièrement, sur le rôle conjoint des différents aspects s'y rattachant en lien avec la persistance des comportements agressifs. Par conséquent, il est loin d'être clair si les aspects relationnels, comme la qualité de la relation d'amitié, sont associés à une diminution des problèmes de comportement agressif, tel que le suggèrent les études mentionnées plus haut qui montrent des liens positifs entre ce construit et l'adaptation personnelle et scolaire des enfants. De plus, comme les enfants ont tendance à s'associer à des amis qui présentent des attributs comportementaux semblables, il n'est pas certain que les dyades d'amis agressifs bénéficient de cette source de provisions sociales que représentent les relations d'amitié de bonne qualité ou que, au contraire, partager une telle relation avec un ami agressif contribue à exacerber le patron de comportement agressif de l'enfant.

À cet effet, les études expérimentales menées par Albert Bandura et ses collègues (Bandura & Waters, 1959; Bandura & Huston, 1961) suggèrent la possibilité que la qualité de la relation d'amitié contribue au développement de l'enfant, mais en exacerbant les risques associés à l'effet négatif des amis agressifs. Ces études montrent en fait que l'influence d'un modèle agressif est amplifiée lorsque ce modèle est hautement valorisé. Dans cette lignée, Berndt (1996; 2002) a proposé que l'influence des amis agressifs puisse être magnifiée quand la qualité de la relation d'amitié est bonne. Selon cette hypothèse, plus la relation est empreinte de réciprocité et de proximité au plan affectif, plus les amis interagissent et s'influencent par voie de modelage en plus d'encourager le recours à l'agression physique envers autrui. D'autres auteurs ont cependant rapporté des résultats divergents. Par exemple, Bowker *et al.* (2007) ont montré que la présence de biais socio-cognitifs chez les enfants agressifs de 5^e et 6^e année du primaire tend à s'estomper plutôt qu'à s'amplifier dans le contexte d'une relation d'amitié de bonne qualité avec un ami agressif.

Par ailleurs, comme des différences entre les sexes, ainsi que des distinctions au niveau des vulnérabilités personnelles face au risque de manifester des comportements d'agressivité physique ont été mises en évidence dans les études antérieures (Côté *et al.*, 2006; Hicks *et al.*, 2004), l'étude des liens qui unissent les expériences entre amis au développement de l'agressivité suggère la possibilité que ces associations s'expriment différemment selon que l'enfant est un garçon ou une fille, ou bien, selon la présence d'une prédisposition génétique face à l'agressivité.

Potentiel d'interaction avec les caractéristiques individuelles

Sexe de l'enfant

Le sexe de l'enfant a été associé dans les études antérieures à des variations importantes dans la façon dont les enfants structurent leur réseau de pairs et interagissent avec ces derniers (Rose & Smith, 2009), à tel point que certains auteurs ont suggéré que les relations entre pairs des garçons et des filles soient considérées comme deux cultures séparées (Maccoby, 1990). Certaines différences entre les sexes portent sur le choix des partenaires d'interaction. Ainsi, les enfants tendent à former plus fréquemment des relations à l'intérieur de dyades de même sexe (Fabes, Martin, & Hanish, 2003). Cette tendance est observée dès

l'âge de deux ans, de façon plus précoce chez les filles que chez les garçons, et tend à augmenter chez les deux sexes au cours de l'enfance (Serbin, Moller, Powlishta, & Colbourne, 1994). Certaines études ont rapporté que la structure du réseau social chez les filles se caractérise par un plus grand nombre de relations d'amitié réciproques que chez les garçons (Lee, Howe, & Chamberlain, 2007; Rudolph, Ladd, & Dinella, 2007). Plusieurs auteurs envisagent que la formation de relations d'amitié avec des pairs du même sexe mène à des patrons distincts d'activités entre les sexes, les garçons ayant plus tendance à s'impliquer dans les jeux actifs, tandis que les filles sont davantage orientées vers la conversation (Mathur & Berndt, 2006; Serbin et al., 1994).

Par ailleurs, des différences entre les garçons et les filles semblent aussi émerger au niveau de la qualité des relations d'amitié. Ainsi, contrairement aux garçons, les filles perçoivent leurs relations d'amitié comme étant davantage empreintes de soutien et plus intimes (Bukowski, Hoza, Boivin, 1994; Parker & Asher, 1993). Les garçons sont quant à eux plus susceptibles de développer des relations d'amitié dyadique antipathiques, à travers lesquelles les partenaires expriment de l'animosité l'un envers l'autre (Abecassis, Hartup, Haselager, Scholte, & Van Lieshout, 2002). Les garçons et les filles semblent aussi gérer différemment les épisodes de conflits, les filles offrant davantage d'explications pour justifier leurs conduites, tandis que les garçons expriment plus de colère en situation de conflits et ont recours à des stratégies de résolution axées sur la préservation de leurs privilèges (Hartup, French, Laursen, Johnston, & Ogawa, 1993). La tendance à interagir avec des pairs du même sexe semble par ailleurs prédire l'augmentation des comportements typiquement observés chez les garçons (Martin & Fabes, 2001). Ainsi, au cours d'une année scolaire, le jeu des garçons âgés de 4 à 5 ans tend à devenir plus distinct de celui des filles, en étant marqué par une intensification du recours aux jeux de chamaillerie et aux jeux physiques.

Ces résultats suggèrent la possibilité que l'influence des relations d'amitié sur le développement des comportements agressifs s'exerce différemment, selon le sexe de l'enfant. Comme les enfants d'âge scolaire jouent fréquemment avec des amis du même sexe, il est possible que les processus de socialisation s'exercent de manière distincte entre les dyades composées de garçons et celles composées de filles (Underwood, Mayeux, & Galperin, 2006). De plus, compte tenu que les garçons ont davantage tendance à manifester des comportements d'agressivité physique que les filles (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Côté,

Vaillancourt, Barker, Nagin, & Tremblay, 2007), il est possible que les relations d'amitié exercent un effet plus significatif chez les garçons que chez les filles.

Vulnérabilité génétique face à l'agressivité chez l'enfant

Les différents aspects liés à la relation d'amitié ne sont pas nécessairement indépendants de l'influence des facteurs génétiques. Selon Scarr et McCartney (1983), il est possible que les enfants agressifs, en fonction de leurs caractéristiques héritées, suscitent des réactions particulières de la part de leur environnement ou encore, qu'ils recherchent activement des environnements qui reflètent leurs caractéristiques héritées. La possibilité que les enfants présentant une vulnérabilité génétique face à l'agressivité recherchent le contact avec des amis qui manifestent également des comportements agressifs, en raison de leur propre disposition génétique envers l'agressivité, semblent néanmoins peu soutenues par les recherches antérieures (e.g. Brendgen, Boivin, Vitaro, Bukowski, Dionne, & Tremblay, 2008; Leve, 2001; Rose, 2002; Van Lier, Boivin, Dionne, Vitaro, Brendgen, Koot, *et al.*, 2007). En fait, les études empiriques montrent plutôt que l'exposition à des amis déviants et les caractéristiques comportementales des amis ne sont pas (ou peu) liées à la vulnérabilité génétique avant l'adolescence, période pendant laquelle la sélection des amis pourrait davantage être influencée par le bagage génétique de l'enfant. Très peu d'études se sont penchées sur la possibilité que la qualité de la relation d'amitié soit influencée par les caractéristiques héritées de l'enfant. Néanmoins, deux études montrent que les facteurs génétiques expliquent une partie de la variance observée au niveau des dimensions positives associées à la qualité des relations d'amitié à l'adolescence, tandis que le conflit entre amis et la présence d'affect négatif ne sont pas reliés aux facteurs génétiques (Manke, McGuire, Reiss, & Hetherington, 1995; Pike & Atzaba-Poria, 2003).

Différents mécanismes ont été proposés afin d'expliquer les liens entre les caractéristiques héritées de l'enfant et les expériences avec les pairs, tels les processus de corrélations gène-environnement et les processus d'interaction gène-environnement (Plomin, DeFries, & Loehlin, 1977). Le mécanisme de corrélation gène-environnement implique que les facteurs génétiques chez l'enfant contribuent à expliquer les liens observés au niveau des caractéristiques comportementales de l'enfant et des expériences avec les pairs. La plupart des études qui ont montré un effet génétique sur les variables environnementales comme les

expériences avec les pairs, n'ont pas examiné les liens potentiels avec les caractéristiques individuelles de l'enfant, par contre. Une exception, cependant, est l'étude de Pike et Atzaba-Poria (2003) qui a montré, à l'aide d'analyses génétiques, que le tempérament de l'enfant était également associé aux facteurs génétiques et à la qualité de la relation d'amitié, et que ces corrélations étaient à leur tour influencées en partie par un chevauchement au niveau des effets génétiques, démontrant ainsi une corrélation gène-environnement.

Le mécanisme d'interaction gène-environnement sous-tend qu'une manifestation comportementale, comme l'agressivité, résulte de l'effet conjoint, plutôt que cumulatif, des facteurs génétiques et environnementaux (Rutter & Silberg, 2002). Ainsi, les effets associés aux différentes dimensions de la relation d'amitié pourraient se manifester différemment selon le risque génétique de l'enfant face à l'agressivité physique. En l'absence d'un effet d'interaction entre les facteurs génétiques et l'exposition à un environnement spécifique, ces deux sources d'influence sont considérées comme indépendantes et affectent de manière cumulative, plutôt que conditionnelle, le développement de l'enfant. Les études ayant recours aux devis génétiques appuient principalement le mécanisme d'interaction gène-environnement montrant, par exemple, que le niveau d'agressivité physique est plus élevé chez les enfants génétiquement vulnérables à l'agressivité qui sont également exposés à des amis agressifs en début de scolarisation (Van Lier *et al.*, 2007) ou à des expériences de victimisation par les pairs (Brendgen, Boivin, Vitaro, Girard, Dionne, & Pérusse, 2008).

Perspectives théoriques et mécanismes potentiellement explicatifs de l'influence des relations d'amitié

Différentes perspectives théoriques ont été invoquées dans les études antérieures afin de mieux cerner le rôle des relations d'amitié sur le développement et l'ajustement général des enfants, soit la théorie de l'attachement (Bowlby, 1969; 1982), les théories du développement de la personnalité (Sullivan, 1953), la théorie de l'apprentissage social (Bandura & Huston, 1961; Bandura & Walters, 1959) et la théorie du jugement moral (Piaget, 1965). En s'inspirant de ces perspectives théoriques, certains auteurs (e.g. Berndt, 2004 ; Dishion, Andrews, & Crosby, 1995 ; Snyder, Schrepferman, McEachern, Barner, Johnson, & Provines, 2008) proposent différents mécanismes susceptibles de rendre compte des effets, bénéfiques ou

néfastes, des différentes dimensions associées aux relations d'amitié sur l'évolution et les manifestations d'agressivité chez les enfants et les adolescents.

Perspective inspirée de la théorie de l'attachement et des théories du développement de la personnalité

La théorie de l'attachement (John Bowlby, 1969 ; 1982) se centre sur l'actualisation des besoins affectifs. Les enfants, dont les besoins affectifs sont adéquatement comblés par leurs premiers donneurs de soins (i.e. habituellement les parents), développent un modèle interne d'eux-mêmes comme étant compétents et aimables et une vision des autres comme étant prévisibles et dignes de confiance. La vision des relations avec autrui qu'ils développent se caractérise donc comme étant potentiellement bénéfique et souhaitable. L'enfant doté d'un lien d'attachement sécurisant avec son parent expérimente aussi un sentiment de sécurité qui lui permet d'explorer son environnement. Selon cette perspective, les enfants qui manifestent des comportements agressifs sont souvent exclus des principaux bénéfices liés à l'établissement des premières relations d'attachement en raison de la difficulté ou de l'incapacité du parent à combler leurs besoins affectifs (Crittenden & Ainsworth, 1989). Les difficultés précoces vécues dans la relation parent-enfant mèneraient à la construction de modèles négatifs de soi et des autres et contribueraient à l'émergence de difficultés d'adaptation (Carlson & Sroufe, 1995; Van Ijzendoorn, Juffer, & Duyvesteyn, 1995).

Les auteurs qui s'inspirent de la théorie de l'attachement pour comprendre le rôle des relations d'amitié dans le développement envisagent l'établissement d'une relation positive avec une figure alternative, tel un ami, comme un facteur bénéfique susceptible de pallier la réponse inadéquate des parents face aux besoins affectifs non comblés de l'enfant. Une relation d'amitié de bonne qualité pourrait ainsi procurer un lien d'attachement alternatif à l'enfant dont le lien d'attachement à son parent a été compromis par des expériences familiales difficiles (Bolger, Patterson, & Kupersmidt, 1998; Sullivan, 1953). Elle pourrait même servir de base de protection face au stress lié à certaines expériences sociales négatives (Hodges, Boivin, Vitaro, & Bukowski, 1999; Vitaro, Boivin, & Bukowski, 2009). Certains aspects des relations d'amitié de bonne qualité pourraient également accroître la motivation de l'enfant à manifester des comportements positifs envers autrui. Dans ce sens, Wentzel (2009) propose que les interactions sociales à l'intérieur d'une relation d'amitié dictent à l'enfant la façon dont

il doit se comporter afin d'être accepté et reconnu comme un individu compétent au plan social, et de cette façon, motivent l'enfant à adopter des conduites prosociales. Le soutien affectif que procure une relation d'amitié de bonne qualité pourrait permettre à l'enfant agressif de se sentir davantage accepté et en sécurité dans son environnement (Furman & Buhrmester, 1985; Weiss, 1974; Youniss, 1980) ainsi que connecté à autrui (Ryan & Deci, 2000).

En recréant un contexte relationnel sécurisant, certains auteurs inspirés des théories du développement de la personnalité proposent que les relations d'amitié de bonne qualité favorisent également les apprentissages sociaux. À travers une relation d'amitié de bonne qualité, les enfants, agressifs ou non, apprendraient à devenir sensibles et attentifs aux besoins interpersonnels, à composer avec l'intimité et à établir un climat de compréhension mutuelle (Sullivan, 1953 ; Youniss, 1980). Ce mode positif d'interaction avec l'ami pourrait ensuite se généraliser aux échanges avec le groupe de pairs, améliorant ainsi la façon dont l'enfant interagit avec les autres (Berndt, 2004; Harter, 1990; Rubin, Bukowski, & Parker, 1998) et réduisant le risque d'être rejeté par ses camarades de classe (Berndt, Hawkins, & Jiao, 1999; Ladd *et al.*, 1996, Hodges *et al.*, 1999). En incitant l'enfant à pratiquer son répertoire d'habiletés sociales (e.g. empathie, entraide), les relations d'amitié contribueraient ainsi à décourager les manifestations de comportements déviants. L'apprentissage et la pratique de ces habiletés interpersonnelles n'excluraient pas, pour autant, la présence de conflits occasionnels entre les amis (Bukowski, Velasquez, & Brendgen, 2008); l'utilité de ces conflits au plan cognitif et social est par ailleurs appuyée par la théorie du jugement moral élaborée par Piaget (1965).

Perspective inspirée de la théorie du jugement moral

La théorie du jugement moral de Jean Piaget (1965) porte sur les possibilités de développement cognitif et les occasions d'apprentissage qui émergent lorsque les enfants interagissent entre eux. Si les interactions entre enfants et adultes sont marquées par un certain déséquilibre au niveau du partage des pouvoirs et de la compétence et ce, au profit de l'adulte, les interactions entre pairs tendent à être davantage caractérisées par l'équilibre et l'égalité. Cette distinction théorique permet d'envisager que les relations marquées par l'équilibre ou «l'horizontalité», contrairement à celles caractérisées par le déséquilibre ou «la verticalité»,

offrent davantage d'opportunités pour expérimenter l'échange, la négociation et la résolution de problèmes.

Selon cette perspective, les conflits occasionnels, lorsqu'ils sont résolus de manière satisfaisante, peuvent contribuer à renforcer le climat de compréhension mutuelle entre les amis, ainsi qu'à développer le raisonnement au plan social et cognitif. Dans sa théorie du jugement moral, Piaget (1965) a proposé que le caractère distinctif des relations avec les pairs tient au fait qu'elles permettent à l'enfant d'explorer activement de nouvelles idées sans risquer d'être critiqué par une figure d'autorité. Contrairement aux relations avec l'adulte, les relations avec les pairs seraient équilibrées, égalitaires et situées sur un axe horizontal de dominance. L'enfant serait donc confronté à trouver des solutions aux situations conflictuelles, devrait s'exercer à négocier, ainsi qu'à faire des compromis s'il souhaite maintenir la relation avec un pair. La coopération entre les enfants implique d'ailleurs qu'ils développent un langage commun, qu'ils « construisent » ensemble une compréhension commune et un système d'idées cohérent afin de favoriser un rapprochement cognitif, susceptible de mener à la résolution des conflits (Rogoff, 1990). Cette forme de coopération entre amis favoriserait l'ajustement positif des enfants par l'acquisition d'habiletés interpersonnelles, comme la capacité à tenir compte de la perspective d'autrui ou à faire preuve d'empathie. En lien avec ces hypothèses théoriques, Vygotsky (1978) a également proposé que via la coopération, le jeu et l'entraide, les amis sont en mesure de résoudre davantage de problèmes que s'ils s'y prenaient seuls pour tenter de les résoudre.

Certains auteurs ont, par ailleurs, montré que les relations d'amitié contribuent à favoriser le développement cognitif. Par exemple, Azmitia et Montgomery (1993) rapportent dans une étude expérimentale que les dyades d'amis, contrairement aux dyades qui regroupent deux enfants non-amis, élaborent, justifient et critiquent davantage le raisonnement de l'autre et que ce processus de coopération entre amis est associé à la présence de meilleures habiletés de résolution de problèmes. De plus, Nelson et Aboud (1985) ont montré, à l'intérieur d'une situation expérimentale, que l'enfant explique sa position et critique davantage l'opinion d'un ami que celle d'une connaissance. Dans leur étude, cette forme de conflit favorisait l'adoption de solutions plus matures face aux problèmes sociaux présentés. Le rôle bénéfique accordé aux conflits dans la dyade d'amis semble néanmoins indissociable de l'importance de résoudre

les désaccords d'une manière satisfaisante, c'est-à-dire en faisant appel à la coopération et au dialogue (Rogoff, 1990), plutôt qu'à la coercition ou à l'hostilité (Rubin *et al.*, 1998).

Selon les auteurs s'inspirant de la théorie du jugement moral ou de la théorie de l'attachement, la qualité de la relation d'amitié contribuerait ainsi à favoriser l'ajustement positif des enfants et par extension, à réduire le risque de maintenir un haut niveau d'agressivité. Similairement, une relation d'amitié de bonne qualité devrait modérer à la baisse les effets potentiellement négatifs associés à la fréquentation d'amis agressifs. À prime abord, ces prédictions semblent appuyées par les études empiriques montrant qu'une relation d'amitié de bonne qualité est associée à une augmentation du bien-être émotionnel chez l'enfant (e.g. Birch & Ladd, 1996) et à l'acquisition de nouvelles habiletés sociales (e.g. Rubin *et al.*, 1998). Cependant, une importante tradition de recherches fondées sur la théorie de l'apprentissage social insiste sur le rôle négatif des relations d'amitié entre enfants agressifs, même lorsque la relation est de bonne qualité.

Perspective inspirée de la théorie de l'apprentissage social

Les auteurs s'inspirant de la théorie de l'apprentissage social (e.g. Dishion *et al.*, 1995; Snyder *et al.*, 2008) proposent que la qualité de la relation d'amitié ne joue pas en soi un rôle principal, mais envisagent néanmoins qu'elle puisse servir à renforcer l'influence négative des amis agressifs. Cette position théorique vient remettre en question la possibilité qu'une relation d'amitié de bonne qualité entre amis agressifs puisse être bénéfique. Par ailleurs, l'attention de ces auteurs semble davantage porter sur l'identification des mécanismes interpersonnels à l'œuvre dans les dyades d'amis agressifs, ainsi que sur l'influence des caractéristiques comportementales de ces amis.

Spécifiquement, la théorie de l'apprentissage social propose que les pairs représentent des agents de renforcement ou de contagion (Dishion & Piehler, 2009). Ainsi, généralement, les amis punissent ou ignorent les comportements sociaux non-normatifs et récompensent ou renforcent positivement les comportements considérés appropriés. L'enfant apprend donc de nouveaux comportements sociaux en observant son ami et en utilisant cette information pour guider l'inhibition ou l'exhibition de certains comportements. Selon cette perspective, lorsque deux enfants présentant des caractéristiques comportementales agressives s'associent l'un à l'autre, ces mécanismes interpersonnels s'activent en faveur des comportements négatifs qui

représentent la norme au sein de la dyade et au détriment des comportements positifs qui sont soumis à une extinction différentielle (Vitaro *et al.*, 2009). Snyder *et al.* (2008) ont montré dans une étude récente que deux processus distincts (i.e. entraînement à la déviance et coercition par les pairs) se manifestent conjointement dans les dyades agressives. L'entraînement à la déviance implique un discours mutuel, une complicité, ainsi qu'une évaluation positive des actes déviants (Boivin & Vitaro, 1995; Dishion *et al.*, 1995), tandis que la coercition par les pairs réfère à des réactions comportementales aversives et à une escalade d'interactions coercitives entre les amis (Coie & Koepl, 1990; Kupersmidt, Burchinal, & Patterson, 1995). Le processus d'entraînement à la déviance dans les dyades d'amis agressifs peut, par ailleurs, prendre différentes formes; se traduisant par des renforcements positifs verbaux ou non verbaux des conduites déviantes (Dishion, Poulin, & Burraston, 2001), des incitations à enfreindre ou mépriser les règles sociales (Bagwell & Coie, 2004) ou par la démonstration et l'imitation de comportements déviants lors de la participation en commun à des activités déviantes (Berndt, 1999; Hartup & Stevens, 1997).

De ce fait, les auteurs inspirés par la théorie de l'apprentissage social proposent qu'une relation d'amitié de bonne qualité exerce un effet modérateur à la hausse, plutôt qu'à la baisse, eu égard à l'influence des amis agressifs sur les manifestations d'agressivité de l'enfant. Cependant, comme les conflits sont peu fréquents ou adéquatement résolus dans les dyades d'amis agressifs qui entretiennent une relation d'amitié de bonne qualité, il est possible que seules les dyades où les conflits demeurent non résolus subissent une pression à la hausse de leurs conduites agressives. Dans ce cas, les conflits et mauvais traitements que les amis agressifs s'infligent l'un à l'autre pourraient médialiser l'effet de l'agressivité de l'ami ou même exercer un effet additif qui va au-delà des caractéristiques de l'ami. À ce jour, peu d'études empiriques ont examiné le rôle de la qualité des relations d'amitié en regard de la persistance ou de l'aggravation des comportements d'agressivité physique en début de scolarisation et en regard de l'influence des caractéristiques négatives des amis. Les relations d'amitié chez les jeunes enfants agressifs ne suivent possiblement pas les mêmes tendances qu'à l'adolescence ou à la préadolescence. Cependant, comme l'ont montré Snyder et ses collègues, l'influence négative des pairs agressifs semble déjà présente en début de scolarisation.

Les perspectives théoriques élaborées par différents auteurs sur l'influence des relations d'amitié en lien avec le développement des comportements sociaux suggèrent des prédictions somme toute assez contrastées par rapport au rôle de la qualité de la relation d'amitié au sein de dyades comprenant un ou deux amis agressifs. Selon les auteurs inspirés de la théorie de l'attachement et des théories du développement de la personnalité, les relations d'amitié forment un contexte propice à l'apprentissage et à la pratique des habiletés interpersonnelles. De plus, selon les auteurs inspirés par la théorie du jugement moral, les conflits entre amis, lorsque résolus adéquatement, exercent un effet bénéfique sur l'ajustement et le bien-être général des enfants. Dans ce contexte, le conflit interpersonnel provoquerait une recherche d'équilibre au plan cognitif et permettrait l'acquisition de meilleures habiletés de résolution de conflits. À l'inverse, les théoriciens de l'apprentissage social se centrent davantage sur l'effet potentiel négatif des interactions avec des amis agressifs. Ces interactions seraient d'ailleurs davantage risquées au niveau du développement des conduites agressives lorsqu'elles se déroulent dans le contexte d'une relation de bonne qualité, puisque les pairs tendent à s'imiter et à se renforcer en particulier quand ils valorisent leur relation. Une avenue de recherche pouvant permettre d'offrir un éclairage pertinent sur la nature des liens qui unissent les relations d'amitié à l'agressivité est la mise en œuvre et l'évaluation de stratégies d'intervention visant spécifiquement à prévenir la problématique de l'agressivité physique.

Stratégies d'intervention visant l'amélioration des relations d'amitié

Dans la mesure où certaines dimensions de la qualité des relations d'amitié sont associées à une diminution des problèmes de comportements agressifs et ce, indépendamment des caractéristiques comportementales et individuelles de risque présentes chez l'ami ou l'enfant lui-même, la mise en œuvre de stratégies d'intervention visant à améliorer la façon dont les enfants établissent et maintiennent de bonnes relations d'amitié devient particulièrement indiquée. Par ailleurs, l'évaluation de l'efficacité de ces stratégies d'intervention permet également de tester des hypothèses spécifiques quant à l'effet causal de la qualité des relations d'amitié, et de ses mécanismes sous-jacents, sur le développement des comportements agressifs. De telles hypothèses peuvent être testées dans un contexte de manipulation expérimentale avec répartition aléatoire entre un groupe qui reçoit une intervention et un groupe qui n'y participe pas.

Il existe un grand nombre de programmes centrés sur l'amélioration des expériences entre pairs et qui intègrent cette cible à travers des programmes d'intervention multimodale (e.g. Anger Coping program – Lochman & Wells, 2002; *Fast Track* – Bierman *et al.*, 1996). Ces divers programmes visent généralement le développement des compétences sociales ou sociocognitives puisque ces habiletés ont été associées dans les études antérieures à des relations positives avec les pairs et ont fait l'objet d'une évaluation des effets en ayant recours à des devis expérimentaux avec répartition aléatoire et suivi à moyen ou long terme) (Fox & Boulton, 2006). Bien qu'il existe un grand nombre de programmes centrés sur l'amélioration des expériences entre pairs, la majorité des programmes existants visent plus spécifiquement à promouvoir l'acceptation par les pairs, et par ricochet, à prévenir le rejet par les pairs plutôt qu'à améliorer la capacité à se faire des amis et la qualité des relations d'amitié (Bierman & Powers, 2009; Bagwell & Schmidt, 2011). Malgré que certains programmes poursuivent à la fois des objectifs qui visent à améliorer le statut de l'enfant à l'intérieur du groupe de pairs et à bonifier la qualité des relations d'amitié, peu d'entre eux ont mesuré les effets spécifiques de leurs interventions en termes d'amélioration de la qualité de la relation (e.g. *UCLA Children's Friendship Program* - Frankel *et al.*, 1996). Il semble en fait, à ce jour, qu'aucune étude n'ait eu recours à une mesure de la réciprocité dans la relation d'amitié ou de la qualité de cette relation suite à la participation à une intervention visant son amélioration ou plus généralement, l'amélioration des expériences entre pairs (Bagwell & Schmidt, 2011). Lorsqu'une mesure du nombre de nominations unilatérales reçues par l'enfant (i.e. le nombre de fois où l'enfant est considéré par un pair comme son meilleur ami) est utilisée, il semble toutefois possible que les habiletés enseignées dans un contexte d'amélioration du statut social de l'enfant soient reliées à celles nécessaires pour établir et maintenir des relations d'amitié de bonne qualité, puisque deux études recensées à ce sujet rapportent une légère augmentation, quoique marginalement significative, du nombre de nominations reçues par les enfants ciblés suite à l'intervention (Asher *et al.*, 1996; Oden & Asher, 1977). Certains programmes, comme le *S.S. GRIN* (DeRosier & Marcus, 2005) ont, quant à eux, montré des effets positifs à court terme sur la diminution de l'association à des pairs déviants.

Les méta-analyses portant sur l'évaluation de l'efficacité des programmes visant l'amélioration des compétences sociales et sociocognitives soutiennent l'utilité de cette approche afin d'améliorer la compétence sociale de l'enfant en général, montrant des tailles

d'effet variant de faibles à modérées et principalement à court terme (Schneider, 1992). Peu d'études d'intervention se sont toutefois penchées sur le développement des habiletés spécifiques à posséder afin d'établir des relations d'amitié de bonne qualité qui sont à la fois essentielles et distinctes de celles utilisées pour être accepté par le groupe de pairs (La Greca, 1993). Il existe certainement un chevauchement entre les habiletés nécessaires pour être accepté par le groupe de pairs et établir des relations d'amitié de bonne qualité sans, toutefois, qu'elles doivent être considérées identiques. Les enfants qui coopèrent et sont amusants sont susceptibles d'être à la fois acceptés par le groupe et d'avoir des amis, mais d'autres habiletés, comme savoir comment partager des confidences, être à l'écoute, faire preuve d'empathie, reconnaître le principe d'égalité en relation, sont davantage susceptibles de favoriser l'établissement de relations d'amitié de bonne qualité que l'acceptation par le groupe de pairs (Asher *et al.*, 1996). On ne peut donc pas discuter de l'effet de ces programmes sur l'amélioration de la qualité de la relation d'amitié.

On observe également des variations importantes au niveau des devis d'évaluation utilisés afin de rendre compte de l'effet de ces programmes sur les expériences entre pairs. Lorsque qu'une composante ciblant les relations entre pairs est incluse dans un programme d'intervention multimodal, il est difficile de déterminer si les changements observés aux niveaux des interactions positives avec les pairs, comme dans le cas du programme Fast Track par exemple (Bierman & Greenberg 1996), sont liés à la composante pairs ou à d'autres volets de l'intervention. Certains programmes d'intervention comme le pairage avec un ami (e.g. *The Buddy System* – Hoza, Mrug, Pelham, Greiner, & Gnagy, 2003; *Thérapie par les pairs* – Selman & Schultz, 1990) montrent des limites importantes au plan méthodologique; tels que le recours de petits échantillons, l'absence de groupe contrôle, de mesures validées empiriquement et de manipulation expérimentale.

Conclusion

Le début de la scolarisation marque chez l'enfant une transition importante au niveau de ses relations interpersonnelles. Lors de l'entrée à la maternelle, l'enfant se trouve exposé de manière soutenue à de nouvelles sources d'influence. La possibilité d'établir des relations avec des personnes significatives en dehors de la famille pourrait contribuer à influencer les manifestations de comportements agressifs en bas âge et les conséquences négatives qui y sont

associées (Rubin *et al.*, 1998). Par exemple, les relations d'amitié pourraient exercer un effet unique et significatif sur le bien-être général des enfants (Parker & Asher, 1993) et particulièrement sur l'ajustement social d'enfants agressifs. La présente thèse s'inscrit dans un courant de recherche qui souligne l'importance d'identifier dans quelles conditions particulières les relations d'amitié peuvent contribuer au maintien et à l'aggravation ou encore, à la diminution des problèmes de conduites agressives en début de scolarisation (Hartup & Stevens, 1997).

En utilisant des échantillons d'enfants suivis longitudinalement au cours de la petite enfance et de l'enfance, ainsi qu'un devis génétiquement informatif et un devis expérimental, cette thèse vise à approfondir les connaissances relatives aux interactions complexes entre la qualité des relations d'amitié, les caractéristiques des amis, les caractéristiques relationnelles et les vulnérabilités individuelles préexistantes. Dans le premier article, les liens longitudinaux entre la qualité générale de la relation d'amitié, les comportements agressifs des amis et la trajectoire d'agressivité physique sont examinés. Dans le deuxième article, les associations entre les conflits entre amis, la présence d'affect positif, la capacité à résoudre les conflits et l'augmentation des comportements d'agressivité physique sont évaluées et dans le troisième article, le rôle causal de certaines dimensions de la qualité de la relation d'amitié est testé à l'aide d'une manipulation expérimentale sous la forme d'une d'intervention dyadique.

Méthodologie

Cette section présente succinctement la méthodologie générale utilisée dans chacun des trois articles de la thèse. La section «méthodologie» de chaque article décrit, toutefois de façon plus détaillée, la composition des échantillons, les mesures utilisées et les analyses statistiques effectuées.

Échantillons

Le premier article de la thèse sera réalisé avec un échantillon de 1 567 enfants faisant partie de l'Étude longitudinale du développement des enfants du Québec (ELDEQ). Les enfants ont été suivis annuellement de l'âge de 5 mois à 8 ans. Les données recueillies lors des trois dernières collectes, lorsque les enfants étaient âgés de 6, 7 et 8 ans et fréquentaient la maternelle, la 1^{ère} et la 2^e année du primaire, seront utilisées dans cette étude.

Le deuxième article de la thèse sera réalisé à l'aide des données collectées auprès d'un échantillon de 657 jumeaux provenant de la région montréalaise et faisant partie de l'Étude des jumeaux nouveau-nés du Québec (EJNQ). Dans le cadre de cette enquête longitudinale, les jumeaux monozygotes et dizygotes ont été évalués annuellement de l'âge de 5 mois à 7 ans. Les données recueillies lors des deux dernières collectes, lorsque les enfants étaient âgés de 6 et 7 ans, seront utilisées dans cette étude. L'application d'un devis de jumeaux permet d'estimer le risque génétique de l'enfant face à l'agressivité et d'examiner la possibilité que ce risque interagisse avec certains facteurs dits environnementaux.

Le troisième article de la thèse sera réalisé avec les données collectées auprès d'un échantillon de 68 enfants (34 enfants ciblés et 34 amis) fréquentant la maternelle ou la 1^{ère} année du primaire. Les enfants de cette étude sont issus de sept écoles différentes, situées sur le territoire de Montréal et ont été suivis au cours d'une même année scolaire, soit de septembre à mai. Ces participants ont été sélectionnés en raison de leur niveau élevé de comportements d'agressivité physique en début d'année. Une répartition aléatoire entre deux groupes permettra d'évaluer à l'aide d'un devis expérimental les effets associés à la participation à une intervention dyadique.

Stratégie analytique

Afin de tester les liens longitudinaux entre les relations d'amitié et les manifestations de comportements agressifs en début de scolarisation, les deux premiers articles de la thèse seront réalisés avec un modèle d'analyse multi-niveaux. L'analyse multi-niveaux est une stratégie permettant d'examiner les différences inter-individuelles (e.g. effets des comportements perturbateurs de l'ami ou de la qualité de la relation d'amitié) sur les trajectoires développementales intra-individuelles (i.e. changement dans le niveau d'agressivité physique à travers le temps), ainsi que de tenir compte de la structure hiérarchique des données collectées auprès des jumeaux. Au plan longitudinal, cette stratégie analytique permet le calcul d'un modèle intra-individuel (i.e. unité d'analyse de niveau I) avec un coefficient de régression associé au statut initial (i.e. constante) et au taux de changement (i.e. pente) pour chaque individu. Ensuite, un modèle inter-individuel (i.e. unité d'analyse de niveau II) est estimé à travers lequel les constantes et les pentes du modèle intra-individuel sont traitées comme des variables dépendantes régressées sur les variables prédictives (Singer

& Willett, 2003). Dans le contexte de l'étude des jumeaux, le modèle multi-niveaux permet de contrôler pour les corrélations possibles entre les jumeaux de même famille. Des modèles interactionnels proposant que certaines dimensions liées à la relation d'amitié ou aux caractéristiques des partenaires puissent modérer les liens entre les relations d'amitié et les manifestations de comportements agressifs ont également été testés à travers ces modèles. Les analyses multi-niveaux incluent donc les interactions entre les différentes dimensions des relations d'amitié et certains modérateurs potentiels.

Afin d'examiner l'effet causal de la qualité de la relation d'amitié sur la diminution des comportements agressifs, et en particulier, les effets potentiellement intermédiaires de certaines dimensions particulières de la qualité de la relation d'amitié suite à la participation à un programme d'intervention, des analyses de régression seront réalisées. Ces analyses permettront de vérifier si la participation au programme est associée à des changements au niveau de la qualité de la relation d'amitié et si, en retour, ces changements sont liés à une diminution des comportements agressifs. Enfin, afin d'examiner si la diminution de ces manifestations comportementales opère via une amélioration des dimensions liées à la qualité de la relation, les effets indirects de l'intervention sont également testés à l'aide de la méthode d'échantillonnages multiples (Hayes, 2012).

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Chapitre II : Interplay Between Friends' Aggression and Friendship Quality in the Development of Child Aggression During the Early School Years

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Abstract

The aim of this study was to investigate the unique and combined role of friendship quality and friends' aggression in regard to the persistence of young children's physical aggression from kindergarten to grade two. The sample included 1555 children (808 girls) assessed annually using teacher ratings. Two theoretical perspectives (i.e., the social learning and the social bonding perspectives) served as frameworks to guide the analyses and interpret the results. In line with the social learning perspective, friends' aggression was related to a significant increase in children's physical aggression. However, in line with the social bonding perspective, good friendship quality played both a compensatory and a protective role, by respectively reducing children's initial level of physical aggression and by mitigating, albeit marginally, the associations between friends' and children's physical aggression. These results suggest that fostering a positive relationship between friends in the early school years may decrease physical aggression even if the friends are aggressive.

Keywords: physical aggression, friendship quality, friends' aggression, early elementary school

Introduction

Recent studies suggest that physical aggression in toddlerhood is normative and tends to decrease in early childhood (Nagin & Tremblay, 2001; Tremblay et al., 2004). Unfortunately, such is not the case for all children. Indeed, a small group of children with high and stable levels of physical aggression has been identified in several studies (Broidy et al., 2003; Nagin & Tremblay, 1999). Considering that persistent physical aggression has been associated with a host of maladjustment problems leading to adolescent violence and adult criminality (Loeber, Green, Keenan, & Lahey, 1995; Moffitt, Caspi, Rutter, & Silva, 2001), the identification of early factors related to this developmental prognosis seems relevant for both theoretical and clinical (i.e., preventive) purposes.

To date, the search for risk and protective factors associated with early childhood physical aggression has mainly focused on prenatal, individual and intra-family factors (e.g., Nagin & Tremblay, 2001; Tremblay et al., 2004). However, extra-family factors may also be involved. In this sense, one specific factor that might foster the persistence of physical aggression in some children is their tendency to affiliate with similarly aggressive peers when starting kindergarten (Estell, Cairns, Farmer, & Cairns, 2002; Snyder, Horsh, & Childs, 1997). This tendency to select friends with similar aggressive behavior may counteract the positively oriented socialization efforts from other socializing agents such as parents or teachers. Indeed, there is empirical evidence that affiliation with aggressive friends predicts an increase in young children's aggressive behaviors. For example, Snyder et al. (1997) found that the amount of time preschoolers spent interacting with aggressive peers was associated with an increase in aggressive behavior over a three-month interval. In a second study with a different sample, Snyder et al. (2005) reported that the association with aggressive-disruptive peers predicted an increase in kindergarten children's overt (e.g., aggression) and covert (e.g., lying) conduct problems during the following two years.

Several authors noted that interactions within dyads containing at least one aggressive child are characterized by more frequent, lengthy, and intense conflicts (e.g., Cillessen, Jiang, West, & Laszkowski, 2005; Coie et al., 1999; Grotzinger & Crick, 1996). Snyder (1995) proposed that this may explain how exposure to aggressive friends could shape and amplify children's aggressive behavior. However, the interactions between aggressive children are not

always negative and of low quality (Bowker, Rubin, Rose-Krasnor, & Booth-Laforce, 2007; Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Poulin, Dishion, & Haas, 1999). Indeed, in some instances, researchers have shown that aggressive children are as likely to form close friendships as their non-aggressive peers (Cairns et al., 1988; Poulin & Boivin, 2000; Ray, Cohen, Secrist, & Duncan, 1997). Such close friendships offer important provisions such as intimacy, support, caring, and trust (Bukowski & Hoza, 1989; Ladd, Kochenderfer, & Coleman, 1996; Parker & Asher, 1993), which have been found to be beneficial for children's psycho-social development (Buhrmester, 1996; Bukowski, Newcomb, & Hartup, 1996). They also offer a training ground for positive interpersonal skills. It is unclear, however, whether young aggressive children also benefit from these provisions (i.e., by practicing positive interpersonal skills with their close friendship also) or, conversely, whether having high quality friendships with similarly aggressive peers makes these children even more susceptible to their friends' negative influence. As we will see, at least theoretically, each of these possibilities is conceivable.

Friendship Quality and Aggressive Friends: Two Theoretical Perspectives

Adequately defining the particular features of dyadic friendships represents a significant challenge because of the changing nature of these relationships over the course of development (Gifford-Smith & Brownell, 2003). Positive dimensions such as high levels of prosocial behavior and intimacy (Berndt, 2004), companionship, reciprocity and shared positive affect (Bukowski et al., 1996; Hartup, 1996) seem nevertheless common to the various definitions used for this construct. Different measurement methods have also been used to evaluate the characteristics of friendship relations in young children. These include behavioral observations that focus on the frequency, stability and affective quality of children's interactions with each other (e.g. Park & Waters, 1989; Youngblade & Belsky, 1992). Teachers and parents have also been asked to identify and evaluate friendship features in young children in various studies (e.g., Howes, Hamilton, Philipson, 1998; Sebanc, 2003). Finally, children themselves have been asked to report on the characteristics and quality of their friendships (e.g., Ladd et al., 1996). Interestingly, individual differences in the quality of these dyadic friendships predicted later social competence during both childhood and adolescence, and even into adulthood (Bagwell, Newcomb, & Bukowski, 1998). However,

young children's dyadic friendships have received less attention than more global peer processes, such as peer acceptance or rejection (Gifford-Smith & Brownell, 2003; Hartup, 1996).

Past researchers have used attachment theory (Bowlby, 1982), theory of personality development (Sullivan, 1953), social constructivist theory (Piaget, 1965) as well as social learning theory (Bandura & Walters, 1959) as frameworks for explaining the potential impact of dyadic friendship on children's aggressive behaviors and the contribution of friends' characteristics in this regard. According to the proponents of attachment, personality and social constructivist theories (henceforth referred to as *social bonding* theorists), a positive relationship with a close friend can serve attachment functions. When establishing a close social bond and interacting positively with others, individuals are believed to feel more secure in their environment (Furman & Buhrmester, 1985; Weiss, 1974; Youniss, 1980) as well as connected to others (Ryan & Deci, 2000). Social bonding theorists also suggest that children in high quality friendship dyads are incited to practice positive interpersonal skills, even if they themselves or their friends are generally aggressive toward others. Therefore, a good relationship with a friend should counter-balance any potential negative influence of an aggressive friend and reduce an aggressive child's propensity to continue using aggressive behavior. Evidence in line with this notion comes from data showing that high quality friendships predict growth in children's positive mood and overall emotional well-being (e.g., Birch & Ladd, 1996), as well as in their social and problem-solving skills (e.g., Rubin, Bukowski, & Parker, 1998).

Notably, the social bonding perspective implies that all children should benefit from a positive friendship, independently of their own propensity for using physical aggression. To our knowledge, there is only one empirical study that examined whether the association between friendship quality and subsequent behavior problems varies depending on the initial level of children's behavior problems (Poulin et al., 1999). The results from that study, however, do not support the idea of a universally beneficial effect of friendship quality. Specifically, the results showed that a high friendship quality tended to mitigate the longitudinal associations between adolescents' delinquency at ages 13-14 and ages 15-16 years for the most delinquent participants but not for the others. However, friends' aggression was not explicitly included in that study. In addition, the Poulin et al. study used an adolescent

sample and it is unclear whether the possible beneficial effect of friendship quality, independent of children's initial level of aggression (as predicted by social bonding theory), can be found in young children.

In contrast to the social bonding perspective, *social learning* theorists argue that (positive or negative) friendship quality is a by-product of the specific interactions between the members of a friendship dyad and, thus, should not play a role of its own in shaping children's social behavior. However, according to the social learning perspective, a positive friendship quality could still moderate (i.e., exacerbate) the associations between friends' aggression and child aggression (e.g., Berndt, 2002; Patterson, Reid, & Dishion, 1992). Bandura's traditional experiments support the view that a good friendship quality might magnify the effect of an aggressive friend. Indeed, his results showed that the effect of an aggressive role model is enhanced when this role model is highly valued (Bandura, 1977; 1986). Hence, proponents of the social learning model argue that the closer a friendship is, the more friends interact and influence each other by modeling and possibly encouraging the use of aggressive behavior against others (Berndt, 2002, 2004; Huesmann & Kirwil, 2007; Poulin et al., 1999; Selfhout, Branje, & Mees, 2008).

However, empirical evidence remains unclear in this respect. For example, using an adolescent sample, Bruinsma (1992) showed that the association between friends' and adolescents' delinquent behavior was enhanced in friendships with high levels of imitation, protection, support and intimacy. In contrast, Bowker et al. (2007) found that hostile social-informational biases in a sample of aggressive 5th and 6th graders diminished, rather than increased, in the context of a high-quality friendship with an aggressive friend. Finally, some authors did not find any evidence for a moderating effect of friendship quality on the link between friends' and adolescents' delinquency (e.g., Selfhout et al., 2008).

In sum, the question of whether friendship quality exerts a main effect or a moderating effect in the link between friends' and children's aggression remains unresolved. This is particularly true in young children, as past studies mostly included adolescent samples. Adolescents may be more sensitive to friends' influence and to deviancy training or coercive interactions that may occur in friendship dyads involving aggressive partners compared to young children, who may be more sensitive to adult norms in regard to deviant behaviors (Dishion, Andrews, & Crosby, 1995; Moffitt & Caspi, 2001). Yet, as shown by Snyder and

others, negative peer influence during the first years of schooling is already underway. However, based on the Snyder et al. studies (1995, 1997; 2005), it is not clear whether the negative impact of peer influence in young children is only short-lived or has long-term consequences. Therefore, in the present study, we examined the role of friends' aggression and of friendship quality on the development of aggressive behaviors over a three-year period (i.e., from kindergarten until grade two).

Sex Differences in the Links Between Early Friendships and Physical Aggression

Although the tendency to affiliate with behaviorally similar friends seems to be similar for boys and girls, we still know little about the distinct ways friends' characteristics may contribute to social development in boys and girls (Rose & Smith, 2009). For example, some authors reported sex differences in how children spend their time with their friends, with early and middle school-age boys engaging more in rough-and-tumble play and in more competitive activities than girls (Fabes, Martin, & Hanish, 2003; Mathur & Berndt, 2006). Other researchers found sex differences in the conversation content between friends, with girls being more prone to use affiliative speech and boys to use assertive speech (Leaper & Smith, 2004). Therefore, some studies (e.g., Ladd et al., 1996; Storvoll & Wichstrom, 2002) found that exposure to aggressive friends is more strongly related to conduct problems or to various forms of school maladjustment in boys than in girls. However, little is known about whether young (i.e., preschool) boys and girls are differently sensitive to friends' influence. Because school-age boys and girls most often play in separate peer groups, it is possible that they socialize one another in distinct ways (Underwood, Mayeux, & Galperin, 2006). Given that boys display physically aggressive behavior more often than girls (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Côté, Vaillancourt, Barker, Nagin, & Tremblay, 2007), it is possible that the links between friends' aggression or friendship quality and children's physical aggression would be stronger in boys than in girls.

Objectives and Hypotheses

The first goal of this study was to examine the role of friends' aggression and friendship quality in kindergarten regarding a) the initial levels of children's physical

aggression, and b) the change in physical aggression from kindergarten to grade two. According to the social bonding perspective, we expected a negative (i.e., beneficial) association between friendship quality and children's physical aggression. Specifically, high friendship quality was expected to predict a reduction in children's aggression. In addition, this association should be independent of friends' level of aggression. Alternatively, according to the social learning perspective, friendship quality was not expected to be related to children's aggression. Instead, high friendship quality was expected to exacerbate the link between friends' aggression and children's aggression.

Guided by empirical evidence showing that children's prosocial behavior is negatively associated with physical aggression (e.g., Tremblay et al., 1991) and positively associated with friendship quality (e.g., Barry & Wentzel, 2006), we controlled for children's prosocial behavior to eliminate a potential confound. We also controlled for initial levels of physical aggression during early childhood (i.e., at ages 2.5, 3.5, and 5 years) because we were interested to investigate whether friends' aggression played a role with respect to change in children's aggression. This also allowed us to examine the possibility that the predictive link between friendship quality and children's physical aggression varied depending on early childhood levels of physical aggression. In line with the social bonding perspective, we expected this predictive link to be as beneficial for children showing high levels of early childhood physical aggression as for those showing low or moderate levels.

The second goal was to examine whether the role of friends' aggression and friendship quality varied depending on child's sex. According to past results, we expected that the links between friendship predictors (i.e., friends' aggression and friendship quality) and children's levels of physical aggression over time would be stronger for boys than for girls. As such, the possible moderating effect of sex was investigated in the present study.

Method

Participants

The 1555 children (52% girls) who participated in this study were part of the ongoing Quebec Longitudinal Study of Child Development (QLSCD). The QLSCD included initially a representative sample of 2223 five-month old infants born to mothers living in the province of

Quebec, Canada, between October 1997 and July 1998. Sixty-seven percent of the families were of Canadian descent, 10% were of first generation European descent, 3% were of African descent, and 3% were Native North Americans. The remaining families (17%) did not provide ethnicity information. Ninety-one percent of parents in this sample lived together at the time of birth of their child. Finally, 4% of the families had an annual total income of less than CAN\$9,999, 9% between \$10,000 and \$14,999, 5% between \$15,000 and \$19,999, 14% between \$20,000 and \$29,999, 15% between \$30,000 and \$39,999, 13% between \$40,000 and \$49,999, 12% between \$50,000 and \$59,999, 15% between \$60,000 and \$79,999, and 13% had more than \$80,000 ($M = 6.47$, $SD = 2.04$).

The children were followed up annually from 5 months to 8 years old. However, only data collected when the children were 2.5 to 8 years old (1555 children) were used for this study. To take into account attrition and non-response, logistic regression analyses were performed on the original sample using time 1 data ($n = 2223$). Results indicated that participants lost through attrition were more likely to be boys (Odds ratio, $OR = 1.36$), to come from families with lower socio-economic status ($OR = 1.05$), to display lower frequency of physical aggression during the preschool years ($OR = .79$) and to come from families of non-Canadian descent ($OR = 1.49$). On the other hand, non-intact family status ($OR = 1.10$) was not significantly associated with attrition.

As suggested by Rubin (1987), participants were included in the analyses even if they had some missing data. Missing cases were imputed using the multiple imputation (MI) method in SAS 9.1 (100 imputations). The main idea of MI method is that plausible values may be used in place of missing values to facilitate parameter interpretation and reduce estimation bias (Graham, Olchowski, & Gilreath, 2007). We previously estimated participant's scores using the Full Information Maximum Likelihood procedure within the program SAS 9.1 (SAS Institute, Cary, NC). Notably, results from the sample in which missing cases on some occasions were included but not estimated yielded basically the same results. Finally, informed written consent was obtained from all participants, according to the Ethics standards of the University of Montreal and the American Psychological Association (2002).

Measures: Children's physical aggression

Teacher ratings of children's physical aggression were collected when the children were in kindergarten (mean age = 6.2 years), grade one (mean age = 7.2 years), and grade two (mean age = 8.2 years) through the use of the Social Behavior Questionnaire (SBQ, Tremblay et al., 1991). The physical aggression scale consisted of 4 items, where the teacher was asked: «Since the beginning of the school year, how often would you say that this child 'physically attacked others', 'hit, bit or kicked others', 'got angry when somebody hurt him accidentally and started a fight', 'was fighting with others'». Each item was rated on a 3-point scale, with 1 corresponding to a very low frequency and 3 to a very high frequency (1 was labeled as 'never or not true', 2 as 'sometimes true', and 3 as 'often or really true'). Cronbach's alpha (α) was .90, both in kindergarten and grade one and .89 in grade two. Modes and medians were equal to 1 at ages 6, 7, and 8 years (See Table 1 for *M* and *SD* by time and sex).

Friends' aggression

Best friends in kindergarten were identified by asking each child in the study to nominate his/her best friend in the classroom. Teacher reports of best friends' aggression were collected with the use of a short version of the SBQ. This short version included two items that referred directly to physical aggression (i.e., «physically attacks others» and «fighting»). In order to improve internal consistency, we decided to add 9 items related to a more general pattern of aggressive behaviors (e.g., «encouraged other children to pick on a particular child; scared other children to get what he/she wanted; try to dominate other children»). Each item was again rated on a 3-point scale, with 1 corresponding to a very low frequency and 3 to a very high frequency ($\alpha = .92$, $M = 1.27$, $SD = .39$, mode = 1, median = 1.09). Bivariate correlations between physical aggression and the rest of the aggression items were $r = .75$ or higher, with a *p*-value smaller than 0.001.

Friendship quality

Friendship quality was measured using teacher reports of an adaptation of the Friendship Qualities Scale (Bukowski, Hoza, & Boivin, 1994) and the Friendship Quality Questionnaire (Parker & Asher, 1993). Teacher ratings were used to assess the quality of the

friendship between the target child and his/her best friend in the classroom. This procedure has been used and validated in a previous study with a sample of preschoolers (Sebanc, 2003). In the Sebanc (2003) study, preschool teachers were asked to evaluate young children's friendships by completing a questionnaire on the mutual friendships in their class, as identified by the children themselves ($n = 98$; M age = 3.91 years). Teacher reports showed moderate inter-rater reliability and were associated with teacher reports of aggression and with peer reports of acceptance and rejection. In the current study, teacher-reports referred to three features of friendship quality: companionship, security and closeness. As noted earlier, these features are common to most definitions of friendship quality. These features were measured using 6 items (e.g., «pleasure of being together; mutually encouraging and supporting each other; sharing personal objects») and were rated on the same 3-point scale described above ($\alpha = .87$, $M = 2.53$, $SD = .45$, mode = 3, median = 2.67).

Additional variables

Children's physical aggression in early childhood, children's prosocial behavior in kindergarten, average family income, and the sex of the child were used as control variables in this study. Yearly interviews were conducted with the person most knowledgeable of the child (in 90% of cases this was the mother) in order to evaluate children's physical aggression when the children were 2.5, 3.5 and 5 years old. The physical aggression scale consisted of 3 items where the mother was asked: «How often would you say that your child physically attacked others; hit, bit or kicked others; engaged in fighting». Each item was rated on a 3-point scale, with 1 corresponding to a very low frequency and 3 to a very high frequency ($M = 1.41$, $SD = .36$). We used mean scores of physical aggression to reflect the children's general pattern of aggression before school entry ($\alpha = .84$). Teacher reports of children's prosocial characteristics in kindergarten were collected with the use of an adaptation of the Prosocial Behavior Questionnaire (PBQ, Weir & Duveen, 1981). The prosocial scale consisted of 3 items (e.g., «helps a sick child; comforts an upset child»), which reflect children's prosocial behavior toward his/her classmates ($\alpha = .85$). In another sample (Longitudinal Study of Kindergarten Children in Quebec, $n = 377$), the correlation between these three items and the total scale was $r = .55$ or higher, with a p -value under 0.001. Information about family income was also obtained during yearly interviews by asking mothers to choose the bracket closest to their total

family annual income ($M = 6.47$, $SD = 2.04$). This information was then averaged across data points from age 2.5, 3.5 and 5 years. Finally, the sex of the child was coded (0) for girls and (1) for boys.

Analyses and Results

Preliminary Analyses

Bivariate correlations (two-tailed) among study variables, as well as means and standard deviations are presented in Table 1. At the mean level, children's physical aggression slightly declined from early childhood (age 2.5-5 years) to age 6 years, but appeared relatively stable thereafter until age 8. Children's mother-rated physical aggression in early childhood was moderately correlated with children's teacher-rated physical aggression in kindergarten ($r = .20$, $p < .001$), grade one ($r = .16$, $p < .001$), and grade two ($r = .16$, $p < .001$). As expected, children's physical aggression in kindergarten was strongly correlated with children's physical aggression in grade one ($r = .58$, $p < .001$) and in grade two ($r = .46$, $p < .001$), despite the fact that children were rated by different teachers at each age. Likewise, children's physical aggression in kindergarten was correlated with friends' aggression ($r = .33$, $p < .001$) and friendship quality ($r = -.20$, $p < .001$), which were negatively correlated with each other ($r = -.15$, $p < .001$). Friends' aggression in kindergarten was also significantly and positively correlated with children's physical aggression in grade one ($r = .21$, $p < .001$) and in grade two ($r = .17$, $p < .001$). Friendship quality in kindergarten was negatively correlated with children's physical aggression in grade one ($r = -.16$, $p < .001$) and in grade two ($r = -.10$, $p < .05$). Children's physical aggression in early childhood, children's prosocial behavior, and sex were correlated with all study variables, supporting their role as control variables. Family income was correlated with most study variables, except sex, children's prosocial behavior and friends' aggression. Finally, Fisher z analyses were conducted in order to examine potential sex differences in correlation estimates. Only two correlations were significantly different from each other: the stability coefficient of children's physical aggression between kindergarten and grade one (boys $r = .57$, $p < .001$; girls $r = .44$, $p < .001$, $z = 2.5$, $p < .05$) as well as the correlation between children's physical aggression and children's prosocial behavior in kindergarten (boys $r = -.17$, $p < .001$; girls $r = -.03$, ns , $z = 2.1$, $p < .05$).

Main Analyses: Analytical Rationale

Using the SAS 9.1 statistical software package (SAS Institute, Cary, NC), multilevel modeling was performed, which allows examining the effect of inter-individual differences (e.g., sex or friendship quality effects) on intra-individual change in the dependent variable (e.g., intra-individual change in level of physical aggression) (Singer & Willett, 2003). In these analyses, a within-person model of regression intercept and slope is calculated for each individual (i.e., level I unit of analysis). In addition, a between-person model is estimated in which the within-person slopes and intercepts are treated as dependent variables regressed on inter-individual predictor variables, such as sex or friendship quality (i.e., level II unit of analysis). These Level II parameter estimates are referred to as fixed effects. As such, the level I variance estimates describe the degree to which children vary over time, whereas the level II variance estimates indicate the degree to which these intra-individual variations are predicted by differences between children.

For the purpose of this study, we first estimated an unconditional means and growth model (Model 1), which allows for the estimation of the Level I intercept and slope as well as of the variance partition between level I and II units of analysis. Time was coded as the number of years that had passed since age 6 (kindergarten), such that the intercept represents the value of child physical aggression in kindergarten. In this unconditional model, no inter-individual predictors (i.e., fixed effects) of intercept and slope were included. The inter-individual predictors of the intercept and slope (e.g., sex, friends' aggression, and friendship quality), were included in the next model (Model 2). Possible interaction effects (as predictors of intercept and slope) were examined in subsequent models. Specifically, in Model 3, two-way interaction effects «friends' aggression*sex» and «friendship quality*sex» were added. In Model 4, a two-way interaction «early childhood physical aggression*friendship quality» was tested. Finally, in Model 5, a two-way interaction «friends' aggression*friendship quality» was tested. In order to simplify interpretation of results, all predictors were z-standardized, with scores of the dependent variable (i.e., physical aggression levels from kindergarten to grade two) z-standardized across time, to model change in the multilevel growth analyses. Significant interactions were probed following procedures described by Holmbeck (2002).

Main Analyses: Results

The results from the unconditional model (see Table 2) revealed a significant variation in initial level in children's physical aggression (estimate = .60, $p < .001$), and significant variation, albeit modest, in the rate of change of children's physical aggression (estimate = .03, $p < .05$), justifying the exploration of level II predictors of variation in physical aggression. Results for model 2 indicated a significant effect of family income (estimate = -.07, $p < .001$), sex (estimate = .49, $p < .001$), and early childhood physical aggression (estimate = .11, $p < .001$), but a non significant effect of children's early prosocial behavior (estimate = -.03, $p > .05$) on the initial level of children's physical aggression in kindergarten. Results showed that, compared to girls, boys were perceived as more physically aggressive at each time point. Examination of the two-way interaction term between sex and time failed to reach significance, suggesting that the sex difference in children's physical aggression levels remained constant across the three time points. Friends' aggression in kindergarten was related to a higher initial level of children's physical aggression (estimate = .25, $p < .001$), and to a negative rate of change over time (estimate = -.06, $p < .01$). Higher levels of friendship quality in kindergarten were associated with lower initial levels of children's physical aggression (estimate = -.13, $p < .001$), and to a marginally significant positive rate of change (estimate = .04, $p = .06$). As such, the main effects of friends' aggression and friendship quality in kindergarten were stronger on children's concurrent levels of physical aggression but declined somewhat in magnitude across the two first years of schooling.

Results from Model 3 revealed a significant two-way interaction between sex and friends' aggression with respect to children's physical aggression (estimate = .11, $p < .05$), as well as a marginally significant two-way interaction effect between sex and friendship quality (estimate = -.08, $p = .07$). Three-way interaction effects including friendship predictors, sex and age were also tested but failed to reach significance, thereby suggesting that the moderating effect of sex on the link between friends' aggression or friendship quality and children's physical aggression did not vary over time. Probing of the significant interaction involving sex showed that friends' aggression was significantly and positively related to children's physical aggression in both boys and girls, but the estimated coefficient was stronger for boys (estimate = .30, $p < .001$) than for girls (estimate = .19, $p < .001$). Probing of

the interaction between sex and friendship quality suggested that friendship quality was significantly and negatively related to children's physical aggression in both boys and girls, but the estimate was stronger for boys (estimate = $-.17$, $p < .001$) than for girls (estimate = $-.09$, $p < .05$). In Model 4, no significant interactions were found between early childhood levels of physical aggression and friendship quality.

However, results from Model 5 indicated a marginally significant two-way interaction between friends' aggression and friendship quality with respect to the initial levels of children's physical aggression (estimate = $-.04$, $p = .06$). As recommended by Holmbeck (2002), the effect of friends' aggression on the initial levels of children's physical aggression was examined at three different levels of friendship quality: high (i.e., $+1 SD$), average (i.e., at the mean), and low (i.e., $-1SD$). Examination of estimates indicated that friends' aggression was significantly related to children's physical aggression at all levels of friendship quality, but that the association between friends' aggression and children's level of physical aggression was slightly stronger at low levels of friendship quality (estimate = $.28$, $p < .001$), than at average (estimate = $.24$, $p < .001$), and high (estimate = $.20$, $p < .01$) levels of friendship quality. Notably, additional tests of three-way interaction terms «friends' aggression*friendship quality*sex» and of «friends' aggression*friendship quality*time» failed to reach significance, suggesting the moderating effect of friendship quality did not differ significantly by sex or over time.

Discussion

The aim of this study was to investigate the potential beneficial and/ or moderating role of friendship quality in regard to the persistence of children's physical aggression from kindergarten to grade two and in regard to the degree of potential «influence» of their friends' aggression in this context. As expected, children's aggression was relatively stable from early childhood to grade two despite the use of different informants (mothers and teachers). Friends' aggression in kindergarten was significantly related to higher levels of children's physical aggression, above and beyond a series of control variables including early childhood levels of physical aggression. This association was maintained as children moved from one school year to another, but tended to decrease slightly over time. In contrast, a high friendship quality in kindergarten was significantly related to a decrease in children's physical aggression, despite a

slight decline in the magnitude of this relation over time. Furthermore, friendship quality marginally moderated the contribution of friends' aggression in kindergarten. Finally, boys showed significantly higher levels of physical aggression compared to girls and sex was found to moderate the predictive links of friends' aggression and friendship quality to children's physical aggression. These results are discussed in light of the two theoretical perspectives that served to frame the objectives, the social bonding and the social learning perspectives, and in light of the possible differences between girls and boys.

Persistence of Physical Aggression and Exposure to Aggressive Friends

Longitudinal studies show a pattern of relative stability of physical aggression throughout childhood despite a general downward tendency (Broidy et al., 2003; Nagin & Tremblay, 2001). Our relatively stable pattern of physical aggression from early childhood to grade two is consistent with these earlier studies. Our results also show a tendency for kindergarten children to have friends who are similar to themselves with regard to physical aggression. More importantly, the present results add to the scarce evidence showing that the association with aggressive peers in kindergarten can amplify existing levels of physical aggression (e.g., Estell et al., 2002; Snyder et al., 1997). Interestingly, this association was stronger for boys than for girls, perhaps suggesting a higher sensibility to peer influence in boys. The weaker association between friends' and children's aggression in girls calls for the future examination of alternative forms of aggressive behavior, such as social or verbal aggression, which are more typical of girls (Björkqvist et al., 1992; Crick, Casas, & Mosher, 1997; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996). Especially in the social world of girls, social aggression (e.g., ignoring someone, spreading rumor, making mean faces) could replace physical aggression as a more «acceptable» way to behave and achieve their goals (Björkqvist et al., 1992).

It appears, however, that for both boys and girls the consequences of having an aggressive friend in kindergarten are not short lived since the link between friends' aggression and changes in target children's physical aggression remained significant over the next two years, although the magnitude of this link tended to decline. Overall, these results are in line with the social learning perspective. Theoretical models that involve modeling, deviancy training or coercive processes have been proposed to account for the link between friends'

aggression and the maintenance or aggravation of children's aggressive behavior (e.g., Vitaro, Boivin, & Bukowski, 2009). Our results also suggest, however, that children's social interactions occurring with friends, even those with aggressive friends, may be beneficial and even protective with respect to the development of children's physical aggression, provided they are of good quality.

Friendship Quality: Beneficial and Protective Effect

The present findings indicated that a good friendship quality in kindergarten predicted lower initial levels of children's physical aggression. These links were observed even when controlling for children's early childhood levels of prosocial and aggressive behaviors. Contrary to findings with adolescent boys (Poulin et al., 1999), the predictive links between friendship quality and the decrease in children's physical aggression was significant irrespective of children's previous level of physical aggression in our young sample. Developmental differences as well as differences at the methodological level between our own and the Poulin et al. study could explain these divergent findings. Overall, our correlational results seem clearly in line with the social bonding perspective. The negative relationship between friendship quality and children's physical aggression was also stronger for boys than for girls. The stronger association between friendship quality and physical aggression in boys suggests, again, that alternative forms of aggressive behavior should be considered in future studies in addition to physical aggression.

Social bonding theorists highlighted some mechanisms by which friendship quality may positively affect children's social development, independently of their own and their friends' level of aggression. Through high friendship quality, children may learn to become interpersonally sensitive as well as to handle intimacy (Sullivan, 1953; Youniss, 1980). Children also learn ways to achieve mutual understanding as well as social and interpersonal skills (e.g., empathic, prosocial and social problem solving skills) which, in turn, may improve the ways they interact with other children (Berndt, 2004; Harter, 1990; Rubin et al., 1998). Hence, positive styles of interacting with a friend may later generalize to the larger peer group, thereby possibly minimizing the risk of rejection by well-adjusted classmates (see Berndt, Hawkins, & Jiao, 1999; Hodges, Boivin, Vitaro, & Bukowski, 1999; Ladd et al., 1996). This explanatory process does not exclude, however, occasional conflicts between friends

(Bukowski, Velasquez, & Brendgen, 2008). In fact, even occasional conflicts, provided they are solved in a satisfactory manner, may foster mutual understanding and improve social maturity (Azmitia & Montgomery, 1993; Nelson & Aboud, 1985; Piaget, 1965). A positive relationship with a friend may also serve attachment functions. Having a supportive relationship with a peer may provide children with a sense of security and acceptance (Furman & Buhrmester, 1985; Sullivan, 1953; Weiss, 1974; Youniss, 1980) as well as connectedness (Ryan & Deci, 2000). Friends may be in a position to better understand the behavior and the common social difficulties their aggressive partner might encounter. Such affective bonds could create a context in which aggressive children feel less defensive and insecure. Finally, by experiencing positive interactions with their best friend, aggressive children may develop stronger relationships with teachers and enhance their motivation in school (Wentzel, Barry, & Caldwell, 2004). Those connections (or bonds) within the school setting may, in turn, help decrease aggressive children's general tendency toward social deviance (Hirschi, 1969).

Contrary to the core assumptions of the social learning perspective, a high quality friendship did not exacerbate the associations between friends' and children' aggression but rather tended to mitigate it to some extent. One possible explanation for the apparent protective role of friendship quality in regard to the contribution of friends' aggression may be found in the micro-social processes in aggressive dyads. Snyder and colleagues showed that two distinct processes (i.e., peer deviancy and peer coercion training) are at work in aggressive dyads (Snyder et al., 2008). Peer deviancy training implies mutual discourse, collusion and positive evaluation of deviant acts (Boivin & Vitaro, 1995; Dishion et al., 1995; Dishion, Spracklen, Andrews, & Patterson, 1996) whereas peer coercion training refers to aversive behavioral reactions and escalation of coercive interactions between friends (Kupersmidt, Burchinal, & Patterson, 1995). In the Snyder et al. (2008) study, peer deviancy training specifically fostered children's covert conduct problems and delinquent behavior because aggressive friends provided extensive opportunities for modeling and reinforcement. However, coercive interactions appeared more likely to predict overt conduct problems and aggression (Snyder et al., 1997, 2008). Since conflict and coercion are rarer (and more often adequately resolved) in high quality friendships, these friendships may be less conducive to fostering overtly aggressive behavior. This tentative explanation suggests that high quality friendships could still exacerbate the links between friends' deviancy and covert behaviors

(i.e., stealing, cheating, truancy) because deviancy training, which is based on positive interactions between friends, could operate in these dyads. This is an empirical question to be addressed in future studies.

Strengths, Limitations, and Conclusion

The present study was the first to examine conjointly the role of friends' aggression and friendship quality on the persistence of early physical aggression. Strengths of the study include: a large sample, the use of multi-level means and growth analyses, and the use of different raters. In addition to these strengths, however, the present study also has some limitations that warrant consideration. First, to measure friendship quality in dyadic relations, the children were first asked to name the classmate they viewed as their very best friend. Unfortunately, we were unable to ascertain whether the friendship was reciprocal since we interviewed only the target child in each classroom. As Hartup (1996) mentioned, the developmental significance of friendship quality cannot be fully understood without distinguishing the effects of identifying a unilateral friend from having a reciprocal friend. However, even friendships that are not reciprocated have been found to account for changes in children's own behavior (Adams, Bukowski, & Bagwell, 2005). Also, we relied on teacher-reports of friendship quality. Although this procedure has been used and validated with preschoolers (Seban, 2003), we still know little about how teacher perceptions relate to children's own perceptions or to systematic observations of the interactions between friends. Thus, future studies should include the perception of various informants (i.e., teachers, parents, friends and self-reports) as well as different measurement methods (i.e., questionnaires, interviews, natural and task observations), to fully capture the different features of friendships.

Second, the focus of this study was on the manifestation of physical aggression during the early school years because it predicts later maladjustment for both boys and girls (Broidy et al., 2003, Nagin & Tremblay, 2001). However, other types of aggressive behavior that may be more specific to girls (i.e., social aggression) should be considered in future investigations. The joint consideration of both forms of aggression (physical and social aggression) should foster a better understanding of the distinct developmental outcomes associated with the role

of friendship relations for both males and females. The same issue applies to the distinction between covert and overt behaviors.

Despite its limitations, we believe the results from the present study contribute to resolving the empirical and theoretical controversy about the role of friendship quality in regard to friends' putative influence on aggressive behavior in children. High friendship quality seems to contribute to the positive socialization of physically aggressive children, as well as to mitigate the possible negative impact of having an aggressive friend for both boys and girls. Identifying sources of inter-individual differences in intra-individual change represents a key task for developmental researchers. The slight declining associations of both friends' aggression and friendship quality with children's physical aggression over time suggests that it may be useful to include repeated measures of these variables as time-varying predictors instead of including them as single-time fixed predictors in future studies. In this way, possible changes in friends' aggression or friendship quality across the school years could be charted to determine how they relate to fluctuations in physical aggression. Future studies should also focus on the micro-social processes and psychosocial mediators by which friendship quality may exert a positive and potentially protective effect on physical aggression. These processes need to be investigated in order to improve our understanding of the peer-related factors implicated in the development of physical aggression in the early school years and to aid in designing comprehensive interventions addressing those factors as early as possible. Our correlational results suggest that fostering positive relationships among friends in the early school years could represent a beneficial force in the lives of aggressive children. Nevertheless, experimental manipulations through intervention programs are also needed to ascertain this tentative conclusion by examining the putative causal role of friendship quality in decreasing aggressive behavior in children.

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Table 1

Bivariate Correlations, Means and Standard Deviations by Sex and Variables (N = 1555)

Variable	1	2	3	4	5	6	7	8	9
1. Sex ^a	-	-	-	-	-	-	-	-	-
2. Family income	-.02	-	-	-	-	-	-	-	-
3. Age 3-5 Children's physical aggression	.17***	-.10***	-	-	-	-	-	-	-
4. K Children's prosocial behavior	-.23***	.06	-.10**	-	-	-	-	-	-
5. K Children's physical aggression	.31***	-.09**	.20***	-.18***	-	-	-	-	-
6. Grade 1 Children's physical aggression	.33***	-.11***	.16***	-.12***	.58***	-	-	-	-
7. Grade 2 Children's physical aggression	.29***	-.08**	.16***	-.12**	.46***	.54***	-	-	-
8. K Friends' aggression	.16***	-.03	.13***	-.10**	.33***	.21***	.17***	-	-
9. K Friendship quality	-.11**	.10**	-.09**	.23***	-.20***	-.16***	-.10*	-.15***	-
<i>M and SD Boys (747)</i>	-	6.42 (2.01)	1.47 (.38)	1.93 (.53)	1.34 (.49)	1.40 (.51)	1.33 (.49)	1.33 (.45)	2.47 (.47)
Girls (808)	-	6.51 (2.09)	1.35 (.33)	2.18 (.52)	1.09 (.26)	1.11 (.29)	1.10 (.26)	1.21 (.31)	2.57 (.42)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ (Two-tailed)

Note. Age 3-5 refers to early childhood. K refers to kindergarten. ^a Coded (0) for girls and (1) for boys.

Table 2

Results from the Multilevel Growth Analysis ($N = 1555$)

		Model									
		1		2		3		4		5	
		Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Variance Components											
Level I	Within-person	.42***	.02	.42***	.02	.42***	.02	.42***	.02	.42***	.02
Level II	Variance in initial level	.60***	.04	.38***	.04	.37***	.04	.38***	.04	.37***	.04
	Variance in rate of change	.03*	.01	.03†	.01	.03†	.01	.03†	.01	.03†	.01
	Correlation	-.27	.37	-.07	.35	-.06	.35	-.06	.36	-.07	.36
Fixed Effects											
	Mean initial level	.003	.03	-.24***	.03	-.25***	.03	-.24***	.03	-.25***	.03
	Family income			-.07***	.02	-.07***	.02	-.07***	.02	-.07***	.02
	Sex ^a			.49***	.04	.49***	.04	.49***	.04	.49***	.04
	Age 3-5 Children's physical aggression (PA)			.11***	.02	.10***	.02	.10***	.02	.11***	.02
	K Children's prosocial behavior (PB)			-.03	.03	-.03	.03	-.03	.03	-.03	.03
	K Friends' aggression (FA)			.25***	.03	.19***	.04	.25***	.03	.24***	.03
	K Friendship quality (FQ)			-.13***	.03	-.09*	.04	-.13***	.03	-.12***	.03
	FA * Sex					.11*	.05				
	FQ * Sex					-.08†	.05				
	PA * FQ							-.02	.02		
	FA * FQ									-.04†	.02
	Mean rate of change	-.003	.02	-.001	.01	-.001	.01	-.001	.01	-.001	.01
	K Friends' aggression			-.06**	.02	-.06**	.02	-.06**	.02	-.06**	.02
	K Friendship quality			.04†	.02	.04†	.02	.04†	.02	.04†	.02

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .07$ (two-tailed)

Note. Estimate = Standardized coefficients. SE = Standard Error of Estimation. Age 3-5 refers to early childhood. K refers to kindergarten.

^a Coded (0) for girls and (1) for boys

Chapitre III : Friendship Conflict and the Development of Aggressive Behavior in the Early School Years: A Genetically Informed Study of Potential Moderators

Marie-Claude Salvas, Frank Vitaro, Mara Brendgen, Ginette Dionne, Richard Tremblay, & Michel Boivin

Abstract

For many authors, high and frequent conflicts between friends during childhood and adolescence represent a serious risk for subsequent conduct problems, such as physical aggression. Whereas it seems logical to assume that friendship conflict could have some negative consequences on children's behaviors, other scholars have also suggested that a certain amount of conflict between friends may actually promote social adjustment. The aim of this study was to investigate the role of friendship conflict in regard to the development of physical aggression in the early school years, i.e., from kindergarten to grade one, as well as the moderating role of some relational (i.e., shared positive affect and dyadic conflict resolution skills) and personal (i.e., children's sex and genetic liability for aggression) characteristics in this context. The sample included 657 twins assessed through teacher, peer, child and friend ratings in kindergarten and grade one. Friendship conflict in kindergarten was related to a linear increase in boys', but not girls' physical aggression over time. However, shared positive affect and conflict resolution skills mitigated the prospective association between friendship conflict and children's physical aggression. These results were independent of children's sex and genetic risk for physical aggression. Fostering a positive relationship between friends at school entry may buffer against the risk associated with experiencing conflict.

Keywords: physical aggression, friendship, conflict, positive affect, conflict resolution skills

Introduction

Children's persistent use of aggressive behaviors is a serious problem that engenders personal and social consequences, particularly in terms of adolescent violence and adult criminality (Loeber, Green, Keenan, & Lahey, 1995; Moffitt, Caspi, Rutter, & Silva, 2001). Importantly, clear individual differences in the developmental course of physical aggression are already apparent during the early school years (Broidy, Nagin, Tremblay, Bates, Brame, Dodge *et al.*, 2003; Snyder, Schrepferman, Brooker, & Stoolmiller, 2007). While a significant part of these interindividual differences in aggression are explained by genetic factors, environmental influences also play a significant role (DiLalla, 2002; Turkheimer, 2000). In terms of potential environmental influences, many studies have focused on young children's experiences within the family, such as their relationships with parents (e.g., Nagin & Tremblay, 2001; Tremblay, Nagin, Séguin, Zoccolillo, Zelazo, Boivin *et al.*, 2004). Over the past decade, however, children's peer relationships, particularly with their friends, have received increased attention in regard to their effect on physical aggression during the early school years (Prinstein & Dodge, 2008).

Even among aggressive children, good quality friendships (i.e., friendships with positive features such as validation, support, and caring) have been linked to a decrease in physical aggression (Bowker, Rubin, Rose-Krasnor, & Booth-LaForce, 2007; Poulin, Dishion, & Haas, 1999; Salvas, Vitaro, Brendgen, Lacourse, Boivin, & Tremblay, 2011), as well as to an increase in emotional well-being (Bagwell, Newcomb, & Bukowski, 1998; Hartup, 1996). Like any other social relationships, however, friendships do not only include positive features; they may also include occasional negative features such as conflicts (Shantz, 1987), especially when one or both members of the friendship dyad are aggressive (Snyder, Schrepferman, McEachern, Barner, Johnson, & Provines, 2008). Conflict is generally described as a state of disagreement that is manifest in terms of opposing views (Laursen & Pursell, 2009; Perry, Perry, & Kennedy, 1992). It can take various forms, ranging from a pacific argument to an intense quarrel (Hartup, 1992). Although most conflicts between friends do not involve direct aggression, some could be characterized by hostile and angry behaviors. It seems logical to assume that friendship conflict could have some negative consequences on children's behaviors. However, the evidence regarding the impact of friendship conflict on children's

aggression is in fact contradictory. The goal of this study was to clarify the conditions under which conflict could be either beneficial or detrimental for the development of physical aggression in young children, i.e., from kindergarten to grade one.

Friendship Conflict: Linear or Nonlinear Patterns of Association with Aggressive Behavior?

For many authors, high and frequent conflicts between friends during childhood and adolescence represent a serious risk for subsequent behavior problems. For example, Kupersmidt, Burchinal, and Patterson (1995) found that adolescents' likelihood of being antisocial increased as the level of conflict with their best friend increased. Children's repeated use of coercive tactics to manage friendship conflict may shape and sustain aggressive behaviors through negative reinforcement and modeling of coercive behaviors (Snyder, Edwards, McGraw, Kilgore, & Holton, 1994), as well as result in a negative reputation among normative peers, and ultimately in social exclusion (Newcomb, Bukowski, & Pattee, 1993; Patterson, Reid, & Dishion, 1992). This negative view of friendship conflict, which rests on social learning principles, suggests that conflict begets aggression in a linear fashion (Snyder *et al.*, 2007).

Some scholars hold a different view, however. Piaget (1965) was one of the first to describe the potential benefits of conflicts, arguing that developmental change has its origins in the cognitive disequilibrium that stems from disagreement. More recently, other scholars have also suggested that a certain amount of conflict between friends may actually promote social adjustment (Laursen, & Hafen, 2010; Laursen & Pursell, 2009). Specifically, their perspective assumes a nonlinear association between conflict and child adjustment: some disagreement is required to address problems and facilitate change, thereby leading to a decrease in aggressive behavior; however, when disagreement is excessively frequent and intense, most benefits have been realized and additional conflict is counterproductive (Adams & Laursen, 2007). According to these authors, the presence of moderate conflict may be constructive by contributing to the establishment of a better-quality relationship, and by providing opportunities to practice interpersonal skills. There is indeed empirical evidence that conflict can be beneficial, but most of this evidence has been constructed from linear patterns of association, in which friendship conflict was associated with better outcomes. For example,

conflict between friends has been linked with greater affective perspective taking and emotional sensitivity (Dunn & Slomkowski, 1992), and increased social skills (Azmitia & Montgomery, 1993). A positive and/or nonlinear pattern of association between conflict and adjustment also posits that there are costs associated with the complete absence of conflicts, for individuals who avoid conflict must suppress their basic needs and deprive themselves of learning opportunities (Laursen & Hafen, 2010).

Dyad Characteristics as Possible Moderators: Friendship Affect and Conflict Resolution Skills

Independent of the presence of conflict, friendships also include affective dimensions, such as high levels of intimacy (Buhrmester, 1990) and satisfaction (Parker & Asher, 1993), as well as positive affect, which refers to the sense of affection, closeness and happiness that children experience within a friendship (Bukowski, Hoza, & Boivin, 1994; Furman & Robins, 1985). To understand the specific patterns of association between conflict and aggression, it may be important to also consider the affective dimension of the relationship in which the disagreement takes place. For example, it is possible that the association between conflict and child aggression varies depending on how much friends experience positive affect within their relationship. To illustrate, the putative beneficial effect of (moderate) friendship conflict may be limited to conflict that arises within a positive nonthreatening relationship. Conversely, the putative negative consequences of (any or high) friendship conflict could be exacerbated within a non-positive friendship.

Evidence for the moderating role of shared positive affect between friends is scarce. Nevertheless, Adams and Laursen (2007) have shown that the nonlinear relationship between conflict with adolescent friends and antisocial behavior was moderated by perceived relationship negativity. Specifically, increase in conflict from low to moderate levels was linked to greater antisociality for adolescents in friendships that were characterized by high levels of relationship negativity. For adolescents reporting low levels of relationship negativity, increases in conflict were not associated with antisocial behavior. By extension, these results suggest that affectively invested friendships may provide a favorable context for dealing with conflict. When occurring in a relational context based on trust and support, conflict may provide occasions to learn to balance competing needs and refine new skills.

Therefore, when a conflict arises, those friends who derive social provisions and meet their affective needs within their relationship might be more motivated to resolve conflict in a satisfactory way for both partners compared to children involved in less satisfactory friendships (Hartup, 1992). This, however, may be more easily achieved if the participants possess basic conflicts resolution skills.

The moderating role of dyadic conflict resolution skills is consistent with the view that friendship conflict may - or may not - have negative consequences, depending on how well children are able to manage the conflicts, in addition to how much they are motivated to manage them at all. However, because dyadic processes reflect the characteristics of the partners who make up the dyad (Kenny & Cook, 1999), how conflicts contribute to an increase or a decrease in child aggression may also depend on some children's individual characteristics.

Genetic Risk and Sex as Possible Moderators

The child's genetic risk for aggression may moderate the influence of friendship factors through a mechanism referred to as gene-environment interaction (Rutter & Silberg, 2002; Turkheimer & Waldron, 2000). Gene-environment interactions may arise through different processes such as a trigger process, which is consistent with the diathesis-stress perspective. A trigger process could occur when a potentially stressful environmental experience such as conflict between friends leads to increased aggression mostly in those individuals with preexisting genetic vulnerabilities towards aggression (Monroe & Simons, 1991; Zuckerman, 1999). Some evidence that children's genotype can exacerbate a peer environmental 'effect' comes from a study on physical aggression in a sample of twins in grade one (Brendgen, Boivin, Vitaro, Bukowski, Dionne, Tremblay *et al.*, 2008). In that study, children were most likely to display high levels of physical aggression if they were at high genetic risk for such behavior, and at the same time, exposed to highly aggressive friends. It is therefore possible that the effect of friendship conflict may be genetically moderated. However, it is also possible that the effect attributed to friendship conflict in past studies was, at least partially, genetically mediated through a mechanism known as gene-environment correlation (Rutter, Moffitt, & Caspi, 2006). Gene-environment correlations refer to situations where heritable factors are associated with specific environments (Brendgen, 2012). These

correlations would occur, for instance, when children with a genetic disposition for aggression are more likely than others to elicit negative reactions from their friends or create conflict with them. Such a possible gene-environment correlation needs to be controlled when testing for potential gene-environment interactions because the same environmental factor may simultaneously be involved in both mechanisms with respect to the developmental outcome (Purcell, 2002). By including genetic risk for aggression as a predictor and a moderator in the present study, we tested for the presence of gene-environment interaction and gene-environment correlation in the hypothesized associations linking friendship conflict to aggression.

Child sex could be another important moderator of the putative associations between friendship factors and later aggressive behavior. Boys may be less well equipped than girls to engage in constructive modes of dealing with conflict because of the slower rate of maturation of their executive functions and language skills (Keenan & Shaw, 1997; Moffitt *et al.*, 2001). In addition, developing intimate connections is more important in girls' friendships (Bukowski *et al.*, 1994) whereas competition is more valued in boys' friendships (Maccoby, 1990). Previous research has also suggested that girls respond more prosocially to conflict situations with peers than boys (Chung & Asher, 1996; Rose & Asher, 1999). It is therefore possible that friendship conflict differentially impacts boys' and girls' functioning.

Objectives and Hypotheses

The aim of the study was to examine the role of friendship conflict in kindergarten regarding the development of children's physical aggression from kindergarten to grade one. The first objective was to test whether the association between conflict and child aggression is linear or nonlinear, while controlling for child's initial level of physical aggression and genetic liability toward aggression. According to some authors, conflicts between friends are hypothesized to be associated in a linear fashion to increased levels of aggressive behavior over time. In contrast, according to the proponents of a beneficial effect of conflict, a moderate amount of conflict between friends may be beneficial for children's adjustment.

The second objective was to examine whether the potential association between friendship conflict and child aggression (i.e., linear or nonlinear) varies depending on the level of shared positive affect between friends. Conflict between friends who share low levels of

positive affect is expected to be more conducive to an increase in aggression. Alternatively, conflict that takes place between friends who share high levels of positive affect is expected to be related to a decrease in aggression or at least have no detrimental effect. A third objective was to investigate whether the potentially moderating effect of shared positive affect, in turn, varies depending on the level of the dyad's conflict resolution skills. The hypothesized benefits of moderate conflicts in the context of high positive affect are expected to depend on the levels of children resolution skills. Similarly, deficits in resolution skills are expected to exacerbate the negative consequences of conflict, particularly in the context of low levels of shared positive affect.

A fourth objective was to test whether the hypothesized association between friendship conflict and child aggression applies equally to those children with a high genetic risk for physical aggression and those with a lower or moderate genetic risk. Hence, the study objectives were addressed using a quantitative genetic design based on data from monozygotic and dizygotic twin pairs reared together. According to the diathesis-stress hypothesis, the link between friendship conflict and child physical aggression is expected to be only evident in children with a strong genetic risk for such behavior. Finally, given that previous studies have found differences between boys and girls regarding various patterns of interactions within friendships, we expected that conflicts between friends would be more strongly related to child aggression in boys than in girls.

Method

Participants

Participants of the present study were part of a longitudinal study (Quebec Newborn Twin Study) of a population-based sample of monozygotic (MZ) and dizygotic (DZ) twins from the greater Montreal area who were recruited at birth between November 1995 and July 1998 (N = 1350 individual twin children). For same-sex twin pairs, zygosity was assessed at 18 months based on physical resemblance via the Zygosity Questionnaire for Young Twins (Goldsmith, 1991). For a subsample of these same-sex twin pairs ($n = 123$), a DNA sample was evaluated with respect to 8-10 highly polymorphous genetic markers. The comparison of zygosity based on the similarity of these genetic markers with zygosity based on physical

resemblance revealed a 94% correspondence rate, which is similar to rates obtained in older twin samples (Forget-Dubois, Perusse, Turecki, Girard, Billette, Rouleau *et al.*, 2003) . Eighty-four percent of the families were of European descent, 3% were of African descent, 2% were of Asian descent, and 2% were Native North Americans. The remaining families (9%) did not provide ethnicity information. The average yearly household income (54,000\$ CAN) in the twin sample was slightly above the national average for couples with children. The demographic characteristics of the twin families were compared to those of a sample of single births that is representative of the large urban centers in the province of Quebec when the children were 5 months of age (Santé-Québec, Jetté, Desroisiers, & Tremblay, 1998). The results indicated that the samples were very similar in terms of parental education, yearly income, age of parents at birth of children, and marital status.

The sample was followed longitudinally at 5, 18, 30, 48, and 60 months focusing on a variety of child-related and family-related characteristics. Further data collections were completed when the children were six and seven years of age to assess children's social adaptation at school entry (i.e., in kindergarten and grade one). The present paper describes findings from these two data collections. The average age at assessment was 72.7 months (i.e., 6 years old) in kindergarten (T1) and 84.5 months (i.e., 7 years old) in grade one (T2). In kindergarten, 30% of the twins in a pair attended the same classroom, whereas 70% attended different classrooms. In grade one, 23% of the two twins in a pair attended the same classroom, whereas 77% attended different classrooms. Attrition in the sample averaged at approximately 7% per year, resulting in a total of 657 twin children for the data collection at 7 years (i.e., 283 monozygotic twins, 182 same-sex dizygotic twins and 192 mixed-sex dizygotic twins). Preliminary analyses showed no significant link between zygosity status (i.e., monozygotic twins versus dizygotic twins) and any of the study variables. There was also no significant effect of the twins' being in the same classroom or not on children's physical aggression at either T1 or T2. As a consequence, zygosity status and the fact of being in the same classroom or not were not included in the main analyses. To take into account attrition and non-response, logistic regressions were performed on the original sample (N = 1350 twins) using T1 data. Results indicated that participants lost through attrition were more likely to come from families with higher socio-economic status ($OR = .90, p < .001$). However, child sex ($OR = 1.07, p > .05$), temperament ($OR = 1.01, p > .05$), and physical aggression during

the preschool years ($OR = .83, p > .05$) were not significantly associated with attrition. Informed written consent was obtained from all participants at each new wave of data collection, according to the Ethics standards of the University of Montreal and the American Psychological Association (2002).

Measures: Aggressive Behavior

Children's physical aggression was assessed using reports from both teachers and peers in kindergarten and grade one. Teacher-rated aggression was measured using four items inspired by the Social Behavior Questionnaire (Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992). Teachers indicated to what extent each target (i.e., twin) child 'gets into fights' or 'physically attacks others'. Responses were given on a 3-point scale (0 = never, 1 = sometimes, 2 = often), Cronbach's alpha was .89 at T1 and T2. Peer-nominated aggression was assessed using two behavioral descriptors, i.e., 'gets into a lot of fights' and 'hits and kicks other children'. Specifically, booklets of photographs of all the children in a given class were handed out to each child's participating classmates for whom parental consent was available (> 75% participation rate). Two research assistants ensured that the children recognized the photos of all their classmates by presenting them individually. Children were asked to circle the photos of up to two classmates who best fit each of the behavioral descriptors. For each child in the class, the nominations received for each item were summed and z-standardized within the classroom to control for variations in classroom size, yielding a score for each target child as well as for each of the other participating children in their class. Next, the item scores were summed up to yield a global peer-rated aggression score, which were again z-standardized within the classroom. The correlations between teacher and peer-rated children's aggression scores were, respectively, $r = .54, p < .001$ at T1, and $r = .64, p < .001$ at T2. Because of this significant convergence between the two raters, the peer-rated and teacher-rated aggression scores were first z-standardized across the sample and then averaged to a composite aggression score.

Friendship identification

During the peer nomination procedure at T1, children were asked to nominate up to three best friends in the classroom. Limiting friendship nominations to the classroom does not

seem to overly restrict selection of friends because the vast majority of elementary school children select a best friend from among their classmates even when they can nominate a friend from outside the classroom (Kupersmidt *et al.*, 1995; Parker & Asher, 1993). Twins who were in the same classroom were not allowed to nominate their co-twin as a friend. On average, the target children nominated 2.94 friends at T1. The number of friends did not differ for girls and boys, and 402 target children (61%) had only same-sex friends whereas 255 (39%) had at least one opposite-sex friend. Overall, 72.3% of the friendships were reciprocated. Reciprocated friendships were friendships where the first, second or third nominated friend also nominated the target child as their first, second or third friend. Similar to previous findings (see Newcomb & Bagwell, 1995; Vitaro, Boivin, & Bukowski, 2009), a preliminary analysis using individual scores showed that friendship reciprocity did not interact with T1 friendship conflict (see measure below) in predicting T2 children's physical aggression. In addition, children with reciprocal friends at T1 did not significantly differ from those without reciprocal friends with respect to child sex, zygosity status, sex composition of the dyad, or mean level of aggression. Because friendships that are not reciprocated have been found to account for changes in children's own behavior (Adams, Bukowski, & Bagwell, 2005) and because friendship reciprocity did not moderate the link between friendship conflict and physical aggression, it was not included as a variable in the main analyses.

Friendship conflict and shared positive affect

At T1, a research assistant individually administered a modified version of the Friendship Features Interview for Young Children (Ladd, Kochenderfer, & Coleman, 1996) to each target child in reference to his/her best friend, as well as to that friend in reference to the target child. For the majority of target children (i.e., 72.3%), the first nominated friend was considered. However, when the first nominated friend was not available (either because parents did not give permission to participate, because the friend was not at school on the day of the assessment or because both twins in the same classroom had selected the same best friend), then the second (in 18% of cases) or the third (10% of cases) nominated friend was used. Similarly, when twins from the same pair had selected the same best friend (4% of cases), the second or third nominated friend was used for one of the twin in a pair, randomly selected. Three items tapped the level of friendship conflict: Since the beginning of the school

year, 'How often did you get into a fight with (friend's name)', 'How often did (friend's name) tell you he/she did not want to be your friend anymore', 'How often did (friend's name) say mean things to you'. Each item could be rated 0 (never), 1 (one or two times), or 2 (more often). Cronbach's alpha for the friendship conflict scale was .70 from the target child's perspective and .67 from the friend's perspective. Three other items were used to evaluate how both the target children and their respective friends felt within their relationship: 'How glad are you that you are friends with (friend's name)', 'Do you feel happy when you are with (friend's name)' and 'Does (friend's name) play mostly with you on the playground'. Each item could be rated 0 (a little), 1 (medium), or 2 (a lot). Cronbach's alpha for the shared positive affect scale was .62 from the target child's perspective and .63 from the friend's perspective. The intraclass correlations between the target child's and his or her friend's perception scores were, respectively, $r = .17, p < .001$ for the friendship conflict scale, and $r = .28, p < .001$ for the shared positive affect scale.

Because studying the behavioral and emotional aspects of interpersonal relationships involves considering both partners as sources of information, and because the members of the friendship dyads seemed to agree at least moderately in regard to the quality of their relationship, the target child's and his or her friend's conflict scores were averaged to create a composite friendship conflict score between the two friends. The same was done for the target child's and his or her friend's positive affect scores to create a shared positive affect score between two friends. Several studies have reported significant levels of congruence between ratings by members of a friendship dyad, both on positive and on negative friendship dimensions, during childhood (Brendgen, Little, & Krappmann, 2000; Lecce, Pagnin, & Pinto, 2009; Schneider, Fonzi, Tani, & Tomada, 1997). To ensure that potential divergence effects were not implicated in aggression (see Brendgen, Vitaro, Turgeon, Poulin, & Wanner, 2004), the friend's perception about conflict and shared positive affect, respectively, was first subtracted from the target child's perception and this new variable was then correlated with the target child's physical aggression, but these estimates failed to reach significance (Δ Friendship conflict: $\beta = .02, p > .05$; Δ Shared positive affect: $\beta = .06, p > .05$). Furthermore, none of the friend's scores interacted with the target child's scores in predicting the target child's aggression outcome.

Dyadic conflict resolution skills

Hypothetical socio-cognitive vignettes were used to study target children's and their friends' responses to interpersonal conflict at T1. This widely used methodology (e.g., Lochman, Wayland, & White, 1993; Rose & Asher, 1999) was chosen because it allows making controlled comparisons between friendship dyads, insofar as each dyad encounters the same social situations. A concern regarding hypothetical vignettes has been whether children's self-reported behavior corresponds to what they actually do. However, available research suggests that children's responses to hypothetical situations do correspond to peer status and/or teacher ratings of social competence (Chung & Asher, 1996; Dodge & Frame, 1982).

In the current study, the target children's and their friends' conflict resolution skills were assessed simultaneously using a modified version of the Preschool Interpersonal Problem Solving Test (PIPS; Spivack & Shure, 1974). In this open-ended interview, each child and his/her best friend were asked to generate strategies to solve a peer-oriented conflict situation where a) a peer seeks to take away a book that is being read by the child and his/her friend and b) said peer afterwards starts to push and insult them. Both the child and his/her friend were asked what they could do or say to solve these two conflict problems together as a dyad. After each of them generated a first strategy, they were asked if they could do or say something else. The interviewer probed for additional strategies until both the child and his/her friend could produce no further new response. In order to assess the target children's and their friends' most salient responses, only the first strategy suggested by each dyad member was used (e.g., see Brendgen, Bowen, Rondeau, & Vitaro, 1999). The responses were tape recorded and then transcribed. Suggested behavioral strategies were categorized later as prosocial or not prosocial strategies. Prosocial strategies referred to the child's and his/her friend's attempts to positively resolve the conflict and included responses such as confronting the peer in a non-aggressive manner (e.g., ask to stop, ask for the book back) or negotiating a compromise (e.g., share, offer another book, take turns reading). For each dyad, the number of prosocial strategies was added across dyad members and across both situations to obtain the frequency of suggested prosocial strategies ($M = 1.1$, $SD = 1.07$, $range = 0$ to 4). This represented the dyad's propensity towards the use of strategies that provide a constructive way to resolve interpersonal conflict (i.e., self-assertion and compromise). The reliability and validity of the

initial version of the PIPS have been established previously (e.g., Spivack & Shure, 1974). For this modified version, kappa inter-raters reliability score for 10% of the sample was .89 for the prosocial category of responses.

Child's genetic risk for physical aggression

The logic of the genetic risk for physical aggression is based on evidence that aggressive behaviour is, at least partly, explained by genetic factors (e.g., Brendgen *et al.*, 2008; DiLalla, 2002). To take into account this genetic contribution to aggressive behavior, an ordinal score of each child's genetic risk for physical aggression was estimated in the current study as a function of his or her co-twin's level of aggression in kindergarten (T1) and the pair's zygosity, following the rationale developed by Ottman (1994) and Andrieu and Goldstein (1998). This method has been used in several studies that examined gene-environment interactions with an epidemiological twin design (e.g., Brendgen, Boivin, Vitaro, Dionne, Girard, & Pérusse, 2008; Jaffee, Caspi, Moffitt, Dodge, Rutter, Taylor *et al.*, 2005).

Specifically, one twin from each pair was selected as the 'target twin' and the second twin as the 'co-twin'. Each twin pair was represented in the data set twice, first with the elder twin as the target and the younger twin as the co-twin, and second with the younger twin as the target and the elder twin as the co-twin. To represent presence or absence of physical aggression, the physical aggression scale was dichotomized using the 75th percentile as the cutoff, which corresponds to .30 *SD* above the mean of the distribution. Children whose aggression score was at or above the 75th percentile value of the sample distribution were considered as being physically aggressive, the others were considered as not being physically aggressive. The presence or absence of aggression in the co-twin was then combined with information on the pair's zygosity into an index of genetic risk for physical aggression. Thus, the target twin's genetic risk for physical aggression was considered to be highest when he/she was part of an MZ pair where both twins shared 100% of their genes, and when aggression was present in the co-twin ($n = 51$, 7.8% of the sample). The target twin's genetic risk for aggression was lower when he/she was part of a DZ pair, who share on average only 50% of their genes, and when aggression was present in the co-twin ($n = 102$, 15.5%). The target twin's genetic risk for aggression was even lower when he/she was part of a DZ pair and when the co-twin was not aggressive ($n = 272$, 41.4%). Finally, the target twin's genetic risk for

aggression was the lowest when he/she was part of an MZ pair and when the co-twin was not aggressive ($n = 232, 35.3\%$).

Analyses and Results

Preliminary Analyses

Bivariate correlations (two-tailed) among study variables are presented in Table 1. Target children's genetic risk for physical aggression was correlated with their physical aggression in kindergarten ($r = .42, p < .001$) and in grade one (T2) ($r = .32, p < .001$), as well as with friendship conflict ($r = .14, p < .001$). The genetic risk was neither associated to shared positive affect ($r = -.03, n.s.$) nor to dyadic conflict resolution skills ($r = -.03, n.s.$). Friendship conflict was positively associated with children's physical aggression in kindergarten ($r = .19, p < .001$) and grade one ($r = .20, p < .001$), and negatively related to shared positive affect ($r = -.15, p < .001$), but not correlated with conflict resolution skills ($r = .01, n.s.$). Shared positive affect was negatively correlated with children's physical aggression in kindergarten ($r = -.13, p < .001$) and grade one ($r = -.08, p < .05$), but not with conflict resolution skills ($r = -.02, n.s.$). In turn, dyadic conflict resolution skills were negatively related to children's physical aggression in kindergarten ($r = -.10, p < .01$) and grade one ($r = -.11, p < .01$). Children's physical aggression in kindergarten was significantly and positively correlated to physical aggression in grade one ($r = .62, p < .001$). Child sex was correlated with all study variables except friendship conflict and shared positive affect.

Main Analyses: Analytical Rationale

Multilevel modeling with the SAS 9.1 statistical software package (SAS Institute, Cary, NC) was performed for the analysis of our hierarchically structured data. In a two-level model, a hierarchy consists of lower-level observations (i.e., level 1 unit of analysis) nested within higher-level observations (i.e., level 2 unit of analysis). In the present study, each individual twin child is nested within a sibling pair. It is assumed that observations across pairs are independent from one another. However, because siblings within a given pair share genetic and environmental factors, observations within a given pair are interdependent, thus violating the assumption of independent observations in traditional linear or nonlinear models.

Multilevel models allow for the estimation of within-pair and between-pair effects while simultaneously adjusting for the amount of data interdependency. As such, the level I variance estimates describe the degree to which siblings within a pair differ from each other (i.e., within-pair variance), whereas the level II variance estimates indicate the degree to which sibling pairs differ from one another (i.e., between-pair variance) with respect to the dependent variable. Child-specific predictors (i.e., independent variables) are included in multi-level analyses as fixed effects. The fixed effect estimates provide information about the unique link between each child-level predictor and the dependent variable and can be interpreted in a similar way as regression coefficients in multiple regressions.

For the purpose of this study, we first estimated an unconditional model (Model 1), which allows for the estimation of the variance partition between level I and II units of analysis. In this unconditional model, no inter-individual predictors (i.e., fixed effects) were included. The inter-individual predictors, i.e., child sex, genetic risk for aggression, friendship conflict (denoted FC), shared positive affect (PA) and dyadic conflict resolution skills (RS), were included in the next model (Model 2), with the addition of a nonlinear (i.e., quadratic) term for the friendship conflict variable (FC^2). Possible interaction effects were examined in subsequent models. Specifically, in Model 3, two-way interaction effects ‘FC*PA’, ‘ FC^2 *PA’, ‘FC*RS’, and ‘ FC^2 *RS’ were added. In Model 4, three-way interactions ‘FC*PA*RS’ and ‘ FC^2 *PA*RS’ were also tested. Potential interactions including child sex and genetic risk for aggression were also estimated within models 2 to 4. In order to simplify interpretation of results, all predictors were z-standardized prior to creating the interaction terms. Significant interactions were probed following procedures described by Holmbeck (2002).

Main Analyses: Results

Calculations based on the variance estimates in Model 1 revealed that 32% of the variance of children’s grade one physical aggression was attributable to within-pair differences, whereas 68% of the variance was explained by between-pair differences. Results for Model 2 (see Table 2) showed that, compared to girls, boys were perceived as more physically aggressive ($\beta = .50, p < .001$) and that children with a higher genetic risk for aggression showed a higher level of physical aggression in grade one than children with a lower risk ($\beta = .09, p < .01$). Higher levels of physical aggression in kindergarten were

positively related to higher levels of these behaviors in grade one ($\beta = .46, p < .001$). The linear term for friendship conflict in kindergarten was significantly associated with increased child physical aggression in grade one ($\beta = .13, p < .001$), whereas the nonlinear term was not ($\beta = -.01, n.s.$). In contrast, neither higher levels of shared positive affect between friends ($\beta = -.02, n.s.$) nor dyadic conflict resolution skills in kindergarten ($\beta = -.02, n.s.$) were significantly associated with children's physical aggression in grade one. Complementary analyses probing potential interactions with genetic risk or child sex were also conducted within this model. No significant interaction was found between friendship conflict (i.e., both linear and nonlinear) and genetic risk for aggression. However, the interaction term between the linear component of friendship conflict and sex was significant ($\beta = .20, p < .001$). Further probing revealed that higher levels of friendship conflict was significantly associated with higher levels of physical aggression only in boys (Boys: $\beta = .24, p < .001$; Girls: $\beta = .03, n.s.$).

Results from Model 3 revealed a significant two-way interaction between the linear component of friendship conflict and shared positive affect in predicting children's physical aggression in grade one ($\beta = -.10, p < .01$). No significant two-way interaction was found between the nonlinear component of friendship conflict and shared positive affect. Moreover, no significant two-way interactions were found between friendship conflict and dyadic conflict resolution skills, neither with the linear nor nonlinear component. Additional tests of three-way interaction terms conducted with Model 3 failed to reach significance, suggesting that moderating effects of shared positive affect did not differ significantly by genetic risk status or sex.

However, results from Model 4 indicated a significant three-way interaction between the nonlinear component of friendship conflict, shared positive affect and dyadic conflict resolution skills ($\beta = .06, p < .01$). To probe this interaction, the predictive effect of friendship conflict on children's physical aggression was examined at different levels of shared positive affect and conflict resolution skills: high (i.e., +1 *SD*) and low (i.e., -1 *SD*). The results indicated that friendship conflict was significantly related to a linear increase in child aggression when shared positive affect and conflict resolution skills were both low (FC: $\beta = .28, p < .001$; FC²: $\beta = .01, n.s.$). Friendship conflict was also linked to an increase in child aggression from low to moderate levels when conflict resolution skills were high but shared positive affect was low (FC: $\beta = .19, p < .01$; FC²: $\beta = -.15, p < .01$). However, friendship

conflict was no longer significantly associated with child aggression when shared positive affect was high and when conflict resolution skills were either high (FC: $\beta = -.02$, *n.s.*; FC²: $\beta = .06$, *n.s.*) or low (FC: $\beta = .10$, *n.s.*; FC²: $\beta = -.02$, *n.s.*). Notably, additional tests of four-way interaction terms conducted within Model 4 failed to reach significance, suggesting that the moderating effects of shared positive affect and conflict resolution skills did not differ significantly by sex or genetic risk status.

Discussion

The aim of this study was to investigate the role of friendship conflict in regard to the development of physical aggression from kindergarten to grade one, as well as potential moderating effects of shared positive affect between friends, dyadic conflict resolution skills, child's genetic risk for aggression and child sex. A linear association between friendship conflict in kindergarten and higher levels of boys' physical aggression in grade one was found, above and beyond the effect of children's personal vulnerabilities toward aggression. Shared positive affect between friends and their conflict resolution skills moderated the effect of friendship conflict for both boys and girls. A correlation between genetic risk and conflicts was also found, suggesting the possibility for a gene-environment correlation. However, no interaction effects were found between the friendship dimensions and genetic risk for aggression, thereby suggesting that children are equally affected, independent from their genetic liability.

Prospective Links between Friendship Conflict and Physical Aggression

Contrary to the assumptions made by the proponents of a beneficial effect of conflict, who argue that a certain amount of conflict should contribute to promote social adjustment, higher levels of friendship conflict were related in a linear fashion to higher levels of physical aggression over time. Conflicts between friends have been linked to emotional, academic and behavioral difficulties in school-aged children and adolescents in past studies (e.g., Coie & Miller-Johnson, 2000; Kupersmidt *et al.*, 1995). Our results extend these findings by showing that the presence of high and frequent friendship conflicts in kindergarten children can also amplify existing levels of physical aggression over time.

Theoretical models that involve coercion training and contingencies in conflicts have been proposed to account for the link between friendship conflicts and the maintenance or aggravation of children's aggressive behavior (e.g., Snyder & Patterson, 1995; Vitaro *et al.*, 2009). Children who engage in frequent conflicts with a friend may be at risk of using coercive behaviors to solve the dispute. If the child persists in coercive actions until the friend «backs down», the behavior is negatively reinforced and is thus more likely to be maintained or even increase over time (Snyder *et al.*, 2007). Alternatively, if the friend uses coercive actions to solve the dispute until the child «backs down», then the child is exposed to negative modeling from a significant peer, a process of vicarious learning through which aggressive behavior is also fostered (Huesmann & Kirwil, 2007). Insofar as such coercive exchanges turn out to be an effective way to gain power and access to various resources or privileges, either from the target child or his/her friend's viewpoint, it is increasingly likely that a child will persist in using this strategy for relating to peers in general and perhaps be involved in exchanges that escalate to physical aggression (Reid, 1986).

Our findings corroborated previous results showing that aggressive behavior is significantly related to a genetic risk component (e.g., Brendgen *et al.*, 2008; DiLalla, 2002). Results from bivariate correlations also indicated that a higher genetic disposition toward aggression was related to the presence of higher levels of conflicts within friendships, suggesting the possibility that the child genetically influenced traits or behaviors may contribute to elicit these episodes of conflicts. Part of the association between friendship conflict and increased child physical aggression could thus be explained by the child genetic makeup that influences both. Interestingly, past findings have indicated that genetic factors do seem to influence the quality of preadolescent and adolescent's friendship relations, but not the negative experiences such as conflicts with best friend (Manke, McGuire, Reiss, & Hetherington, 1995; Pike & Atzaba-Poria, 2003). Because these previous studies have focused on adolescent samples, as well as unilateral friendship nominations, it is possible that genetic factors mostly influence negative interactions in younger children and/or in the context of a reciprocated friendship where friends share similar perceptions about the relationship. The present findings, however, are not in line with a diathesis-stress perspective, according to which an environmental stressor such as conflicts between friends should lead to a greater risk for maladjustment in individuals with preexisting genetic vulnerabilities. Instead, high levels

of conflicts between friends were directly related to high levels of children's physical aggression, regardless of whether children had a high or low genetic disposition for such behavior. This additive effect suggests that both personal (i.e., the child's genetic liability) and environmental (i.e., the experiences with conflict) factors contribute to the development of aggressive behavior problems. Exposure to frequent and intense conflicts may thus be considered a powerful socialization experience that has the potential to elicit physically aggressive behavior, regardless of whether children have a genetic disposition for such behavior or not. Future longitudinal and genetically informative studies would be necessary to ascertain these tentative explanations.

Interestingly, the direct association between friendship conflict and increased child aggression was limited to boys in our study. These results are in line with past findings showing that boys make more negative statements in response to peer provocation (Underwood, Hurley, Johanson, & Mosley, 1999) and are also more likely than girls to use threat and physical force in responding to peer conflict, whereas girls are more prone to mitigate peer conflict by using tactics that maintain interpersonal harmony (Miller, Danaher, & Forbes, 1986) or to negotiate a resolution (Sheldon, 1990). Accordingly, kindergarten boys may be less equipped to engage in constructive modes of dealing with friendship conflict than girls (Keenan & Shaw, 1997), thus contributing to the escalation and maintenance of coercive interactions between friends and to the generalization of this behavior to other classmates or adults. Besides, future studies should examine whether girls are affected by conflict with a friend as much as - if not more than - boys but with respect to internalizing, but not externalizing problems. Chronic conflict may indeed provoke more apprehension and anxiety in girls than in boys, given that girls tend to internalize stress reactions more than boys (Costello & Angold, 1995; Uchino, Cacioppo, Kiecolt-Glaser, 1996). Conflict may also foster rumination, which, in addition to anxiety, increases the risk for depression and affective disorders in girls more than in boys (Gil-Rivas, Greenberg, Chen, & Lopez-Lena, 2003). Our results also suggest that the detrimental effect of conflicts on aggression varies depending on the dyads' ability or motivation to resolve them.

Moderating Effect of Positive Affect and Conflict Resolution Skills

Shared positive affect between friends, as well as their conflict resolution skills, were found to mitigate the association between friendship conflict and changes in children's physical aggression, independent of genetic risk for aggression and child sex. Namely, friendship conflict was related to a linear increase in children's physical aggression over time when both shared affect and resolution skills were low. However, when children experienced high levels of shared positive affect and displayed positive conflict resolution skills, friendship conflict was no longer related to physical aggression. Therefore, children whose friendships are characterized by high levels of shared positive affect and resolution skills may be more attuned to the needs of others and motivated to respond to disagreements in a constructive manner. Importantly, high levels of shared positive affect between friends still buffered the association of friendship conflict with increased aggression when the dyad's conflict resolution skills were low. However, the reverse pattern indicated that friendship conflict was related to a moderate increase in physical aggression (i.e., from low to moderate levels) when shared positive affect was low, even if conflict resolution skills were high.

The complex moderating interplay of shared positive affect and conflict resolution skills may be explained by children's emotional reactions during conflict with a friend. Virtually everyone experiences negative emotions during interpersonal conflict, typically in the form of anger or sadness (Arsenio, Lover, & Gumora, 1993; Whitesell & Harter, 1996). Feelings of anger during peer conflict have been associated with aggressive behavior (Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994), poor peer relations, and low social functioning (Murphy & Eisenberg, 1996; Rose & Asher, 1999). Yet, in a friendship characterized by high levels of shared positive affect, it is possible that children experience mostly feelings of sadness rather than anger during conflicts, for they are more likely to be concerned with the protection and maintenance of the relationship. Conversely, anger during conflicts may be more common in friendship characterized by low levels of shared positive affect, as these friendships may be less satisfying and provide fewer social provisions and benefits. Either feeling, i.e., anger or sadness, may also be associated with the type of strategy children use for conflict management (Chung & Asher, 1996; Crick & Dodge, 1994). Hostile and domination goals are more likely to be formulated during conflicts that elicit mostly anger

(Arsenio *et al.*, 1993; Eisenberg *et al.*, 1994), whereas prosocial and affiliative goals are more common when children report feelings of sadness (Roseman, Wiest, & Swartz, 1994; Rotenberg, Mars, & Crick, 1987). In return, physical retaliation and less constructive strategies are more likely during conflicts that elicit anger than during conflicts that elicit sadness (Whitesell, Robinson, & Harter, 1993). Hence, the emotions children feel during conflict with a friend may be related to the strategies they choose for managing their emotions and dealing with the conflict.

Our results suggest that the dyad's conflict resolution skills are a useful tool to protect children who experience conflict with their friend from developing aggressive behaviors. Conflict resolution skills alone are not, however, a sufficient tool for this protection to operate. Indeed, an affective bond between friends also seems necessary to buffer children who experience conflicts with their friends. These findings nuance to some extent the idea that aggressive behavior may be curbed by teaching good conflict resolution skills, as these capacities may be used only insofar as children are motivated to apply them in the context of affectively invested relationships.

Strengths, Limitations, and Conclusion

The current study offers several strengths: a large sample, the use of different raters and measurement methods, and a genetically informative longitudinal design. In addition to these strengths, this study also has some limitations that warrant consideration. First, to measure distinct friendship dimensions, we relied on each friends' subjective perceptions via self-reports, rather than on more objective measures such as observations of actual conflicts and their resolution. Given, however, the low agreement between participants and observers as to whether an exchange involved conflict in direct observations of interactions between friends (Gonzales, Cauce, & Mason, 1996; Welsh, Galliher, & Powers, 1998), collecting information from multiple informants may nevertheless be an adequate alternative. Second, we could not take into account some specific aspects of conflict episodes, such as topics, intensity or denouement. Various patterns of conflict between friends have been identified (Laursen, Hartup, & Koplas, 1996) that may be differentially related, either linearly or nonlinearly, to children's developmental outcomes. Finally, the members of a friendship dyad may differ in their views about conflict interactions, or their capacities to deal with them. In the current

study, we used aggregated scores across members of friendships dyads because this reduces rater-specific error and allows considering shared perspectives. However, aggregation may result in a loss of unique information provided by each friend.

Despite these limitations, we believe the results from the present study highlight that friendship conflict is not a trivial event, for it contributes to increased aggression in young children. By the same token, constructively managed conflicts, especially those that arise in an affectively invested relationship, have the potential to buffer some of the adverse consequences of conflicts even for children with a genetic liability for aggression. In the right context, we may even consider that real or simulated friendship conflicts may serve as a potential training ground for the development of interpersonal competences, and not solely as a source of tension from which the child must be removed. Conflict may be used to teach children how to regulate negative emotions and use mutually beneficial strategies, thereby reducing their aggressive behaviors and perhaps fostering the development of prosocial behavior. Future studies should examine these possibilities by conducting experimental manipulations through friendship intervention programs and by considering positive as well as negative behavioral outcomes.

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Table 1. *Bivariate Correlations Among Study Variables (n = 657).*

Variable	1	2	3	4	5	6
1. Sex	–	–	–	–	–	–
2. K Physical aggression	.36 ***	–	–	–	–	–
3. K Genetic risk	.13 ***	.42 ***	–	–	–	–
4. K Friendship conflict	.01	.19 ***	.14 ***	–	–	–
5. K Shared positive affect	– .03	– .13 ***	– .03	– .15 ***	–	–
6. K Dyadic conflict resolution skills	– .20 ***	– .10 **	– .03	.01	– .02	–
7. G1 Physical aggression	.42 ***	.62 ***	.32 ***	.20 ***	– .08 *	– .11 **

Note: Sex is coded so that a higher value (1) represents boys. K refers to kindergarten. G1 refers to grade one.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2. Results from the Multilevel Analyses in Predicting Children' Physical Aggression in Grade One (n = 657)

Model	Predictor	Fixed effect (SE)	Level I Variance (SE)	Level II Variance (SE)
1	Unconditional model		.61***	.39***
2	Sex	.50***	.41***	.12***
	K Physical aggression	.46***		
	K Genetic risk	.09**		
	K Friendship conflict (FC)	.13***		
	K Friendship conflict ² (FC ²)	– .01		
	K Shared positive affect (PA)	– .02		
	K Dyadic conflict resolution skills (RS)	– .02		
3	FC x PA	– .10**	.39***	.12***
	FC ² x PA	.03		
	FC x RS	– .05		
	FC ² x RS	– .03		
4	FC x PA x RS	– .01	.40***	.10***
	FC ² x PA x RS	.06**		

Note : Sex is coded so that a higher value (1) represents boys. K refers to kindergarten. Each model is tested against the respective preceding model. ** $p < .01$, *** $p < .001$.

Chapitre IV : Prospective Links Between Friendship Quality and Early Physical Aggression: Testing Causality Through a Dyadic Intervention

Marie-Claude Salvas, Frank Vitaro, Mara Brendgen, & Stéphane Cantin

Abstract

Positive friendships have been related to decreasing levels of children's physical aggression over time. While this evidence calls for interventions aimed at helping children build and maintain good-quality friendships, tests of causality through experimental manipulations are still needed. The goal of this study was to examine whether a dyadic friendship quality intervention can decrease young children's physical aggression over a school year. The intervention targeted specific features of friendship quality, i.e. dyadic cooperation, dyadic conflict resolution, and shared positive affect between friends. Participants consisted of 34 children from kindergarten and grade one. They were randomly assigned to two groups: an intervention group where the children participated in a 12-week dyadic intervention sessions with a friend and a no-intervention control group. Results showed an indirect effect of the intervention on decreasing levels of physical aggression through the improvement of one specific feature of friendship quality: conflict resolution. These results support the causal role of friendship quality on the developmental course of physical aggression and point to the inclusion of this relational aspect in prevention programs targeting young aggressive children.

Keywords: physical aggression, friendship quality, conflict resolution, cooperation, positive affect, dyadic intervention.

Introduction

Many researchers have documented that early physical aggression is a high-risk predictor of later conduct problems and antisocial behavior (e.g. Brendgen, Vitaro, Tremblay, & Lavoie, 2001; Loeber, Green, Keenan, & Lahey, 1995). Not only do aggressive children cause harm to victims, but they also cause harm to themselves by being deprived of positive social experiences with others (Moffitt, 1993; Nagin, Pagani, Tremblay, & Vitaro, 2003), either at the group level (because they are often rejected) or at the dyad level (because of the oftentimes low quality of their friendships). Since physical aggression has been found to be stable across time and to be a predictor of other damaging forms of social maladjustment later on (Broidy, Nagin, & Tremblay, 2003; Loeber, 1990), research has been directed at identifying ways to curb aggressive tendencies in young children (Barker, Vitaro, Lacourse, Fontaine, Carbonneau, & Tremblay, 2010; Phillips & Lochman, 2003).

To this end, several authors have argued that peer relationships can make substantial and unique contributions to young children's social development (e.g. Bukowski & Hoza, 1989; Hartup, 1992; Parker & Asher, 1993). While peer rejection and affiliation with deviant peers has been associated with later antisocial and delinquent behaviors (Bagwell, Newcomb, & Bukowski, 1998; Snyder, Schrepferman, McEachern, Barner, Johnson, & Provines, 2008), friendship quality has been identified as an important predictor of later emotional and social adjustment (Parker & Asher, 1987). Indeed, several theorists and researchers have advocated that an intimate, caring and supportive friendship has the potential to positively influence young children's psychological well-being and school adjustment (Hartup & Stevens, 1997; Sebanc, 2003; Ladd, Kochenderfer, & Coleman, 1996). Interestingly, there is also some evidence showing that positive friendships features are related to a decrease in children's aggression over time.

For instance, Poulin, Dishion, and Haas (1999) have shown that high-quality friendships, reflected by the friends' perceived level of trust and satisfaction toward the relationship, prevented an escalation in boys' delinquency, regardless of the degree of delinquency of their friends. Aggregated measures of friendship quality (e.g. cooperation, help and guidance, conflict resolution) were also related to a decrease in young children's physical aggression, independent of friends' aggressive profile (Bowker, Rubin, Rose-Krasnor, & Booth-LaForce,

2007; Salvas, Vitaro, Brendgen, Lacourse, Boivin, & Tremblay, 2011). However, the processes underlying these associations and the relative contribution of particular features of friendship quality to aggression development remain unknown.

Effect of Friendship Quality on Aggression: Potential Intermediary Mechanisms

Past researchers have used attachment theory (Bowlby, 1982), theories of personality development (e.g. Selman & Schultz, 1990; Sullivan, 1953), or social constructivist theories (e.g. Piaget, 1965; Youniss, 1980) as frameworks for explaining the putative positive impact of high-quality friendships on children's aggressive behaviors. According to these theoretical perspectives, a positive relationship with a close friend can serve attachment functions, as well as contributing to enhance children's social and cognitive functioning. While attachment and personality theorists emphasized on the positive internal states generated by a high quality friendship, social constructivists underlined the importance of interpersonal skills that children acquire throughout high quality friendships. Evidence in line with these notions comes from data showing that when establishing a close social bond and interacting positively, children feel more secure in their environment, as well as accepted, and connected to others (Buhrmester, 1996; Bukowski, Newcomb, & Hartup, 1996; Ryan & Deci, 2000). In support of the social constructivist view, it also seems that children evolving in high-quality friendships are incited to practice positive interpersonal skills at least toward each other (Putallaz & Sheppard, 1992), notwithstanding the fact that they themselves or their friends are generally aggressive toward others (Berndt, 2004; Rubin, Bukowski, & Parker, 1998).

At first glance, these correlational results call for interventions aimed at helping aggressive children build and maintain good-quality friendship in order to improve their social functioning. From better-quality friendships, aggressive children may derive both instrumental and emotional resources that enable them to cope more successfully with social demands and interactions with classmates (Ladd *et al.*, 1999). Experimental manipulations are, however, necessary to ascertain the causal nature of friendship quality toward a decrease in children's aggression. The current short-term experimental study tested the putative causal role of friendship quality on the course of early physical aggression by developing and evaluating a friendship quality intervention based on various dyadic intervention strategies and friendship

programs (e.g. Bierman & Furman, 1984; Greenberg & Kusché, 1998; Lochman & Wells, 2002; Selman & Schultz, 1990). The focus of the intervention was to improve the quality of the relationship between an aggressive child and a friend and examine whether this improvement would, in turn, be linked to a decrease in children's aggression.

Objectives

The intervention was dedicated to the improvement of friendship quality in a dyadic framework. Namely, each individual child was paired with a friend and each dyad was separately exposed to the intervention. Three specific features of friendship were targeted: the extent to which friends share, help and guide one another, the ease and readiness with which they resolve their conflicts, and the degree of positive affect that characterizes their relationship. In turn, proximal improvements in these features of friendship quality were expected to operate as putative intermediary variables in the pathway linking the intervention to a decrease in children's aggression.

The current program was designed to improve dyadic cooperation and conflict resolution, as well as shared positive affect between friends (see description of the program below) because these friendship features are often cited as important benefits of having friends (Hartup, 1992) and because friendships of aggressive children are likely to be characterized with high and frequent conflicts, which in turn are associated with maladjustment (Dishion, Eddy, Li, & Spracklen, 1997). The children and their paired friends were 5 or 6 years of age at the beginning of the intervention. Low friendship quality and conflicts among friends at this young age can explain, at least partly, why and how affiliating with aggressive friends predicts an increase in children's aggression (Snyder et al., 1996; Vitaro, Brendgen, Boivin, Cantin, Dionne, Tremblay, Girard, & Pérusse, 2011).

Using a randomized design, this study is in line with the tradition of using interventions as a mean to test predictions made by different theoretical perspectives (Cicchetti & Toth, 1992; Coie, Watt, West, Hawkins, Asarnow, Markman *et al.*, 1993). That is, a theoretically guided intervention trial can test the effect of friendship quality on physical aggression. If children's physical aggression could be reduced with an intervention that works by improving certain friendship features, then these features of friendship should be considered as putative causal factors in the development of aggression, rather than only markers of children's social

maladjustment. This is particularly true if indirect effects are properly tested. Therefore, according to the proponents of a beneficial effect of friendship quality, a good relationship with a friend should reduce an aggressive child's propensity to continue using aggressive behavior, either by providing a sense of security and acceptance or by offering a favorable context for developing interpersonal skills, such as conflict resolution and cooperation skills. Thus, we expected that the intervention would contribute to a decrease in children's physical aggression (i.e. distal variable) through the improvement of dyadic friendship features such as cooperation and conflict resolution or an increase in shared positive affect (i.e. proximal variables targeted by the intervention). Therefore, friendship features were expected to operate as intermediary variables in the effect of the intervention on physical aggression (Hayes, 2009).

Method

Participants

The 68 children (34 target children and 34 friends) who participated in this study were selected from a community sample of 689 kindergarteners and first grade boys and girls attending seven French-speaking public elementary schools in Montreal (Quebec, Canada), six of which were located in low socioeconomic areas. Children's mean age at pretest (Fall 2009, T1) was 5.9 years ($SD = .69$). Fifty-two percent of the target children's parents were of European descent, 10% of African descent, 10% of Asian descent, 10% Arabic descent and 14% were of Hispanic descent. The remaining parents (4%) did not provide ethnicity information. The average yearly household income was \$35,000 CAN. The majority of parents of the target children had less than 14 years of schooling (58%). Two-thirds (70%) of the target children lived in an intact family (i.e. with their biological parents), whereas the others lived in a non-intact family (i.e. all other cases). This research was approved by the University of Montreal's ethics board as well as by each participating school. Parents were provided with informed verbal and written consents were obtained from parents of all participants, whereas informed verbal assent was obtained from all participating children. Participants were treated according to the American Psychological Association principles (2002).

Selection Criteria and Friendship Identification

Two criteria were used to select the target children. Firstly, the children's physical aggression was assessed by their teacher at the beginning of the school year (i.e. October-November 2009). Participants were identified using a physical aggression threshold estimated from the Quebec Longitudinal Study of Child Development (QLSCD). The QLSCD includes a representative sample of 2,223 five-month old infants born to mothers living in the province of Quebec (Canada) between October 1997 and July 1998 and thereafter, followed up annually from the age of 5 months to 8 years old. In that study teacher-ratings of physical aggression in kindergarten (mean age = 6.2 years) and grade one (mean age = 7.2 years) were collected using the Social Behavior Questionnaire (SBQ, Tremblay, Loeber, Gagnon, Charlebois, Larivée, & LeBlanc, 1991). The physical aggression scale consisted of 3 items in which teachers were asked: "Since the beginning of the school year, how often would you say that this child 'physically attacked others', 'hit, bit or kicked others', 'was fighting with others'", with a response scale ranging from 1 (never), to 2 (sometimes) or 3 (often). Reliability and validity of the SBQ have been established with kindergarten, first and second grade children (see Tremblay *et al.*, 1991). Teacher-rated mean scores of physical aggression in the QLSCD sample, estimated separately for kindergarten and first grade boys and girls, were considered as normative levels of physical aggression. The subjects scoring on more than one standard deviation above the QLSCD mean (i.e. 90th percentile in the present study sample) on the physical aggression scale of their respective aged and sex group were classified as physically aggressive and thus selected as potential participants in the intervention.

Secondly, because the intervention program involved working with partnered friendship pairs, potential participants had to be involved in a friendship. To identify friendship partners, a sociometric peer nomination procedure was conducted where target children were asked to nominate up to three best friends in the classroom. Limiting friendship nominations to the classroom does not seem to overly restrict selection of friends because the vast majority of elementary school children select a best friend from among their classmates even when they can nominate a friend from outside the classroom (Kupersmidt, Burchinal, & Patterson, 1995; Parker & Asher, 1993). Reciprocal friends were chosen when possible. Reciprocated friendships were friendships where the first, second or third nominated friend also nominated

the target child as their first, second or third friend. Using this criterion, 62% of the friendships were reciprocated. In addition to friendship nominations during the sociometric procedure, children were also asked to nominate three classmates with whom they most liked to play with. For target children who did not have a reciprocal friendship, a friendship partner was selected from the target child's nominated friends, with the additional constraint that the selected nominated friend had to have identified the target child as a preferred play partner in the second sociometric question (i.e. for 38% of the cases). The screening process identified 36 children from the total sample (25 boys and 11 girls). Two children were excluded because of parental refusal.

Group Composition

The present study followed a randomized blind design. Target children ($n = 34$) were randomly assigned to the experimental group (i.e. children participating in the dyadic intervention program with a friend) or the control group (i.e. children not participating in the intervention). Randomization was performed at the classroom level to minimize potential contagion effects. The experimental group included 20 target children (12 boys and 8 girls; 19 same-sex and 1 cross-sex dyads; 10 in kindergarten and 10 in grade one) whereas the control group included 14 target children (11 boys and 3 girls; 12 same-sex and 2 cross-sex dyads; 6 in kindergarten and 8 in grade one). Cross-sex dyads from both groups were formed with target boys.

Onsite facilitators who conducted the intervention program and teachers knew about the group assignment. However, the research assistants, as well as classmates and paired friends were blind to group assignment (i.e. children and friends from both groups were told that they were chosen to participate in friendship activities, which for the control group were, in fact, limited to the pre and post test evaluation activities). Comparison of the two groups through independent sample t tests and chi-square tests revealed no significant differences ($p > .05$) in regards to selection criteria (i.e. initial level of physical aggression, friendship reciprocity), study variables at T1 (i.e. cooperation, conflict resolution, and shared positive affect), or individual, family and friend's characteristics (i.e. child sex, grade, age at the beginning of the study, parental education, family income, family status, friend's prosocial behavior, externalizing problems and physical aggression). The groups were therefore considered equal.

Attrition and Missing Data

Two target children from the control group had missing data at either the first or the second post-test because they had left the school to move to a new neighborhood. Apart from these two exceptions, there was no intervention dropout reported in this study. No statistical differences were found between the remaining participants ($n = 32$) and the two children missing at post-test in terms of selection criteria or other behavioral and socio-demographic indicators at T1. Because of the relatively small sample size, we included all available participants in each analysis ($T1 = 34$, $T2 = 33$, and $T3 = 32$). Analyses of the program outcomes were conducted using an intent-to-treat strategy, i.e. analyses were conducted using all participants, including participants who failed to adhere to the intervention procedures (Fishman, 2000; Kendall, Flannery-Schroeder, & Ford, 1999). The primary advantage of this approach is to maximize internal validity and ensure the equivalence of groups generated by the random assignment. This strategy also allows testing the effectiveness of the intervention program in a way that stimulates real world application.

Dyadic Intervention Program

Objectives and Dyadic Intervention Strategies

The dyadic intervention program was designed to improve the friendship quality of young children with aggression problems. In accordance with conceptual considerations presented in the introduction, the proximal goals of the intervention were to: 1) improve dyadic friendship features considered as important indicators of good quality friendship (i.e. cooperation and conflict resolution), and 2) strengthen positive affect within friendship. To achieve these objectives, we used a dyadic intervention framework. Each child was paired with a friend from his/her classroom, as identified during the peer evaluation procedure at T1. The target child and his/her paired friend formed a dyad, and each of the 20 experimental dyads was exposed separately to the intervention program, which was divided in two parts. The first part was dedicated to dyadic friendship skills training. Through the use of various learning strategies (e.g. oral demonstration, stories, games, hypothetical scenarios), the target child and his/her friend were taught how to express their own feelings, how to understand

others' feelings, how to use pacifistic conflict resolution strategies, how to provide support, and how to receive help from their friend. These were inspired by existing individual-level programs (e.g. *PATHS: Promoting Alternative Thinking Strategies*, Greenberg & Kusché, 1998; *Social skills training and peer involvement*, Bierman & Furman, 1984; *The anger coping program*, Lochman & Wells, 2002) and adapted to fit a dyadic intervention framework. The second part was devoted to an art project, a technique used in peer pair therapy (Birnbaum, 1975; Bender, 1976; Fuller, 1977; Selman & Schultz, 1990). Specifically, friendship dyads were told that they had to build a boat during the intervention (i.e. a large toy-model boat, which was built with a plastic bottle and made to float). Children were helped by the facilitator to make sure that they could achieve their plan. This boat could take any form they wanted, but had to please them both, and would be presented to other intervention dyads on the occasion of a varnishing-day. Pleasant play was hypothesized to foster an open attitude toward behavioral change in children (Kramer, 1971; Plante & Berneche, 2008). While encouraging the practice of dyadic friendship skills in a pleasant context, this activity was also intended to encourage personal investment in a significant and rewarding joint project.

The objectives and modalities of the intervention were the same for all participating children, but intervention strategies were adjusted to the specific needs of each target child, friend and/or dyad. For instance, specific strategies could be used for distinct difficulties or deficits presented by a target child in relation to his/her friend, such as poor conflict resolution skills (e.g. negotiation, capacity to make compromises) or cooperation skills (e.g. communication, listening skills). The friendship dyads were engaged in weekly sessions, each designed to last 1 hour, for the duration of a 12-week period. In accordance with teacher planning, the sessions were taking place during classroom time, outside the classroom, in a private room.

Program Fidelity and Implementation Assessment

Eight graduate university students training in psycho-education were employed to act as facilitators and conduct the sessions. To ensure program fidelity, facilitators received a two-day training session with respect to the specific intervention objectives, the intervention content and the dyadic intervention strategies. Facilitators also had access to an intervention manual describing in details the schedule to be followed, verbatim to be used and activities to

be realized with the dyads. They also attended individual and group supervision meetings with the first author to monitor their application of the dyadic intervention strategies. Some intervention sessions were videotaped (i.e. three sessions per facilitator for each assigned dyad). These videos were used during supervision meetings to emphasize specific aspects of the intervention (e.g. quality of their relational and dyadic intervention strategies). In addition, the facilitators systematically completed reports after each session, to record the strategies used, the program content covered and the quality of children's participation. Analysis of these reports indicated little variability across participants, notably with respect to the number of content quantity covered in each session, range of intervention strategies used by the facilitators during sessions, number of sessions (i.e. 100% of participants attended all 12 sessions planned in the intervention) and quality of children's participation.

Assessment Protocol and Measures

Participants were assessed three times over the school year. Baseline measures (T1; prior to random assignment to groups) were taken at the beginning of the school year (October-November). The T2 post-test assessment occurred immediately following the intervention. This assessment focused on the proximal goals of the intervention, i.e. to improve the quality of dyadic friendship features and strengthen shared positive affect between friends. The T3 post-test assessment was conducted one month after T2 and focused on the distal goal of the intervention, i.e. to affect target children's level of physical aggression.

Friendship Quality

Ratings of the quality of the friendship of each dyad were collected from target children, their friends and teachers. At T1 and T2, a research assistant individually administered a modified version of the Friendship Features Interview for Young Children (FFIYC, Ladd *et al.*, 1996) and of the Friendship Qualities Scale (FQS, Bukowski, Hoza, & Boivin, 1994) to each target child and his/her friend. Four items tapped the degree of help and assistance (i.e. *dyadic cooperation*) the child and the friend provided each other with respect to emotional and instrumental problems (e.g. 'If some kids at school were teasing you, would (friend's name) tell them to stop' or 'If your teacher yelled at you and it made you feel bad, would (friend's name) make you feel better'). Items could be rated 1 (a little), 2 (medium), or

3 (a lot). The intra-class correlations between the target children's and the friends' evaluations of dyadic cooperation were, respectively, $r = -.03$, $p > .05$ at T1, and $r = .63$, $p < .001$ at T2. Cronbach's alphas for the cooperation scale were, at T1 and T2 respectively, .70/.79 for the target children, and .85/.76 for the friends.

The dyadic cooperation feature was also measured using teacher reports of an adaptation of the Friendship Quality Questionnaire (FQQ, Parker & Asher, 1993). Teachers were considered a good source of information because they observe children interacting with their friends in the classroom on a daily basis. This procedure has been used and validated in previous studies with samples of preschoolers and young school-aged children (e.g. Howes, Hamilton, & Philipson, 1998; Sebanc, 2003; Salvat *et al.*, 2011). Teacher's perception was measured on a 5-point scale using three items (e.g. '(child's name) helps (friend's name) with schoolwork a lot' or '(child's name) shares things with (friend's name)'). The scale ranged from 'not at all true (1) to a little true (2) to somewhat true (3) to pretty true (4) to really true (5). The teacher completed the questionnaire twice, once for the target child and once for the friend (i.e. each child's name was embedded in each individual item). Teachers were instructed to think about the specific behavior of each child in reference to his/her friend, and what each child does when the teacher sees them play or interact together. The intra-class correlations between the target child's and his or her friend's dyadic cooperation as evaluated by the teacher were, respectively, $r = .38$, $p < .05$ at T1, and $r = .33$, $p < .05$ at T2. Cronbach's alphas were, at T1 and T2 respectively, .85/.74 for the target children's behavior, and .84/.78 for the friends' behavior.

Hypothetical socio-cognitive vignettes as well as teacher reports of dyadic conflict resolution were used to study target children's and their friends' *responses to interpersonal conflict*. The former methodology was chosen because it allows making controlled comparisons between friendship dyads, insofar as each dyad encounters the same social situations (Lochman, Wayland, & White, 1993; Rose & Asher, 1999). A concern regarding hypothetical vignettes has been raised as to whether children's self-reported behavior corresponds to what they actually do. Available research suggests that children's responses to hypothetical situations do correspond to children's peer status and to teacher ratings of their social competence (Chung & Asher, 1996; Dodge & Frame, 1982).

At T1 and T2, the socio-cognitive vignettes used to assess conflict resolution were based on a modified version of the Preschool Interpersonal Problem Solving Test (PIPS; Spivack & Shure, 1974). In this open-ended interview, each child and his/her best friend were asked individually to generate strategies to solve a hypothetical conflict situation that could occur between them and where one, firstly a) seeks to take away a book that is being read by the other, and afterwards b) starts to push and insult him/her. Each child and each friend were asked what they could do or say to solve this conflict problem. After they generated a first strategy, they were asked if they could do or say something else. The interviewer probed for additional strategies until neither the target child nor the friend could provide any further new response. In order to reflect the target children's and their friends' most salient responses, only the first strategy suggested by each dyad member was used (e.g. see Brendgen, Bowen, Rondeau, & Vitaro, 1999). The responses were tape recorded and then transcribed. Suggested behavioral strategies were categorized later as prosocial or not prosocial. Prosocial strategies referred to the child's and his/her friend's attempts to positively resolve conflict and included responses such as confronting in a non-aggressive manner (e.g. ask to stop, ask for the book back) or negotiating a compromise (e.g. share, offer another book, take turns reading). For each dyad, the number of prosocial strategies was added across dyad members and across both parts of the situation to obtain the frequency of suggested prosocial strategies (T1: *range* = 0 to 4 and T2: *range* = 0 to 3). This represented the dyad's propensity towards the use of strategies that provide a constructive way to resolve interpersonal conflict (i.e. self-assertion and compromise). The reliability and validity of the initial version of the PIPS have been established previously (e.g. Spivack & Shure, 1974).

Teacher reports were also used to evaluate the ease and readiness with which both the child and his/her friend could resolve their conflicts. Three items originating from the FQQ (Parker & Asher, 1993) were used to tap into the dyad's ability to resolve conflicts quickly and amicably (e.g. 'make up easily when they have a fight' or 'talk about how to get over being mad at each other'). The response scale ranged from 'not at all true (1)' to 'a little true (2)' to 'somewhat true (3)' to 'pretty true (4)' to 'really true (5)'. From an outsider's perspective, conflict resolution may be considered as a dyadic process, in that the behavior of each partner cannot be isolated from the whole process. Thus, teachers completed the

questionnaire in reference to the dyad's ability for conflict resolution, rather than in reference to each child's behaviors. Cronbach's alphas were .79 at T1, and .89 at T2.

Children's and friends' *positive affect* to one another was measured using five items from the FFIYC (Ladd *et al.*, 1996) and the FQS (Bukowski *et al.*, 1994) (e.g., 'how glad are you that you are friends with (friend's name)' or 'do you feel happy when you are with (friend's name)'). These items focused on the sense of affection that the child experiences with a friend and the strength of the child's attachment or bond to the friend (and vice versa). Items could be rated 1 (a little), 2 (medium), or 3 (a lot). Cronbach's alphas for the positive affect scale were, at T1 and T2 respectively, .94/.92 from the target child's perspective and .89/.90 from the friend's perspective. The intra-class correlations between the target child's and his or her friend's positive affect scores were, respectively, $r = .32, p < .05$ at T1, and $r = .39, p < .05$ at T2.

Data Reduction of Dyadic Features of Friendship Quality

Because studying the behavioral and emotional aspects of interpersonal relationships involves considering both partners as sources of information, and because the members of the friendship dyads seemed to agree, at least moderately and with only one exception, in regards to the features of their relationship, the target child's and his or her friend's scores were averaged to create composite scores between the two friends. Several studies have reported significant levels of congruence between ratings by members of a friendship dyad during childhood (Brendgen, Little, & Krappmann, 2000; Schneider, Fonzi, Tani, & Tomada, 1997). Composite scores were created at each assessment point, except for the cooperation score at T1, because the correlation coefficient between target children's and friends' perception of cooperation was not significant. We also created higher aggregated scores for the cooperation and conflict resolution features by combining the child-friend composite scores (i.e. dyad's scores) with teacher-rated scores. This procedure was used in order to fully exploit our multiple sources and raters design, while reducing data and synthesizing results (e.g. see Hoza, Mrug, Pelham, Greiner, & Gnagy, 2003). Composite scores between multiple raters were not created at T1 for the conflict resolution score or for the cooperation score, because of the non-significant correlation coefficient between the respective dyad's score and teacher's scores. Nevertheless, correlations between teacher and dyad-rated scores were $r = .33, p < .05$ at T2

for the cooperation score, and $r = .54, p < .001$ at T2 for the conflict resolution score. Because of this significant convergence between raters at T2, the dyad and teacher-rated scores were first z-standardized across the sample and then averaged to create T2 composite scores.

Aggressive Behaviors

Children's physical aggression was assessed using reports from both teachers and peers at T1 and T3. Teacher-rated aggression was measured using the three items from the SBQ (Tremblay *et al.*, 1991) described in the selection criteria section. Responses were given on a 5-point scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = really often). Cronbach's alpha was .93 at T1, and .94 at T3. Peer-nominated aggression was assessed using three behavioral descriptors, i.e. 'gets into a lot of fights', 'hits and kicks other children' and 'throw things to other children'. Specifically, booklets of photographs of all the children in a given class were handed out to each child's participating classmates for whom parental consent was available (> 80% participation rate). Two research assistants ensured that the children recognized the photos of all their classmates by presenting them individually. Children were asked to circle the photos of up to five classmates who best fit each of the behavioral descriptors. For each child in the class, the nominations received for each item were summed and z-standardized within the classroom to control for variations in classroom size, yielding a score for each target child as well as for each of the other participating children in their class. Next, the item scores were summed up to yield a global peer-rated aggression score, which were again z-standardized within the classroom. The correlations between teacher and peer-rated children's aggression scores were, respectively, $r = .59, p < .001$ at T1, and $r = .50, p < .001$ at T3; therefore, the peer- and teacher-rated aggression scores were first z-standardized across the sample and then averaged to create a composite aggression score, separately for T1 and T3.

Analytical Rationale

Group differences in friendship features (i.e. levels of dyadic cooperation, conflict resolution, shared positive affect) and physical aggression were first investigated with t-tests (0 = control group and 1 = experimental group). Preliminary univariate regression analyses were also conducted to test whether intervention status was significantly related to change in

friendship features, and whether these putative changes were related to changes in children's physical aggression. Finally, to test whether intervention effects worked through changes in friendship features, we also tested the indirect effect of the intervention on aggression (the distal target) via changes in friendship features (the proximal target of the intervention). Of note, to test such a mediation chain, Baron and Kenny (1986) initially proposed that the first step was to establish a significant relationship between the predictor (in this case the intervention) and the distal outcome (in this case aggression). Since then, however, several scholars have advocated relaxing the assumption that the predictor to final outcome path must be significant. Instead, they suggested that the presence of a significant indirect pathway is the sole requirement to test whether an intermediary variable links a predictor variable with a distal outcome (e.g. Barker *et al.*, 2010; Brotman, O'Neal, Huang, Gouley, Rosenfelt, & Shrout, 2009; Fritz & MacKinnon, 2007; Hayes, 2012; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). This approach is especially recommended when the sample size is small in order to avoid underestimation of the mediation effect (Fritz & MacKinnon, 2007).

In order to test the putative indirect effect of the intervention on children's physical aggression levels, we followed the resampling method (i.e. bootstrapping with 1,000 iterations) proposed by Hayes (2012, see also Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007). Since a large number of samples are taken from the original sample with replacement in this procedure, the indirect effect can be calculated for each new sample, forming a bootstrap distribution of that parameter, and confidence intervals can be formed to test indirect effects. We chose bootstrapping methodology as a mean of testing indirect effect over the commonly used Sobel test because the Sobel test assumes a large sample size and a normal distribution of the indirect effect (Fritz & MacKinnon, 2007; Muller, *et al.*, 2005; Preacher, *et al.*, 2007). Bootstrapping is a non-parametric approach to effect-size estimation and hypothesis testing and makes no assumptions about the shape of the distributions of the variables or the sample distribution of the statistic (Efron & Tibshirani, 1993). This procedure tests the null hypothesis that the indirect path from the intervention status (i.e. independent variable) to children's physical aggression (i.e. the dependent variable) through friendship features (i.e. the putative intermediary variables) does not significantly differ from zero. If zero is not contained within the confidence intervals (CI) computed by the bootstrapping procedure, then one can conclude that the indirect effect is indeed significantly different from

zero at $p < .05$. These confirmatory analyses were performed using PROCESS (Hayes, 2012), a computational tool added to SPSS version 18. PROCESS works very much like other programs when using regressions, although all variables are entered at once in one block.

Results

Descriptive Data and Bivariate Correlations

Bivariate correlations (two-tailed) among study variables at post-test assessment (T2 and T3) are presented in Table 1, whereas means and standard deviations are detailed in Table 2. Intervention status was correlated with the dyadic conflict resolution at T3 ($r = .35, p < .05$), but not with other study variables. As expected, children's physical aggression was correlated with child sex ($r = .39, p < .05$), indicating a higher level of physical aggression in boys, compared to girls. Likewise, dyadic conflict resolution was positively correlated with dyadic cooperation ($r = .57, p < .001$) and with shared positive affect ($r = .50, p < .001$), which was also significantly related to dyadic cooperation ($r = .79, p < .001$). Children's physical aggression was negatively correlated with shared positive affect ($r = -.44, p < .05$) and with dyadic cooperation ($r = -.40, p < .05$). Importantly, conflict resolution was negatively correlated to children's physical aggression at T3 ($r = -.35, p < .05$), in addition to be significantly associated with the intervention status.

Tests of Indirect Effects

Multivariate linear regression analyses were performed using PROCESS to examine whether conflict resolution (i.e. a proximal intervention target) may be considered a putative intermediary variable linking the intervention with the aggression (the distal outcome) at T3 via improved conflict resolution (the proximal outcome) at T2. Because the bivariate correlations had revealed that the intervention did not affect any other friendship features, indirect effects analyses were only performed with conflict resolution as the intermediary variable. Results showed that intervention status was associated significantly and positively with conflict resolution at T2 ($\beta = 1.32, SE = .64, p < .05$) and that conflict resolution at T2 was related significantly and negatively to children's physical aggression at T3 ($\beta = -.16, SE = .08, p < .05$). Moreover, there was a significant indirect effect of the intervention on children's

physical aggression through a change in the dyad's conflict resolution ability (indirect effect $\beta = -.23$, bootstrapped 95% CI based on 1000 iterations = $[-.598; -.019]$).

Discussion

The aim of this study was to investigate the beneficial role of friendship quality in regards to the development of physical aggression during the early school years. Through the use of an experimental intervention design, intermediary effects of different features of friendship quality were examined (i.e. dyadic cooperation, dyadic conflict resolution, shared positive affect between friends). Our findings indicated that the effect of the dyadic friendship quality intervention on decreased levels of children's physical aggression was indirect and a function of the improvement in the quality of one friendship feature; namely, the conflict resolution feature. Overall, the results are in line with the predictions made by social constructivist theorists. By the same token, these findings do not necessarily contradict the assumptions made by the attachment or personality theorists, considering that the cooperation and positive affect features were not modified by the intervention, and therefore, could not be tested. The results are discussed in light of the theoretical perspectives that served to frame the objectives.

Intermediary Effect of Dyadic Conflict Resolution: Potential Explanatory Processes

The current findings support the causal role of one aspect of friendship quality by showing an indirect effect of the intervention on decreasing levels of children's aggression. Specifically, intervention participants manifested improved levels of dyadic conflict resolution skills following the termination of the intervention and this improvement in their conflict resolution skills was, in turn, related to lower levels of physical aggression one month later. Thus, when compared to the control group, children of the intervention group were more able to adequately resolve their interpersonal conflicts with their best friend, and thereafter, less likely to use aggressive behaviour toward classmates and adults.

Specific processes that may explain the intermediate effect of the conflict resolution feature may be found in some mechanisms highlighted by the social constructivist perspective.

According to this perspective, the presence of conflicts, provided they are solved in a satisfactory and egalitarian manner, fosters interpersonal skills, such as mutual understanding, perspective-taking and empathy skills (Azmitia & Montgomery, 1993; Nelson & Aboud, 1985). Indeed, when two friends disagree, they are confronted with the fact that their partner can actually see the world differently than themselves. To protect their friend's happiness and satisfaction and ultimately the stability and the quality of their relationship, target children may be motivated to learn how to resolve conflicts with their friend. Once acquired and practiced in the context of the friendship dyad, these important skills may be used to resolve conflicts that arise with others peers and classmates. To the extent that friendships provide models for future relationships, positive friendship experiences in conflict resolution may serve as positive relationship templates to be use with the larger peer group and encourage positive peer responding (Berndt, 2004; Hartup, 1992). Improvement of their conflict resolution skills may also lower exposition to, and escalation in coercive interactions with the friend, which have been found to increase children's aggression (Dishion, Andrews, & Crosby, 1995; Snyder, Schrepferman, Brooker, & Stoolmiller, 2007). Moreover, these new skills may also elicit more positive responses and acceptance from the peer group (Bierman & Powers, 2009; Elliott & Gresham, 1993). Improved acceptance at the group level can in turn reduce the risk of developing a host of adjustment problems, including victimization, antisocial behavior, and delinquency (Bierman, 2004; Rubin *et al.*, 1998).

Other Features Targeted by the Intervention

We also expected to improve the levels of dyadic cooperation and shared positive affect between friends in order to test whether changes in these features were (also) related to decreasing levels of children's physical aggression. However, the intervention did not modify these components. Measures used to evaluate changes in these friendship features and the context of the intervention may, at least partially, explain why no changes were observed. Whereas dyadic conflict resolution was evaluated through a hypothetical test of children's and friends' capacities to resolve their conflicts, i.e. the number of prosocial strategies both said they would use in a conflict situation, cooperation and shared positive affect were evaluated through self-ratings. Because most children from both the experimental and control groups reported high positive ratings in regards to these features at the beginning of the study, a

ceiling effect may have prevented any possible gain for the intervention children. This tentative explanation calls for the inclusion of direct observational measures of friendship quality in future studies, such as experimental tasks in the context of a collaborative game or free play. The absence of expected improvement in the teacher perceptions also raised some concerns about the intervention duration and intensity required to observe changes in the cooperation feature. Indeed, it is possible that to observe changes, more time and repetition of positive interactions are needed in the context of a shared and supervised experience. Moreover, according to personality theorists (i.e. Sullivan, 1953; Youniss, 1980), children only appear to develop a real sensitivity to what matters to their friend around the age of 8 years old. Therefore, it is possible that the kindergarteners and first grade children who participated in the current study were not mature enough at the cognitive or the affective level to fully benefit from an intervention targeting caring skills about others.

Strengths and Limitations

To the best of our knowledge, this study is the first to implement an experimental intervention program to improve the quality of the friendships between young aggressive children and their best friends. Our results, as well as the conclusion that may be drawn from them, are preliminary. The sample size was small, limiting our power to detect statistically significant differences between the groups and preventing us from using more sophisticated analyses, such as multi-level dyadic analyses. A small sample size also precluded the possibility to examine children's or friends' characteristics as moderating variables. The experimental manipulation was also relatively short. The short-term design of this study may also have precluded significant changes in positive friendship features (i.e. cooperation and affect), which may need a longer period of time to improve following exposure to a friendship quality intervention than conflict resolution skills. Finally, some concerns can also be raised about the community sample of aggressive children used in the current study. Results may differ with the use of a clinically aggressive sample of children, although target children showed a high level of physical aggression when compared to normative children (i.e. above the 90th percentile).

Future Studies and Implications for Prevention

In spite of its limited duration, our intervention program had an indirect effect on decreasing physical aggression through the improvement of dyadic conflict resolution. Nevertheless, several avenues may be considered to improve the efficacy of the current intervention. Special attention should be paid to friends' characteristics when pairing them with a target child. It is not clear, in fact, which peers might make optimal partners in a friendship quality intervention. Highly skilled and well-liked peers might be good partners for aggressive children, serving as outstanding models of socially skillful behavior, and possibly providing entry into mainstream peer groups. However, popular children may already have many other friends and be less open than more 'average' children to new partnered friendships in the context of an intervention. It may be that grouping children, who share a need and a desire to make friends, but have complementary social deficits, may be a viable intervention strategy (Bierman & Powers, 2009). In addition, teachers could be involved in monitoring some aspect of a friendship intervention, providing rewards to the dyad for behaving appropriately and cooperatively in the classroom (Oden & Asher, 1977). While replication is necessary, the beneficial effect of the conflict resolution feature is consistent with previous findings on the role of friendship quality in the development of early physical aggression, and particularly on the potential of friendship to offer an experience that promotes the development of positive conflict resolution skills and competencies. To fully understand the causal role of friendship quality in the development of physical aggression, other features of friendship quality might be integrated in future experimental manipulations. To this end, identifying - through prospective correlational studies - which friendship features are specifically associated with decreasing levels of aggressive behavior might be a key direction for future research. Manipulating these identified friendship features in subsequent focused intervention studies like the one described here is then the best possible tool to determine their causal role with regard to children's development. Our findings suggest that interventions specifically tailored to improve friendship quality could reduce exposure to the risks associated with aggression already in kindergarten, thus promoting healthy peer socialization and potentially foster positive long-term outcomes.

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Table 1

Bivariate correlations between study variables at post-test assessments (T2 and T3)

	1	2	3	4	5	6	7	8
1. Intervention status	–	–	–	–	–	–	–	–
2. Child sex	–.20	–	–	–	–	–	–	–
3. Child grade	–.07	–.15	–	–	–	–	–	–
4. T2 Dyadic cooperation	.10	–.14	–.26	–	–	–	–	–
5. T2 Dyadic conflict resolution	.35*	–.23	–.06	.57***	–	–	–	–
6. T2 Shared positive affect	.02	.04	–.24	.79***	.50**	–	–	–
7. T3 Children's physical aggression	–.06	.39*	.31†	–.40*	–.35*	–.44**	–	–
8. T3 Friend's physical aggression	.18	.14	.03	–.15	–.09	–.21	–.01	–

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$ (two-tailed)

Estimate = Standardized coefficients. T2 refers to first post-test and T3, to second post-test. Coded (0) for control and (1) for intervention group. Coded (0) for girls and (1) for boys.

Table 2

Means and standard deviations (*M*, *SD*) at baseline (*T1*), and post-test assessment (*T2* and *T3*)

	Control group (n = 14)			Experimental group (n = 20)		
	T1 <i>M</i> (<i>SD</i>)	T2 <i>M</i> (<i>SD</i>)	T3 <i>M</i> (<i>SD</i>)	T1 <i>M</i> (<i>SD</i>)	T2 <i>M</i> (<i>SD</i>)	T3 <i>M</i> (<i>SD</i>)
Friendship feature						
C Z-Dyadic cooperation	–	–.11 (.85)		–	.07 (.89)	
Child	2.20 (.67)	2.18 (.82)		2.29 (.59)	2.35 (.65)	
Friend	1.95 (.58)	2.11 (.75)		2.00 (.82)	2.24 (.65)	
Teacher	2.73 (.72)	2.52 (.58)		2.77 (.74)	2.60 (.76)	
C Z-Dyadic conflict resolution	–	–.75 (1.27)		–	.56 (1.98)	
Friend's dyad	1.21 (.89)	1.17 (.71)		1.60 (1.27)	2.00 (1.17)	
Teacher	3.24 (.84)	2.83 (.71)		3.06 (.58)	3.26 (.85)	
C Shared positive affect	2.51 (.58)	2.66 (.41)		2.73 (.31)	2.68 (.52)	
Child	2.69 (.59)	2.93 (.24)		2.72 (.53)	2.70 (.61)	
Friend	2.34 (.77)	2.43 (.67)		2.74 (.31)	2.66 (.58)	
Outcome						
C Z-Children's physical aggression	1.01 (.72)		.70 (.99)	.92 (.67)		.61 (.73)
Peer	1.06 (.99)		1.35 (1.13)	1.22 (.99)		1.23 (1.14)
Teacher	3.24 (.93)		2.23 (1.17)	2.88 (.70)		2.20 (.89)
Friend's physical aggression						
Teacher	1.86 (1.05)		1.32 (.40)	1.54 (.77)		1.60 (.92)

C refers to aggregated data from multiple informants, *Z* refers to standardized scores.

Chapitre V : Discussion

La présente thèse, composée de trois articles, avait pour but d'examiner le rôle des relations d'amitié sur le développement des comportements d'agressivité physique en début de scolarisation. Pour ce faire, deux aspects liés aux relations d'amitié, la qualité de la relation et les attributs comportementaux des amis, ont été examinés, ainsi que certains facteurs contextuels se rattachant aux caractéristiques individuelles de l'enfant, comme son sexe, ses antécédents comportementaux et sa vulnérabilité génétique face à l'agressivité. La qualité de la relation d'amitié, la présence de conflits entre amis, ainsi que les comportements agressifs chez les amis en maternelle ont été mis en relation avec les manifestations d'agressivité physique chez l'enfant en 1^{ère} et 2^e années de l'école primaire. Le rôle modérateur de certaines dimensions spécifiques de la qualité de la relation d'amitié et de facteurs individuels a aussi été évalué afin de vérifier si ces associations variaient selon les niveaux d'affect positif et la capacité de la dyade d'amis à résoudre les conflits, les vulnérabilités individuelles au plan de l'agression et le sexe de l'enfant. Le rôle causal de certaines dimensions spécifiques de la qualité de la relation a, par ailleurs, été testé en évaluant les effets d'une intervention réalisée auprès de dyades d'enfants agressifs. De façon générale, les résultats des trois études appuient les hypothèses initiales en mettant en évidence des effets principaux et d'interaction entre la qualité globale de la relation d'amitié, certaines dimensions spécifiques, les attributs comportementaux des amis et différents facteurs personnels impliqués.

En premier lieu, les résultats obtenus suggèrent que ce ne sont pas tous les enfants qui s'associent à des amis agressifs qui sont plus à risque de maintenir ou aggraver leurs problèmes de comportement agressif. Les garçons semblent plus sensibles à cette source d'influence que les filles. De plus, les enfants qui établissent des relations d'amitié de bonne qualité semblent protégés, en partie du moins, des effets négatifs associés aux amis déviants. Ces observations appuient les hypothèses formulées par les théoriciens de l'apprentissage social et les auteurs qui suggèrent que la ségrégation naturelle entre pairs de même sexe peut influencer les patrons de comportement agressif à travers le temps via les mécanismes de socialisation (Adams, Bukowski, & Bagwell, 2005, Kandel, 1978). Par ailleurs, la qualité globale de la relation d'amitié est significativement associée à une diminution des

comportements agressifs, au-delà du niveau initial d'agressivité de l'enfant ou de son meilleur ami. Ces résultats viennent également appuyer les perspectives théoriques inspirés de la théorie de l'attachement et des théories du développement de la personnalité (Sullivan, 1953; Youniss, 1980) qui soulignent l'importance de considérer la réponse aux besoins affectifs pour comprendre le développement social des individus. De plus, en lien avec les théoriciens qui soutiennent un effet bénéfique du conflit entre amis (Azmitia & Montgomery, 1993; Piaget, 1965), les résultats du deuxième article suggèrent que les conflits entre amis ne sont pas un événement qui doit nécessairement être évité à tout prix. Ainsi, dans la mesure où les amis entretiennent une relation d'amitié caractérisée par un haut niveau d'affect positif et de bonnes stratégies de résolution de conflits, la présence d'interactions conflictuelles en maternelle n'est pas liée à une augmentation de l'agressivité physique chez l'enfant un an plus tard. Enfin, le troisième article de la thèse met en lumière le rôle causal d'une des dimensions de la qualité de la relation d'amitié, la capacité à résoudre les conflits, sur la diminution des comportements agressifs en début de scolarisation. À l'aide d'un devis expérimental, l'évaluation des effets d'une intervention dyadique visant à améliorer la qualité de la relation d'amitié auprès d'enfants présentant un niveau élevé de comportements d'agressivité physique en début d'année scolaire a montré que la participation à l'intervention était liée à une diminution de l'agressivité physique chez ces derniers. En somme, les expériences liées aux relations d'amitié peuvent être associées à une diminution des problèmes de comportements agressifs et protéger les enfants contre certains risques, dans la mesure où elles sont de bonne qualité.

Premier article : interaction entre les caractéristiques comportementales de l'ami et la qualité de leur relation d'amitié

Les résultats du premier article ont montré que la présence de comportements agressifs chez le meilleur ami de l'enfant en maternelle est significativement associée à une augmentation de l'agressivité physique chez l'enfant entre la maternelle et la 2^e année du primaire, au-delà de l'effet de certains antécédents personnels et familiaux, comme l'agressivité de l'enfant à la petite enfance et le revenu de la famille, et de facteurs concomitants, comme la prosocialité de l'enfant. La qualité de la relation d'amitié avec ce même ami en maternelle est, quant à elle liée à un plus faible niveau initial d'agressivité

physique, indépendamment des caractéristiques comportementales négatives de l'ami ou de l'enfant lui-même. De plus, une interaction entre l'agressivité de l'ami et la qualité de la relation d'amitié, quoique marginalement significative, soulève la possibilité que la présence de caractéristiques comportementales négatives chez l'ami soit liée à une augmentation des conduites agressives principalement dans un contexte de faible qualité de la relation d'amitié. Inversement, une relation de bonne qualité pourrait protéger les enfants agressifs contre le risque associé au fait d'interagir avec un ami qui présente également des problèmes de comportement. Ces liens sont enfin modérés par le sexe de l'enfant, indiquant une force d'association plus grande chez les garçons que chez les filles.

Les effets principaux observés au niveau de l'association à des amis agressifs font écho aux propositions théoriques élaborées par les théoriciens de l'apprentissage social (Patterson, Littman, & Bricker, 1967; Snyder, Schrepferman, McEachern, Barner, Johnson, & Provines, 2008). Ces auteurs avancent que l'apprentissage par observation et le conditionnement opérant sont des mécanismes associés au développement des comportements d'agressivité physique. Ainsi, la perspective de l'apprentissage social souligne que les pairs tendent à s'imiter entre eux et que l'observation de conduites menant à des conséquences positives favorise la reproduction de ces mêmes comportements dans le futur. Compte tenu de leur proximité relationnelle et de leurs similarités comportementales, les amis représentent des modèles comportementaux naturels et accessibles qui sont susceptibles d'être imités (Bandura & Huston, 1961). De plus, les théoriciens de l'apprentissage social proposent que les pairs se punissent et se récompensent pour différents comportements négatifs ou positifs. Par conséquent, il est possible que les enfants qui fréquentent des amis agressifs subissent une pression sociale de leur part pour adopter ou maintenir des comportements agressifs. Les résultats obtenus dans le premier article appuient ces hypothèses chez les enfants de la maternelle, des associations qui avaient d'ailleurs été démontrées dans des études empiriques précédentes (Estell, Cairns, Farmer, & Cairns, 2002; Snyder, Horsh, & Childs, 1997). Les résultats confirment ainsi que les jeunes enfants en début de scolarisation ont tendance à s'associer à des amis qui possèdent également des caractéristiques comportementales agressives et que l'association avec ces amis contribue à amplifier les niveaux existants de comportements agressifs à travers le temps.

L'interaction significative entre l'agressivité de l'ami et la qualité de la relation d'amitié en maternelle suggère toutefois que les interactions sociales qui se produisent entre amis, même celles qui surviennent entre enfants agressifs, peuvent être bénéfiques ou encore exercer un effet protecteur au niveau du développement de l'agressivité physique, dans la mesure où celles-ci sont de bonne qualité. Les résultats de cet article ont ainsi montré qu'une relation d'amitié de bonne qualité, définie comme une source significative de soutien, de compagnonnage et de valorisation par l'enseignant qui observe les dyades d'amis en contexte de classe et sur la cour d'école, est associée à un plus faible niveau initial de comportements agressifs chez l'enfant, au-delà de l'effet des facteurs antécédents et concomitants. Ces résultats diffèrent de ceux obtenus par Poulin, Dishion et Haas (1999) auprès d'une population d'adolescents. En effet, ces auteurs n'ont pas trouvé d'association significative entre la qualité positive de la relation d'amitié, telle que perçue par l'adolescent, et les problèmes de comportements externalisés un an plus tard. Des différences développementales et méthodologiques pourraient expliquer ces résultats contradictoires, puisque la qualité de la relation d'amitié a été estimée au cours de périodes développementales distinctes et par des informateurs différents.

Dans l'ensemble, cependant, les effets principaux observés dans la présente étude au niveau de l'association entre la qualité de la relation d'amitié et la diminution de l'agressivité semblent en lien avec les propositions élaborées par les auteurs inspirés de la théorie de l'attachement et des théories du développement de la personnalité (e.g. Sullivan, 1953; Youniss, 1980). Ces théoriciens ont proposé différents mécanismes afin de rendre compte de l'effet positif d'une relation d'amitié de bonne qualité qui va au-delà des risques associés à la présence de comportements agressifs chez les amis ou l'enfant lui-même. Ainsi, à travers une relation d'amitié de bonne qualité, les jeunes enfants seraient exposés à un contexte relationnel qui leur permettrait d'apprendre à devenir plus sensibles aux besoins d'autrui et à manifester une attitude empathique. Les apprentissages réalisés dans ce contexte contribueraient à améliorer la nature prosociale de leurs interactions, non seulement avec l'ami en question, mais possiblement aussi avec l'ensemble du groupe de pairs. Dans la mesure où ce style positif d'interaction se généralise à un certain nombre de pairs, l'enfant se trouve possiblement moins à risque de vivre des situations de rejet social qui ont, quant à elles, été associées à des niveaux plus élevés de conduites agressives (Berndt, Hawkins, & Jiao, 1999; Hodges, Boivin,

Vitaro, & Bukowski, 1999; Ladd, Kochenderfer, & Coleman, 1996). Le fait d'être moins rejeté par le groupe pourrait également permettre à l'enfant de bénéficier de nouvelles expériences relationnelles et de créer des liens d'amitié avec des pairs normatifs ou conventionnels au plan comportemental.

Certains auteurs ont également proposé qu'une relation positive avec un ami puisse répondre à des besoins affectifs en procurant à l'enfant un sentiment de sécurité et d'acceptation (Furman & Buhrmester, 1985; Weiss, 1974). D'ailleurs, s'il s'avérait que la capacité de l'enfant à établir une relation d'amitié de bonne qualité lui permette d'être davantage accepté par le groupe de pairs, cette expérience pourrait également contribuer à combler un besoin fondamental lié au sentiment d'appartenance (Ryan & Deci, 2000). Une relation d'amitié de bonne qualité pourrait également créer un contexte relationnel où l'enfant agressif se sent moins sur la défensive et mieux disposé à développer une attitude empathique et sensible aux besoins de l'autre, ainsi qu'à moduler son comportement afin de préserver, voire d'enrichir la relation. Enfin, un enfant qui établit une relation d'amitié de bonne qualité est susceptible d'être perçu plus positivement par son enseignant, et d'être davantage motivé à fréquenter l'école (Wentzel, Barry, & Caldwell, 2004). Tel que conceptualisé par Hirschi (1969), ces connections positives avec des acteurs de l'école, les pairs et les enseignants, pourraient en retour contribuer à diminuer la tendance à la déviance sociale observée chez les enfants agressifs.

Contrairement aux hypothèses formulées par les auteurs inspirés de la théorie l'apprentissage social, une relation d'amitié de bonne qualité ne semble pas exacerber l'association entre les comportements agressifs de l'ami et ceux de l'enfant, mais semble plutôt l'atténuer. Un autre mécanisme invoqué par les théoriciens de l'apprentissage social pour rendre compte de l'effet associé à l'exposition à des amis agressifs est l'entraînement à la coercition. Ce mécanisme réfère aux interactions négatives et coercitives qui peuvent survenir entre deux amis agressifs et qui sont susceptibles de s'intensifier lorsqu'elles se produisent à répétition. Snyder et ses collègues (2008) ont montré que les interactions coercitives prédisent des problèmes de comportement manifestes et agressifs. Même si les résultats ne permettent pas d'évaluer spécifiquement les mécanismes expliquant les effets principaux et interactionnels observés, telle la présence d'interactions coercitives au sein de la relation, il est possible d'envisager que les relations d'amitié de bonne qualité soient caractérisées par un

niveau moins élevé de telles interactions ou, à tout le moins, par une capacité et une volonté plus grande à les résoudre adéquatement. Par conséquent, en l'absence d'un des mécanismes invoqués pour expliquer le lien entre l'agressivité des amis et celle de l'enfant, les relations d'amitié de bonne qualité entre amis agressifs sont potentiellement moins susceptibles d'être reliées à l'agression.

L'étude aide aussi à approfondir les connaissances sur les relations d'amitié en montrant que les associations entre les comportements agressifs de l'ami, la qualité de la relation d'amitié et le changement au niveau de l'agressivité physique chez l'enfant sont de plus forte amplitude chez les garçons que chez les filles. Il a été montré dans les études antérieures que l'association entre pairs est fortement ségréguée, de sorte que les garçons et les filles interagissent avec des amis de même sexe et que ce patron prévaut de la petite enfance jusqu'à l'adolescence (Rose & Smith, 2009). La tendance à l'association ségréguée par sexe pourrait contribuer à expliquer pourquoi les interactions sociales entre enfants agressifs à la maternelle conduisent davantage à une augmentation des comportements agressifs chez les garçons que chez les filles. En début et milieu d'enfance, les garçons sont plus susceptibles que les filles de s'impliquer dans les jeux de chamaillerie, les jeux actifs et les sports, des contextes à travers lesquels les contacts physiques entre pairs sont nombreux (Blatchford, Baines, & Pellegrini, 2003; Fabes, Martin, & Hanish, 2003). Il est ainsi possible que ce contexte précis dans lequel se déroule le jeu des garçons favorise moins l'apprentissage de la gestion des émotions et sollicite davantage de réactions agressives (Mathur & Berndt, 2006). Tandis que les filles ont tendance à jouer à proximité des adultes, les garçons sont plus susceptibles de jouer dans des endroits où la supervision est moins présente, comme l'arrière de la cour d'école ou la ruelle, par exemple (Martin & Fabes, 2001). En lien avec ce contexte de jeu, les garçons se trouvent possiblement moins exposés que les filles aux tentatives de socialisation de la part des adultes qui encouragent l'utilisation de stratégies autres que l'agression pour interagir avec les pairs. Il est ainsi envisageable que les garçons qui réussissent à établir des relations d'amitié de bonne qualité y puisent des ressources et y trouvent des occasions d'apprentissage auxquelles ils seraient moins fréquemment exposés que les filles, compte tenu que leurs activités se déroulent plus loin du regard des adultes.

En somme, cette étude a permis d'examiner conjointement le rôle des comportements agressifs chez les amis et la qualité de la relation d'amitié au niveau du maintien et de

l'aggravation des conduites agressives à travers le temps. Afin de mieux comprendre ces phénomènes, l'exploration des processus interactionnels s'avère être une piste de recherche prometteuse. Une relation d'amitié de bonne qualité n'exclut pas, cependant, la présence de conflits entre amis. À cet effet, le deuxième article de la thèse a permis de documenter les associations entre différentes dimensions positives et négatives de la qualité de relation d'amitié et l'agressivité physique, ainsi que les contextes particuliers où elles sont observées, en tenant compte des interactions possibles entre les facteurs environnementaux et génétiques.

Deuxième article : conflit entre amis, autres dimensions et vulnérabilité génétique

Les résultats du deuxième article ont fait ressortir plusieurs interactions significatives montrant que l'association entre la présence de conflits entre amis à la maternelle et l'augmentation des comportements d'agressivité physique en 1^{ère} année dépend de différents facteurs contextuels et personnels. Tandis que le premier article a porté sur la qualité globale de la relation d'amitié, en ayant recours à une mesure agrégée de dimensions positives, le deuxième article met en scène certaines dimensions spécifiques associées à ce construit; c'est-à-dire, une dimension dite négative de la relation d'amitié, i.e. la présence de conflits, conjointement avec deux autres dimensions dites positives, i.e. la présence d'affect positif et la capacité à résoudre les conflits. L'analyse des dimensions liées à la qualité de la relation d'amitié, ainsi que des interactions potentielles entre ces dimensions, rejoint dans une certaine mesure les tenants d'une approche typologique qui proposent d'examiner l'influence de la qualité de la relation d'amitié en prenant en considération différents patrons relationnels (Hussong, 2000). La prise en compte de différentes dimensions, plutôt que d'une seule dimension globale et positive, appuie ainsi l'idée que les caractéristiques particulières d'une relation devraient être étudiées en se penchant sur le contexte à travers lequel elles se manifestent.

En premier lieu, les résultats ont montré une association linéaire entre la présence d'un haut niveau de conflits entre amis et l'augmentation de l'agressivité physique chez l'enfant. Contrairement aux hypothèses formulées par les auteurs qui proposent qu'un certain niveau de conflits dans la relation d'amitié soit bénéfique au plan du développement social et cognitif, ce

résultat est plutôt congruent avec les conclusions des études antérieures qui montrent que le conflit entre amis est lié à différents problèmes d'adaptation au plan externalisé chez les enfants d'âge scolaire, comme chez les adolescents (Coie & Miller-Johnson, 2000; Kupersmidt, Burchinal, & Patterson, 1995). L'association linéaire entre la présence d'interactions conflictuelles et l'agressivité physique dans la présente étude vient préciser que ce type d'interactions à la maternelle prédit une augmentation des niveaux initiaux d'agressivité physique à travers le temps. Ce résultat appuie les modèles théoriques inspirés de l'apprentissage social qui associent la présence de conflits intenses et fréquents au mécanisme d'entraînement à la coercition. En fait, les principes de renforcement négatif et d'apprentissage vicariant sur lesquels reposaient les mécanismes liés à l'association à des pairs déviants dans la première étude, ont également été proposés par plusieurs auteurs afin d'expliquer comment les interactions conflictuelles entre amis conduisent au maintien et à l'aggravation des problèmes de comportements agressifs à travers le temps (Huesmann & Kirwil, 2007; Snyder & Patterson, 1995).

Le renforcement négatif des comportements coercitifs, par le fait que l'ami cède aux pressions de l'enfant qui utilise la coercition pour parvenir à ses fins, incite l'enfant à continuer à utiliser des stratégies semblables dans le futur. La résistance de l'ami qui a déjà été exposé aux tactiques coercitives de l'enfant pourrait par ailleurs encourager l'enfant à intensifier ses efforts, favorisant à nouveau le recours aux comportements agressifs ultérieurement (Snyder *et al.*, 2007). Inversement, si l'ami lui-même utilise des stratégies coercitives pour tenter de mettre fin aux disputes, l'enfant se trouve exposé à des comportements négatifs qu'il sera tenté de reproduire via le modelage par un pair significatif. Dans la mesure où ces stratégies sont efficaces pour atteindre les buts fixés par l'enfant ou par son ami, il est possible que l'enfant persiste à les utiliser dans le futur en relation avec cet ami. Par ailleurs, il est également envisageable que l'enfant généralise ce style d'interactions coercitives à ses autres relations d'amitié et liens avec le groupe de pairs, de sorte que l'enfant manifeste davantage de comportements agressifs, non seulement en interaction avec l'ami avec lequel il pratique et s'expose à des comportements coercitifs, mais également avec son entourage. Ce dernier élément complète la séquence liant les conflits entre amis à l'augmentation des comportements agressifs en général en justifiant pourquoi l'augmentation subséquente des conduites agressives est observée auprès d'un plus grand nombre de pairs.

Les résultats de cet article ont également montré un patron d'interactions complexes à travers lequel la présence d'affect positif et la capacité à régler adéquatement les conflits réduisent les risques associés à l'implication dans des interactions conflictuelles au niveau de l'augmentation des conduites agressives. Spécifiquement, les résultats indiquent que le conflit est lié de façon linéaire à une augmentation de l'agressivité quand la présence d'affect positif entre les amis et la capacité à régler les conflits de manière juste et équitable sont toutes deux faibles. À l'inverse, lorsque la relation d'amitié est caractérisée par de hauts niveaux d'affect positif et que les amis sont en mesure de gérer adéquatement leurs désaccords, le conflit ne prédit plus l'augmentation de l'agressivité. Par conséquent, il est envisagé que les enfants dont la relation d'amitié est caractérisée par la présence et l'échange d'affect positif, ainsi que par l'utilisation de bonnes stratégies de résolution de conflits, soient davantage à l'écoute des besoins de leur ami et motivés à résoudre le désaccord d'une manière constructive (Rogoff, 1990).

Des particularités émergent également lorsque sont considérées différentes combinaisons des niveaux de ces deux dimensions positives de la qualité de la relation. Ainsi, un haut niveau d'affect positif ne contribue pas, à lui seul, à atténuer le lien entre les conflits et l'agressivité quand la capacité à résoudre les conflits est faiblement déployée ou absente. De façon semblable, le conflit est associé à une augmentation de l'agressivité quand la présence d'affect positif est faible, même si les capacités à résoudre les conflits sont élevées. Ces résultats illustrant différentes combinaisons au niveau des caractéristiques de la relation suggèrent que la capacité de la dyade d'amis à résoudre les conflits n'est pas suffisante en elle-même pour protéger les enfants contre les risques associés aux interactions conflictuelles dans cette étude. Le lien affectif entre les enfants semble être une dimension importante à prendre en considération afin de décrire les liens qui unissent la présence de conflits à l'augmentation de l'agressivité. Il semble enfin que les enfants soient plus susceptibles d'utiliser de bonnes stratégies de résolution de conflits dans le contexte d'une relation empreinte d'affect positif. L'interprétation de ce patron particulier d'interactions pourrait refléter les différentes réactions émotionnelles des enfants face aux conflits, les interactions négatives survenant dans le contexte d'une relation peu investie au plan affectif pouvant être davantage susceptibles de susciter la colère, tandis que les conflits qui se produisent au sein d'une relation marquée par l'affect positif engendraient principalement des sentiments de tristesse (Crick & Dodge, 1994).

Ces réactions émotionnelles ont été associées à l'augmentation des conduites agressives, dans le cas de la colère mais non de la tristesse, ainsi qu'aux recours à des stratégies agressives en situation de conflits (Murphy & Eisenberg, 1996). Les enfants qui expriment de la colère sont ainsi plus susceptibles de recourir à des stratégies coercitives, tandis que ceux qui ressentent de la tristesse dans les situations de conflits tendent à formuler des intentions plus prosociales et positives face à la résolution de conflits.

L'association linéaire entre la présence de conflits intenses et fréquents et l'agression demeure toutefois limitée aux garçons dans la présente étude. Cela rejoint l'interprétation des résultats du premier article dans lequel il a été montré que les garçons présentaient des niveaux plus élevés d'agressivité physique lorsqu'ils s'associaient à des amis agressifs ou, à l'inverse, des manifestations moins importantes lorsqu'ils étaient en mesure d'établir une relation d'amitié de bonne qualité. Ce résultat appuie également ceux de Ladd et ses collègues (1996) qui ont montré que l'adaptation à la maternelle s'avérait particulièrement difficile pour les garçons qui entretiennent des relations conflictuelles avec leurs amis. Les différences observées au niveau des patrons d'interaction chez les garçons et les filles pourraient contribuer à expliquer pourquoi seulement les garçons subissent les conséquences négatives associées au conflit en terme d'augmentation de l'agressivité. Par exemple, les garçons ont plus tendance à recourir à des stratégies de confrontation, à faire des demandes directes, ainsi qu'à adopter des attitudes compétitives, dominantes et égocentriques en interaction avec leurs pairs (Maccoby, 1990). Les filles ont, quant à elles, davantage tendance à formuler des demandes polies, ainsi qu'à adopter des attitudes qui favorisent la coopération et la communication (Serbin, Moller, Gulko, Powlishta, & Colburne, 1994). Contrairement aux filles, les garçons semblent d'ailleurs plus fréquemment exposés à des situations provocantes et plus prompts à y réagir en manifestant des comportements d'agressivité physique (Zakriski, Wright, & Underwood, 2005). Il est donc possible que le style d'interaction des garçons favorise l'émergence des conflits et le recours à des stratégies basées sur la compétition et la dominance (Fabes *et al.*, 2003). Les résultats des deux premières études de la thèse suggèrent ainsi la possibilité d'une sensibilité plus grande à l'influence des pairs chez les garçons.

L'association linéaire entre le conflit et l'agressivité demeure néanmoins la même, peu importe la prédisposition génétique de l'enfant face à l'agressivité physique. Contrairement à la perspective de stress et vulnérabilité qui stipule que la présence d'événements stressants

dans l'environnement devrait engendrer plus de risque chez les individus qui y sont génétiquement vulnérables (Scarr & McCartney, 1983), les résultats de cette étude suggèrent que les enfants qui présentent un risque génétique face à l'agressivité physique ne sont pas plus à risque de subir l'influence négative des expériences conflictuelles que ceux qui ne présentent pas une telle vulnérabilité. En lien avec les études antérieures portant sur les effets génétiques liés à cette dimension négative, les conflits ne semblent pas non plus davantage susceptibles de se produire en présence de prédispositions génétiques face à l'agressivité dans la présente étude (Pike & Atzaba-Poria, 2003).

En somme, les résultats du deuxième article font écho à ceux du premier article, en suggérant que les enfants qui sont impliqués dans une relation marquée par l'affect positif et de bonnes stratégies de résolution de conflits, deux dimensions spécifiques associées à la qualité de la relation, ne subissent pas les conséquences négatives liées à la présence de conflits. Il apparaît donc essentiel de tenir compte de la qualité de la relation d'amitié, en interaction avec certaines dimensions négatives comme le conflit, et certains aspects relationnels comme les caractéristiques agressives des amis, pour décrire adéquatement les liens entre les relations d'amitié et le développement de l'agressivité physique. L'analyse de différents contextes à travers lesquels le conflit mène à l'agression réalisée dans le deuxième article offre ainsi un éclairage particulier sur le rôle de la qualité de la relation d'amitié. En complément à l'approche dimensionnelle appliquée à un construit global, l'étude des interactions possibles entre différentes dimensions de ce même construit permet une compréhension plus approfondie des patrons impliqués dans le développement des conduites agressives. Ces mises en évidence d'associations corrélationnelles sont d'autant plus importantes qu'elles peuvent servir à indiquer sur quelles dimensions particulières devraient porter les efforts de prévention dirigés vers les difficultés relationnelles que manifestent les enfants agressifs.

Troisième article : effets d'une intervention sur la qualité de la relation d'amitié

Les résultats du troisième article de la thèse ont montré que l'amélioration de la capacité à résoudre les conflits entre amis en maternelle et en 1^{ère} année, une dimension

positive associée à la qualité de la relation d'amitié, contribue à diminuer les problèmes de comportements d'agressivité physique au cours de la même année scolaire. À l'aide d'un plan de recherche expérimental, incluant une répartition aléatoire des participants, l'évaluation des effets à court terme d'une intervention dyadique visant à améliorer la capacité des enfants à coopérer, à résoudre leurs conflits et à échanger des affects positifs, appuie l'idée que le maintien et l'aggravation des conduites agressives peuvent être prévenus en ciblant ces dimensions positives et en particulier, la capacité de la dyade à résoudre adéquatement les conflits qui surviennent entre amis. La contribution des dimensions de coopération et d'affect positif n'a pu être testée puisque ces dimensions n'ont pas été influencées par la participation au programme d'intervention.

Les résultats indiquent que les effets observés au niveau des comportements d'agressivité physique, suite à la participation à une intervention dyadique portant sur la qualité de la relation d'amitié, sont indirects et opèrent via l'amélioration de la capacité de la dyade à résoudre positivement leurs conflits. Suite à la participation à l'intervention, les enfants ciblés et leurs amis étaient davantage en mesure de proposer des stratégies de résolution de conflits de type prosocial, c'est-à-dire, axées sur la résolution des conflits de manière positive, juste et acceptable pour chacun des partenaires. Ces améliorations ont été observées en contexte de situation problématique hypothétique, ainsi que rapportées par l'enseignant. Ces résultats soutiennent les hypothèses explicatives soulevées par les auteurs inspirés de la théorie du jugement moral. Selon ces auteurs, le conflit entre amis, lorsque résolu adéquatement, encourage le développement des habiletés interpersonnelles, comme la capacité à comprendre le point de vue d'autrui et à faire preuve d'empathie (Azmitia & Montgomery, 1993; Nelson & Aboud, 1985). Afin d'assurer la continuité de la relation, l'enfant serait possiblement tenté de chercher une issue favorable au conflit et ainsi, de se pratiquer à utiliser des stratégies de résolution de conflits qui sont perçues comme acceptables par le partenaire. La capacité à résoudre les conflits, une fois pratiquée dans le contexte relationnel de la dyade, pourrait être utilisée pour résoudre les conflits qui surviennent avec d'autres pairs ou adultes.

En lien avec les résultats du deuxième article, les effets indirects de l'intervention sur les manifestations de comportements agressifs montrent que la résolution de conflits entre amis est une cible importante à prendre en considération afin de soutenir les enfants dans

l'apprentissage de comportements socialement acceptables et de les protéger contre les risques associés à la présence de conflits. Il est à noter que des analyses additionnelles réalisées à partir des données actuelles n'ont pas démontré de différences significatives entre les groupes expérimentaux et contrôle au niveau de la présence de conflits après l'intervention. Ainsi, les résultats permettent d'envisager que l'amélioration de la capacité à résoudre les conflits suite à la participation à l'intervention, et non la suppression des épisodes de conflits, conduit à une diminution des problèmes de comportements agressifs dans la présente étude. Ce résultat est en lien avec la théorie du jugement moral et reflète l'idée que l'évitement des conflits n'est pas nécessairement un but souhaitable. Les effets de l'intervention n'ayant été évalués qu'à court terme, une étude de suivi, par contre, aurait permis d'offrir un éclairage plus détaillé sur cette hypothèse alternative. En lien avec les auteurs qui ont montré une association longitudinale entre les interactions coercitives et l'augmentation de l'agressivité (Dishion, Andrews, & Crosby, 1995), il est possible que l'amélioration de la capacité à résoudre les conflits mène également à une diminution de ces expériences coercitives, mais sur une plus longue période de temps, grâce à la pratique et la consolidation des habiletés.

La réplication de ces résultats s'avère nécessaire afin de confirmer le rôle causal de la qualité des relations d'amitié. Il demeure que l'effet bénéfique associé à la résolution de conflits, suite à la manipulation expérimentale de ce construit, est cohérent avec les résultats des deux études longitudinales précédentes de la thèse qui ont montré que la qualité de la relation d'amitié est associée à une diminution de l'agressivité physique en général, et protège contre les risques associés à la présence de conflits. Les conclusions de la présente étude suggèrent, en somme, que le contexte de la relation d'amitié offre un potentiel intéressant pour apprendre et pratiquer des compétences personnelles utiles pour interagir entre amis, ainsi qu'avec l'ensemble du groupe de pairs.

Implication au plan de la prévention

Les résultats de cette thèse ont mis en lumière une combinaison de facteurs individuels et interpersonnels associée à des manifestations plus importantes ou dans certains cas, moins importantes, de problèmes de comportement agressif en début de scolarisation. Ces observations ont un intérêt pour les psychoéducateurs et les intervenants œuvrant auprès de jeunes enfants qui présentent des problèmes d'adaptation au niveau des comportements

externalisés. Tout d'abord, les résultats suggèrent de considérer la qualité des relations d'amitié dans les interventions auprès des jeunes enfants présentant des difficultés en lien avec l'agressivité physique. En effet, le fait d'entrer à l'école primaire en présentant un haut niveau de comportements agressifs, de s'associer à des amis qui possèdent des caractéristiques semblables et d'établir des relations d'amitié de faible qualité semblent avoir un impact sur le maintien et l'aggravation des conduites agressives, ainsi que les risques associés à la présentation de difficultés d'adaptation au cours de l'enfance. Cet élément apparaît central, lorsque l'on sait que les interventions actuellement développées et utilisées pour améliorer les relations entre pairs tendent à sous-estimer l'importance de la qualité des relations d'amitié dans le développement, en dépit des démonstrations empiriques en ce sens. Dans une perspective d'intervention, les résultats de la thèse suggèrent que certaines dimensions de la qualité de la relation d'amitié, en particulier les stratégies dyadiques de gestion des conflits, devraient constituer des cibles d'intervention privilégiée pour aider les enfants plus vulnérables devant l'expérience d'intégration à l'école primaire. Le début de la scolarisation devrait, par ailleurs, être envisagé comme une période propice pour induire promouvoir des changements comportementaux puisque les enfants se trouvent exposés à de nouvelles expériences relationnelles, à un âge où les problèmes de comportement agressif ne sont pas forcément aussi cristallisés qu'à l'adolescence, par exemple.

Les résultats de la thèse soulèvent aussi des questions importantes relativement aux processus expliquant pourquoi certains enfants agressifs sont en mesure d'établir des relations de bonne qualité et présenter moins de problèmes liés à l'agressivité physique. Dans cette optique, les prochaines sections abordent les forces et les limites de la thèse, de même que des pistes de recherches futures, afin d'approfondir la compréhension de l'impact des relations d'amitié sur le développement des comportements agressifs à l'enfance.

Forces et limites

Les trois études empiriques composant cette thèse présentent des forces importantes. En effet, l'utilisation de trois échantillons différents d'enfants québécois, dont deux issus de vastes enquêtes prospectives, comporte des avantages notables. Premièrement, il a été possible d'évaluer les liens entre les expériences avec les amis et les comportements agressifs de façon longitudinale, en couvrant une période de transition importante, de la maternelle à la 2^e année

du primaire. La disponibilité des informations sur les participants dès l'âge de 5 ans a constitué un avantage important pour étudier les relations d'amitié en bas âge, lesquelles sont moins souvent considérées dans les études portant sur le rôle des pairs. Deuxièmement, le recours à un devis génétiquement informatif a permis de tenir compte à la fois des facteurs génétiques et environnementaux afin de décrire les liens entre certaines dimensions des relations d'amitié et les conduites agressives. À ce jour, peu d'études empiriques portant sur l'étiologie des comportements agressifs et le rôle des amis ont été réalisées dans un contexte qui permet de déterminer dans quelle mesure les facteurs environnementaux sont corrélés ou interagissent avec les facteurs génétiques. Troisièmement, la mise en œuvre et l'évaluation d'une intervention dyadique dans le contexte d'une manipulation expérimentale, avec répartition aléatoire, représentent une avenue de recherche privilégiée afin d'examiner le rôle de certaines dimensions relationnelles dans le développement des comportements agressifs. L'évaluation des effets associés à une intervention permet de tester des hypothèses spécifiques formulées à travers différentes perspectives théoriques quant à l'effet causal des relations d'amitié. Enfin, les études réalisées à partir de l'EJNQ et du programme d'intervention dyadique ont inclus plusieurs sources d'information ainsi que différentes méthodes d'évaluation.

Toutefois, l'utilisation d'enquêtes longitudinales, comme l'ELDEQ et l'EJNQ, comporte aussi un certain nombre de limites. La première concerne le manque important de profondeur dans la mesure de certains concepts. Étant donné le nombre élevé de thématiques examinées dans de telles enquêtes, les mesures sont souvent réduites en raison de contraintes monétaires et logistiques. Certaines mesures utilisées dans cette thèse constituent des versions abrégées de questionnaires, comme la mesure de la qualité globale de la relation d'amitié. Davantage d'éléments sur ce construit, ainsi que le recours à des mesures d'observation des interactions entre amis, auraient permis une compréhension plus poussée de leur rôle dans la prédiction des comportements agressifs. Ainsi, en dépit des résultats trouvés, les processus explicatifs n'ont pu être directement testés à l'aide de plans de recherche longitudinaux. De plus, plusieurs mesures issues de l'ELDEQ étaient rapportées par l'enseignante, ce qui a pu contribuer à amplifier les associations trouvées entre les variables. Toutefois, bien que certains concepts auraient pu bénéficier d'une évaluation plus approfondie, il est important de souligner que tous les questionnaires de chacune des études ont été validés par une équipe

d'experts avant le début de l'enquête. Enfin, les résultats associés à l'évaluation des effets d'une intervention dyadique, ainsi que les conclusions pouvant en être tirées au sujet de l'influence de la qualité de la relation d'amitié demeurent préliminaires. La petite taille de l'échantillon, ainsi que la courte durée de la période d'évaluation suivant la fin de la participation au programme nécessitent de répliquer les résultats obtenus avant de conclure que la qualité de la relation d'amitié est un aspect qui contribue de manière causale au développement de l'agressivité physique.

Pistes de recherches futures

Afin de mieux comprendre le rôle des relations d'amitié en lien avec le développement des comportements d'agressivité physique, il apparaît maintenant important d'identifier les processus expliquant pourquoi les enfants qui sont en mesure d'établir une relation de bonne qualité semblent présenter moins de problèmes d'agressivité. Une piste de réponse évoquée dans cette thèse se trouve potentiellement dans l'amélioration des stratégies dyadiques de résolution de conflits. Cependant, l'étude plus approfondie des liens prédictifs entre différentes dimensions de la relation d'amitié, à la fois positives et négatives, et les manifestations de comportements agressifs représente une étape incontournable afin de répondre adéquatement aux besoins des enfants qui présentent de tels comportements et éprouvent des difficultés en relation avec leurs amis. L'inclusion d'aspects relationnels en lien avec l'amitié dans les programmes orientés vers la prévention des problèmes d'agressivité est en fait tributaire de l'identification des dimensions de la qualité de la relation qui sont spécifiquement liées à la diminution de l'agressivité, de même que les micros processus impliqués dans les relations d'amitié entre enfants agressifs. À cet effet, le recours à des analyses dyadiques, en contexte de recherches longitudinales et prospectives, pourrait offrir un éclairage supplémentaire sur les liens complexes qui unissent les relations d'amitié à l'agressivité. De telles analyses permettent de tenir compte à la fois des caractéristiques relationnelles et des attributs comportementaux propres à chacun des partenaires de la relation, ainsi que de leur influence respective, auprès de l'enfant, comme de son ami (Card, Little, & Selig, 2008).

L'analyse plus approfondie des mécanismes étiologiques qui peuvent expliquer le lien entre les caractéristiques de l'enfant et les relations d'amitié, comme les corrélations gène-

environnement par exemple, représente également une piste de recherche prometteuse. Ainsi, l'étude de la contribution des gènes de l'enfant aux différentes dimensions de la qualité de la relation, à la petite enfance, pourrait enrichir les quelques évidences empiriques qui ont montré que l'enfant, en fonction de son bagage génétique, est susceptible de provoquer certaines réponses particulières chez ses amis. L'étude de ces liens entre les vulnérabilités génétiques et les relations que l'enfant établit avec ses amis pourrait permettre de documenter quelles sont les expériences avec les pairs susceptibles d'être envisagées comme de véritable source d'influence environnementale. La mise en œuvre d'interventions qui ciblent à la fois les dimensions de la qualité des relations d'amitié étant liées à la diminution des comportements d'agressivité physique et les aspects des relations d'amitié qui sont les moins tributaires de l'influence des prédispositions génétiques de l'enfant pourrait donner des résultats intéressants en terme de prévention des problèmes d'adaptation, les enfants agressifs y étant potentiellement plus réceptifs. Ces hypothèses, qui demeurent spéculatives, devraient être vérifiées à l'aide de devis de recherche longitudinaux et génétiquement informatifs.

Les conclusions tirées de la thèse suggèrent que les garçons subissent différemment l'influence de la qualité des relations d'amitié et de l'association à des amis qui sont agressifs. La ségrégation entre les sexes dans les relations d'amitié a été proposée afin de tenter d'expliquer pourquoi les garçons bénéficient davantage d'une relation de bonne qualité ou, à l'inverse, sont plus à risque que les filles de présenter des problèmes d'agressivité lorsqu'ils interagissent avec des amis agressifs et expérimentent des conflits. Cette piste d'explication demeure toutefois assez spéculative, dans la mesure où l'association à des amis du même sexe, bien qu'elle semble conduire à des patrons d'interaction distincts chez les garçons et les filles, nous informe peu sur les mécanismes spécifiques qui font en sorte que les garçons soient plus sensibles que les filles à l'influence possible d'une relation d'amitié qui s'avère être de bonne qualité, par exemple. Ainsi, les processus qui expliquent pourquoi les garçons sont plus vulnérables ou susceptibles de bénéficier des expériences entre amis devraient faire l'objet d'une attention particulière dans les études futures. De plus, l'analyse des liens entre les relations d'amitié et l'évolution de d'autres formes d'agression, comme l'agressivité indirecte, ainsi le développement des problèmes internalisés, tels que les symptômes dépressifs et anxieux, pourrait permettre de mieux comprendre les liens entre ces expériences et l'adaptation personnelle et sociale chez les filles. Il est ainsi possible que les relations

d'amitié, ainsi que les différents aspects y étant liés, contribuent plutôt au développement de ces problématiques observées plus fréquemment chez les filles.

Conclusion

En conclusion, la présente thèse a permis de montrer que certains aspects liés aux relations d'amitié, comme les comportements agressifs des amis et le conflit, devraient être envisagés comme des sources potentielles d'influence négative au niveau du maintien ou de l'aggravation des conduites agressives en début de scolarisation. Par ailleurs, les relations d'amitié de bonne qualité, principalement celles caractérisées par le soutien, le plaisir, l'affect positif et la capacité à résoudre adéquatement les conflits, semblent créer un contexte relationnel qui fait varier l'effet de l'exposition à des amis agressifs et à des épisodes de conflits. D'autres études sont nécessaires pour préciser les processus expliquant pourquoi les enfants agressifs qui établissent des relations d'amitié de bonne qualité présentent moins de problèmes d'adaptation.

Les résultats de cette thèse ont proposé une piste de réflexion sur la question afin d'être en mesure de mieux soutenir les enfants qui manifestent des comportements d'agressivité physique en début de scolarisation. À l'instar de Georges Brassens qui le souligne si bien dans ses chansons, il semble que les relations d'amitié entre jeunes enfants soient significatives au plan développemental et que l'établissement et le maintien de liens d'amitié de qualité devraient être encouragés :

*« Des bateaux j'en ai pris beaucoup
Mais le seul qui ait tenu le coup
Qui n'ait jamais viré de bord
Naviguait en père peinard
Sur la grande-mare des canards
Et s'appelait Les Copains d'Abord »* (Georges Brassens, *Les Copains D'Abord*)

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