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Early Adolescent Depression Symptoms and School Dropout: Mediating Processes Involving Self-Reported Academic Competence and Achievement

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Research on adolescent well-being has shown that students with depression have an increased risk of facing academic failure, yet few studies have looked at the implications of adolescent depression in the process of school dropout. This study examined mediation processes linking depression symptoms, self-perceived academic competence, and self-reported achievement in 7th grade to dropping out of school in later adolescence. We followed 493 (228 girls and 265 boys) French-speaking adolescents from low-socioeconomic-status secondary schools in Montreal (Quebec, Canada) for 6 years. Almost 34% of participants dropped out of school during this period. Findings indicated that self-reported depression symptoms in 7th grade increased the risk of dropping out of school in later adolescence. Structural equation modeling revealed that the predictive relationship between depression symptoms and school dropout was mediated by self-perceptions of academic competence. Current findings provide support for self-perceptions of competence as mediational processes in the relationship between adolescent depression symptoms and early school leaving.

Keywords: depression, school dropout, academic competence, achievement, mediation process

A troubling number of adolescents showing serious emotional distress and depression symptoms are at risk for school failure and dropout (Quiroga, Janosz, Lyons, & Morin, 2012; Thompson, Moody, & Eggert, 1994; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). Despite this, there is much we do not understand about the role of depression in dropping out of school. School dropout is a complex long-term process involving multiple environmental, psychological, and academic factors (Rumberger, 2011). Depression can contribute to this process in different ways and interfere with adolescent development by impairing social, cognitive, and academic functioning (Kovacs & Goldstone, 1991;

Nolen-Hoeksema, Girgus, & Seligman, 1992). Yet the research examining the educational outcomes of adolescent depression is sparse and has shown inconsistent findings (Fergusson & Woodward, 2002; Vander Stoep, Weiss, McKnight, Beresford, & Cohen, 2002), leaving many unanswered questions about this issue. One particular matter concerns the unraveling of the processes through which depression symptoms in adolescence might become linked to school leaving.

These processes possibly involve the relationship between depression, academic competence, and achievement. Studies have shown that depression symptoms are negatively associated with self-reported academic competence and achievement and that these factors can undermine school success (Birmaher et al., 2004; Hishinuma et al., 2001; Roeser, Eccles, & Sameroff, 2000). Yet the dynamics implicating depression, self-competence, and achievement have not been examined in relation to school dropout. Theoretical models integrating mental health issues and school success suggest that depression in adolescence can compromise schooling through self-regulation processes such as student sense of competence and mastery (Roeser & Eccles, 2000; Rudolph, 2004). Hence, the objective of this research is to test a model examining the relationship between depression and school dropout that includes student self-perceptions of academic competence and self-reported achievement as mediating processes.

Depression and School Dropout

Although cross-sectional studies have shown that depressed youths are more likely to interrupt their schooling (Asarnow et al., 2005; Reinherz, Frost, & Pakiz, 1991), longitudinal research link-

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ing depression to dropout has reported contradictory results. Namely, whereas Vander Stoep et al. (2002) showed that adolescents with depression were less likely to complete school in young adulthood, other studies found no effect of depression after adjusting for risk factors of school dropout (such as family, individual, and social experience; Fergusson & Woodward, 2002; Miech, Caspi, Moffitt, Wright, & Silva, 1999). It remains unclear whether the relationship between depression and dropout reflects the spurious effect of adverse life experiences as suggested by Fergusson and Woodward (2002), or whether depression contributes indirectly to the dropout process. It may be that the effect of depression is actually mediated by other risk factors of school dropout. In that case, it is essential to identify risk factors that link depression and dropout to understand the needs of students struggling with depressive symptoms.

Depression, Self-Reported Academic Competence, and Achievement

One of the key factors linking depression to school dropout might be student self-perception of academic competence. Studies have shown that depression and other internalizing problems are negatively associated with academic competence beliefs (Muris, Schouten, Meesters, & Gijbbers, 2003; Roeser, Strobel, & Quihuis, 2002). These symptoms can lead to the deterioration of student self-perceptions in adolescence (Cole, Martin, Peeke, Seroczynski, & Fier, 1999; Cole, Martin, & Powers, 1997; Roeser et al., 2000). Small but consistent covariations between depression symptoms, lower competence, and achievement have also been reported (Hishinuma et al., 2001; Roeser, Eccles, & Sameroff, 1998). It seems that depressed adolescents have more problematic patterns of academic functioning and achieve inferior grades than other students as reflected by lower grade point average (GPA) and self- and parent-reported academic performance (Aluja & Blanch, 2002; Birmaher et al., 2004; Puig-Antich et al., 1993; Shahar et al., 2006; Wiest, Wong, & Kreil, 1998). Yet, other studies have found no such relation (Fleming et al., 2005; Hamilton, Asarnow, & Tompson, 1997; Nurmi, Onatsu, & Haavisto, 1995). It has been suggested that the relationship between depression and academic achievement may reflect primarily lower self-perceptions of competence rather than actual academic competency levels (Aluja & Blanch, 2002; Roeser et al., 1998). Overall, although it may be unclear whether depression affects student achievement per se, findings highlight that youth facing emotional problems tend to hold more pessimistic self-views about school success.

Despite this evidence, few theoretical models integrating mental health issues and academic experience have been proposed, with the exception of Roeser's (Roeser & Eccles, 2000) and Rudolph's (2004) work. According to these theoretical models, depression can both compromise school success and emerge from academic difficulties. To explain how depression may affect schooling, both models "emphasize self-regulation processes as links between depression and school adjustment" (Rudolph, 2004, p. 36) that include low self-perceptions of academic competence. Roeser argued that feelings of depression can undermine school success by activating related negative motivational beliefs (Roeser & Eccles, 2000). This is important because students who believe in their ability to control school outcomes successfully are more likely to deploy the necessary efforts for achieving their goals, so positive

self-perceptions of academic competence translate into higher expectations of success (Eccles & Wigfield, 2002; Malmberg, Wanner, & Little, 2008; Skinner, 1995; Skinner, Wellborn, & Connell, 1990). Depressed individuals tend however to have more pessimistic views about themselves and future events and of their ability to successfully influence or change their outcomes (Abramson, Metalsky, & Alloy, 1989; Hankin, Abramson, & Siler, 2001). This is particularly problematic, as perceived competence relates directly to specific cognitive and behavioral aspects of student self-regulation. So students with low self-perceived competence also tend to report reduced attention, activity value, monitoring of work time, and task persistence and more achievement-related helpless behavior (Bouffard-Bouchard, Parent, & Larivée, 1991; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Nolen-Hoeksema et al., 1992; Perels, Gürtler, & Schmitz, 2005; Pintrich, Roeser, & De Groot, 1994; Skinner, Furrer, Marchand, & Kindermann, 2008). As a result, negative perceptions of competence lead to decreased engagement in learning activities and underachievement (Bandura, 1993; Fortier, Vallerand, & Guay, 1995; Pajares & Graham, 1999; Shim, Ryan, & Anderson, 2008; B. J. Zimmerman, 2000). In the long run, children and adolescents with lower self-perceived competence and achievement are more likely to drop out of school (Alexander, Entwisle, & Kabbani, 2001; Caprara et al., 2008; Guay, Larose, & Boivin, 2004; Vallerand, Fortier, & Guay, 1997).

Research Objective and Hypothesis

Although research examining outcomes of depression indicates that young people with mental health issues fare poorly in school (Vander Stoep et al., 2002), little is known about the dynamics connecting adolescent depression to school dropout. Theoretical models suggest that depression can interfere with academic experience and lead to dropout through self-perceptions of academic competence and school performance. In this study, we sought to test the mediation linkages proposed. We hypothesized that the relationship between depression symptoms and dropout would be mediated by student self-perceptions of academic competence and self-reported achievement. Further, we anticipated that self-perceived academic competence would influence dropout partly through its association with self-reported achievement.

Method

Participants and Procedure

This study is based on a high-risk longitudinal sample (2000–2006) of French-speaking adolescents living in Montreal (Quebec, Canada; see Morin, Janosz, & Larivée, 2010, for more details). Participants were recruited from two suburban secondary schools ranked by the Ministry of Education of Quebec (MEQ) in the three lowest deciles of socioeconomic status (SES) according to mother's education and parental employment. Many of these students received special education (40%) and had history of grade retention (26%). All the students in seventh grade were invited to take part in the study after obtaining parental consent. Out of 602 students, 496 consented to participate (82.4%). Three students who had not responded to the depression symptoms inventory were withdrawn from the sample. Our final sample included 493 par-

ticipants (228 girls and 265 boys). The average age of participants was 12.54 years ($SD = 0.73$) at the beginning of the study. Most participants came from Caucasian French-speaking families (82%).

The variables used in this study were drawn from data collected when participants were in the seventh grade. Three waves of data collection took place during that school year, in the fall, winter, and spring. Self-reported questionnaires were administered in class with the help of trained research assistants. Some additional information was obtained through the MEQ. We followed this cohort for 6 years to assess student educational enrollment.

Measures

Control variables (parental education, gender, and grade retention) were measured at the beginning of the school year. The predictor variable (depression) was measured in the fall and in spring, and the mediator variables (self-reported academic competence and achievement) were measured at each wave of data collection. For every variable, we calculated the average of the scores gathered at each wave to obtain global measures of participant academic adjustment and well-being in the seventh grade. The outcome (dropout status) was measured up to 6 years later. See Appendix for details of measures.

Outcome variable: School dropout. Secondary education in the province of Quebec spans from the seventh through the 11th grade and is thereby normally completed within 5 years. To determine student dropout status, we followed participants until 1 year beyond expected graduation. This information was obtained through the MEQ’s educational database. The MEQ keeps records of all the students enrolled in public and private schools across the province of Quebec, including those who transferred to a different school, vocational program, or adult education. Although this monitoring system results in some sample bias by labeling students who move out of Quebec as not enrolled, the extent of the bias is limited by low rates of interprovincial mobility across Canada (Bernard, Finnie, & St.-Jean, 2008). We considered students who were continuously enrolled in school or had completed their education and obtained a high school diploma to be nondropouts. Conversely, students who were not enrolled in school a particular year and who had not obtained a diploma were considered dropouts. Overall, 166 students dropped out of school in this study. Among them, 29 dropped out in the 10th grade, 39 dropped out in the 11th grade, and 98 left school without qualification 1 year beyond expected graduation. Although more than a third of dropouts (37%) tried to reenroll during the study, none of them had obtained a diploma by the final follow-up. The dependent variable was coded 0 (nondropout) or 1 (dropout). As shown in Table 1, 33.7% of participants dropped out of school in our sample, and

there were more dropout boys than girls, although this difference reached only marginal statistical significance, $\chi^2 = 3.48(1)$, $p = .07$.

Control variables. To eliminate the effect of potential confounding factors, we controlled for gender, parental education, and grade retention. Participant gender was coded 0 (female) or 1 (male). To assess parental education, we calculated the mean number of years for mother’s education and father’s education reported by participants. Student history of grade retention was measured with the number of retained years in elementary school according to MEQ’s database.

Predictor variable: Depression. Self-reported symptoms of depression were measured with the French version of the Inventory to Diagnose Depression (IDD; M. Zimmerman & Coryell, 1987b), translated by Pariente, Smith, and Guelfi (1989). The 22-item scale can be used to assess depression according to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) criteria, or to evaluate symptoms of depression on a continuous scale. In this study, we used the continuous scale. Each item is graduated in five propositions, rated from 0 to 4, which illustrate increasing severity of symptoms.

This measure of depression presents remarkably stable psychometric qualities across cultures and populations with adolescents and adults (Ackerson, Weigman Dick, Manson, & Baron, 1990; Ruggero, Johnson, & Cuellar, 2004; Sakado, Sato, Uehara, Sato, & Kameda, 1996). Previous studies have shown that the IDD displays good internal consistency, with a Cronbach’s alpha coefficient of .92 and Spearman–Brown coefficient of .90 (M. Zimmerman & Coryell, 1987a). Similarly, we obtained alpha coefficients ranging from .90 to .93 with our sample. The IDD is also correlated to other known measures of depression such as the Beck Depression Inventory (Beck, 1978), with coefficients ranging from .88 to .96 (Haaga, McDermut, & Ahrens, 1993; Rogers, Adler, Bungay, & Wilson, 2005).

Mediator variables. Student self-perceived academic competence was measured with four items on a Likert-type scale adapted in French from Skinner’s (1995) questionnaire. The items reflected student sense of mastery (“Even if I want to, I can’t succeed in school”; “No matter what I do, I don’t get good grades”) and control in the academic domain (“I get good grades when I want to”; “I can do well in school if I want to”). They were ranked on a scale from 1 (*completely disagree*) to 4 (*completely agree*). Self-reported academic achievement was the mean of student-reported school performance in two basic subjects (language arts and mathematics). Self-reported grades in specific subjects, like mathematics and language arts, are considered to reflect actual grades with reasonable accuracy (Kuncel, Credé, & Thomas, 2005).

Analytical Strategy

We tested mediation hypotheses following Baron and Kenny’s (1986) recommendations. According to Baron and Kenny, four conditions are required to establish mediation. There must be a significant relation (a) between the predictor (depression) and the mediator variable (academic competence), (b) between the predictor and the outcome variable (school dropout), and (c) between the mediator and the outcome variable, and (d) the impact of the

Table 1
Distribution of Dropouts and Nondropouts According to Gender

Dropout	Girl		Boy		Total	
	N	%	N	%	N	%
Nondropout	161	70.6	166	62.6	327	66.3
Dropout	67	29.4	99	37.4	166	33.7
Total	228	100	265	100	493	100

predictor on the outcome variable must be altered when controlling for the effect of the mediator.

To support these conditions, first, we tested for correlations to determine the degree of association among variables. Second, we performed a series of simple logistic regressions testing the effect of the predictor and mediator variables on school dropout. Measures were standardized to facilitate the interpretation of coefficients and odds ratios across variables. Odds can thus be interpreted as the expected change in outcome when a variable varies by ± 1 standard deviation and that all other variables are at their sample means.

Third, we tested three models using structural equation modeling (SEM) with weighted least-squares estimation on Mplus 3.13 software (Muthén & Muthén, 2005). The use of SEM allows testing more complex models that include the simultaneous modeling of sequential linkages among variables, testing the strength of direct and indirect effects, and modeling constructs into latent variables. The hypothesized mediation model with paths going from the control variables toward all the predictors and the outcome was initially estimated. Then an alternative model was tested where the path between depression symptoms and academic competence was removed and the direct effect of depression symptoms on school dropout was estimated. Finally, the model with the best fit was estimated as a reduced model with all nonsignificant paths removed. Self-perceived academic competence was modeled as a latent variable with two dimensions measuring student mastery and student control. All other constructs in the model were observed variables. Assessing model fit relies on several indices and commonly used criteria (Hu & Bentler, 1999). Besides the chi-square statistic designed to test how well the model fits the data, we reported the comparative fit index (CFI; Bentler, 1990) and the Tucker–Lewis index (TLI; Tucker & Lewis, 1973) that compare model fit to a more restricted baseline model and require values larger than .95 for good fit. The root-mean-square error of approximation (RMSEA; Steiger, 1990) examining population discrepancy with a recommended cutoff value of .06 was also listed. Standardized coefficients for direct and indirect effects (Bollen, 1989) are reported for the final model.

Results

Correlations Among Study Variables

Descriptive statistics and bivariate correlations among variables are shown in Table 2. Results show that depression scores were

negatively correlated with self-perceived academic competence but not with self-reported academic achievement. As expected, self-reported academic competence and achievement were positively associated.

Prediction of School Dropout

Table 3 presents regression coefficients (B) for simple logistic regression analysis showing the degree of association between predictors and the outcome, standard errors, the Wald test and its significance value, and odds ratios (OR). Findings showed that all the variables under study were significantly related to dropping out of school, with the exception of gender, which was marginally significant. The association between depression ($OR = 1.23$) and dropping out of school indicated that adolescents with higher symptoms of depression were 23% more likely to become school dropouts.

Testing the Hypothesized, Alternative, and Reduced Models With SEM

Results of SEM fit indices are presented in Table 4. The chi-square statistic for the hypothesized mediation model was nonsignificant, indicating that the model fitted the data well, $\chi^2 = 6.72(7)$, $p = .46$. All other fit indices reached the expected criteria values: CFI = 1.00, TLI = 1.00, RMSEA = .00. In comparison, the alternative model demonstrated an overall poor fit, with $\chi^2 = 35.67(6)$, $p = .00$, and fit indices below expected values (CFI = .90, TLI = .68, RMSEA = .10), indicating that removing the path between depression and self-perceived academic competence oversimplified the model. The hypothesized mediation model was thereby selected.

To improve model parsimony, some modifications to the hypothesized model were judged necessary in the light of empirical results. A reduced model removing nonsignificant paths from gender to self-perceived competence, and from grade retention to self-reported achievement, was thus estimated. For theoretical considerations, we kept the statistically marginal significant path going from gender to dropping out (standardized coefficient = .08, $p < .15$). All other paths were significant at $p < .05$. The fit values for the reduced model demonstrated adequate fit to the data, $\chi^2 = 6.66(7)$, $p = .47$. CFI = .99 and TLI = .99 showed that the estimated model fit was very good in comparison to an independent model, whereas RMSEA = .00 indicated that the error of approximation in fitting the model to the population covariance

Table 2
Correlations Among Control Variables, Predictor, and Mediators

Variables	1	2	3	4	5	M	SD	Skewness ^a	Kurtosis ^b	Min	Max
1. Parental education	—					2.16	0.97	0.63	-0.58	1	4
2. Grade retention	-.11*	—				0.26	0.44	1.12	1.25	0	1
3. Depression	-.06	.12**	—			14.02	11.03	-0.74	1.80	0	59.50
4. Academic competence	.11*	-.20***	-.22***	—		3.27	0.52	-0.45	-0.52	1.67	4.00
5. Achievement	.19***	-.18***	-.07	.41***	—	72.66	8.85	0.15	-0.59	52.00	95.00

Note. $n = 493$. Min = minimum; max = maximum.

^a $SE = 0.11$. ^b $SE = 0.22$.

* $p < .05$. ** $p < .01$. *** $p < .000$.

Table 3
Prediction of School Dropout With Simple Logistic Regression

Variable	B	SE	Wald	OR
Parental education	-0.33	0.10	10.97**	0.72
Gender	0.36	0.19	3.48†	1.43
Grade retention	1.45	0.22	44.36***	4.25
Depression	0.21	0.09	5.03*	1.23
Academic competence	-0.45	0.10	21.24***	0.64
Achievement	-0.57	0.11	28.93***	0.57

Note. OR = odds ratio.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .000$.

matrix was small and that the model fit was good (Browne & Cudeck, 1993).

Examining direct effects. The reduced model showed that adolescents exhibiting symptoms of depression reported feeling less competent and in control in the academic domain (standardized coefficient = $-.23$). Self-perceptions of academic competence were in turn positively related to self-reported achievement (standardized coefficient = $.51$) and negatively to dropping out of school (standardized coefficient = $-.20$). Higher self-reported achievement predicted lower risk of dropping out (standardized coefficient = $-.15$). Girls were more likely to feel depressed (standardized coefficient = $-.32$) and to have better grades than boys (standardized coefficient = $-.09$). Grade retention was negatively associated with most predictors: being retained in elementary school led to feeling more depressed (standardized coefficient = $.14$) and less competent (standardized coefficient = $-.22$) at the beginning of secondary school. It also significantly increased the risk of dropping out (standardized coefficient = $.26$).

Testing indirect effects. We hypothesized that the relationship between depression and dropout would be mediated by self-reported academic competence. This hypothesis was confirmed. The results showed an indirect relationship between depression and dropout through self-perceived academic competence (standardized indirect coefficient = $.05$), indicating that the probability of leaving school before completion was 5% higher each time that depression symptoms increased by 1 standard deviation. Furthermore, the relationship between self-perceived academic competence and dropout was partially mediated by self-reported achievement, with an indirect effect of self-perceptions of competence and dropout through self-reported achievement (standardized indirect coefficient = $-.09$). These findings provided additional evidence of the mediating processes that explain the linkage between depression in adolescents and school leaving.

Table 4
Goodness-of-Fit Indices for Structural Equation Models

Model	χ^2	df	p	CFI	TLI	RMSEA	Free parameters
Hypothesized	6.72	7	.458	1.000	1.000	.000	27
Alternative	35.67	6	.000	.898	.677	.100	27
Reduced	9.60	9	.384	.998	.996	.012	24

Note. Good fit is indicated by nonsignificant chi-square, comparative fit index (CFI) $> .95$, Tucker–Lewis index (TLI) $> .95$, root-mean-square error of approximation (RMSEA) $< .10$.

Discussion

Research on adolescent well-being has suggested that students with depression have an increased probability of facing academic failure (Asarnow et al., 2005), yet few studies have looked at the implications of adolescent depression in the process of school dropout prospectively. This study sought to examine mediating processes implicated in the relationship between depression symptoms and academic adjustment at the entry of secondary school and dropping out in later adolescence. Our findings revealed that self-reported depression symptoms in seventh grade predicted school dropout 1 year beyond expected graduation. The relationship between depression and dropping out of school was, however, mediated by self-perceptions of academic competence. This indicates that depression symptoms at the beginning of secondary school are related to higher dropout mainly by being associated with pessimistic views about the likelihood to reach desired school outcomes; student negative self-beliefs are in turn related to lower self-reported academic performance and predict a higher risk of dropping out. These findings emphasize that the connection between early depression and leaving school without qualifications is mostly indirect, as it is accounted for by achievement-related self-perceptions.

Linking Depression Symptoms to School Dropout

Theoretical models seeking to integrate mental health issues and school experience suggest that depression can lead to academic difficulties through self-regulation processes (Roeser & Eccles, 2000; Rudolph, 2004). Our findings support these models. Students who experience depression are also characterized by negative patterns of self-beliefs and have a higher risk of dropping out partly because they tend to doubt their ability to do well in school. They may also be inclined to ruminate on their negative experiences, feeling anxious and guilty about school performance or blaming themselves for failing in school, which could lead to feelings of helplessness (Eccles, Roeser, Vida, Fredricks, & Wigfield, 2006; Nolen-Hoeksema et al., 1992). The ensuing consequences on school perseverance can be considerable. Individuals who have developed more problematic motivational profiles are more likely to experience decreased engagement and performance (Skinner, Zimmer-Gembeck, & Connell, 1998). Self-perceptions of competence may thus be determining in student success, as they are directly associated with elements of academic engagement and performance that may result in emotional and behavioral withdrawal from school and eventually dropout. Including a broader range of motivational variables (task value, etc.) in future studies

would allow elaborating on the processes linking mental health issues and school success.

The connection between depression and negative self-perceptions did not extend to self-reported academic achievement in this study. Although some studies have reported small but statistically significant associations between depression and academic achievement (Hishinuma et al., 2001; Roeser et al., 1998; Wiest et al., 1998), others have found no relationship between these variables (Fleming et al., 2005; Hamilton et al., 1997; Nurmi et al., 1995). Our findings are consistent with the latter research. In addition to lower perceived competence, children and adolescents with withdrawn behavior or depression also tend to have more helpless school behavior (Nolen-Hoeksema et al., 1992; Roeser et al., 2002). These shortcomings may translate into lower performance mainly because they are related to poor academic self-regulation rather than negative affect per se (Roeser et al., 1998). In time, the association between depression and school performance could become more pronounced as adolescents who are persistently depressed undergo a decline in achievement (Marcotte, Lévesque, & Fortin, 2006). This would suggest a possible long-term effect for those who continuously experience depression. Future studies should investigate whether persistence or fluctuations of depressive mood during adolescence would affect differently school adjustment.

Implications for School Dropout Research

This study underscores the need to include mental health issues in explanatory models of school dropout. Theoretical perspectives on school dropout generally encompass academic, social, and emotional factors, at least to some degree, but for the most part these factors are limited to externalizing problems and deviance (Battin-Pearson et al., 2000; Janosz, Le Blanc, Boulerice, & Tremblay, 2000; Newcomb et al., 2002; Rumberger, 2011). The few studies examining depression in middle adolescence (14–16 years) and later education were unable to demonstrate a relation after controlling for risk factors of dropout (Fergusson & Woodward, 2002; Miech et al., 1999). Fergusson and Woodward (2002) concluded that the association between depression and education was explained by exposure to adversity often co-occurring with depression. The current study, however, indicates that depression in adolescence is one of the links that connect indirectly to lower education. It illustrates the critical need to test for potential mediators between psychological variables and academic failure in order to shed light on the mechanisms involved. Neglecting to examine those indirect links could lead to the underestimation of significant relationships implicated in the process of school dropout.

This study has implications for mental health prevention and school dropout prevention. Mental health prevention should consider negative academic self-perceptions in early adolescence as indicative of potentially coexisting depression symptoms. Students with pessimistic academic self-views ought to be screened for depression and offered appropriate care when indicated. Additionally, interventions that target student mental health and negative self-perceptions are likely to improve dropout prevention. Early interventions that aim at enhancing student mental health and sense of mastery could be instrumental in preventing premature school exit, as they are likely to increase academic engagement

(Appleton, Christenson, Kim, & Reschly, 2006; Christenson & Thurlow, 2004).

Limitations

Since this sample was made up mainly of high-risk French-speaking students from low-SES schools in Montreal, caution should be applied when generalizing the results to other groups. Replication with a normative sample would help to extend findings to the general population. Another limitation of the study is that it relied on self-reported measures of depression, academic competence, and achievement. Our results are thus based on individual perceptions of well-being and academic adjustment. Because large-scale standardized testing is not implemented in Quebec schools, we used student reports of achievement in specific subjects (language arts and mathematics), which tend to be more reliable than self-reported GPA (Kuncel et al., 2005), but ideally future studies should examine the effect of actual GPA. Third, the mediation analyses were based on seventh-grade measures of adolescent experience (depression, self-reported academic competence, and achievement), therefore restricting our observations to the beginning of secondary school. Although we accounted for some aspects of earlier school experience, such as history of grade retention, other studies should consider more diverse measures of academic experience and emotional well-being in primary school. Despite these caveats, this study encompasses a number of strengths worth mentioning. It was based on a 6-year prospective design that allowed us to draw conclusions about the long-term consequences of adolescent depression symptoms and academic experience on subsequent educational attainment. Moreover, whereas previous research on depression and dropout relied on observations in middle adolescence (14–16 years; Fergusson & Woodward, 2002; Miech et al., 1999), we investigated outcomes of depression based on information gathered at 12 years of age, thus enabling our understanding of the consequences of early adolescent experience on schooling.

Conclusion

The implications of this study shed light on early mechanisms involved in the process of dropping out. School dropout is a cumulative process influenced by multiple risk factors (Rumberger, 2011). Whereas among individual factors, achievement-related variables have received much attention, emotional factors have been studied unevenly. This study brings attention to adolescent depression symptoms, a risk factor largely overlooked by research in the past, and shows its ties to school dropout mainly through the association with achievement-related beliefs. In a context of school reform in the United States and in Canada, this informs policy and practice about the necessity to improve school-based mental health promotion and services to enhance adolescent well-being and academic success.

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Appendix

Description of the Measures Used in the Study

Variable	Wave	Item	Alpha	Item sample	Scale
School dropout				Status in 10th–11th+ grade according to MEQ	0 (nondropout), 1 (dropout)
Gender	1	1		What is your gender?	0 (girl), 1 (boy)
Parental education	1	2		Which level of education has your mother reached?	1 (<i>secondary education not completed</i>) to 4 (<i>university enrollment</i>)
Grade retention	1			History of retention in elementary school (MEQ)	0 (never retained), 1 (retained)
Academic competence	1–3 ^a	4	.73–.81	No matter what I do, I don’t get good grades. ^b	1 (<i>completely disagree</i>) to 4 (<i>completely agree</i>)
Achievement	1–3 ^a	2		What is your average grade in mathematic?	0%–100%
Depression	1 and 3 ^a	22	.90–.93	(a) I was not sleeping less than normal; (b) I occasionally had slight difficulty sleeping; (c) I clearly didn’t sleep as well as usual; (d) I slept about half my normal amount of time; (e) I slept less than two hours per night.	Symptom count: 0–88

Note. MEQ = Ministry of Education of Quebec.
^a Used the mean score for waves. ^b Inversed item was recoded.

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