Contemporary Educational Psychology 44-45 (2016) 32–40

Contents lists available at ScienceDirect

Contemporary Educational Psychology

journal homepage: www.elsevier.com/locate/cedpsych

Dropping out of high school: The role of parent and teacher self-determination support, reciprocal friendships and academic motivation

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ARTICLE INFO

Article history:
Available online 7 January 2016

Keywords:
Dropping out of high school
Support for basic psychological needs
Reciprocal friendships
Academic motivation

ABSTRACT

The purpose of this study was to examine whether parent and teacher support for basic psychological needs (i.e., autonomy, competence and relatedness), students' reciprocal friendships, and academic motivation assessed in Grade 10 ($N = 624$) could predict dropping out of high school two years later in Grade 12. Results revealed that reciprocal friendships contributed to the prediction of dropping out of high school, above and beyond the effects of academic motivation, or parent and teacher support for basic psychological needs. Although parent support for basic psychological needs appeared to be the most significant predictor of academic motivation and dropping out of high school, results suggested that reciprocal friendships represented an important factor that affect both motivation and persistence. Most specifically, our findings demonstrated that a lack of reciprocal friendships had detrimental effects on these aforementioned processes, whereas having reciprocal friendships lead to favorable outcomes.

1. Introduction

It is well documented that one of the most critical issues facing the educational system in North America is the problem of students who leave school before they graduate from high school with a regular diploma. Dropping out of high school is an important problem that affects thousands of students each year. Statistics Canada's most recent report on the issue revealed that one out of 12 (8.5%) Canadian adults, aged 20 through 24 years, had not completed a high school diploma nor were they attending school in 2009–2010 (Center for Education Statistics, Statistics Canada, 2010). Similarly, in the United States, the status dropout rate for those aged 16 through 24 years was estimated at 7% in 2012 (National Center for Education Statistics, U.S. Department of Education, 2014). Compared with high school graduates, those who do not complete high school have greater chances of unemployment, which can lead to welfare dependency; higher levels of depression and alienation, which can result in physical and mental health problems; and an increased frequency of delinquency, which can lead to criminal activity and incarceration (Sum, Khatiwada, McLaughlin, & Palma, 2009). Clearly, the ramifications related to dropping out of high school are far-reaching and significant, at both the individual and social levels.

The high prevalence of dropping out of high school, as well as its economic and personal costs, has prompted the development of a considerable body of research exploring prevention strategies for dropping out of high school (Chia, Keng, & Ryan, 2015). However, targeted prevention strategies are dependent on the identification of factors that predict dropping out of high school. As a result, the early identification of students who are likely to drop out of high school and monitoring of these students throughout their education represent critical factors.

In response to Canadian legislation that permits dropping out of school at the age of 16, some studies have focused on predicting such behavior starting when students are in grade nine (Alivernini & Lucidi, 2011; French & Conrad, 2001; Vallerand, Fortier, & Guay, 1997). This period of high school is one of significant transition, in which students, for the first time in their academic careers, are able to form intentions of dropping out upon which they can legally act. Vallerand et al. (1997) postulated that it is during this influential stage that students who have developed intentions of dropping out will eventually do so, while the others will go on to acquire their diplomas.

Beyond establishing when prevention programs should be initiated in order to maximize their effectiveness, identifying factors that predict dropping out of high school is another important prerequisite for its prevention. Some studies suggest that factors like students' academic performance (Battin-Pearson et al., 2000), history of absenteeism, and general disengagement (Archambault, Janosz,

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http://dx.doi.org/10.1016/j.cedpsych.2015.12.003
0361-476X/

Fallu, & Pagani, 2009; Janosz, Archambault, Morizot, & Pagani, 2008) from school life represent proximal factors that are closely associated to dropping out of high school. However, other empirical evidence suggests that support from parents and teachers (Alivernini & Lucidi, 2011; Bowers & Sprott, 2012; Fall & Roberts, 2012; Legault, Green-Demers, & Pelletier, 2006), peers acceptance (Chen, Hughes, Liew, & Kwok, 2010; Kindermann, 2007; Kiuru, Aunola, Vuori, & Nurmi, 2007), and academic motivation (Fortier, Vallerand, & Guay, 1995; Hardre & Reeve, 2003; Skinner, Furrer, Marchand, & Kindermann, 2008; Vallerand & Bissonnette, 1992; Vallerand et al., 1997) are important and critical factors that could also predict dropping out of high school. Although factors like academic performance, absenteeism, and disengagement may represent reliable factors to identify students at risk of dropping out of school, we believe that factors such as support for students' basic psychological needs (i.e. autonomy, competence and relatedness; Deci & Ryan, 1985, 2000) from parents and teachers, reciprocal friendships with classmates, and academic motivation are critical because they may not only predict dropping out, but that could also be the reasons why students are absent, have lower grades, and are disengaged. Furthermore, these factors may serve as targeted intervention strategies that are more easily employed.

To our knowledge, no study has examined simultaneously how parent and teacher support for basic psychological needs (i.e. autonomy, competence and relatedness), reciprocal friendships, and academic motivation predict dropping out of high school. Drawing from past literatures on self-determination theory (Deci & Ryan, 1985, 2000; Ryan & Deci, 2009) and the influence of friendships on school engagement (Cillessen & Marks, 2011; Goulet, Cantin, Archambault, & Vitaro, 2015; Kindermann, 2007; Mayeux, Houser, & Dyches, 2011; Parker & Asher, 1993; Parkhurst & Hopmeyer, 1998), in this article, we propose to examine how these two areas of research can be merged to provide a clearer portrait of dropping out of high school.

1.1. Self-determination theory

Self-determination theory (SDT; Deci & Ryan, 1985, 2000) is a conceptual framework that proposes different types of motivation. It also stresses the importance of having three basic psychological needs (i.e. autonomy, competence and relatedness) satisfied in order to achieve optimal personal development and functioning. SDT portrays motivation as a multidimensional construct that suggests that different types of motivation are associated with different reasons underlying behavior (Deci & Ryan, 1985, 2000). It is theorized that the type of motivation is more important than the total amount of motivation in predicting outcomes (Deci & Ryan, 2008). SDT suggests that motivation varies along a continuum of self-determination. When motivation is more self-determined, behavior is carried out with a full sense of autonomy and choice. In contrast, when motivation is less self-determined, behavior is carried out under external constraints in order to attain specific outcomes (Deci & Ryan, 1985, 2000). Several studies have supported the validity of this continuum in education and a variety of other life domains (see Vallerand, 1997, for a review of these studies).

Intrinsic motivation represents the highest level of self-determination. When individuals are intrinsically motivated, they engage in behavior for the pleasure and satisfaction that they inherently experience with participation (Deci & Ryan, 1985). For example, a student who is intrinsically motivated will go to school for the enjoyment of learning new things. Conversely, when people are extrinsically motivated they perform an activity as a means to some other end (Deci & Ryan, 1985, 2000). Deci and Ryan proposed different forms of extrinsic regulatory styles that represent different levels of self-determination. From lowest to highest self-determination, the regulatory styles are: external regulation, introjected regulation, and identified regulation (Deci & Ryan, 1985, 2000). Behavior that is *externally regulated* is controlled by an outside source. For example, students who go to school because their parents or the law force them to, demonstrate behavior that is externally regulated. *Introjected regulation* occurs when the formerly external source of motivation is partially internalized, but has not yet been fully accepted by the individual. Students demonstrate this type of regulation when they go to school to avoid the guilt associated with dropping out. *Identified regulation*, a higher form of self-determined extrinsic motivation, occurs when an activity has been judged to have personal value and importance. Students who go to school because they want to pursue a career that requires an education demonstrate identified regulation.

Amotivation occurs when participation is perceived as not having any impact on the desired result. This regulatory style is consistent with the concept of learned helplessness (Abramson, Seligman, & Teasdale, 1978), and is displayed when students do not know why they are going to school. Amotivated students see no point in their attendance, or they are not able to foresee the consequences of their behavior. They have a pervasive sense that their behaviors are caused by external forces beyond their control. When students are amotivated, they experience feelings of incompetence and lack of control (Deci & Ryan, 1985). These amotivated students once had good reasons for going to school, but now wonder whether they should continue with their education.

1.1.1. Basic psychological needs

SDT posits that individuals take an active role in their own lives and in the fulfillment of three innate psychological needs: the need for autonomy, competence, and relatedness. Although human development is naturally inclined toward more autonomy, behaviors must be nurtured by experiences of autonomy, competence, and relatedness. The concept of needs as proposed in SDT refers to the innate psychological drives that must be fulfilled in order to promote growth, integrity, and personal well-being (Ryan & Deci, 2000). The need for *autonomy* refers to the experience of psychological freedom and volition; to being the source of one's own behavior (deCharms, 1968; Deci & Ryan, 1985). The need for *competence* refers to the experience of effectance and a sense of confidence in one's interaction with the physical and social environment (Deci & Ryan, 2002). Finally, the need for *relatedness* refers to the experience of reciprocal care and feeling connected to others; to having a sense of belongingness with others and with one's community (Deci & Ryan, 2002).

People grow and flourish in environments that facilitate the satisfaction of the three basic psychological needs. Environment that satisfy these needs favor internalization and healthy psychological functioning, whereas thwarting of these needs leads to negative consequences. More specifically, autonomy supportive (as oppose to controlling) contexts support autonomy, well-structured (as opposed to unorganized and chaotic) contexts favor competence, and caring and responsive (as opposed to distant and neglectful) contexts facilitate relatedness (Deci & Ryan, 2002; Vansteenkiste, Niemiec, & Soenens, 2010). In sum, when basic psychological needs are less satisfied (or when they are thwarted), behaviors are more likely to be carried out for non-self-determined reasons (i.e. controlled regulation), whereas when the needs are satisfied, behaviors will be carried out for self-determined reasons (i.e. autonomous regulation). Behaviors that are engaged in autonomously are associated with better functioning and persistence, while controlled behaviors often lead to self-regulation problems and failures. According to SDT, motivation plays a mediating role amid the satisfaction of basic psychological needs and the behavior or outcome that will result from it (Deci & Ryan, 1985, 2002). Thus, from an applied perspective, students who are provided with an environment that foster the satisfaction of the three basic psychological needs should theoretically increase their academic motivation. In turn, this should lead to academic persistence over time.

1.1.2. SDT and dropping out of school

The first study to examine dropping out of school from a motivational prospective was conducted in 1992 by Vallerand and Bissonette. This prospective study looked at the academic motivation and persistence of 1042 college students enrolled in a compulsory French course. Academic motivation was measured in September and behavioral persistence (i.e. successful completion of the course) was evaluated five months later in January. Results revealed that students who persisted in the course had previously reported higher levels of self-determined regulation (intrinsic and identified regulation) and lower levels of non-self-determined regulation (external and amotivated regulation) than students who had dropped out. The significance of this study was in showing that experimental findings on motivation could be generalized into real-life academic settings and that SDT could be used to predict academic persistence. However, the results were limited by the relatively short predictive time frame and the cross-sectional design, as opposed to a longitudinal design and by the fact that the study focused on the persistence in a single course.

To improve on these limitations, Vallerand et al. (1997) conducted a second study that once again applied SDT to academic persistence. In this study, a motivational model of dropping out of school was tested with 4537 participants, in grades 9 and 10, in a 1-year prospective design. Results revealed that the students who perceived their teachers, parents and school administration as less autonomy supportive, reported lower levels of self-determined motivation. In turn, low levels of self-determined motivation significantly predicted students' intentions to drop out, which predicted dropping out of school one year later. Although this study was the first of its kind to show the contribution of SDT in predicting dropping out of school, its results were limited by the fact that students were only followed for one year.

In sum, the research presented above provides support for the effects of teachers and parents autonomy supportive behaviors on students' self-determined motivation and the role of self-determined motivation in the prediction of students' school engagement and persistence. However, this research has examined exclusively the role played by teachers and parents in the support of one need, the need for autonomy. Furthermore, it did not examine the role that friends could play in the prediction of students' motivation and persistence in school.

1.2. Influence of friendships, parents and teachers on school engagement and persistence

There is a vast empirical literature examining the influence of reciprocal friendships with classmates on school adjustment and engagement (Buhs, Ladd, & Herald, 2006; Chen et al., 2010; Goulet et al., 2015; Kindermann, 2007; Kiuru et al., 2007; Parker & Asher, 1987, 1993). Indeed, a considerable amount of research has shown that a lack of reciprocal friendships with classmates results in school adjustment difficulties (Buhs et al., 2006; Ladd, 1990, 2003; Parker & Asher, 1987, 1993). Significant differences in behavioral, cognitive and social skills have been demonstrated between students who have reciprocal friendships and those without reciprocal friendships (Kindermann, 2007; Parker & Asher, 1993; Parker & Seal, 1996).

Some studies have also examined the combined effects that parents, teachers, and relationships with classmates have on a student's academic motivation and persistence in school (Flook, Repetti, & Ullman, 2005; Furrer & Skinner, 2003; Guay, Boivin, & Hodges, 1999; Ryan, Stiller, & Lynch, 1994). Within this area of research, studies have found that a student's relationships to parents and teachers can significantly predict their academic motivation and educational outcomes (i.e. school adjustment, persistence, performance, etc.). The findings on the effects of classmate relationships on academic motivation and persistence in school are, nonetheless, unclear, as past research has produced mixed results.

Ryan et al. (1994) examined the impact of student's relationships to parents, teachers, and classmates as predictors of academic motivation and self-esteem. Areas of specific interest were students' feelings of security, as well as emotional and school utilization (i.e. utilization of others in respect to school problems). Findings indicated that students' relationships to parents and teachers were significantly and positively interrelated to students' motivation and school adjustment, while relationships to classmates were not. As well, it is noteworthy that students who indicated that they emulated parents and teachers showed more positive school adjustment, motivation, and self-esteem in comparison to students who emulated classmates. In a study examining students' relationships to parents, teachers, and classmates as potential factors that could predict academic engagement and performance, Furrer and Skinner (2003) found that when students had quality relationships with parents and teachers, classmate relationships did not significantly impact academic engagement and performance. However, it is worth mentioning that students' emotional experience in the classroom was affected by low peer acceptance. Flook et al. (2005) found opposing results when looking at the classmate variable in isolation. Their study looked at the longitudinal effects of classroom social experiences as predictors of academic performance in 677 fourth grade students. Flook and colleagues used teacher reports, student self-reports, and report card grades for math and reading in order to measure students' peer acceptance and academic performance. Their results indicated that there was a significant association between peer acceptance and academic performance. In addition, they found that low peer acceptance was negatively associated with academic performance, self-concept, and mental health. Similarly, a study by Guay et al. (1999) which examined whether the quality of students' relationships with classmates affects students' perceptions of academic competence showed that low peer acceptance hampered students' academic achievement.

1.3. Objectives and hypotheses

Previous research has shown that the influence of reciprocal friendships yields different outcomes when examined in isolation than when it is combined with the influence of parents and teachers. In the present study, the reciprocal friendships variable was isolated from the parents and teachers variables in order to examine whether reciprocal friendships represented a significant predictor of students' academic motivation and persistence in school, beyond the joint influence of parents and teachers. Therefore, the purpose of this study was to examine the complimentary roles of parent and teacher support for basic psychological needs, and reciprocal friendships in the prediction of academic motivation and dropping out of high school. The first hypothesis pertained to the prediction of academic motivation. Past research on SDT suggests that parent and teacher support for basic psychological needs are of primary importance in the prediction of academic motivation. Therefore, it was hypothesized that reciprocal friendship would be a significant predictor of academic motivation, but not as strong of a predictor as parent and teacher basic psychological needs support. The second hypothesis pertained to the prediction of dropping out of high school. We examined whether reciprocal friendships contributed to the prediction of dropping out directly, beyond what can be explained by academic motivation and parent and teacher basic psychological needs support. It was hypothesized that reciprocal friendships would be a significant predictor of dropping out above and beyond the role played by parents and teachers support for basic psychological needs.

2. Method

2.1. Participants and procedure

A total of 624 students of the possible total 657 students registered (95%) in nine different French-speaking schools from a Canadian school district were initially tested in grade 10, and their files were re-evaluated two years later with regards to their academic status. Mean age of students was 15 years. The sample consisted of 308 females, 308 males, and 8 students who did not declare their gender. A number of students had one or both of their parents who at least completed a college degree (29% of fathers and 35% of mothers), and 69% of the students were living with both parents.

With consent from both the school district office and parents obtained prior to testing, students were invited to complete the questionnaire via the schools' intranet system during a class period. Students were assured that the testing was not an academic evaluation, would not influence their grades, that the information would remain confidential and that there were no right or wrong answers. The questionnaire took approximately 45 minutes to complete, and students answered the questions individually. Two years after the data collection, a representative of the school district office informed us of the students who obtained their high school diploma and those who had not. Thus, in agreement with the criteria used by the school district, students were considered as having dropped out of school if they did not complete their high school degree without any interruptions.

2.2. Measures

2.2.1. Support for basic psychological needs by parents and teachers

A short version of the Interpersonal Behavior Questionnaire (IBQ; Otis & Pelletier, 2005) was used to measure students' perceived support for basic psychological needs by their parents and teachers. Based on SDT, the original scale was designed to measure the extent to which participants perceived various members of their social network (e.g. best friend, employer, parents, romantic partner, etc.) to be supportive of their basic needs for autonomy, competence, and relatedness. For the purpose of this study, the items only pertained to students' perceptions of the support received from their parents and teachers. Sample items with Cronbach's alpha reliability coefficients in parentheses are as follows: Autonomy support – My parents/teachers encourage me to be myself (items for parents $\alpha = 0.63$, items for teachers $\alpha = 0.62$); Competence support – The feedback I receive from my parents/teachers makes me doubt my abilities (inverse coding – items for parents $\alpha = 0.73$, items for teachers $\alpha = 0.73$); Relatedness support – My parents/teachers seem to really be interested in what I do (items for parents $\alpha = 0.67$, items for teachers $\alpha = 0.69$). Responses ranged from 1 (never) to 5 (always). Items were computed in order to create two separate composite measures: one for parent support for basic psychological needs (12 items, $\alpha = .79$), and another for teacher support for basic psychological needs (12 items, $\alpha = .75$).

2.2.2. Reciprocal friendships

Students' reciprocal friendships were identified using a sociometric nomination procedure (Cillessen & Marks, 2011; Mayeux et al., 2011; Parker & Asher, 1993; Parkhurst & Hopmeyer, 1998). Students were asked to write the full name of three students in their grade level whom they considered their "best friends." This procedure permitted us to identify students who did and did not have reciprocal friendships among their classmates. Students were considered to have reciprocal friendships if at least one of the classmates they named in turn named them as one of his/her best friend ($n = 527$ versus $n = 97$ whom did not have a reciprocal friendship). This dichotomous variable was coded as follow: –1 = no reciprocal friendship, 1 = reciprocal friendships[1].

2.2.3. Academic motivation

The French version of the Academic Motivation Scale for High School (Grouzet, Otis, & Pelletier, 2006; Otis, Grouzet, & Pelletier, 2005; Vallerand & Bissonnette, 1992; Vallerand, Blais, Brière, & Pelletier, 1989; Vallerand et al., 1992, 1993) was used to measure students' motivational orientation toward academic activities. This scale comprises 20 items ranked on a five-point Likert scale in which four items represent each of the five SDT motivational types. The items offer various answers to the question, "Why do you go to school?". Students were asked to rank their responses from 1 (does not correspond at all) to 5 (corresponds exactly).

Past research has demonstrated the validity and reliability of this scale, including its invariance in measurement across gender and grade level (Grouzet et al., 2006; Otis et al., 2005; Otis & Pelletier, 2005; Vallerand et al., 1993). Sample items are as follows: intrinsic motivation – "Because I experience pleasure and satisfaction while learning new things"; identified regulation – "Because I think that my studies will help me better prepare for the career I have chosen"; introjected regulation – "To show myself that I am an intelligent person"; External regulation – "To have a better salary later on"; and amotivation – "I can't see why I go to school and frankly I could not care less."

Students' responses were used to create a global score of academic motivation called the Self-Determination Index (SDI). The SDI weights the measures of the five regulatory styles according to the following formula: SDI = 2*IM + IDEN – (INTRO + ER)/2 – 2*AMO. Scores theoretically range from –12, representing low motivation, to +12, representing high motivation. In past research (Blais, Sabourin, Boucher, & Vallerand, 1990; Fortier et al., 1995; Grolnick & Ryan, 1987; Vallerand & Bissonnette, 1992), the SDI was found to be a valid and reliable measure of motivation, and it is commonly used in research (Blanchard, Pelletier, Otis, & Sharp, 2004; Green-Demers, Pelletier, & Menard, 1997). Cronbach's alpha for the combined items forming the self-determination index in this sample was .83.

2.2.4. Academic status

Two years after the data collection, the school board informed us of which students had obtained their high school diploma and which students did not. The school board contacted students who did not graduate to ensure that they were not attending high school elsewhere and that they had indeed dropped out. This information was used to classify students who graduated ($n = 536$), and students who dropped out ($n = 88$). As mentioned earlier, for the purpose of this study, students were considered to have dropped out of high school if they did not complete their high school degree without any interruptions (not including a sickness or a death in the family). This dichotomous variable was coded as follows: –1 = students who graduated, 1 = students who dropped out.

3. Results

3.1. Preliminary analyses

Preliminary analyses consisted of a set of screening procedures designed to ensure that the assumptions for multiple linear regressions and logistic regressions were met (Tabachnick & Fidell,

[1] It is noteworthy that studies taken place in schools are conducted under specific conditions determined by the school district and each of the schools involved. The measure of reciprocal friendships used in this study represented a simple strategy which permitted us to meet the study objectives, and which was judged as acceptable by each of the school principals and the school district.

Table 1
Descriptive statistics and correlation matrix.

	M	*SD*	Skewness	Kurtosis	2	3
1. Academic motivation	3.79	2.94	–.94	.98	.37**	.40**
2. Parent support for basic psychological needs	3.67	.66	–.67	.28		.27**
3. Teacher support for basic psychological needs	3.13	.59	–.21	.35		

* $p < .05$, ** $p < .01$.

2001). Therefore, prior to analyses, the data were examined for missing and outlying values, as well as distribution normality, linearity, homogeneity of variance, and homogeneity of regression. The percentage of missing data was less than 5% and a missing values analysis confirmed that it was missing at random. Using a Malhanobis distance criterion of $p < .001$, no outliers were identified among the cases. Multicollinearity and singularity were also inspected. Values of skewness and kurtosis were considered satisfactory as they were all below |2|. Examination of the means and standard deviations of the continuous variables revealed that their values were plausible, falling within the expected theoretical range. Lastly, zero-order Pearson correlations were computed in order to examine the relations among the variables of interest. All the variables correlated with one another significantly and in the expected direction. Descriptive statistics and correlation coefficients are presented in Table 1.

3.2. Predictors of academic motivation

We first examined whether reciprocal friendships was a significant predictor of academic motivation, above and beyond support for basic psychological needs from parents and teachers. A hierarchical linear regression analysis was performed in which (a) parent and (b) teacher basic psychological needs support were first entered, adjusted $R^2 = .23$, $F(2, 620) = 96.19$, $p < .001$, and (c) reciprocal friendships was added in a second step, adjusted $R^2 = .24$, $F(3, 619) = 65.82$, $p < .001$.

There was a significant change in explained variance when considering reciprocal friendships in addition to parent and teacher support for basic psychological needs ($p < .05$), showing that reciprocal friendships contributed something more to the variance in academic motivation than can be explained by parent and teacher support for basic psychological needs. However, it is noteworthy that parent support for basic psychological needs and teacher support for basic psychological needs remained highly significant even after reciprocal friendships was entered in the equation; only a very minor decrease in the beta weight was observed for each of the two predictors. Overall, the results showed that parent support for basic psychological needs, teacher support for basic psychological needs, and reciprocal friendships are all significant positive predictors of academic motivation; however parent support for basic psychological needs and teacher support for basic psychological needs remain the stronger predictors. The beta weights, *t*-statistics, *p*-values, and R^2 change value are presented in Table 2.

Table 2
Predictors of academic motivation.

Steps	Predictors	β	*t*	*p*	ΔR^2
1	Parent support for basic psychological needs	.28	7.71	.001	—
	Teacher support for basic psychological needs	.33	9.01	.001	
2	Parent support for basic psychological needs	.27	7.47	.001	.01*
	Teacher support for basic psychological needs	.32	8.89	.001	
	Reciprocal friendships	.07	2.03	.043	

* $p < .05$, ** $p < .001$.

3.3. Predictors of dropping out of high school

We then examined whether reciprocal friendships contributed to the prediction of dropping out of high school, above and beyond what can be explained by SDT constructs (i.e. academic motivation, parent support for basic psychological needs, and teacher support for basic psychological needs). A hierarchical logistic regression analysis was performed in which academic motivation, parent basic psychological needs support, and teacher basic psychological needs support were entered in the first block of the equation. Examination of the Chi-square value and log-likelihood value for this first block suggested that this first model was statistically reliable and had a good fit, $\chi^2_{(3)} = 30.87$, $p < .001$, $log = 472.92$. Academic motivation and teacher basic psychological needs support failed to be significant predictors of dropping out, while parent basic psychological needs support was found to be a highly significant negative predictor of that outcome, that is that the more parents were perceived to offer support for basic needs, the less students dropped out of high school.

Reciprocal friendships predictor was then entered in the second block of the equation. Examination of the Chi-square value and log-likelihood value revealed that the overall model was statistically reliable and fit the data well, $\chi^2_{(4)} = 47.29$, $p < .001$, $log = 456.50$. Reciprocal friendships was found to be a significant negative predictor of dropping out, while parent support for basic psychological needs remained a highly significant negative predictor. Academic motivation and teacher support for basic psychological needs failed to significantly contribute to the overall prediction of dropping out, but their associations with the outcome followed the expected direction as they were both negatively related to dropping out of high school. The results from this hierarchical logistic regression analysis suggested that reciprocal friendships contributes to the prediction of dropping out, beyond what can be explained by SDT constructs. However, our analysis revealed that parent support for basic psychological needs plays an essential role in the prediction of dropping out of high school. Table 3 shows regression coefficients, Wald statistics, odds ratios, *p*-values, and 95% confidence intervals for odds ratio.[2,3]

4. Discussion

4.1. Summary of findings

The objective of the present study was to examine the simultaneous roles of parents and teacher support for basic psychological needs, and reciprocal friendships in the prediction of academic motivation and dropping out of high school. We tested the first hypothesis pertaining to the prediction of academic motivation. Results revealed that reciprocal friendships contributed to the prediction of academic motivation beyond what can be explained by parent support for basic psychological needs and teacher support

[2] Another set of regression analyses were performed in which an interaction term for reciprocal friendships and parent support for basic psychological needs and an interaction term for reciprocal friendships and teacher support for basic psychological needs were entered in the equation as a third step in order to examine whether parent and teacher support for basic psychological needs could be used to moderate the effect of reciprocal friendships on academic motivation and dropping out of school. These effects failed to be significant and to reduce the effect of reciprocal friendships on both academic motivation and dropping out of high school.

[3] The analyses were also performed while controlling for students' standardized test scores in French language competency, reading comprehension, and mathematical problem solving. Analyses using these covariables provided findings that were not significantly different from the global findings presented in this section. Statistical power was not sufficient for the analyses to be conducted separately for males and females due to a small overall sample of students without reciprocal friendships.

Table 3
Predictors of dropping out of high school.

Steps	Predictors					95% confidence intervals for odds ratio	
		B	Wald test (z-ratio)	Odds ratio	*p*	Lower	Upper
1	Academic motivation	–.06	1.97	.94	.161	.87	1.02
	Parent support for basic psychological needs	–.80	19.59	.45	.001	.32	.64
	Teacher support for basic psychological needs	–.01	.01	1.01	.984	.65	1.56
2	Academic motivation	–.05	1.05	.96	.307	.88	1.04
	Parent support for basic psychological needs	–.75	16.41	.47	.001	.33	.68
	Teacher support for basic psychological needs	–.03	.02	1.03	.896	.66	1.61
	Reciprocal friendships	–1.15	17.66	.32	.001	.19	.54

for basic psychological needs, which were also significant positive predictors. This result is in accordance with findings from prior studies (Flook et al., 2005; Guay et al., 1999), which showed that peer acceptance was significantly associated with academic performance. Furthermore, in support of past research on SDT and findings by Furrer and Skinner (2003), our analysis showed that parent support for basic psychological needs and teacher support for basic psychological needs were the strongest predictors of academic motivation. What transpired overall is that reciprocal friendships have undoubtedly an important role to play in the prediction of academic motivation but, in further support of SDT and our hypothesis, support for basic psychological needs by parents and teachers represent the most considerable influences of students' school motivation.

Our second hypothesis pertained to the prediction of dropping out of high school. Results revealed that while academic motivation and teacher support for basic psychological needs failed to be significant predictors of dropping out, reciprocal friendships and parent support for basic psychological needs were highly significant negative predictors of this outcome. Overall, findings supported our hypothesis in showing that reciprocal friendships contribute to the prediction of dropping out, beyond what can be explained by SDT constructs. However, in support of past SDT research, parent support for basic psychological needs plays the most essential role in the prediction of students' likelihood of dropping out of high school.

4.2. Theoretical implications

A primary theoretical contribution of the present study is integrating the views of complementary literatures (i.e. SDT and the influence of friends on school engagement) in order to address the proposed research questions and offer support to both areas of research. On the one hand, results revealing that reciprocal friendships significantly predicted dropping out of high school, which solidifies the argument that friends do play an important role in students' long-term engagement in school. On the other hand, our findings provided support for propositions from SDT in showing that support for the three basic psychological needs by all three figures of influence (i.e. parents, teachers, and friends) and self-determined motivation are important components in sustaining academic motivation. In sum, our assessment suggests that the two areas of research contributed differently to the quality of students experience in school.

Findings from this study also raise some interesting theoretical and methodological questions. One important point that needs to be mentioned is that our results failed to support previous studies that showed that academic self-determined motivation was a significant predictor of dropping out of high school (Vallerand & Bissonnette, 1992; Vallerand et al., 1997). It is possible that some unknown participants' characteristics, or differences between this study and previous studies in the assessment of long-term persistence or the ways to identify student attrition, could explain the differences between our results and the ones observed by past studies. It is also possible that previous studies overstated the role of academic motivation in the long-term prediction of dropping out of high school and undervalued the contribution of other factors, such as reciprocal friendships and parent support for basic psychological needs, which were found to be highly significant predictors of dropping out of school in our investigation. The nonsignificant effect of teacher support for basic psychological needs on the prediction of dropping out of high school also needs to be addressed. Considering the role that teachers play in students' academic experience, one may be surprised with the present finding. However, this finding is in accordance with previous research which has shown that since teachers change from year to year, in contrast to parents and reciprocal friendships with classmates whom remain more stable influences in a student's life, teachers' impact on students' academic success may not be as important over a period that is longer than the school year (Grolnick, 2009; Grolnick, Kurowski, Dunlap, & Hevey, 2000). Our study also provided clear evidence of the effect of having reciprocal friendships on the satisfaction of basic psychological needs and self-determined motivation.

4.3. Practical applications

The use of a longitudinal design represents a noteworthy practical application of the present study. This study also holds the significant strength of having been conducted in a real-life setting and population. It is notable to mention that close to 100% of the students in grade 10 within the schools, we targeted participated in our investigation. Our study adds to the existing body of literature which examined the long-term effects of the influence of having reciprocal friendships on students' behaviors and adjustment in school (Buhs et al., 2006; Goulet et al., 2015; Ladd, 1990, 2003; Ladd, Herald-Brown, & Reiser, 2008; Parker & Asher, 1987, 1993); thus contributing to this important area of research. Furthermore, this study contributed to the investigation of some of the factors involved in the early prediction of high school functioning and the role of these factors in predicting dropping out of high school in the long term. Our results suggested that interventions should aim at increasing students' academic motivation via the support of their basic psychological needs. Most importantly, our findings shed light on the key role played by all three influential figures (i.e. parents, teachers, and friends) in students' school adjustment.

Another major contribution is showing that not having reciprocal friendships with classmates in the 10th grade was significant enough to have a detrimental effect on students' school motivation and also that it could significantly predict a higher incidence of dropping out of school two years later. Based on our findings, it

is possible to argue that students who lack reciprocal friendships can be motivated to go to school, but the fact that their school environment does not provide them with this much needed sense of belongingness, they may not want to go to school and therefore end up dropping out. In other words, our results suggest that there could be a difference between being motivated to go to school and not wanting to be in school because you feel you don't belong.

How, then, could we encourage friendships among classmates? Recent studies suggest several strategies to facilitate the development of friendships among children. Feldman, Bamberger, and Kanat-Maymon (2013) have found that parents that teach social skills to their children (e.g., how to be an active listener, to make conversation, to trade information about what you like and dislike) have kids that have less trouble making friends. Some studies suggest that steering kids away from competitive games and leading them toward cooperative games creates less disruptive behaviors among unpopular kids and greater tolerance among popular kids (Gelb & Jacobson, 1988). Finally, coaching children on how to cope with tricky social situations by showing them how to do something relevant by observing what others are doing before trying to join, or by not being critical or trying to change a game, facilitate the integration of children into new groups (Finnie & Russell, 1998).

Perhaps most importantly, it is crucial to consider the role that schools play in encouraging parents and teachers to engage with and be more supportive of students that have difficulties forming relationships with their classmates. More specifically, when trying to increase their participation, schools need to pay careful attention to the rational provided to parents (Bouchard, Lee, Asgary, & Pelletier, 2007; Grolnick, 2009, 2015) and teachers (Pelletier & Rocchi, 2015; Pelletier & Sharp, 2009) for why they should get involve. Strategies used to increase parents and teachers' engagement that involve pressure and coercion may in turn result in lower levels of support for basic psychological needs and self-determined motivation in students. When parents and teachers' involvement is due to more external and introjected reasons (e.g. guilt), they may perceive the experience negatively, resulting in a less positive experience for the students as well. In order to encourage parents and teachers to be more supportive of students, schools need to emphasize how important their involvement is to students' school engagement and achievement. Furthermore, schools may improve parents and teachers' participation by asking for their input regarding activities that could foster the development of better relationships and friendships among students. Efforts to coerce parents and teachers to participate in activities involving children may have adverse effects by creating more non-self-determined motivation in parents and teachers, which is likely to result in them becoming more controlling toward students and adhering to the minimal commitment required to foster sustained engagement over time. Therefore, these efforts are unlikely to help students develop friendships and a sense of belongingness in school.

4.4. Limitations and suggestions for future research

Despite providing additional insight on the influence of friendships on school engagement, as well as the applications of SDT, this study has some noteworthy limitations. To begin with, there are a few methodological limitations that should be considered. This study was conducted in a population of junior high school students from the same school board. As our sample of students represents a specific sample with specific characteristics and thus not fully representative of the general population of students from other school boards, studies should be conducted on other types of samples in order to further validate the generalizability of the findings obtained from this sample of students. Nevertheless, considering that peer rejection is a widespread social phenomenon in youth populations across North America (Leary, Kowalski, Smith, & Phillips, 2003), this current investigation is far from trivial.

Also, this study was unable to test for potential gender differences due to a small global sample of students with nonreciprocal friendships with classmates. Past developmental psychology research (Blyth, Hill, & Smith-Thiel, 1982; Furman & Buhrmester, 1992) has shown some distinctions between males and females, most notably in younger populations, regarding the importance they confer to their friendships; thus, gender differences should be investigated in future studies in order to take these findings into account. Along the same idea, national statistics (Center for Education Statistics, Statistics Canada, 2010) have shown that incidences for dropping out of school are much higher in the male population than the female population; therefore the possibility of observing an interaction between peer acceptance and gender when predicting dropping out of high school is most plausible, and thus should be considered for future research.

Some psychometric limitations also need to be mentioned. First, most of the tested variables were measured using self-report. It must be taken into account that any research using self-reported measures, whether it involves socially sensitive issues or not, could be limited by the occurrence of range restriction, self-selection bias, and social desirability bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In order for self-report measures to be reliable, participants must respond honestly and accurately. We tried to minimize such biases by making the questionnaires confidential, as well as stating in the questionnaires that participants should answer the items as honestly as possible.

A further psychometric limitation relates to our measure of reciprocal friendships (i.e. asking students to write the name of their three best friends in their grade level). This measure does not account for the possibility that students may have friends who are in another grade level, as well as the likelihood that they have friends outside of school. However, a significant amount of time in a student's life is spent in school, even more so with students in their grade level; in this way, being an outcast in school, even though it is not the case in other contexts, will likely affect students' psychological functioning and general well-being. It is noteworthy that this study examined the effects of the influence of friendships on variables pertaining to academic success; therefore measuring students' reciprocal friendships with classmates is fitting. That being said, in order to minimize the impact of this possible limitation, future studies should consider including a measure of perceived support for basic psychological needs by friends in their life in general. This could provide further knowledge on whether students' reciprocal friendships and other classmates have a positive or negative influence on their academic motivation. Furthermore, other variables (such as problems at home, teen pregnancy, etc.), which have not been considered in our investigation, could influence students' persistence in school and thus should be considered in future studies.

From a theoretical standpoint, we recognize that this study yield some conflicting findings with prior research and/or propositions from SDT. These findings represent limitations and therefore some of the questions assessed would require further investigation. Such results concern the nonsignificant effect of self-determined academic motivation on the prediction of dropping out of high school.

To conclude, we believe that a few other interesting avenues of research could be the focus of future investigations. Future studies should also examine the specific motivational orientations and personality profiles of students who do not have reciprocal friendships with classmates, more precisely, what characterizes these individuals. It is possible that these students possess specific individual characteristics that make them less desirable to others. One could assume that students with less self-determined motivational orientations, or amotivated individuals, may be more likely to be having difficulties making friends, even more so in social contexts and settings that require social interactions.

Acknowledgments

The preparation of this article was supported by a grant from the Social Science and Humanities Research Council of Canada (SSHRC 435-2013-0097).

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