

Reciprocal Prospective Associations Between Depressive Symptoms and Perceived Relationship With Parents in Early Adolescence

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Objective: Adolescent depressive symptoms are associated with difficult family relationships. Family systems and interpersonal theories of depression suggest that this association could reflect a circular process in which symptoms and family functioning affect each other over time. Few longitudinal studies have tested this hypothesis, and the results of these studies have been equivocal. In this study, we examine reciprocal prospective associations in early adolescence between depressive symptoms and 2 important aspects of parent–child relationships: communication and conflict.

Methods: Participants were 3862 students who annually filled out self-reports. Path analysis was used to examine prospective associations between depressive symptoms and perceived communication and conflict with parents from the age of 12 to 13 and 14 to 15 years. Independence of these associations was assessed by controlling for family context (parental separation and family socioeconomic status) and adolescent behaviour problems (delinquent behaviours and substance use). Sex differences were evaluated with multiple group analysis.

Results: Reciprocal prospective associations were found between depressive symptoms and perceived conflict with parents, but not between depressive symptoms and communication with parents. Depressive symptoms were found to predict poorer communication with parents over time, but communication was not predictive of lower depressive symptoms in subsequent years. All paths were sex-invariant and independent from family context and behaviour problems.

Conclusion: This study highlights the importance of considering the potential impact of adolescent symptomatology on parent–child relationships and suggests that reciprocity may characterize the association between depressive symptoms and negative aspects of parent–child relationships. The role of adolescent perceptions in the interplay between depressive symptoms and family relationships remains to be clarified.



Associations prospectives réciproques entre les symptômes dépressifs et la relation perçue avec les parents au début de l'adolescence

Objectif : Les symptômes dépressifs des adolescents sont associés à des relations familiales difficiles. Les systèmes familiaux et les théories interpersonnelles de la dépression suggèrent que cette association pourrait refléter un processus circulaire dans lequel les symptômes et le fonctionnement familial exercent une influence les uns sur les autres avec le temps. Peu d'études longitudinales ont vérifié cette hypothèse, et elles ont conclu à des résultats équivoques. Dans cette étude, nous examinons les associations prospectives réciproques du début de l'adolescence entre les symptômes dépressifs et 2 aspects importants des relations parent–enfant : la communication et le conflit.

Méthodes : Les participants étaient 3862 élèves qui remplissaient chaque année une auto-évaluation. L'analyse des pistes causales a servi à examiner les associations prospectives entre les symptômes dépressifs et la communication et le conflit perçus avec les parents,

de 12 à 13 ans et de 14 à 15 ans. L'indépendance de ces associations a été évaluée en contrôlant le contexte familial (séparation parentale et statut socioéconomique familial) et les problèmes de comportement de l'adolescent (comportements délinquants et utilisation de substances). Les différences selon le sexe ont été évaluées par une analyse de groupes multiples.

Résultats : Des associations prospectives réciproques ont été observées entre les symptômes dépressifs et le conflit perçu avec les parents, mais non entre les symptômes dépressifs et la communication avec les parents. Les symptômes dépressifs prédisaient une communication médiocre avec les parents avec le temps, mais la communication ne prédisait pas de symptômes dépressifs plus faibles dans les années subséquentes. Toutes les pistes ne variaient pas selon le sexe et étaient indépendantes du contexte familial et des problèmes de comportement.

Conclusion : Cette étude souligne l'importance de tenir compte de l'effet potentiel de la symptomatologie adolescente sur les relations parent-enfant, et suggère que la réciprocité peut caractériser l'association entre les symptômes dépressifs et les aspects négatifs des relations parent-enfant. Le rôle des perceptions des adolescents dans l'interaction entre les symptômes dépressifs et les relations familiales demeure à préciser.

Adolescent depression is a disorder occurring within the context of interpersonal relationships.^{1,2} Adolescents with depression tend to experience various types of relational impairments, which often involve family members.^{3,4} Studies using direct observations, parent reports, and self-reports have consistently shown that depressive symptoms in adolescents are associated with lower positive aspects of relationship with parents, such as support and communication, as well as increased negative aspects, such as conflict.⁵⁻⁹ However, the directionality and nature of the associations among different aspects of family relationships and depressive symptoms remain unclear. A better understanding of the way(s) in which family relationships relate to adolescent depressive symptomatology is central to the development of effective family-centred prevention strategies.¹⁰

Most prospective studies to date have examined whether difficult parent-child relationships predict the development of depressive symptoms over time.^{3,11} However, theoretical frameworks, such as family systems^{11,12} and interpersonal^{1,13} theories of depression, suggest reciprocal rather than unidirectional relationship models, in which depressive symptoms and interpersonal dysfunctions exacerbate each other over time. Relationship difficulties with parents may increase the risk of developing depressive symptoms by interfering with adolescents' sociobehavioural functioning,

Abbreviations

CES-D	Center for Epidemiologic Studies Depression Scale
CFI	Comparative Fit Index
FIML	full information maximum likelihood
ISEI	International Socioeconomic Index
MASPAQ	Mesures de l'adaptation sociale et personnelle pour les adolescents Québécois
NANS	New Approaches, New Solutions
RMSEA	root mean square error of approximation
SES	socioeconomic status
TLI	Tucker-Lewis Index

Clinical Implications

- Depressive symptomatology and conflicting parent-child interactions may exacerbate each other in early adolescence.
- Depressive symptomatology may also contribute to diminish positive exchanges between adolescents and their parents over time.
- These processes are found in both adolescent boys and girls.

Limitations

- Self-report data do not allow us to rule out potential cognitive biases in the way adolescents report relationships with their parents.
- Relationship with mothers and fathers were not considered separately.
- Attrition may influence associations, although missing data were taken into account using a modern maximum likelihood technique.

emotion regulation abilities, and cognitions regarding themselves and others.^{3,4} Conversely, depressive symptoms may elicit negative responses from parents because adolescents with more severe depression tend to rely on maladaptive interpersonal strategies, such as excessive demands for, and resistance to, reassurance,¹ and act in ways that generate stress in their interactions with their parents.¹⁴ Once established, these feedback processes may serve to maintain or exacerbate both symptoms and relational difficulties over time.

Despite these compelling theoretical grounds, only a handful of studies have tested the existence of these feedback processes by looking simultaneously and longitudinally at family relationship effects on depressive symptoms and symptoms effects on family relationships. Further, these studies have produced mixed evidence. A recent study found mutual associations between depressive symptoms and relationship with parents over time.¹⁵ However, other studies have only found predictions of depressive symptoms by parent-child relationship,^{6,16} predictions of parent-child relationship by depressive symptoms,¹⁷ or no association

in either direction.¹⁸ These equivocal results may be due to several factors, including methodological variations pertaining to samples, developmental period of assessment, and measures. However, a more substantive reason is that associations may vary according to specific aspects of family relationship. For example, reciprocal associations were found between depressive symptoms and a general index of the quality of relationship with parents,¹⁵ but not with more specific aspects of family relationship, such as parental support.^{6,16,18}

Here we expand the literature on this issue by examining whether adolescent depressive symptoms relate in the same way to positive and negative dimensions of relationship with parents. Positive and negative dimensions of family relationship have been discussed as qualitatively distinct constructs, rather than opposite ends of a single continuum, and may have different implications for adolescent functioning.⁶ One investigation in a sample of mid-to-late adolescents of wide-ranging ages (14 to 20 years) found both supportive and conflicting aspects of relationship with parents to predict depressive symptoms, but not the reverse.⁶ To our knowledge, no similar investigation exists regarding developmentally specific patterns in early adolescence, at a time when associations between depressive symptoms and relationship difficulties in the family appear to be particularly strong¹⁹ and may be exacerbated by the transition into middle school.³

Independence From Potential Confounders

Compared with the issue of directionality, independence from confounders has received limited attention. However, depressive symptoms and poor family relationships may be correlated without any causal link between the 2. For instance, symptoms and poor relationships may result from an adverse family environment.^{20,21}

In addition, adolescents with depression often have behaviour problems, such as externalizing and substance use,^{22,23} and these problems have also been linked to detrimental cycles involving relationships with parents.^{24,25} As such, behaviour problems could actually account for patterns of reciprocity between depressive symptoms and family relationships. Most studies have failed to rule out the contribution of these potential confounders.

Sex Differences

The interpersonal mechanisms involved in the development of depressive symptoms and disorders may differ between adolescent boys and girls.^{3,26} Girls have been suggested to have a greater interpersonal orientation and higher sensitivity to relational difficulties than boys, as well as to respond to these difficulties using more depressogenic strategies, such as rumination.^{27,28} Further, depressive symptoms have also been suggested to be more damaging for interpersonal relationships in girls than in boys. The interpersonal deficits that often accompany depression (for example, excessive reassurance seeking) may be more prevalent and met with lower acceptance in girls than in boys, causing more impairment in relational patterns over time.²⁸ As such, sex could be a key potential modulator of

the transactions between depressive symptoms and parent-child relationships.

Our Study

This study examined prospective associations between depressive symptoms and 2 aspects of perceived parent-child relationships (positive communication and conflict with parents) during 3 consecutive years of early adolescence. Based on interpersonal and family systems theories of depression,^{12,13} we expected to find reciprocal associations between depressive symptoms and parent-child relationships rather than unidirectional relationship effects or symptoms effects. We tested whether these associations were independent from potential familial and behavioural confounders and explored the existence of sex differences.

Method

Participants

Participants were a cohort of students who took part in the evaluation of the NANS program, a large-scale governmental initiative aimed at preventing student drop out in secondary schools of disadvantaged areas.²⁹ This longitudinal data set includes French-speaking students from low SES secondary schools across the province of Quebec who filled out self-report questionnaires each spring between 2003 and 2005. Our sample included all students from the first NANS program cohort who were living with at least 1 biological parent, who were aged 12 or 13 years in 2003 (Wave 1, Grade 7), and who had available data on the 3 main study constructs ($n = 3862$). The sample was mostly Caucasian (88.8%) and about equally represented by sex (53.9% females). Follow-up information (Waves 2 and 3, 2004 and 2005, respectively) provided by participants was also used. Loss at follow-up on outcome measures was 26% to 27% in Wave 2 and 33% to 34% in Wave 3. Missing data on control variables ranged from 0% to 11.4%. Informed consent was obtained from all study participants, and all data collection procedures were approved by the Institutional Review Board of the Université de Montréal.

Measures

Depressive Symptoms. Depressive symptoms were measured each wave with the CES-D.³⁰ This 20-item scale ($\alpha = 0.90$) assesses how a person felt or behaved in the past week and has been validated for use with adolescents.³¹

Perceived Communication and Conflict With Parents. Perceived positive communication and conflict with parents were measured at each wave using the MASPAQ,³² a self-report questionnaire. The 7-item communication scale ($\alpha = 0.86$) includes items such as, "Do you talk with your parents about your thoughts and feelings?" and "When your parents ask things of you, do they explain why?" (Answers ranged from "never" to "often.") The 3-item conflict scale ($\alpha = 0.75$) includes items such as, "Do you have arguments with your parents?" and "Do you disagree with your parents?" (Answers ranged from "never" to "continuously.")

Potential Confounders. Two types of potential confounders were considered: family context, which was assessed by family structure (0 = intact, 1 = non-intact); and parental SES, which was assessed with the ISEI.³³ Behaviour problems were considered by measures of delinquent behaviours (16-item scale, $\alpha = 0.94$) and substance use (4-item scale, $\alpha = 0.75$) from the MASPAQ.³²

Analytic Strategy. We used path analysis to examine the associations between depressive symptoms and perceived conflict and communication with parents over the first 3 years of high school. We specified a model including stability paths over time for each construct, contemporaneous correlations between the 3 constructs in each grade, and prospective paths over 1 year between depressive symptoms and perceived communication with parents, as well as between depressive symptoms and perceived conflict with parents. Model fit was assessed with the CFI, the TLI, and the RMSEA.³⁴ Models were considered to fit acceptably with values of 0.90 or greater for the CFI and the TLI and lower than 0.08 for the RMSEA.³⁵

Independence from confounders was assessed by re-estimating the model controlling for indicators of family context (family structure and parental SES) and behaviour problems (delinquent behaviours and substance use). We used 2 complementary adjustment strategies, in which behaviour problems were treated respectively as fixed and time-varying covariates. The fixed model was designed to control for initial individual and familial characteristics of participants that could better account for concurrent and subsequent associations between depressive symptoms and family relationships. The time-varying model was designed to consider the possibility that observed family processes involving depressive symptoms may actually result from rival processes involving behaviour problems and family relationships.^{24,25}

Sex differences were evaluated with multiple group analysis. A model in which all paths and correlations were constrained to be equal for the 2 sexes was compared with a series of models in which 1 parameter was left to be freely estimated for boys and girls using chi-square difference tests. This was repeated for all model parameters.

Attrition in the NANS program sample was mostly a result of participants being absent from school on the day when questionnaires were administered and of participants having moved to another school or having dropped out of school.²⁹ As can be seen in online eAppendix A, people who had missing data in Waves 2 and (or) 3 had higher scores than did those who participated in all waves on several risk factors in Wave 1 (including initial depressive symptoms); this indicates that attrition was not completely at random. Missing data were considered as part of maximum likelihood FIML model estimation, which can reduce bias associated with differential attrition.³⁶ We also replicated analyses using listwise deletion of missing data. Estimates were similar in listwise and FIML analyses, suggesting that findings were robust with respect to the treatment of missing data.

Results

Descriptive Statistics

Table 1 presents the means and standard deviations of depressive symptoms, perceived communication with parents, and perceived conflict with parents from Wave 1 to Wave 3, as well as the bivariate correlations between these constructs. Consistent with most studies on adolescent depression,³⁷ girls tended to report higher average depressive symptoms than did boys. Girls also tended to report higher conflict and poorer communication with parents than did boys. The main study constructs were significantly correlated at all time points, with higher 1-year lag correlations than 2-year lag correlations.

Associations Between Depressive Symptoms and Perceived Family Communication and Conflict. We first examined the associations between depressive symptoms and perceived family relationship with parents in the full sample. We specified a model with bidirectional adjacent-year prospective paths between depressive symptoms and perceived communication and between depressive symptoms and conflict with parents; the model was embedded within a structure of stability paths for each construct and cross-sectional correlations between constructs. Figure 1 depicts the results. As can be seen, model fit was acceptable on all indices. All constructs were correlated within each year. The examination of prospective paths shows that depressive symptoms were predictive of both positive and negative aspects of parent-child relationships over time. Indeed, depressive symptoms predicted increases in perceived conflict and decreases in perceived communication with parents from Wave 1 to Wave 2, as well as from Wave 2 to Wave 3. However, only perceived conflict with parents was predictive of subsequent depressive symptoms. This was the case from Wave 1 to Wave 2 and from Wave 2 to Wave 3. Perceived communication with parents did not predict subsequent depressive symptoms at any wave. All prospective associations between constructs were modest and considerably lower than cross-sectional correlations.

Independence From Family Context and Behaviour Problems. Next, we tested whether model paths remained statistically significant when controlling for family context (family structure and family SES) and behaviour problems (delinquent behaviours and substance use). We used 2 different adjustment strategies: 1 with fixed covariates and 1 with time-varying covariates. In the first model, only control subjects in Grade 7 were considered and allowed to predict depressive symptoms, perceived communication, and perceived conflict with parents concurrently. In the second model, delinquent behaviours and substance use were included as time-varying covariates linked to depressive symptoms and perceived family relationships concurrently and prospectively in Waves 1, 2, and 3. The latter strategy was used to account not only for the initial behaviour problems of adolescents, but also for potential rival feedback processes linking behaviour problems and family relationships over time.^{24,25} All significant paths in the overall model remained statistically significant in the 2 adjustment strategies. Details of these models can be found in online eAppendix B.

Sex Differences. Sex differences were examined with multiple group analyses. Results of this examination are shown in parentheses in Figure 1. No sex difference was found in the prospective associations linking depressive symptoms with perceived communication and conflict with parents. However, contemporaneous correlations between constructs were found to be generally higher in girls than in boys. This was the case for the correlation between depressive symptoms and perceived conflict in grades 7 and 8, as well as for the correlation between depressive symptoms and perceived communication in Grade 7. Stability paths for perceived communication and conflict over time also tended to be higher for girls than for boys.

Discussion

In this study, we examined prospective associations between depressive symptoms and perceived communication and conflict with parents during 3 consecutive years in early adolescence. Based on family systems and interpersonal theories of depression,^{1,11} we expected to find reciprocal associations between symptoms and positive and negative aspects of parent–adolescent relationship over time. Despite strong theoretical grounds, current evidence of reciprocity between depressive symptoms and family relationships is modest and inconsistent.^{6,15–18} Previous research suggests that findings may vary depending on how parent–child relationships are measured and which relational aspects or dimensions are specifically considered.

Consistent with our hypothesis, we found depressive symptoms and perceived conflict with parents to predict each other. Conflict may influence the development of depressive symptoms by acting as an interpersonal stressor³⁸ or by causing the internalization of negative self-views and loss of perceived control in relationships.³ Depressive symptoms, conversely, may influence conflict with parents because adolescents with depression tend to have interpersonal patterns that elicit negative reactions from their surroundings, such as excessive reassurance seeking.¹ Over time, a vicious cycle may be established: as adolescents with depression seek more and more interpersonal support to ease their emotional distress, their efforts may paradoxically result in increased relational conflict, which may further contribute to their affective symptoms by confirming the negative cognitions they hold about themselves and others.¹ This mechanism may foster early maintenance and exacerbation of mood disturbances over time.

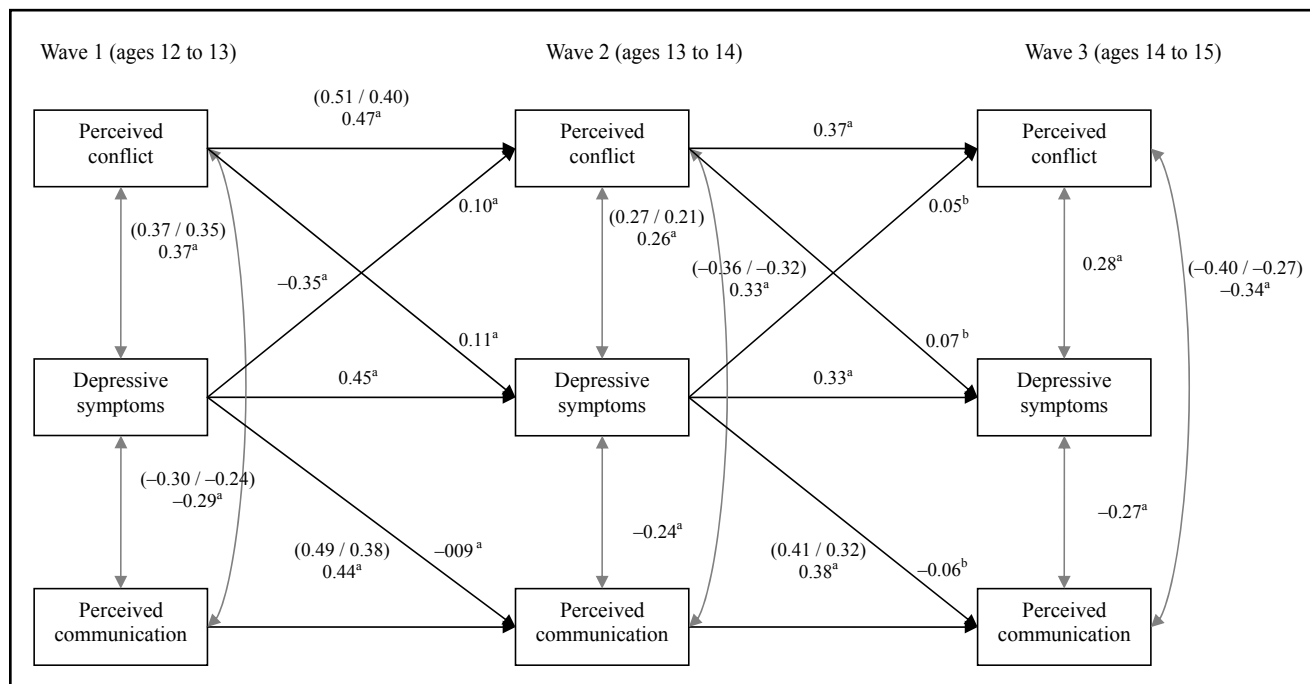
We did not find support for a similar reciprocal model regarding depressive symptoms and positive communication with parents. Depressive symptoms were predictive of poorer communication at every time point, but better communication did not anticipate lower depressive symptoms in subsequent years. The latter result contrasts with those from previous investigations focusing on parental support, another characteristic of positive parent–child relationships.^{6,16} These studies have found parental support to predict lower depressive symptoms over time, but not the reverse prediction from depressive symptoms to lower parental support. The discrepancy between these

Table 1 Correlations, means, and standard deviations for the main study constructs

Variable	1	2	3	4	5	6	7	8	n	Mean	SD
1. Depressive symptoms (Wave 1)									3862	12.65	10.63
2. Depressive symptoms (Wave 2)	0.49								2824	13.40	10.50
3. Depressive symptoms (Wave 3)	0.36	0.44							2559	12.18	10.33
4. Perceived communication with parents (Wave 1)	-0.28	-0.18	-0.16						3862	2.84	0.77
5. Perceived communication with parents (Wave 2)	-0.21	-0.30	-0.20	0.48					2831	3.04	0.72
6. Perceived communication with parents (Wave 3)	-0.17	-0.19	-0.33	0.42	0.50				2559	3.04	0.73
7. Perceived conflict with parents (Wave 1)	0.38	0.30	0.21	-0.35	-0.27	-0.19			3862	1.09	0.62
8. Perceived conflict with parents (Wave 2)	0.28	0.38	0.24	-0.25	-0.42	-0.24	0.52		2836	1.13	0.63
9. Perceived conflict with parents (Wave 3)	0.22	0.24	0.37	-0.18	-0.24	-0.39	0.40	0.49	2589	1.13	0.61

All correlations are statistically significant at $P < 0.001$

Figure 1 Path model describing the overall and sex-specific associations linking depressive symptoms with perceived communication and conflict with parents in the first 3 years of secondary school



^a $P < 0.001$; ^b $P < 0.01$

Model fit: CFI 0.993, TLI 0.981, RMSEA 0.03

Coefficients in parentheses indicate sex differences: boys / girls

Paths not shown: Wave 1 depressive symptoms to Wave 3 depressive symptoms: 0.17^a; Wave 1 conflict to Wave 3 conflict: 0.20^a; Wave 1 communication to Wave 3 communication: 0.22^a

findings and our results could be related to the specific meaning of communication in early adolescence. Indeed, young adolescents normatively move away from their parents and increase their involvement with peers.³⁹ Most will retain a good underlying relationship with their parents, and more distant communication alone may not be associated with the development of emotional problems. Conversely, depressive symptoms appear to contribute to an erosion of positive communication with parents over time. This mechanism may not have direct implications for the development of further depressive symptoms, but may be relevant for other aspects of adjustment, such as school and behavioural functioning.

Importantly, all prospective associations between depressive symptoms and perceived relationship with parents were independent from family context and behaviour problems of adolescents. This suggests that the processes observed in our study do not simply represent an artifact of important confounding contextual or individual difficulties that often accompany youth depressive symptomatology.²⁰⁻²³ Our analysis of potential confounders, including consideration of dynamic rival processes involving time-varying behaviour problems,^{16,24} contributes new knowledge to the literature on the interpersonal processes of adolescent depression. Compared with other areas of developmental psychopathology, studies on this topic often bestow a limited focus on issues of potential confounding.

Consistent with theoretical suggestions,^{3,27,28} the contemporaneous associations between depressive symptoms and perceived relationship with parents tended to be stronger in females than in males. However, all prospective associations between symptoms and communication or conflict were sex-invariant. This suggests that there may be sex differences in terms of how adolescents with more severe depression perceive and report the relationship with their parents, but these perceptual differences may not have implications in the processes linking depressive symptoms and family relationships over time.⁶

Our results are partly consistent with previous research, but partly differ from a closely related study by Sheeber et al.⁶ These authors found evidence of a prediction from less supportive and more conflicting relationship with parents to subsequent depression, but not for the reverse during a 1-year period in a group of older adolescents of wide-ranging age (14 to 20 years). Differences between the 2 studies may be due to age-related specificities in the processes linking depressive symptoms and family relationships. The various changes of early adolescence, such as physical maturation and entry into middle school, may foster a specific risk period regarding the negative impact of child emotional adjustment on family dynamics. Alternatively, equivocal findings may also result from differences in the measurement of depressive symptoms and relationship aspects. Sheeber et al⁶ used multi-informant evaluations of

depression and family relationship variables, whereas our study relied on self-reports alone. The processes captured here are more dependent on the cognitions and perceptions of adolescents with depression regarding their relationships, which tend to be negatively biased.⁴⁰ A direct comparison of similar models tested with measures obtained from different strategies will be necessary to clarify this question.

Our study benefits from a transactional design across multiple time points but also has some limitations. First, no distinction was made between the relationship with the mother and father. The interplay between depressive symptomatology and relationship aspects may not be the same for both parents, especially in situations of split custody. Second, although the sample comprised a large population followed prospectively, this sample was mostly recruited from schools in disadvantaged areas. This makes it difficult to generalize results to all adolescents. Third, missing data in the sample are related to participant characteristics and might have influenced associations. However, model-based treatment of missing data and the similarity of FIML and listwise results support the validity of estimated associations. Fourth, our study did not consider all aspects of emotional or behavioural adjustment that could be linked to family relationships, although we included relevant behaviour problems in addition to depressive symptoms. Similarly, we also did not consider all elements of the parent–adolescent relationship that may contribute to depressive symptoms.

Future studies are needed to replicate these findings with other measurements of depressive symptoms and family relationship aspects. It would also be relevant to investigate the conditions under which the transactions between depressive symptoms and family relationships are exacerbated or attenuated. Potential moderators include other meaningful relationships of early adolescents (for example, friends and teachers) or individual predispositions, such as self-regulation abilities.^{18,41,42} Future studies could also explore the high cross-sectional correlations between depressive symptomatology and family relationships using shorter frame designs, such as daily diary procedures.⁴³

Conclusion

The main implication of our study is to support clinically informed models that consider not only effects of family relationships on depressive symptoms but also the detrimental impact of child symptomatology on parent–child relationships. Our findings also highlight that depressive symptomatology can relate in specific ways to different dimensions of parent–child relationships and perhaps also to different aspects within these dimensions (for example, positive communication, compared with support). Because impaired transactional patterns between teenagers with depression and their parents appear to play an important role in the etiology and maintenance of mood disorders, improvement of these transactions is likely to represent an effective target of prevention and intervention. Intervening jointly with youth and their parents on specific relationship difficulties could be helpful to interrupt circular patterns that challenge adolescent and family emotional health.

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References

1. Joiner TE, Coyne JC, editors. The interactional nature of depression. Washington (DC): American Psychological Association; 1999.
2. Rudolph KD. The interpersonal context of adolescent depression. In: Nolen-Hoeksema S, Hilt LM, editors. Handbook of depression in adolescents. New York (NY): Routledge; 2009. p 377–418.
3. Rudolph KD, Flynn M, Abaied JL. A developmental perspective on interpersonal theories of youth depression. In: Abela JRZ, Hankin BL, editors. Handbook of depression in children and adolescents. New York (NY): The Guilford Press; 2008. p 79–102.
4. Sheeber L, Hops H, Davis B. Family processes in adolescent depression. *Clin Child Fam Psychol Rev.* 2001;4:19–35.
5. Hops H, Lewisohn PM, Roberts RE. Psychological correlates of depressive symptomatology among high school students. *Clin Child Fam Psychol Rev.* 1990;19:211–220.
6. Sheeber L, Hops H, Alpert A, et al. Family support and conflict: prospective relations to adolescent depression. *J Abnorm Child Psychol.* 1997;25:333–344.
7. Gil-Rivas V, Greenberger E, Chen C, et al. Understanding depressed mood in the context of a family-oriented culture. *Adolescence.* 2003;38:93–109.
8. Rueter MA, Scaramella L, Wallace LE, et al. First onset of depressive or anxiety disorders predicted by the longitudinal course of internalizing symptoms and parent–adolescent disagreements. *Arch Gen Psychiatry.* 1999;56:726–732.
9. Marmorstein NR, Iacono WG. Major depression and conduct disorder in youth: associations with parental psychopathology and parent–child conflict. *J Child Psychol Psychiatry.* 2004;45:377–386.
10. Kaslow NJ, Robbins Broth M, Cowles Arnette N, et al. Family-based treatment for adolescent depression. In: Nolen-Hoeksema S, Hilt LM, editors. Handbook of depression in adolescents. New York (NY): Routledge; 2009. p 531–570.
11. Hughes EK, Gullone E. Internalizing symptoms and disorders in families of adolescents: a review of family systems literature. *Clin Psychol Rev.* 2008;28:92–117.
12. Minuchin P. Families and individual development: provocations from the field of family therapy. *Child Dev.* 1985;56:289–302.
13. Coyne JC, Burchill SAL, Stiles WB. An interactional perspective on depression. In: Snyder CR, Forsyth DR, editors. Handbook of social and clinical psychology: the health perspective. Elmsford (NY): Pergamon Press; 1991. p 327–429.
14. Hammen C. Stress generation in depression: reflections on origins, research, and future directions. *J Clin Psychol.* 2006;62:1065–1082.
15. Branje SJ, Hale WW 3rd, Frijns T, et al. Longitudinal associations between perceived parent–child relationship quality and depressive symptoms in adolescence. *J Abnorm Child Psychol.* 2010;38:751–763.
16. Stice E, Ragan J, Randall P. Prospective relations between social support and depression: differential direction of effects for parent and peer support? *J Abnorm Psychol.* 2004;113:155–159.
17. Slavin LA, Rainer KL. Gender differences in emotional support and depressive symptoms among adolescents: a prospective analysis. *Am J Community Psychol.* 1990;18:407–421.
18. Young JF, Berenson K, Cohen P, et al. The role of parent and peer support in predicting adolescent depression: a longitudinal community study. *J Res Adolesc.* 2005;15(4):407–423.
19. Greenberger E, Chen C. Perceived family relationships and depressed mood in early and late adolescence: a comparison of European and Asian Americans. *Dev Psychol.* 1996;32:707–716.
20. Adam EK, Chase-Lansdale PL. Home sweet home(s): parental separations, residential moves, and adjustment problems in low-income adolescent girls. *Dev Psychol.* 2002;38:792–805.

21. Klebanov PK, Brooks-Gunn J, Duncan GJ. Does neighborhood and family poverty affect mothers' parenting, mental health, and social support? *J Marriage Fam.* 1994;56:441–455.
22. Armstrong TD, Costello EJ. Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *J Consult Clinical Psychol.* 2002;70:1224–1239.
23. Wolff JC, Ollendick TH. The comorbidity of conduct problems and depression in childhood and adolescence. *Clin Child Fam Psychol Rev.* 2006;9(3–4):201–220.
24. Patterson GR, DeBaryshe BD, Ramsey E. A developmental perspective on antisocial behaviour. *Am Psychol.* 1989;44:329–335.
25. Stice E, Barrera M. A longitudinal examination of the reciprocal relations between perceived parenting and adolescents' substance use and externalizing behaviours. *Dev Psychol.* 1995;31:322–334.
26. Nolen-Hoeksema S, Girgus JS. The emergence of gender differences in depression during adolescence. *Psychol Bull.* 1994;115:424–443.
27. Shih JH, Eberhart NK, Hammen CL, et al. Differential exposure and reactivity to interpersonal stress predict sex differences in adolescent depression. *J Clin Child Adolesc Psychol.* 2006;35:103–115.
28. Rose AJ, Rudolph KD. A review of sex differences in peer relationship processes: potential trade-offs for the emotional and behavioural development of girls and boys. *Psychol Bull.* 2006;132:98–131.
29. Janosz M, Bélanger J, Dagenais C, et al. *Aller plus loin, ensemble : synthèse du rapport final d'évaluation de la stratégie d'intervention Agir autrement.* Montréal (QC): Montréal Groupe de recherche sur les environnements scolaires, Université de Montréal; 2010.
30. Radloff LS. The CES-D Scale: a self-report depression scale for research in the general population. *Appl Psychol Meas.* 1977;1:385–401.
31. Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *J Youth Adolesc.* 1991;20:149–166.
32. Le Blanc M, McDuff P, Fréchette M. *Manuel sur des mesures de l'adaptation sociale et personnelle pour les adolescents québécois.* Montréal (QC): Université de Montréal, Groupe de recherche sur l'inadaptation psychosociale chez l'enfant; 1994.
33. Ganzeboom HBG, De Graaf PM, Treiman DJ. A standard international socio-economic index of occupational status. *Soc Sci Res.* 1992;21:1–56.
34. Bollen KA. *Structural equations with latent variables.* New York (NY): Wiley; 1989.
35. McDonald RP, Ho MH. Principles and practice in reporting structural equation analyses. *Psychol Methods.* 2002;7:64–82.
36. Graham JW. Missing data analysis: making it work in the real world. *Annu Rev Psychol.* 2009;60:549–576.
37. Essau CA, Chang WC. Epidemiology, comorbidity, and course of adolescent depression. In: Essau CA, editor. *Treatment of adolescent depression: theory and practice.* Oxford (GB): Oxford University Press; 2009.
38. Hammen C. Interpersonal factors in an emerging developmental model of depression. In: Johnson SL, Hayes AM, editors. *Stress, coping, and depression.* Mahwah (NJ): Lawrence Erlbaum Associates, Inc; 2000. p 71–88.
39. Steinberg L, Morris AS. Adolescent development. *Annu Rev Psychol.* 2001;52:83–110.
40. Reinecke MA, Ginsburg GS. Cognitive-behavioural treatment of depression during childhood and adolescence. In: Abela JRZ, Hankin BL, editors. *Handbook of depression in children and adolescents.* New York (NY): The Guilford Press; 2008. p 179–206.
41. Durbin CE, Schafir DM. Emotion and emotion regulation in child and adolescent depression. In: Abela JRZ, Hankin BL, editors. *Handbook of depression in children and adolescents.* New York (NY): The Guilford Press; 2008. p 149–178.
42. Yap MB, Allen NB, Sheeber L. Using an emotion regulation framework to understand the role of temperament and family processes in risk for adolescent depressive disorders. *Clin Child Fam Psychol Rev.* 2007;10:180–196.
43. Bolger N, Davis A, Rafaeli E. Diary methods: capturing life as it is lived. *Annu Rev Psychol.* 2003;54:579–616.