

Self-Determination and Persistence in a Real-Life Setting: Toward a Motivational Model of High School Dropout

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The purpose of this study was to propose and test a motivational model of high school dropout. The model posits that teachers, parents, and the school administration's behaviors toward students influence students' perceptions of competence and autonomy. The less autonomy supportive the social agents' behaviors are, the less positive are students' perceptions of competence and autonomy. In turn, the less positive students' perceptions are, the lower their levels of self-determined school motivation are. Finally, low levels of self-determined motivation lead students to develop intentions to drop out of high school, which are later implemented, leading to actual dropout behavior. This model was tested with high school students ($N = 4,537$) by means of a prospective design. Results from analyses of variance and a structural equation modeling analysis (with LISREL) were found to support the model for all participants and for each gender separately.

High school dropout represents an important problem that affects thousands of students each year. Roughly one third of all students will drop out of high school without having received their high school diplomas, both in Canada (Canada Manpower and Immigration, 1990) and in the United States (Hammack, 1986; Mann, 1986). Dropping out of school is not only an educational problem but a significant social problem as well. Indeed, it has obvious psychological, economical, and social ramifications. For instance, dropouts may undergo a loss of self-esteem, turn to drugs, and become a financial burden to society (Mensch & Kandel, 1988; Tidwell, 1988).

A survey of research on high school dropout reveals that one factor in a student's decision to drop out of school may be motivation (see Bean, 1985; Rumberger, 1987; Tidwell, 1988; Tinto, 1975). The purpose of this study was to propose and test

a motivational model of high school dropout on the basis of theory and research in the field of intrinsic and extrinsic motivation. We believe that such an undertaking can yield benefits on three counts. First, it can provide a real-life test of current theory and research on intrinsic and extrinsic motivation. Second, because the proposed model deals with an unfolding sequence, it may serve to integrate existing knowledge on intrinsic and extrinsic motivation, especially as pertains to their antecedents and consequences. Finally, such a model, if proven valid, should provide a better understanding of the process involved in dropping out of high school, thereby leading to potential insights concerning future interventions with this population. Below, we present the motivational model with the supportive evidence.

A Motivational Model of High School Dropout

The motivational model is depicted in Figure 1. It is made up of four parts. First, low levels of autonomy-supportive behaviors from critical social agents in the school system, namely parents, teachers, and the school administration, are hypothesized to undermine students' perceptions of competence and autonomy. Second, these low perceptions of competence and autonomy, in turn, diminish students' self-determined motivation. Third, low levels of self-determined motivation lead students to develop intentions to drop out of school. Finally, these intentions are later acted on, when it is possible to do so. The conceptual and empirical evidence supporting the model is presented below.

Motivation Toward School

One motivational approach that has been found useful in education posits that behavior can be intrinsically or extrinsically motivated (Csikszentmihalyi & Nakamura, 1989; Deci & Ryan, 1985, 1991; Lepper & Hodell, 1989). *Intrinsic motivation* is generally defined as the fact of engaging in an activity for the

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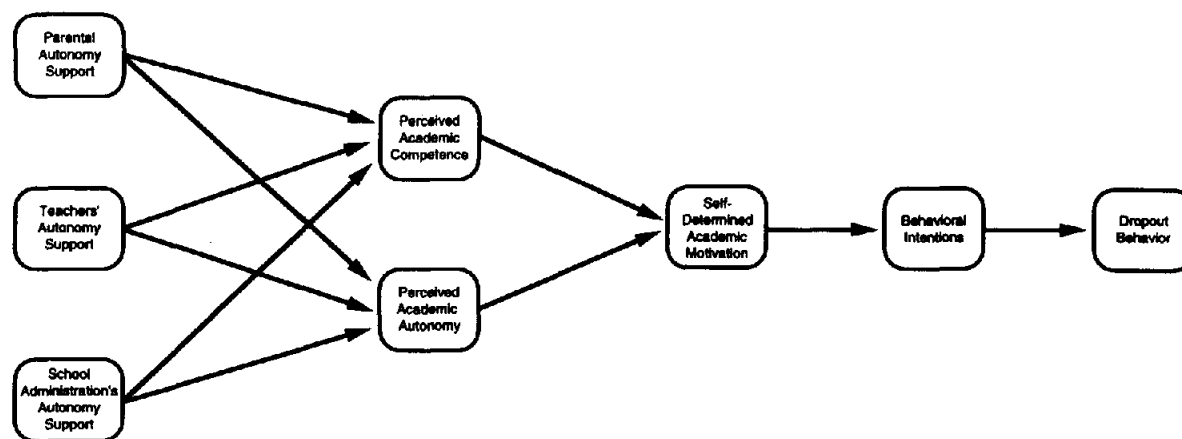


Figure 1. The motivational model of high school dropout.

pleasure and satisfaction derived from participation itself (Deci, 1975). For instance, a student who reads a history book because she finds it interesting displays intrinsic motivation. On the other hand, *extrinsic motivation* is experienced when someone engages in an activity as a means to an end. Three major types of extrinsic motivation have been proposed (Deci & Ryan, 1985, 1991; Ryan, Connell, & Deci, 1985), namely external regulation, introjected regulation, and identified regulation. Individuals are *externally regulated* when the source of control is outside the person. For instance, students who go to school because their parents force them to do so are externally regulated. With *introjected regulation*, the individual has only partially internalized previous external pressure or inducement to engage in the activity. For instance, students might say that they do their homework because they would feel guilty if they did not. When motivated out of *identified regulation*, the individual performs the behavior out of choice and values it as being important. Thus, students might go to school because they feel that this is the path they have chosen to follow to have access to the career they have selected. Finally, Deci and Ryan (1985) have suggested that a third motivational concept is necessary to provide a more complete account of human behavior. This concept, termed *amotivation*, refers to the relative absence of motivation. Individuals who are amotivated engage in the activity without any sense of purpose and do not see any relationship between their actions and the consequences of such behavior.

Much research supports the validity of the concepts of intrinsic and extrinsic motivation and amotivation in education. For instance, results from several studies have supported the validity of different subscales that assess the concepts of intrinsic and extrinsic motivation and amotivation. Thus, the various subscales have been found to distinguish themselves clearly in factor analyses and to display adequate levels of reliability (Ryan & Connell, 1989, Study 1; Vallerand & Bissonnette, 1992; Vallerand, Blais, Briere, & Pelletier, 1989; Vallerand et al., 1992). Furthermore, as we demonstrate below, the different subscales have been found to relate as predicted by self-determination theory (Deci & Ryan, 1985, 1991) to various educational determinants and consequences, thereby providing construct validity for the different concepts underlying the scales.

On the Social Determinants of School Motivation

Research reveals that the social context in education can have an important influence on motivation (see Ames, 1992). The motivational model posits that three social agents in particular play a major role in influencing students' motivation: teachers, parents, and the school administration. These social agents may affect students in more than one way. One dimension that appears fundamental with respect to motivation, however, is whether these social agents support the students' autonomy or control their behavior (Deci & Ryan, 1987). Providing students with autonomy support implies allowing them to make certain choices and decisions about their schooling. Such a practice increases students' self-determined motivation (i.e., they develop high levels of intrinsic motivation and identification but low levels of amotivation and external regulation; Deci & Ryan, 1985). Conversely, controlling students' behaviors signifies telling them what to do and how to do it, with little respect for their own choices and orientations. This last practice undermines students' self-determined motivation (Deci & Ryan, 1985, 1987).

Much research supports this line of reasoning. For instance, controlling behavior from the teacher (Deci, Nezlek, & Sheinman, 1981; Ryan & Grolnick, 1986) and parents (Gottfried, Fleming, & Gottfried, 1994; Grolnick & Ryan, 1989; Grolnick, Ryan, & Deci, 1991) has been found to induce losses in students' intrinsic motivation toward school. No study so far has assessed the role of the school administration on students' motivation. However, evidence exists that schools vary in general climate and that climates may affect students' motivation (see Eccles, 1993). Because of its authority position at school, the school administration, we believe, is in a prime position to influence this general school climate and thus have an impact on students' sense of autonomy and competence, as well as on their school motivation.

It is important to emphasize that the motivational model posits that social agents do not influence students' motivation directly. Rather, in line with self-determination theory, social agents' effects are hypothesized to be mediated by students' perceptions of competence and autonomy. Some evidence for this proposi-

tion exists. For instance, research has shown that the impact of feedback from a supervisor (Harackiewicz & Larson, 1986) or the experimenter (Vallerand & Reid, 1984, 1988) on intrinsic motivation is mediated by individuals' perceptions of competence. Recent research by Reeve and Deci (1996) has also shown that the impact of the social context on intrinsic motivation is mediated by perceptions of both competence and autonomy.

Dropping Out of High School as a Motivational Consequence

Considerable research reveals that motivation can lead to important outcomes. Although most studies have focused on the effects of intrinsic motivation (see Deci & Ryan, 1985, 1987, for review), more recent research based on the tenets of self-determination theory (Deci & Ryan, 1985, 1991) has dealt with the whole spectrum of motivations. The various forms of motivation are posited to differ in their inherent levels of self-determination. Listed from low to high levels of self-determination, these motivations are amotivation, external regulation, introjection, identification, and intrinsic motivation. Because self-determination has been hypothesized to be associated with enhanced psychological functioning (Deci, 1980; Deci & Ryan, 1985), one would expect self-determined forms of motivation (intrinsic motivation and identified regulation) to lead to positive outcomes more readily than non-self-determined forms of motivation (amotivation and external regulation), which have been found to induce negative outcomes. These findings have been obtained with several educational outcomes, such as effort, positive emotions experienced in class, psychological adjustment at school, quality of conceptual learning, concentration, satisfaction with one's academic life, school performance, and intentions of continuing one's schooling (e.g., Fortier, Vallerand, & Guay, 1995; Gottfried, 1985, 1990; Grolnick & Ryan, 1987; Grolnick et al., 1991; Harter & Connell, 1984; Lloyd & Barenblatt, 1984; Ryan & Connell, 1989; Vallerand & Bissonnette, 1992; Vallerand et al., 1989; Vallerand et al., 1993).

In addition, much experimental (laboratory) research reveals that individuals who are induced to become externally regulated persist much less than those who are intrinsically motivated (see Deci & Ryan, 1985, for a review). This is especially likely to be the case when subsequent engagement in the activity is not compulsory. We feel that the parallel with high school dropout is striking. Although certain students do drop out of high school when they are only 14 or 15 years old, it appears that the majority of students pursue their schooling at least until they are legally obliged to do so (i.e., until the age of 16, in the Province of Quebec). During that period, they form intentions of either persisting or dropping out of school. A large number of the students who have developed an interest in certain subjects or who desire a career that requires a college degree intend to pursue their schooling. For a substantial portion of students, however, self-determined motivation toward school has become so low (i.e., they have developed low levels of intrinsic motivation and identified regulation but high levels of amotivation and external regulation) that they eventually develop intentions to drop out. The critical point comes when the obligation to remain in school is terminated, that is, when students are 16 years old and have to decide either to stay in or to drop out of school. It

is postulated that it is at this point that students act in line with their intentions. Students who have developed intentions to quit school will do so; the others will remain in school. Research in the attitude literature reveals that intentions represent a key predictor of behavior (see Ajzen & Fishbein, 1980). We believe that this relationship applies to the dropout situation as well.

Not only is the motivational model theoretically sound, it is also in line with the high school dropout literature. First, with respect to the social context, dropout students, relative to persistent students, report that they participate much less in the decision-making process at school, that they are told to improve more often, and that they are disciplined much more (Dohn, 1992). Dropout students also report that they have a less positive teacher-student relationship than persistent students and that their teachers are controlling toward them (Bearden, Spencer, & Moracco, 1989; Dohn, 1992). They also report that their parents are more controlling and punitive both behaviorally and affectively toward them than are parents of persistent students (Bachman, Green, & Wirtanen, 1971; Rumberger, Ghatak, Poulos, & Ritter, 1990). Second, as pertains to students' perceptions of competence and autonomy, several studies have demonstrated that dropout students have lower perceptions of school competence (e.g., Horowitz, 1992) and autonomy (Dohn, 1992) than persistent students. Finally, with respect to motivation, dropout students display lower levels of interest and attitudes but higher levels of alienation and boredom toward school than persistent students (e.g., Bearden et al., 1989; Calabrese & Poe, 1990; Horowitz, 1992; Rumberger, 1987; Tidwell, 1988). In addition, Dohn (1992) reported that when they applied for high school, eventual dropout students, relative to persistent students, indicated pursuing their schooling much more because of parental pressure and much less because of their own wishes or goal directedness. These results tend to support the hypothesis that dropout students may have internalized a non-self-determined motivational orientation.

Although several studies from both the motivation and dropout literatures support the different parts of the motivational model, only one, to the best of our knowledge, has focused on the school dropout issue from an intrinsic-extrinsic motivation perspective. In that study, Vallerand and Bissonnette (1992) assessed the role of intrinsic and extrinsic motivation in dropping out of a compulsory course at the college level. Over 1,000 1st-year students from the Cegep level (a 2-year institution between high school and university in the Quebec educational system) completed the French version of the Academic Motivation Scale (AMS; Vallerand et al., 1989) at the beginning of the term. The following term, students who had dropped from the course were identified. Scores on the questionnaire they had completed the previous term were compared with those of students who had persisted. Results revealed that students who had dropped from the course had initially reported lower levels of intrinsic motivation and identification but higher levels of amotivation than students who completed the course. Also of interest is that, in line with past research (e.g., Ryan & Connell, 1989, Study 1; Vallerand et al., 1992), women reported higher levels of intrinsic motivation and identification but lower levels of external regulation and amotivation than men. Women also displayed lower levels of dropout behavior than men (10% vs. 16%).

In sum, the motivational analysis presented above and the

results of the Vallerand and Bissonnette (1992) study suggest that motivation comes into play in the decision to drop out of high school. However, the Vallerand and Bissonnette study did not provide a complete assessment of the motivational model and did not deal with dropping out from high school as such. The purpose of the present study, therefore, was to provide a more thorough test of the motivational model of high school dropout using a prospective design and structural equation modeling. Overall, we believe that the present study should allow us to better understand the psychological processes involved in dropping out of high school as well as provide a test of intrinsic-extrinsic motivation theory and research, which underlie the motivational model of high school dropout.

Method

Participants

Participants were 4,537 9th- and 10th-grade French-Canadian students (2,280 boys and 2,245 girls; 12 did not indicate their gender). Participants had a mean age of 14.97 years and came from seven Montreal public high schools.

Questionnaire

The questionnaire was made up of five parts. In the first part, participants completed three scales that assessed perceptions of different social agents' (parents, teachers, and the school administration) autonomy support in the school domain.¹ Each scale consisted of three items. The Parental Autonomy Support Scale (e.g., "My parents provide me with lots of opportunity to make personal decisions concerning my school activities"), the Teacher Autonomy Support Scale (e.g., "I feel that my teachers pressure me to do what they want"; this scale used reverse scoring), and finally, the School Administration Autonomy Support Scale (e.g., "The school administration generally consults students before introducing new school policies") had Cronbach alphas of .54, .56, and .65, respectively.² Participants rated items on a 7-point Likert scale, ranging from *not at all in agreement* (1) to *completely in agreement* (7). These scales were adapted from the Perceived Interpersonal Style Scale (Pelletier, 1992), which has been found to be a reliable and valid measure of perceived interpersonal style. For instance, in the sports context, the Autonomy Support scale yielded a Cronbach alpha of .76, whereas the construct validity was supported through correlations that showed autonomy support from the coach's part to be positively related to athletes' intrinsic motivation and identified regulation but negatively related to their amotivation (Pelletier et al., 1995).

In the second part of the questionnaire, participants completed two scales that assessed educational motivational mediators (Deci & Ryan, 1985, 1991), namely, perceived school competence and perceived autonomy at school. The Perceived School Competence Scale measured students' perceptions of competence in the academic domain. This scale consisted of three items (e.g., "I consider myself to be a good student") and had a Cronbach alpha of .61. Adapted from the Perceived Competence in Life Domains Scale (Losier, Vallerand, & Blais, 1993), it assesses perceptions of competence toward various life domains, including education, and has been found to be highly reliable and valid. The second instrument, the Perceived School Autonomy Scale, measured students' feelings of freedom in the school environment. It also consisted of three items (e.g., "I feel controlled at school"; this scale used reverse scoring) and had an alpha of .54. This scale was adapted from the Perceived Autonomy Toward Life Domains Scale (Blais, Vallerand, & Lachance, 1990) and assesses one's perceptions of autonomy in different life domains, including education. The Education subscale has been found to possess adequate internal consistency ($\alpha = .71$) and to relate positively

to intrinsic motivation and identified regulation but negatively to amotivation (Blais et al., 1990). It thus appears to be a reliable and valid measure of perceived autonomy. Responses to these two scales were rated on a 7-point Likert scale ranging from *not at all in agreement* (1) to *completely in agreement* (7).

The third part of the questionnaire was the French version of the Academic Motivation Scale (AMS; Vallerand et al., 1992, 1993), namely L'Échelle de Motivation en Éducation (EME; Vallerand et al., 1989), which assesses students' motivation toward educational activities. The EME is composed of seven subscales. Three subscales assess types of intrinsic motivation: intrinsic motivation to know (e.g., "Because I experience pleasure and satisfaction while learning new things"), to accomplish things (e.g., "For the pleasure I experience while surpassing myself in my studies"), and to experience stimulation (e.g., "For the high feeling that I experience while reading about various interesting subjects"). Three subscales assess types of extrinsic motivation: external regulation (e.g., "Because I need at least a high school degree in order to find a high-paying job later on"), introjected regulation (e.g., "To show myself that I am an intelligent person"), and identified regulation (e.g., "Because I think that a high school education will help me better prepare for the career I have chosen"). One subscale assesses amotivation (e.g., "I can't see why I go to school and frankly I couldn't care less"). There are 4 items per subscale and thus a total of 28 items. Each item represents a possible reason for students to go to school. These reasons are scored on a 7-point Likert scale, ranging from *not at all* (1) to *exactly* (7). In previous research, this scale (Vallerand et al., 1989), as well as its English counterpart (Vallerand et al., 1992, 1993), have been found to have high internal consistency levels and a stable seven-factor structure. In addition, correlations between the subscales and various motivational antecedents and consequences also supported the scale's construct validity. In the present study, the internal consistency ranged from .72 to .87.

In the fourth part of the questionnaire, students were asked to complete two items that measured their future schooling intentions ("I often consider dropping out of school" and "I intend to drop out of school"). Responses to this behavioral intention scale were rated on a 7-point Likert scale, ranging from *not at all in agreement* (1) to *completely in*

¹ One might suggest that it would have been preferable to assess teachers', parents', and school administrators' behaviors instead of students' perceptions. However, cognitive evaluation theory (Deci & Ryan, 1985) insists that it is not the behavior of others per se that influences one's motivation but rather one's perceptions of such behavior. In addition, research (e.g., Smith, Smoll, & Curtis, 1979) reveals that children's perceptions of adults in authority positions are quite accurate and in fact more accurate than adults' reports of their own behaviors. We therefore feel that our strategy was appropriate.

² That some of the scales used in this study yielded alphas in the .50 and .60 range may be regarded as problematic by some researchers. We feel that there is no need for concern on this issue, however, because internal consistency that is based on the alpha coefficient may not be an adequate reliability estimate for a scale made up of a small number of items. Indeed, as noted by Cronbach (1951), given a small number of items, low alphas can underestimate scale item intercorrelations that are the basis for internal consistency. For instance, given the same average item intercorrelations, the three-item teacher autonomy-support scale, which yielded an alpha coefficient of .56 in this study, would produce an alpha of .81 if there were eight items. With short scales such as the ones used in this study, the adequacy of the underlying measurement model is generally more indicative of the quality of construct measurement than internal consistency (Pedhazur & Schmelkin, 1991; see also Smith, Shutz, Smoll, & Ptacek, 1995 for a similar argument). As the results of the structural equation modeling revealed, the measurement model was adequate. Overall, it would thus appear that the scales used in this study had acceptable levels of reliability.

agreement (7). There was a correlation of .63 between these two items. Finally, in the fifth and last part of the questionnaire, participants were asked to indicate their age, student identification number, gender, and date of birth.

Procedure

In October, during the fall semester, students were asked to complete the questionnaire described above in class. The questionnaire was administered by a trained experimenter according to standardized instructions. The experimenter explained that the purpose of the questionnaire was to learn about the feelings and behaviors of high school students. Students were told that additional information would be gathered later on, and so it was important that they write their student identification numbers on the questionnaire. The experimenter also explained the types of questions that students would be asked to answer and provided examples. It was clearly stated that confidentiality of their answers would prevail at all times. Following these instructions, the experimenter answered questions, and students completed the questionnaire individually. Following completion of the questionnaire, students were thanked for their cooperation.

A year later, we contacted the Quebec Ministry of Education to establish a list of students who did not re-enroll in any high school in the Province of Quebec. Once we had this initial list, we contacted the seven schools individually to determine which of the students were true dropouts, that is, those who had not simply moved to another province or died. Through these procedures, we identified a total of 282 dropout cases. The number of dropout students recorded amounts to a 6% dropout rate. There were 161 boys and 121 girls in the dropout sample, leaving 4,255 participants (2,119 boys and 2,124 girls, and 12 of unspecified gender) in the "persistent" group. Thus, 57% of all dropouts were boys, whereas only 43% were girls. This difference is significant, $\chi^2(1, N = 4,525) = 5.41, p < .02$, and in line with recent reports (Royer, Moisan, Saint-Laurent, & Gasson, 1993).

Results

Motivation Toward School and Behavioral Intentions

A 2 (type of student: dropout vs. persistent) \times 2 (gender) \times 7 (type of school motivation) analysis of variance (ANOVA) with repeated measures on the motivation variable was performed on the data.³ This approach involved taking the scores on the seven motivation subscales and incorporating them into the Type of Student \times Gender design as a repeated measure (BMDP; Dixon, Brown, Engelman, & Jennric, 1990; Program 4V). This design allows one to test for the presence of a Type of Student \times Motivation interaction, in which dropout students are expected to score lower than persistent students on self-determined forms of motivation (i.e., intrinsic motivation and identified regulation) but higher on non-self-determined types of motivation (especially amotivation). It should be noted that to correct for positively biased F tests due to repeated measures (Kirk, 1984), we used the Greenhouse-Geisser formula.

Results revealed a significant main effect for school motivation, $F(3.20, 14000) = 895.27, p < .0001$. Newman-Keuls post hoc analyses revealed that the seven motivational subscales were significantly different from one another. The most important forms of motivation for participants in this sample were, in decreasing order, identified regulation, external regulation, introjected regulation, intrinsic knowledge, intrinsic accomplishment, intrinsic stimulation, and amotivation. Results also revealed a significant main effect for type of student, $F(1, 4521) = 50.75, p < .0001$.

Results indicated that overall, persistent students scored higher on the motivation subscales than dropout students. Similarly, results revealed a significant main effect for gender, $F(1, 4521) = 23.01, p < .0001$, where overall, female students scored higher on the motivation subscales than male students.

Of greater interest, however, results also revealed a significant Type of Student \times Motivation interaction, $F(3.20, 14000) = 45.51, p < .0001$. Simple effect analyses indicated that six of the seven motivational subscales yielded significant differences ($p < .0001$) between the two types of students. Results showed that dropout students were significantly less intrinsically motivated to accomplish, to know, and to experience stimulation and were less identified and introjected toward education than persistent students. However, dropout students displayed significantly more amotivation than persistent students. Finally, no differences were found between the two types on external regulation. The means and standard deviations of the motivational subscales as a function of type of student appear in Table 1.

A significant Gender \times Motivation interaction was also found, $F(3.20, 14000) = 28.90, p < .0001$. Simple effect analyses indicated that six of the seven motivational subscales yielded significant gender differences ($p < .0001$). Female students reported higher levels of the three types of intrinsic motivation (to know, to accomplish, and to experience stimulation) and higher levels of introjection and identified regulation but lower levels of amotivation than male students. However, no differences were found between male and female students on external regulation. Finally, the Gender \times Type of Student, $F(1, 4521) = 4.84, p = .028$, and the Gender \times Motivation \times Type of Student interaction, $F(3.20, 14000) = 2.41, p = .061$, were found to be nonsignificant. The means and standard deviations of the motivational subscales as a function of gender appear in Table 2.

With respect to behavioral intentions,⁴ results revealed a main effect for type of student, $F(1, 4521) = 213.06, p < .0001$. Students who eventually dropped out had greater intentions to drop out of school early in the school year than did those who persisted. A gender main effect was also obtained, $F(1, 4521) = 11.58, p < .001$. Male students reported higher dropout intentions than female students. The interaction was not significant ($p > .05$).⁵

Perceived School Competence and Autonomy

We also conducted two 2 (type of student: dropout students vs. persistent students) \times 2 (gender) ANOVAs on students'

³ We also performed a 2 (type of student: dropout vs. persistent) \times 2 (gender) \times 7 (type of school motivation) ANOVA with repeated measures on the motivation variables using a random sample of 282 persistent students and the 282 dropout students. The results were remarkably similar to those obtained with the whole sample.

⁴ Because the measure of intention was not normally distributed, we performed a logarithmic transformation on this variable. The analyses were conducted with this transformed variable.

⁵ We also conducted a regression analysis to predict behavioral intentions from the motivation scales. Results revealed that four predictors were significant ($p < .01$): amotivation ($\beta = .50$), identification ($\beta = -.11$), intrinsic motivation toward stimulation ($\beta = -.07$), and intrinsic motivation toward accomplishment ($\beta = -.06$). These four predictors accounted for 38% of the variance in dropout intentions.

Table 1
Means and Standard Deviations of the Motivational Subscale and Behavioral Intentions
Scores for Dropout and Persistent Students

Subscale	Dropout students (<i>n</i> = 282)		Persistent students (<i>n</i> = 4,243)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Intrinsic Motivation–Knowledge	4.12	1.54	4.68	1.35	<0.0001
Intrinsic Motivation–Accomplishment	3.74	1.49	4.40	1.40	<0.0001
Intrinsic Motivation–Stimulation	3.12	1.46	3.68	1.39	<0.0001
Identified Regulation	5.17	1.37	5.77	1.07	<0.0001
Introjected Regulation	4.21	1.59	4.74	1.46	<0.0001
External Regulation	5.23	1.37	5.50	1.18	<i>ns</i>
Amotivation	2.80	1.55	2.11	1.34	<0.0001
Behavioral Intentions ^a	0.87	0.63	0.38	0.52	<0.0001

Note. Scores ranged from 1 to 7 and are based on four items for each of the seven motivational subscales. Means differ significantly at *p* value listed.

^a Means for this scale are based on logarithmic transformation of scores.

perceptions of competence and autonomy.⁶ The results of the Perceived School Competence Scale revealed the presence of a type of students main effect, $F(1, 4521) = 118.52, p < .0001$. Results indicated that dropout students perceived themselves as significantly less competent in school activities than persistent students. A significant gender main effect was also revealed, $F(1, 4521) = 6.42, p < .01$. Female students perceived themselves as more academically competent than male students. Results of the Perceived School Autonomy Scale also revealed a significant type of student main effect, $F(1, 4521) = 27.89, p < .0001$. Results indicated that dropout students reported feeling significantly less autonomous at school than persistent students. Finally, the gender main effect was also significant, $F(1, 4521) = 7.13, p < .01$. Results showed that female students felt more autonomous at school than male students. The interactions for these two analyses were not significant ($F_s < 1$). The means and standard deviations of the Perceived School Competence and Autonomy Scales as a function of type of student appear in Table 3 and as a function of gender in Table 4.

Social Agents' Autonomy Support

The ANOVAs⁷ with the Parental Autonomy Support Scale revealed the presence of a type of student main effect, $F(1, 4521) = 51.12, p < .0001$. Results indicated that dropout students perceived their parents as significantly less autonomy supportive than persistent students. The gender main effect for this variable, $F(1, 4521) = 1.36, p = .24$, was found to be nonsignificant. The results with the School Administration Autonomy Support Scale also revealed a significant type of student main effect, $F(1, 4521) = 30.34, p < .0001$, in which dropouts perceived the school administration as significantly less autonomy supportive than did persistent students. A gender main effect was also revealed, $F(1, 4521) = 11.27, p < .001$. Results indicated that female students perceived the school administration as more autonomy supportive than did male students. Finally, with respect to the Teacher Autonomy Support Scale, a significant gender main effect was revealed, $F(1, 4521) = 50.40, p < .0001$. Results showed that female students perceived

their teachers as significantly more autonomy supportive than did male students. Similarly, the type of student main effect for this variable, $F(1, 4521) = 7.33, p < .01$, was also significant; dropout students perceived their teachers as being less autonomy supportive than did persistent students. All interactions were not significant ($F_s < 1$, except for the parental measure, $p = .03$). The means and standard deviations of the social agents' autonomy support scales as a function of type of student and gender also appear in Tables 3 and 4, respectively.

The Motivational Model of High School Dropout

We tested the proposed model (see Figure 1) using structural equation modeling. The model contained three exogenous variables, parental autonomy support, teacher autonomy support, and school administration autonomy support, and five endogenous variables, perceived school competence, perceived school autonomy, self-determined academic motivation, behavioral intentions (of dropping out of school), and actual dropout behavior.

The latent constructs of parental autonomy support, teacher autonomy support, school administration autonomy support, school competence, and school autonomy were measured by three items each (see *Questionnaire section*). In light of the already high number of variables in the model, we decided to reduce the number of latent variables assessing motivation to one. This variable, self-determined school motivation, was measured by four separate composite scales reflecting self-deter-

⁶ We also performed 2 (type of student: dropout vs. persistent) \times 2 (gender) ANOVAs on the perceptions of competence and autonomy variables using a random sample of 282 persistent students and the 282 dropout students. The results were very similar to those obtained with the overall sample.

⁷ We also performed 2 (type of student: dropout vs. persistent) \times 2 (gender) ANOVAs on the parental, teacher, and school direction autonomy-support variables using a random sample of 282 persistent students and the 282 dropout students. Once again, the results were almost identical to those obtained with the whole sample.

Table 2
Means and Standard Deviations of the Motivational Subscale and Behavioral Intentions
Scores for Female and Male Students

Subscale	Female students (<i>n</i> = 2,245)		Male students (<i>n</i> = 2,280)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Intrinsic Motivation–Knowledge	4.63	1.45	4.17	1.44	<0.0001
Intrinsic Motivation–Accomplishment	4.32	1.43	3.83	1.45	<0.0001
Intrinsic Motivation–Stimulation	3.59	1.45	3.21	1.40	<0.0001
Identified Regulation	5.65	1.14	5.28	1.29	<0.0001
Introjected Regulation	4.75	1.46	4.20	1.59	<0.0001
External Regulation	5.33	1.30	5.40	1.26	<i>ns</i>
Amotivation	2.21	1.39	2.70	1.50	<0.0001
Behavioral Intentions ^a	0.36	0.50	0.47	0.58	<0.001

Note. Scores ranged from 1 to 7 and are based on four items for each of the seven motivational subscales. Means differ significantly at *p* value listed.

^a Means for this scale are based on logarithmic transformation of scores.

mined motivation indexes. A self-determined motivation index (Grolnick & Ryan, 1987; Vallerand & Bissonnette, 1992) consists of a summation of specifically weighted scores and is used to integrate the information from the different motivational subscales under one score. In line with previous studies, we assigned weights to the motivational items according to their respective placement on the self-determination continuum (Fortier et al., 1995; Grolnick & Ryan, 1987). Intrinsic motivation and identified regulation items, because they are considered self-determined forms of motivation, were assigned weights of 2, and 1, respectively. Amotivation and external regulation items, because they are conceptualized as less self-determined forms of motivation, were assigned weights -2 and -1 , respectively. As there were four items for each of the motivational subscales, we computed four indexes using individual motivational items. Support for the validity and reliability of this type of composite index has been obtained in several studies (e.g., Blais et al., 1990; Grolnick & Ryan, 1987; Vallerand & Bissonnette, 1992).

Two manifest indicators were used to create the behavioral intentions latent variable (see *Questionnaire* section). Actual dropout behavior was assessed through a dichotomous variable

that reflected enrollment status the following fall semester (0 = *re-enrolled*; 1 = *dropped out*). The variance–covariance matrix of the 22 observed variables was used as the database for the analysis. The variance–covariance matrix of the observed variables (which also include the means) is shown in the Appendix.

The model was statistically tested using LISREL VII (Jöreskog & Sörbom, 1989). Using maximum likelihood estimation, LISREL generates standardized estimates of all parameters not constrained to specific values (generally, 1 or 0). Goodness of fit of the estimated model is assessed by means of comparing the reproduced covariance matrix, which is based on the specified constraints, with the observed covariance matrix. Indexes of fit provided by LISREL and reported in this section are the chi-square statistic, the goodness-of-fit index (GFI), and the adjusted goodness-of-fit index (AGFI). Because the chi-square statistic is a poor fit estimate when the sample is as large as in this study, we also used the critical-N (CN) statistic (Hoelter, 1983). This statistic consists of the value that would be required for accepting the fit of a given model for a chi-square test. Hoelter suggested that a model with a CN value exceeding 200 is an adequate representation of the sample data. Results showed

Table 3
Means and Standard Deviations for the Motivational Antecedent and Mediating Variable
Subscales for Dropout and Persistent Students

Subscale	Dropout students (<i>n</i> = 282)		Persistent students (<i>n</i> = 4,243)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Perceived school competence	4.08	1.30	4.97	1.29	<0.0001
Perceived school autonomy	3.53	1.28	3.95	1.25	<0.0001
Perceived parental autonomy support	4.75	1.28	5.28	1.22	<0.0001
Perceived teacher autonomy support	4.44	1.24	4.68	1.22	<0.01
Perceived school administration autonomy support	3.56	1.35	4.05	1.40	<0.0001

Note. Scores ranged from 1 to 7 and are based on three items for each of the five subscales. Means differ significantly at *p* value listed.

Table 4
Means and Standard Deviations of Scores for Motivational Antecedent and Mediating Variable Subscales for Female and Male Students

Subscale	Female students (<i>n</i> = 2,245)		Male students (<i>n</i> = 2,280)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Perceived school competence	5.01	1.33	4.82	1.28	<0.0001
Perceived school autonomy	4.05	1.23	3.80	1.26	<0.0001
Perceived parental autonomy support	5.28	1.28	5.21	1.18	<i>ns</i>
Perceived teacher autonomy support	4.94	1.14	4.39	1.25	<0.0001
Perceived school administration autonomy support	4.20	1.38	3.83	1.39	<0.0001

Note. Scores ranged from 1 to 7 and were based on three items for each of the five subscales. Means differ significantly at *p* value listed.

that for the overall model, the chi-square was significant, $\chi^2(197, N = 4,537) = 2,176.06, p < .001$. However, the CN was 494.83, thereby indicating an appropriate fit. This assessment was also supported by the GFI (.96) and the AGFI (.94). The total coefficient of determination (TCD) for the overall model was .65.

Structural and measurement coefficients from the completely standardized solution under maximum likelihood are displayed in Figure 2. As can be seen, all coefficients were found to be significant except for the direct effect of school administration autonomy support on perceived school competence. Therefore, the structural path between these two variables was deleted and does not appear in Figure 2. These findings support the model.

The less autonomy supportive the parents ($\beta = .51$) and teachers ($\beta = .35$) were, the less competent the students felt. Similarly, the less autonomy supportive the parents ($\beta = .41$), the teachers ($\beta = .22$), and the school administration ($\beta = .28$) were, the less autonomous the students felt at school. In turn, the less competent ($\beta = .32$) and autonomous ($\beta = .65$) students felt, the less self-determined their school motivation. Low levels of self-determined motivation ($\beta = -.67$) led to intentions to drop out of high school, which were later implemented ($\beta = .24$). In sum, results from the structural equation modeling analysis strongly supported the motivational model of high school dropout.

We also tested the model separately for boys and girls. Results

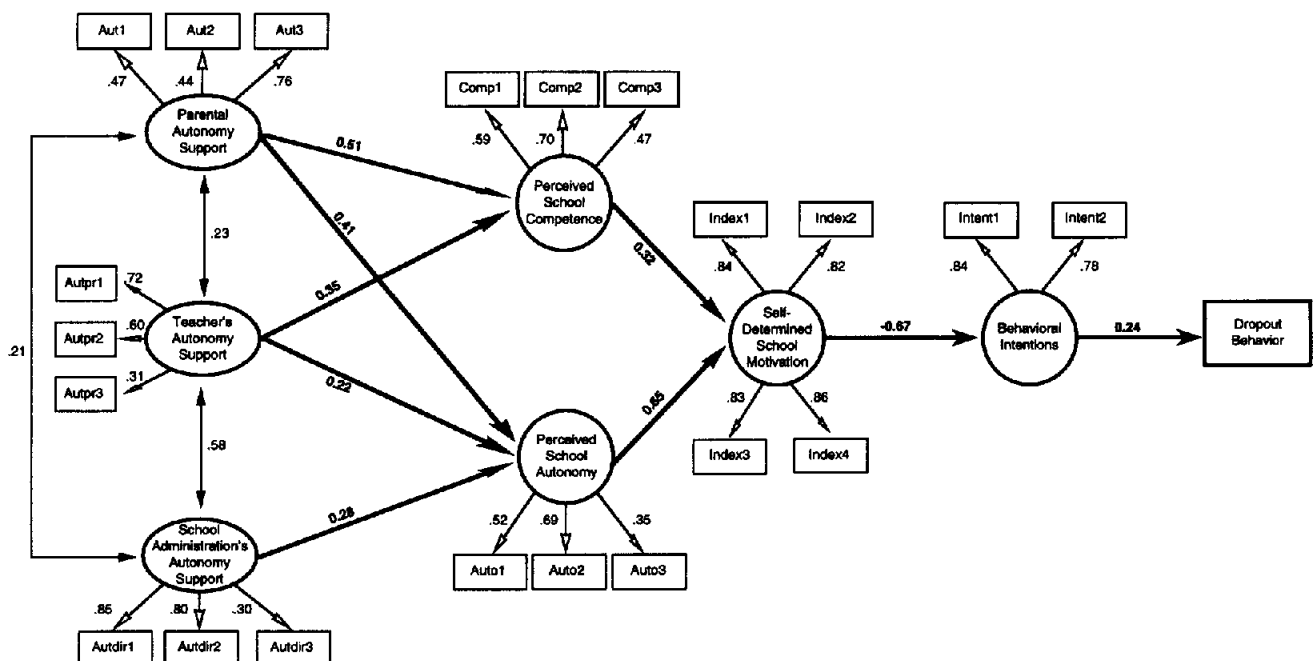


Figure 2. A confirmatory structural analysis of the motivational model of high school dropout with the overall sample. Numbered, shortened names are the indicators that make up the latent variables.

from the various indexes were almost identical and showed an appropriate fit: for boys, $GFI = .95$, $AGFI = .94$, $\chi^2(197, N = 2,280) = 1,169.30$, $p < .001$, $TCD = .60$; for girls, $GFI = .95$, $AGFI = .93$, $\chi^2(197, N = 2,245) = 1,283.67$, $p < .001$, $TCD = .67$. The CN for boys (460.73) and girls (416.27) indicated that there was support for the model for both genders. The structural and measurement coefficients were very similar to those of the model with the overall sample.⁸ Overall, these last findings support the invariance of the model across gender.⁹

Discussion

The purpose of this study was to propose a model that integrates existing knowledge on the determinants and consequences of intrinsic and extrinsic motivation and to test it with the real-life social problem of dropping out of high school. This model posits that teachers', parents', and the school administration's autonomy-supportive behaviors toward students influence their perceptions of competence and autonomy. The less autonomy supportive (or the more controlling) the social agents' behaviors are, the less positive are students' perceptions of competence and autonomy. In turn, the less positive students' perceptions are, the lower their levels of self-determined motivation are. Finally, low levels of self-determined motivation are expected to lead students to develop intentions to drop out of high school, which are later acted out.

The present results provide strong support for the motivational model of high school dropout. First, results revealed that dropout students had lower levels of intrinsic motivation, identification, and introjection, but higher levels of amotivation, toward school activities than persistent students. Second, as expected, dropout students perceived themselves as being less competent and autonomous at school activities. Third, in line with the motivational model, dropout students perceived their teachers, parents, and the school administration as being less supportive of autonomy than persistent students. Finally, results from structural equation modeling provided support for all proposed relations among the model variables except for the link between the school administration's autonomy-supportive behavior and students' perceived school competence. The present results have important implications for intrinsic-extrinsic motivation theory and research, gender differences, and the issue of high school dropout. We discuss each of these issues in turn.

Implications for Intrinsic-Extrinsic Motivation Theory and Research

The findings from this study have a number of implications for intrinsic-extrinsic motivation theory and research. A first implication is that motivation, and more specifically, self-determined motivation (or the lack of it), leads to important real-life outcomes, such as dropping out of high school. This is in agreement with recent motivation research, which has shown that self-determined motivation has a host of positive affective (positive affect, psychological adjustment, satisfaction, etc.) and cognitive (concentration, learning, etc.) consequences (see Deci & Ryan, 1985, 1987, 1991; Vallerand, in press). The present results add to this literature by showing that motivation can also help predict behavioral consequences. These findings are in line with recent research of Vallerand and Bissonnette (1992),

which also showed that motivation assessed early in the academic semester can predict future academic behavior, and research of Williams, Grow, Freedman, Ryan, and Deci (1996), which showed that over a 23-month period, self-determined motivation positively predicted attendance at weight loss program meetings. Thus, the present findings reinforce the notion that motivation is a powerful force that leads to action and support self-determination theory's (Deci & Ryan, 1985) position on the role of self-determination in human behavior.

In certain instances, we believe, the impact of motivation on behavior is not direct but is mediated by behavioral intentions. Such a position is in line with abundant research in the attitude literature that reveals that intentions mediate the impact of attitudes on behavior (see Ajzen & Fishbein, 1980). We believe that such a process is likely to take place when there is a time lag between the assessment of motivation and the display of behavior. Such is the case with the dropout process, where students first form behavioral intentions of dropping out of (or staying in) school, which are implemented several months later.

We believe that considering behavioral intentions in such situations should lead to at least three advantages. First, incorporating behavioral intentions in the motivational model may better reflect the actual process through which people come to implement behavior. Often, motivation does not lead directly to behavior, especially if the latter occurs months later. However, motivation is still important, as it plants the seed (the intentions) that will eventually grow into behavior. Second, using behavioral intentions should allow a better prediction of behavior. To achieve this goal, however, there should be correspondence between intentions and behavior with respect to elements of action,

⁸ The measurement and structural coefficients from the models run separately with male and female students can be obtained from Robert J. Vallerand.

⁹ To further assess the validity of the model, we tested three alternative models. Alternative Model 1 involved the unmediated direct effects of the exogenous variables (parental, teacher, and school administration autonomy support) on dropout behavior. Alternative Model 2 involved the direct effects of the exogenous variables (as in Alternative Model 1) plus the direct effects of perceived competence and perceived autonomy on dropout behavior. The final model included all of these effects and also incorporated the direct effect of self-determined motivation on dropout behavior. Results with the overall sample provided support for the basic model. First, none of the alternative models yielded an improvement in fit over that of the motivational model ($GFI = .96$, $AGFI = .94$, for all three alternative models). Second, of all six direct effects, only one was worth noting, namely that of perceived competence ($\beta = -.14$ in Alternative Model 2; $\beta = -.16$ in Alternative Model 3). However, it should be noted that this direct effect was smaller than that of intentions ($\beta = .22$) and much smaller than that of competence on self-determined motivation ($\beta = .32$), thereby supporting the basic hypothesis that the impact of perceived competence on dropout behavior is mediated by motivation and behavioral intentions. Nevertheless, in light of these findings, we tested a final alternative model in which only the direct effect of perceived competence was added to the motivational model. Results revealed that this model had the same fit as that of the motivational model ($GFI = .96$, $AGFI = .94$). The beta linking perceived competence and dropout behavior was only $-.09$. The same basic findings were obtained in separate analyses for males ($GFI = .95$, $AGFI = .94$; beta for perceived competence = $-.12$) and females ($GFI = .95$, $AGFI = .93$; beta for competence = $-.06$). Overall, the results of these analyses provide additional support for the validity of the motivational model.

target, situation, and time (Ajzen & Fishbein, 1977). In the present study, correspondence was achieved only with respect to the first two elements. This may explain why the link between intentions and behavior was only of moderate magnitude.¹⁰ By assessing behavior and intentions at the same level of correspondence, future researchers should be able to show an intimate relation between these two constructs. Finally, the integration of behavioral intentions in our motivational model allows us to make use of knowledge acquired from the attitude-behavior literature in order to better predict and understand behavior. For instance, attitude research has revealed the existence of moderators of the link between attitude and intentions or behavior. An individual's direct experience with a task (Fazio & Zanna, 1981) and degree of self-monitoring (Snyder, 1979) have been found to moderate this relation. Future researchers might show that these variables also act as moderators of the link between motivation and intentions or behavior.

A second implication of the present findings for motivation theory and research is that there is an important parallel between the present findings and those from the experimental (laboratory) research on intrinsic motivation. Such research typically induces a loss of intrinsic motivation through a manipulated independent variable (e.g., a controlling reward, such as money) and leaves the participant alone in the room with the opportunity to engage further in the activity. Results generally reveal that rewarded participants persist much less on the activity during the subsequent free-choice period than nonrewarded participants. The present findings reveal that, like the rewarded participants from laboratory experiments, dropout students find the task (school) less interesting and eventually disengage from it. However, the present findings have also shown that it is not only a lack of intrinsic motivation that is at fault but also a loss of identified regulation (or purposeful extrinsic motivation) and a concomitant increase in amotivation. In light of the present findings, researchers should assess whether these other motivational states (identified regulation and amotivation) play a causal role in the lack of persistence observed in laboratory settings.

It should be noted that the results of the present study that pertained to introjected regulation were somewhat surprising. Persistent students displayed higher levels of introjection than dropout students. Considering that introjection is a non-self-determined form of motivation, one would have expected dropout students to score higher than persistent students—and even more so in light of findings in other life contexts, such as politics (Koestner, Losier, Vallerand, & Carducci, 1996) and interpersonal relationships (Blais, Sabourin, et al., 1990), which have shown introjection to be negatively related to adaptive outcomes. One explanation for these findings may relate to home influences. Persistent students have started to internalize the value of going to school in a self-determined way. This was evident in this study by their scores on the identified regulation subscale, which were higher than those of dropout students. Because students live at home, however, they may still be subjected to the subtle influence of their parents to do schoolwork. Such influence may have some impact on their introjected regulation toward school, thereby preventing them from fully integrating school values (Ryan, 1995). Another explanation is that introjection may lead to different outcomes in education than in other life contexts. Finally, as posited by Vallerand (in press), it is also possible that the effects of certain types of motivation,

including introjection, vary as a function of the type of consequences. Thus, introjection may have negative effects on affective variables (e.g., Blais, Sabourin, et al., 1990; Koestner et al., 1996; Ryan & Connell, 1989) but positive effects on behavioral persistence (as in the present study). Future research is needed to shed light on these findings.

A third implication of interest deals with the role of the social context as a source of influence on motivation. Three points must be made in this respect. First, as shown by the present results, the impact of social context on motivation is mediated by the individual's perceptions of competence and autonomy. Thus, others' behaviors will influence our motivation only in cases in which they affect our perceptions of competence and autonomy. Several theories, such as cognitive evaluation theory (Deci & Ryan, 1985), self-efficacy theory (Bandura, 1986; Bandura & Schunk, 1981), and achievement goal theory (Ames, 1992), propose such a mediation with respect to perceptions of competence. Although some support has been found for the mediational role of perceptions of competence on intrinsic motivation (e.g., Harackiewicz & Larson, 1986; Reeve & Deci, 1996; Vallerand & Reid, 1984, 1988), most research has focused on the direct influence of social agents (e.g., teachers and parents) on students' motivation (e.g., Deci et al., 1981; Gottfried et al., 1994) or has assessed the link between social agents' behaviors and students' perceptions of competence without testing the link between competence perception and motivation (e.g., Grolnick et al., 1991). Results from the present study provide additional support for the role of perceived competence as a crucial mediator between influences from the social context and self-determined motivation.

Much less research has focused on the link between perceptions of autonomy and motivation. Fortier et al. (1995) found that perceptions of autonomy had an impact on students' self-determined school motivation. However, these researchers did not include an assessment of the social context and therefore could not test for the mediational role of autonomy. Reeve and Deci (1996) did, however, and showed that, indeed, perceived autonomy serves as a mediator of the impact of the social context on self-determined motivation. The present findings are in agreement with these results and reinforce the role of perceptions of autonomy as a crucial mediator of school motivation.

A second, related point deals with the relative impact of social-context-engendered perceptions of competence and autonomy on motivation. On one hand, theorists such as Bandura (1986) suggested that perceptions of autonomy are not especially useful because only perceptions of competence (or self-efficacy) are important predictors of motivation. On the other

¹⁰ Another potential explanation for the fact that the link between intention and behavior was not stronger in this study is that there was very little variation in behavior, as only 6% of the students dropped out. This lack of variance in behavior may have reduced the intention-behavior relationship. To further test this hypothesis, we conducted structural equation modeling analyses (with LISREL) on the motivational model with equal numbers of dropout students ($n = 282$) and persistent students (a random sample of 282 students). Results replicated those obtained with the overall sample ($GFI = .92$, $AGFI = .90$), and all links were very similar. However, the beta for the intention-behavior path moved from .24 to .43, thereby providing some support for our hypothesis.

hand, theorists such as Deci and Ryan (1985) posited that both types of perceptions are important and that the relative impact of each should vary as a function of the functional significance of the social event. If the event is relevant for one's sense of competence, then perceptions of competence would be expected to have a more important impact on motivation. If the event is relevant for one's sense of autonomy, however, then perceptions of autonomy should have a more potent effect on motivation. Very little research has addressed this issue. In their study on school achievement, Fortier et al. (1995) found that the path from perceived competence to self-determined motivation ($\beta = .58$) was slightly stronger than that from perceived autonomy to self-determined motivation ($\beta = .53$). However, in their laboratory study, Reeve and Deci (1996) found perceived autonomy ($\beta = .41$) to have stronger effects on intrinsic motivation than perceived competence ($\beta = .26$). The latter findings were replicated in the present study, where results indicated that the path from perceived autonomy to self-determined motivation ($\beta = .65$) was significantly stronger than that from perceived competence to self-determined motivation ($\beta = .32$).¹¹ Future research is needed to better understand the relative impact of perceived competence and autonomy on motivation.

A third and final point with respect to the social context refers to the strategy used to assess the influence of social agents on motivation. Much of the relevant intrinsic-extrinsic motivation research in education has focused on the impact of either teachers (e.g., Deci et al., 1981; Ryan & Grolnick, 1986) or parents (Gottfried et al., 1994; Grolnick et al., 1991) on students' motivation. However, very little research has focused on multiple sources of impact (for exceptions, see Boggiano et al., 1992; Eccles, 1993; Ryan & Stiller, 1991). Results from this study revealed that such a perspective is fruitful and ecologically valid, because all three social agents were found to influence students' motivation through their impact on their perceptions of competence, autonomy, or both. Future research from such a multivariate perspective is encouraged, as it could lead to a more complete understanding of the processes involved in human motivation. In this vein, the role of friends and fellow students deserves scientific scrutiny in light of research that has revealed that children who entertain negative relationships with others are at risk of dropping out (Parker & Asher, 1987) and that by Grade 7, high school dropouts tend to affiliate with students who are already at risk for dropping out (Cairns, Cairns, & Neckerman, 1989).

It should also be noted that in the present study, we focused on autonomy-supportive behavior from important social agents. However, Deci, Ryan, and their colleagues (Connell & Wellborn, 1991; Deci & Ryan, 1991; Grolnick & Ryan, 1989; Grolnick, et al., 1991) have proposed that two other factors from the environment may also affect students' perceptions of competence and autonomy: structure and involvement. *Structure* refers to clear guidelines about ways to interact with the environment that lead to desired outcomes, whereas *involvement* denotes the expression of affection and caring toward a child. Research has shown that parental involvement (Grolnick et al., 1991; Grolnick & Slowiaczek, 1994) and teacher-engineered classroom structures (Skinner & Belmont, 1993) are positively related to adaptive outcomes in students, including motivation. Thus, future researchers would do well to assess the relative impact of social agents' structure, involvement, and autonomy

support on students' motivation through their impact on students' sense of competence and autonomy.

Gender Differences in Motivation and Behavior

The present findings also revealed that girls displayed a more self-determined motivational profile than boys. This is in line with research that has explored gender differences in intrinsic and extrinsic motivation in various life contexts. Such research generally reveals that women display a more self-determined motivational profile than men in a diversity of life activities, such as sports, leisure, interpersonal relationships, and education (see Vallerand, 1993, for a review). Because self-determined motivation is associated with positive outcomes, one would expect women to generally display more positive outcomes than men because their motivation is more self-determined than men's. Very little research has addressed gender differences in outcomes as a function of motivation. However, the education literature appears to support the above hypothesis. A good example of this is the dropout phenomenon. The literature clearly reveals that girls are much less likely to drop out of high school than boys (see Royer et al., 1993). In the Province of Quebec, as well as in Canada as a whole, 40% of dropout students are girls (Quebec Ministry of Education, 1991). The present results replicated and extended these findings in showing that girls represented only 43% of our dropout sample and that they displayed a more self-determined motivational profile than boys. These findings are also in line with those of Vallerand and Bissonnette (1992), who showed that significantly fewer women than men dropped out of a college course (9.5% vs. 16.2%) and that women displayed a more self-determined motivational profile than men.

The present findings, which show that girls display a more self-determined motivational profile than boys, are intriguing because they seem to run counter to past findings that women display higher levels of learned helplessness than men (see Dweck, 1986). However, such research has typically used attributional measures and has been conducted in laboratory settings. The present research used motivational measures and was conducted in an educational setting. Thus, methodological differences may explain the divergent findings. It should be noted that the present findings on gender differences have been replicated numerous times in the United States (Ryan & Connell, 1989, Study 1), Quebec (Vallerand et al., 1989), and Ontario (Vallerand et al., 1992) in education as well as in several other

¹¹ Using the LISREL program, we tested an additional model to determine whether the perceived autonomy-motivation path was statistically different from that involving competence and motivation. In this model, the stronger path (i.e., the autonomy-motivation path, $\beta = .65$) was constrained to equality with the weaker path (i.e., the competence-motivation path, $\beta = .32$). The chi-square from that model was then compared with that from our original motivational model. No difference between the two chi-squares would reveal equality in the two betas. However, a significantly higher value for the "equality" model would indicate that the fit of this new model is lower than that of the original model and thus that the two betas are significantly different. The results from this analysis revealed a significantly higher value for the equality model $\Delta\chi^2(1, N = 4,537) = 25.87, p < .05$. Thus, it can safely be concluded that the two paths were statistically different.

life contexts (see Vallerand, 1993, for a review). Finally, the present finding that fewer girls drop out than boys is directly in line with the fact that girls report a more self-determined motivational profile than boys but conflicts with Dweck's finding, in which women are posited to display higher levels of learned helplessness. In sum, our more self-determined motivational profile of girls appears to represent a rather robust finding.

In light of the important consequences for school persistence (and other outcomes) that these gender differences in motivation seem to engender, research on the determinants of these motivation differences is definitely called for. We feel that the motivational model includes important determinants of these gender differences. For instance, the social context at school may be responsible to some extent for these gender differences. Results from this study revealed that boys perceived their teachers as being less supportive of autonomy than girls did. Past research has also revealed that teachers do not act in the same way toward boys and girls in the classroom: Boys receive much more criticism from teachers (e.g., Brophy & Good, 1974) and are less highly regarded than girls on a host of variables, such as motivation, conduct, and skills (see Dweck & Goetz, 1978). Teachers tend to be more controlling and punitive with boys, presumably to control their inappropriate behaviors (Boggiano & Katz, 1991; Brophy & Good, 1974). However, the unintended effect might be that boys' motivation is negatively affected by such practices, which eventually lead to the development of a non-self-determined motivational profile that in turn triggers undesirable consequences, including dropping out of high school. Although past research has not focused on the autonomy-supportive behavior of the school administration, the present results revealed that administrators may act in a fashion similar to teachers. Future research on the role of social agents in the development of different motivational profiles for boys and girls would benefit both theoretical and applied perspectives.

On the High School Dropout Issue

Results from the present study have at least two important implications for the high school dropout issue. First, motivation, and specifically self-determined motivation, is a key variable for one to consider when attempting to predict high school dropout. The present results showed that four types of motivation were found to distinguish dropout students from persistent students: lower levels of intrinsic, identified, and introjected regulation but higher levels of amotivation. These results are in direct agreement with those of Vallerand and Bissonnette (1992), who found that students who dropped out of a compulsory course had indicated at the beginning of the term that they were less intrinsically motivated and less identified but more amotivated than persistent students. It thus appears that these three constructs represent central motivational variables in the understanding and prediction of high school dropout.

These findings are also in line with research on high school dropout that has shown dropout students to display more alienation (a construct akin to that of amotivation) but fewer positive attitudes and less liking (constructs related to intrinsic motivation) toward school than persistent students (e.g., Astone & McLanahan, 1991; Bearden et al., 1989; Horowitz, 1992). However, the present findings go beyond the mere fact that dropout students find school boring and meaningless; these findings un-

derscore the fact that dropout students are not motivated extrinsically in a meaningful and choiceful manner, or identified, as persistent students are. Many students' behaviors are not intrinsically motivated but rather are performed in an extrinsic fashion (Ryan, Connell, & Grolnick, 1992). The question is what type of extrinsic motivation will underlie their behavior. When extrinsic motivation is self-determined (i.e., identified regulation), positive outcomes, including persistence, may be expected. However, when extrinsic motivation is not self-determined (especially external regulation), negative outcomes may ensue. Much research in education now supports this conclusion (see Ryan & Connell, 1989; Vallerand et al., 1989, 1993). Thus, especially because school tends not to be interesting, students need to find purpose and choice (i.e., identified regulation) in attending school. Most students generally manage to achieve this end and become motivated out of identified regulation (see the means for identified regulation in Table 1). Students who do not, however, are at risk of dropping out.

A second implication is that the social context plays a fundamental role in the dropout process. Much theorizing and research has focused almost exclusively on the personal determinants of dropping out of high school (see Wagenaar, 1987). Although personal determinants are important, we believe that such an approach represents an oversimplified picture of the process. A more integrated perspective wherein the person interacts with the social context is needed in order to explain changes in motivation that may lead to the decision to quit school. The present findings support this perspective in showing that teachers, parents, and the school administration behave in a more controlling way toward future dropout students than toward persistent students. These findings are consistent with research that reveals the use of harsh and controlling teaching and parental techniques to be positively associated with school dropout (e.g., Bachman et al., 1971; Bearden et al., 1989; Rumberger et al., 1990). In addition, research on school morale reveals that high school dropout is more prevalent in schools with low morale than in those with high morale. Because the school administration plays an important role in creating a school's structure, there is a link between the school administration and its impact on students' motivation.

Finally, results revealed that parents' influence on motivation (through their impact on their children's perceptions of competence and autonomy) proved significantly more important than that of teachers and school administrators.¹² These findings, especially with respect to teachers, may have resulted from two methodological aspects of this study. First, the teacher autonomy-support measure was taken in October, early in the school year. It is thus possible that students had not yet formed clear impressions of their teachers. Second, the measure that involved teachers asked students to assess their teachers "in general."

¹² Using the same strategy as that discussed in footnote 11, we compared the paths involving parents, teachers, and the school administration, on one hand, and perceptions of competence and autonomy, on the other. Here again, all differences in chi-square values from the equality models relative to the motivational model were significant, average $\Delta\chi^2(1, N = 4,537) = 33.39, p < .05$. These results revealed that the paths involving parental autonomy support and perceptions of competence and autonomy are statistically different from those involving teachers and the school administration.

This task of "averaging out" perceptions of their teachers may have proven difficult for students. Still, we believe that our finding that parents exert a stronger influence than teachers and school administrators on their children's perceptions of competence and autonomy is valid and important. One is reminded that teachers usually teach students for a year and that most students have few direct interactions with the school administration. Conversely, by the time their children reach the age of 15, most parents will have spent close to 10 years engaging in school-related activities with them. The greater impact of the parents is therefore understandable. This finding implies that if we are to do something about the high school dropout problem, we must involve the parents and not simply focus on teachers or the school administration (see Handel, 1990; Hart, 1988, on this issue). A multidimensional approach is definitely called for.

In sum, in this study, a motivational model of high school dropout was proposed. This model was tested and supported through various analyses, including structural equation modeling. We believe that the present findings provide a much needed real-life test of existing motivation theory and knowledge, as well as a greater understanding of the intricate links among social context, motivation, and behavior.

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(Appendix follows)

Appendix

Variances, Means, and Covariance Matrix for the Motivational Model of High School Dropout for All Participants

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Teacher autonomy support																						
1. Autpr1	.94																					
2. Autpr2	.40	.92																				
3. Autpr3	.22	.22	.95																			
Parental autonomy support																						
4. Autp1	.06	.06	-.01	.85																		
5. Autp2	.07	.04	.00	.14	.93																	
6. Autp3	.13	.12	.06	.31	.34	.88																
School administration autonomy support																						
7. Autdir1	.32	.27	.11	.06	.09	.11	.94															
8. Autdir2	.32	.27	.13	.06	.06	.12	.64	.94														
9. Autdir3	.18	.11	.02	.12	.20	.17	.24	.19	.94													
Perceived school autonomy																						
10. Auto1	.17	.15	.00	.11	.14	.17	.23	.21	.24	.95												
11. Auto2	.18	.16	-.03	.17	.12	.25	.21	.20	.17	.36	.95											
12. Auto3	.23	.22	.09	.07	.04	.12	.20	.21	.11	.15	.20	.92										
Perceived school competence																						
13. Comp1	.22	.18	.13	.12	.11	.19	.15	.14	.12	.07	.16	.15	.93									
14. Comp2	.24	.15	.04	.20	.18	.33	.18	.18	.19	.25	.35	.14	.35	.94								
15. Comp3	.10	.12	.11	.10	.08	.15	.10	.08	.10	.04	.08	.14	.39	.27	.90							
Self-determined school motivation																						
16. Index1	1.75	1.39	.36	1.45	1.03	1.82	1.88	1.76	1.34	2.01	3.02	1.37	1.82	2.72	1.22	39.68						
17. Index2	1.40	1.08	.06	1.18	.87	1.49	1.48	1.38	1.11	1.66	2.53	1.01	1.21	2.05	.58	23.41	27.98					
18. Index3	1.52	1.35	.45	1.21	.83	1.59	1.62	1.56	1.22	1.68	2.49	1.25	1.57	2.23	1.09	24.71	19.62	31.24				
19. Index4	1.61	1.33	.23	1.23	.85	1.61	1.69	1.64	1.15	1.76	2.61	1.27	1.43	2.28	.88	24.28	20.55	21.59	29.16			
Behavioral intentions																						
20. Intent1	-.18	-.16	.06	-.18	-.11	-.21	-.19	-.18	-.14	-.20	-.27	-.14	-.23	-.30	-.20	-2.68	-2.01	-2.45	-2.21	.78		
21. Intent2	-.15	-.14	-.05	-.15	-.10	-.17	-.13	-.14	-.12	-.13	-.19	-.10	-.19	-.24	-.15	-2.14	-1.69	-2.00	-1.83	.45	.61	
Dropout behavior																						
22. Dropout behavior	-.02	-.01	-.02	-.05	-.02	-.04	-.03	-.04	-.02	-.03	-.04	-.01	-.06	-.06	-.05	-.42	-.31	-.40	-.40	.09	.07	.26
Mean	4.74	4.80	4.46	5.65	4.72	5.35	3.81	3.84	4.40	3.75	3.78	4.24	4.75	5.00	4.98	3.73	3.51	5.18	5.08	.55 ^a	.27 ^a	.06

Note. Variances appear in the diagonal entry. Numbered, shortened names are the indicators that make up the latent variables.

^a Mean is based on logarithmic transformation of scores.

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