Intrinsic, Extrinsic, and Amotivational Styles as Predictors of Behavior: A Prospective Study

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ABSTRACT This research ascertained the role of intrinsic, extrinsic, and amotivational styles as predictors of behavioral persistence in a real-life setting. At the beginning of the academic year, 1,042 first-term junior-college students enrolled in a compulsory college course completed a scale assessing intrinsic motivation, four styles of extrinsic motivation (namely, external regulation, introjection, identification, and integration), and amotivation toward academic activities. At the end of the semester, individuals who had dropped out of the course and those who had persisted were identified. Results showed that individuals who persisted in the course had reported at the beginning of the semester being more intrinsically motivated, more identified and integrated and less amotivated toward academic activities than students who dropped out of the course. Gender differences also emerged. These revealed that female

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were more intrinsically motivated, integrated, and identified and less externally regulated and amotivated than male students. Females also displayed higher levels of behavioral persistence than males. Results are discussed in light of Deci and Ryan's (1985a) self-determination theory, and suggestions for future research are proposed.

The concept of motivation has been studied from several perspectives (e.g., Freud, 1923/1962; Hull, 1943; Skinner, 1953). One perspective which has proven useful over the past 20 years suggests that behavior can be seen as intrinsically or extrinsically motivated (e.g., de Charms, 1968; Deci, 1971, 1975). Intrinsically motivated behaviors are those that are engaged in for their own sake, in other words, for the pleasure and satisfaction derived from performing them (Deci, 1971). They are activities that people voluntarily perform in the absence of material rewards or constraints (see Deci & Ryan, 1985a, 1987). To read a book for the sheer pleasure of learning something interesting is an example of intrinsic motivation.

On the other hand, extrinsic motivation pertains to a wide variety of behaviors where the goals of action extend beyond those inherent in the activity itself. They are behaviors that are engaged in as a means to an end and not for their own sakes (Deci, 1975; Kruglanski, 1978). Originally, it was thought that extrinsic motivation referred to behaviors performed in the absence of self-determination and thus which could only be prompted by external contingencies. However, more recently, Deci, Ryan, and their colleagues (Deci & Ryan, 1985a, 1987; Ryan & Connell, 1989; Ryan, Connell, & Deci, 1985; Ryan, Connell, & Grolnick, in press) have proposed that different types of extrinsic motivation exist, some of which are self-determined and may be performed through self-regulation. According to these researchers, there are four types of extrinsic motivation which can be ordered along a self-determination continuum. From lower to higher levels of self-determination, they are (*a*) external, (*b*) introjected, (*c*) identified, and (*d*) integrated regulation.

External regulation occurs when behavior is externally regulated (usually through rewards or constraints). For example, students may participate in activities because they feel urged to do so by the teacher. In this case, an activity that can or should be fun is performed in order to avoid negative consequences (e.g., criticisms from the teacher). The motivation is extrinsic because the reason for participation lies outside the activity itself. Furthermore, the behavior is not chosen or self-determined. External regulation may also be fueled by a desire for rewards. For example, students may work hard at school in order to receive a prize promised by their parents. In this case the motivation is still extrinsic and nonself-determined, but the instigating factor is the desired reward rather than a constraint. Regardless of whether the goal of behavior is to obtain rewards or to avoid sanctions, the individual experiences an obligation to behave in a specific way, and feels controlled by the reward or by the constraint (Deci & Ryan, 1985a).

With *introjected regulation*, individuals begin to internalize the reasons for their actions. Thus, the source of control is inside the individual. However, while internal to the person, this form of internalization is not truly self-determined since it is limited to the internalization of external contingencies. Rewards or constraints are now imposed by the individual and not by others. The individual is internally controlling (Ryan, 1982). Thus, a student might say, "I study the night before exams because I feel guilty when I don't." Beliefs and controls are now internalized, although these are not self-determined and are experienced as pressure and tension toward specific aims.

In contrast, *identified regulation* occurs when a behavior is valued by the individual and is perceived as being chosen by oneself. Behavior is internally regulated but in a self-determined way. An example would be students who *choose* to do extra work in math because they believe that this will eventually improve their ability in that particular subject. The motivation is extrinsic because the activity is not performed for itself but as a means to an end (to improve their ability in math). However, the behavior is nevertheless self-determined: Rather than being bribed into doing extra work in math, the students have chosen to do it because they feel that it would be beneficial for them. Students then experience a sense of direction and purpose, instead of obligation and pressure, in performing the behavior.

The last type of extrinsic motivation is *integrated regulation*. At this level the person does the behavior willingly and the self-regulation is consistent with the individual's self-concept. The focus is on how the chosen extrinsically motivated behavior fits in with the rest of the person's life activities and valued goals. To the extent that there is harmony between the behavior and the individual's other facets of his or her self, there is integration. For instance, a student might say "I've decided to study for this exam and forego other interesting activities because doing well in school is important for me as a person." When there is conflict, however, the behavior is not integrated. It should be noted that it is

at this stage of integration that the individual experiences the greatest level of self-determination for extrinsically motivated behaviors.

Apart from intrinsic and extrinsic motivation, Deci and Ryan (1985a) claim that a third construct, *amotivation*, must be considered to fully understand human behavior. Individuals are amotivated when they perceive a lack of contingency between their behavior and outcomes. There is an experience of incompetence and lack of control. Amotivated behaviors are neither intrinsically nor extrinsically motivated: They are nonmotivated. There are no rewards (intrinsic or extrinsic) and participation in the activity will eventually cease. Amotivated behaviors are the least self-determined because there is no sense of purpose and no expectation of reward or of the possibility of changing the course of events. Amotivation can be seen in many ways as similar to learned helplessness (Abramson, Seligman, & Teasdale, 1978) since the individual will experience feelings of incompetence and expectancies of uncontrollability. The reader is referred to Deci and Ryan (1985a) for a more elaborate discussion of these different types of motivation.

Research in this area has typically focused on intrinsic motivation and more specifically on its determinants. Results of such research generally support cognitive evaluation theory (Deci & Ryan, 1980, 1985a), in that changes in intrinsic motivation can take place either through changes in feelings of self-determination or through changes in feelings of competence. Increases or decreases in either of these processes lead to corresponding changes in intrinsic motivation (see Deci & Ryan, 1980, 1985a, for reviews). Because the various types of extrinsic motivation and amotivation have only recently been postulated, research on their determinants has been scarce (see Deci & Ryan, 1985a, 1987, 1991, for a review of available research).

More recently, research has focused on the consequences and correlates of intrinsic motivation. Such research reveals that situational events known to facilitate intrinsic motivation produce greater interest (Harackiewicz, 1979; Ryan, Mims, & Koestner, 1983), more creativity (Amabile, 1979, 1982, 1983; Amabile, Hennessey, & Grossman, 1986; Koestner, Ryan, Bernieri, & Holt, 1984; Kruglanski, Friedman, & Zeevi, 1971), more cognitive flexibility (McGraw & McCullers, 1979), better conceptual learning (Benware & Deci, 1984; Grolnick & Ryan, 1987), and a more positive emotional tone (Garbarino, 1975) than events known to be controlling. The correlates and consequences of the various forms of extrinsic motivation have been less documented but appear to be less positive both in terms of affect and performance as the

type of extrinsic motivation is less self-determined (see Deci & Ryan, 1985a, for a review). Finally, amotivation is generally associated with impaired cognitive performance, negative affect, and, at times, low self-esteem (see Abramson et al., 1978; Peterson & Seligman, 1984, for reviews).

The studies reviewed above have examined situational factors that facilitate intrinsic and extrinsic motivation as well as their consequences. More recently, researchers have started to ascertain the relation between motivational styles and various outcomes. Motivational styles refer to rather stable motivational orientations of the individual to behave in predisposed ways. Thus, to the same extent that situational variables can lead individuals to engage in a task with a specific orientation, motivational styles predispose individuals generally to engage in activities with a given orientation (e.g., intrinsic orientation). While some researchers have attempted to measure broad causality orientations across domains (e.g., Deci & Ryan, 1985b), most researchers have limited their assessment of motivational styles to specific domains, with education being the most researched domain (e.g., Harter, 1981; Ryan & Connell, 1989).

Three studies (Grolnick & Ryan, 1987; Harter & Connell, 1984; Vallerand, Blais, Brière, & Pelletier, 1989) have recently explored the relationship between motivational styles and educational outcomes. In the first study, Harter and Connell (1984) showed that mastery motivation toward school was related to students' academic achievement. Unfortunately, Harter and Connell used Harter's (1981) Intrinsic/Extrinsic Motivation Scale, which pits intrinsic against extrinsic motivation. Therefore, the scale does not allow an independent assessment of these two constructs. In addition, the scale does not assess amotivation. Therefore, the role of extrinsic motivation and amotivation in educational outcomes remains unclear.

In the second study, Grolnick and Ryan (1987) measured children's external, introjected, and identified regulation and intrinsic motivation toward school through the Self-Regulation Questionnaire (see Grolnick & Ryan, 1987; Ryan & Connell, 1989). Using a self-determination index (the Relative Autonomy Index) derived from the questionnaire, the authors were able to show that higher forms of self-determination were related to better conceptual learning. However, the authors did not assess the respective role of each construct in learning. Finally, in the third study, Vallerand et al. (1989) used the Academic Motivation Scale in order to assess the concepts of amotivation, external, introjected, and

identified regulation, and intrinsic motivation toward school with college students. In addition, various other educational measures dealing with perceptions of competence, positive emotions, concentration, and time spent on academic tasks were also assessed. Results showed that intrinsic motivation was consistently positively associated with educational outcomes. Identified regulation was also positively related to outcomes, although not as strongly as intrinsic motivation. External regulation and introjection were either slightly negatively related or not related to outcomes. Finally, amotivation was strongly negatively correlated with educational outcomes.

The above findings, and especially those of the last two studies, are encouraging because they show that intrinsic, extrinsic (especially identified regulation), and amotivational styles can be related to important outcomes. However, because outcomes in these studies were measured concomitant to the motivational style measures, it is difficult to determine the role of motivational styles in producing these outcomes. Indeed, causality cannot be inferred since both motivational styles and outcomes could be caused by a third spurious variable. Therefore, it would be important to complement these results with a prospective study, in which motivational styles are assessed at Point A and outcomes are assessed much later at Point B. While such a prospective study does not use a true experiment design per se, and thus, one should avoid speaking in terms of causality, this study would nevertheless provide a much-needed test of the predictive (rather than concomitant) effects of motivational styles on outcomes.

In light of the above, the purpose of this study was to extend past research by assessing the role of intrinsic, extrinsic, and amotivational styles as predictors of future behavior using a prospective design. Specifically, the predictive effects of intrinsic, extrinsic, and amotivational styles toward academic activities on persistence in a junior-college course were assessed. We selected behavioral persistence as a dependent variable because it represents a real-life direct analog to the free-choice measure of intrinsic motivation used in laboratory research (see Deci & Ryan, 1985a). In addition to informing us on the predictive role of motivational styles in real-life outcomes, the use of behavioral persistence could also allow comparison between the findings of this study and that of previous laboratory experiments. This could help establish a parallel between the role of individual differences and that of the situation in behavior.

During the second week of class, first-term French-Canadian junior-college students who were taking a compulsory French course completed a questionnaire assessing intrinsic, extrinsic, and amotivational styles toward academic activities. Four months later, at the end of the semester, persistent and drop-out behavior was assessed and related to the motivational styles. It was hypothesized that individuals who persisted in the course would be found to have displayed more self-determined motivational styles (i.e., students less amotivated, externally regulated, and introjected, but more identified, integrated, and intrinsically motivated toward academic activities) at the beginning of the term than students who dropped out of the course.

METHOD

Subjects

Subjects were 388 male and 674 female French-Canadian students from a junior college (General and Vocational College, in the Quebec educational system) of the Montreal area. Subjects had a mean age of 17.7 years. All students were in their first semester and were tested in the context of their first compulsory French course.

Questionnaire

The questionnaire was made up of two parts. In the first part, subjects completed an experimental version of the Academic Motivation Scale (AMS; Vallerand et al., 1989), which assessed their motivational styles toward academic activities. The scale was an adaptation and an extension of the Self-Regulation Questionnaire developed by Ryan and Connell (1989; see also Grolnick & Ryan, 1987). Similar to Ryan and Connell's Self-Regulation Questionnaire, the AMS assesses intrinsic motivation and external regulation, introjection and identification toward two main academic activities, "going to school" and "doing homework." In addition, the AMS also assesses amotivation and integration toward these two types of academic activities. Thus, the AMS assesses all concepts proposed in Deci and Ryan's theory. It should also be pointed out that the AMS has been developed for college students, while the Ryan and Connell scale is targeted at elementary schoolchildren.

In the AMS, subjects are asked "Why are you going to school?" and "Why do you do your homework?" These two general questions were used by Ryan and Connell (1989) and were chosen here because they were thought to represent the most salient academic activities for students beginning their first junior-college term. For each of these two questions, subjects were provided with 18 items (thus a total of 36 items overall) presented in the form of answer

to the questions. These items assessed the constructs of amotivation, the four types of extrinsic motivation (external, introjected, identified, and integrated regulation), and intrinsic motivation. Subjects indicated the extent to which each item was true for them, on a scale ranging from 1 (not true at all) to 7 (completely true). Items for the two academic activities were combined, thus forming six motivational subscales.

The amotivation subscale was formed of 4 items (e.g., "I don't know why [I go to school]; I can't really see what good it will do for me") and had a standardized Cronbach alpha of .65. The external regulation subscale was formed of 8 items (e.g., "[I go to school] because my parents pressure me to go") and had an alpha of .59. The introjection subscale was composed of 6 items (e.g., "[I go to school] because if I did not go I'd be angry with myself for a long time"). It had an internal consistency value of .67. The identification subscale was made up of 6 items (e.g., "[I go to school] because I feel that post-secondary studies will help me to prepare myself for the career I have chosen") and had an alpha value of .69. The integration subscale contained 6 items (e.g., "[I go to school] because in choosing to continue to study, I'll be the type of person that will be in a better situation to get better job opportunities") and had an internal consistency value of .74. Finally, the intrinsic motivation subscale was made up of 6 items ("[I go to school] because I experience pleasure and satisfaction in learning new things"), with an alpha value of .83. Thus, the internal consistency of the various subscales seems adequate.

The experimental version of the AMS was used for the first time in this study. Therefore, no previous evidence of validity existed for the scale. However, extensive evidence exists for the validity of a more recent version of the scale (Vallerand et al., 1989, in press) and for a similar scale, namely the Self-Regulation Questionnaire (Connell & Ryan, 1986). Thus, it should be expected that similar validity levels exist for the present scale. In order to empirically verify this hypothesis, we assessed the validity of the present scale within the confines of this study by testing for the presence of a simplex structure among the correlations of the six subscales. This simplex structure should correspond to an underlying self-determination continuum ranging from amotivation (lowest level of self-determination) to intrinsic motivation (highest level of self-determination).

Finally, in the second part of the questionnaire, subjects were asked to indicate their age, gender, date of birth, and name.

Procedures

In the second week of the fall term (September 1986), first-term college students in 40 sections of a compulsory French one-semester course were asked to complete the questionnaire described above. This course was selected for

four reasons. First, it is a difficult course that is not liked by everyone. Thus, students who enjoy school (or at least those who are self-determined) should be more likely to remain in the course than students who don't like school and who may feel that if the course is too difficult, they still can drop out and take the course some other time. Second, a compulsory course was thought to be better suited for the purpose of this study than optional courses because most junior-college students who take optional courses enjoy them. Presumably motivation comes into play during the selection of optional courses. Once students enroll in an optional course, they tend to remain in that course. A third reason for the selection of the French course is that although it is compulsory, students can still drop out of the course if they wish at little cost. They can still continue their schooling without any problems, except that they will eventually have to retake the course at a time of their choosing. Thus, students do not have to persist in the course the first time they take it. There is thus a parallel between the experimental free-choice period and behavioral persistence in the French junior-college course. Fourth, and finally, the first-term French course is the course with the largest enrollment in the junior-college system. Since we wanted to control for the content of the course and needed a large number of subjects for comparison purposes between persistent and drop-out students the first-term French compulsory course seemed to represent the most logical choice.

The questionnaire was administered by two trained experimenters according to standardized instructions. The experimenters explained that the purpose of the questionnaire was to know more about the feelings and behaviors of first-semester junior-college students. It was also explained that additional information would be gathered later on and, accordingly, it was important to put their name down on the questionnaire. The experimenters explained the type of questions that students would be asked to answer and provided examples of these questions. Subjects were assured that the professor would not see their answers. It was clearly stated that anonymity and confidentiality of their answers would prevail at all times. Following these instructions, questions were answered and subjects started to complete the questionnaire. The questionnaire was completed in the classroom and the professor was absent during this period of time. Completing the questionnaire took an average of 20 minutes. Following completion of the questionnaire, students were thanked for their collaboration and the professor returned to the classroom.

At the beginning of the next semester (January 1987), we contacted the professors of the 40 sections of the French course in order to establish a list of persistent and drop-out students. For the purpose of this study, drop-out behavior was defined in two ways. The first type of drop-out behavior consisted of the usual means of signing a drop-out sheet and giving it to the administration for acceptance. While this procedure is the one most generally used a second type of drop-out behavior was used by students, i.e., dropping th

course without notifying the administration. Such an approach leads to a low failure grade. In order to include these drop-out students in our sample, it was decided to consider as drop-out students all students with a final grade lower than 40% (the passing grade is 60% in the Quebec educational system). According to professors of the French course, it is impossible to receive a grade lower than 40% in French if the student remains in the course. By using a grade lower than 40 we were assured that the students who had received these grades would be individuals who had dropped the course during the term.

Through these procedures a total of 127 drop-out cases were identified. We tested for differences in motivation between the two types of drop-outs mentioned above. No significant differences were uncovered. The two types of drop-outs were therefore combined to form the drop-out group. The number of drop-out students recorded amounts to an 11.9% drop-out rate. This is consistent with recent reports (Conseil des Collèges, 1988), which reveal that the drop-out rate for first-year courses is around 12%. There were 63 males and 64 females in the drop-out sample, leaving 935 subjects in the "persistent" group. These groups were used in the analyses reported below on behavioral persistence.

RESULTS

Preliminary Analyses

In order to provide a preliminary assessment of the validity of the scale used in this study, we computed the intercorrelations among the six subscales. Support for the validity of the scale would be obtained if the correlations displayed a simplex structure. A simplex structure is supported if positive correlations between adjacent concepts are obtained and these become progressively less positive and gradually negative as the concepts are farther apart. In other words, the most positive correlations should be obtained between adjacent concepts (e.g., external regulation and amotivation), while concepts at the opposite end of the continuum (i.e., amotivation and intrinsic motivation) should show the most negative correlations. The correlation matrix appears in Table 1. As this table shows, the pattern of correlations supports the proposed simplex structure. The highest positive correlations were obtained between adjacent concepts (e.g., amotivation and external regulation, $r = .39$; intrinsic motivation and integration, $r = .77$), while the most negative correlations were obtained between concepts at the opposite ends of the continuum (amotivation and intrinsic motivation, $r = -.38$). Correlations involving other concepts are progressively positive as one moves from one end of the continuum and closer to the other. Overall, these

Table 1
Correlation Matrix among the Motivational Subscales

	Intrinsic motivation	Integration	Identification	Introjection	External regulation	Amotivation
Intrinsic motivation	—					
Integration	.77	—				
Identification	.65	.73	—			
Introjection	.35	.51	.46	—		
External regulation	−.04*	.04*	−.01*	.37	—	
Amotivation	−.38	−.38	−.38	−.06*	.39	—

*nonsignificant, $p > .01$.

results provide support for the contention that a self-determination continuum (Deci & Ryan, 1985a) underlies the six subscales and therefore yield preliminary evidence for the validity of the scale.

Motivational Styles and Behavioral Persistence

A 2 × 2 (Gender × Drop-Out vs. Persistent Students) multivariate analysis of variance (MANOVA) was conducted on the scores of the six motivational subscales as dependent variables. These total scores for each subscale were divided by the number of items per subscale in order to render the scores comparable in the analyses. Results revealed a significant multivariate main effect for the type of students independent variable, $F(6, 1050) = 3.20$, $p < .004$. Results from the univariate analyses indicated that four of the motivational subscales yielded significant differences ($p < .05$) between the two groups of subjects. As expected, at the beginning of the term persistent students had reported being more intrinsically motivated, integrated, and identified, but less amotivated toward academic activities than students who dropped out of the course. The total means of the motivational subscales for the two groups are presented in Table 2.

A main effect for gender was also obtained, $F(6, 1050) = 4.36$, $p < .001$. Results from the univariate analyses yielded significant differences ($p < .05$) on five of the six motivational subscales. Results showed that female students were more intrinsically motivated, integrated, and identified, but less externally regulated and amotivated

Table 2
Scores on the Motivational Subscales as a Function of Type of Students

	Drop-out students	Persistent students
Intrinsic motivation	26.46*	28.14*
Extrinsic motivation		
Integration	27.48*	29.40**
Identification	32.28*	33.42*
Introjection	26.76	27.12
External regulation	20.80	20.24
Amotivation	8.36**	7.08**

Note. There are 127 drop-out and 935 persistent students. Total scores are based on six items for the intrinsic motivation, integration, identification, and introjection subscales, and eight and four items for the external regulation and amotivation subscales, respectively.
*$p < .05$
**$p < .01$.

toward academic activities than male students. Finally, the Gender × Type of Students interaction was not significant, $F < 1$. The means of the motivational subscales as a function of gender appear in Table 3.

A 2 × 2 (Gender × Drop-Out vs. Persistent Students) analysis of variance (ANOVA) was also conducted on the Relative Autonomy Index (RAI; Grolnick & Ryan, 1987). The RAI is informative because it indicates whether individuals are predominantly self-determined (a + sign) or nonself-determined (a − sign). In line with recent research (Grolnick & Ryan, 1987; Ryan & Connell, 1989), the RAI was obtained by weighting each of the six motivational subscales on a self-determination continuum from amotivation to intrinsic motivation, and then summing the products. Intrinsic motivation is the highest self-determined form of motivation and is thus given the highest positive weight (+3). On the other hand, integration (+2), and identification (+1), although representing self-determined types of extrinsic motivation, are lower on the continuum than intrinsic motivation (see Deci & Ryan, 1985a) and deserve lower positive weights. Conversely, amotivation represents the absence of self-determination and should be weighted highly negatively (−3). Finally, external regulation (−2) and introjection (−1) also represent lower forms of extrinsic motivation and are also negatively weighted (see Grolnick & Ryan, 1987; Ryan & Connell, 1989, for more information on these scoring procedures).[1] Results from the ANOVA revealed a significant main effect for type of students, $F(1, 1055) = 12.20$, $p < .001$. Persistent students ($M = +2.11$) had significantly higher RAI than drop-out students ($M = -2.46$). A significant main effect for gender was also obtained, $F(1, 1055) = 39.25$, $p < .001$. Female students ($M = +3.38$) had a higher RAI than male students ($M = -1.58$). The Gender × Type of Students interaction was not significant, $F < 1$.

Table 3
Scores on the Motivational Subscales as a Function of Gender

	Male students	Female students
Intrinsic motivation	26.94**	28.50**
Extrinsic motivation		
Integration	28.26*	29.64*
Identification	32.70*	33.60*
Introjection	26.64	27.30
External regulation	21.76**	19.52**
Amotivation	8.00**	6.76**

Note. There are 388 male and 674 female students. Total scores are based on six items for the intrinsic motivation, integration, identification, and introjection subscales, and eight and four items for the external regulation and amotivation subscales, respectively.
*$p < .05$
**$p < .01$.

In light of the systematic gender differences in motivation, we decided to assess whether this positive motivational style displayed by females translated into positive effects on behavioral persistence. A chi-square analysis was first performed. Assessment of drop-out rate revealed that while males showed a 16.23% drop-out rate (63/388), the drop-out rate for females was only 9.49% (64/674). These difference were highly significant, $\chi^2(1) = 10.60$, $p < .01$. In order to more fully assess whether these gender differences were due to females' more self-determined motivational profile, a loglinear analysis was conducted (Norusis, 1985). This analysis involved fitting loglinear models to the

1. For instance, a subject who obtained the scores (on a 7-point scale) of 3, 5, 5, 4, and 6 on the six motivational scales of amotivation to intrinsic motivation would obtain the following global score on the RAI: $(3 \times -3) + (5 \times -2) + (5 \times -1) + (4 \times +1) + (4 \times +2) + (6 \times +3) = +6$.

multiple contingency table resulting from the Gender × Behavioral Persistence (persistence − dropping out) × Motivation (RAI, high − low) design. In this analysis, we have used the approach wherein the contribution of each of the proposed models composed of the various main effects and interaction terms are compared to the fully saturated model (a model explaining all possible variance). In this instance, adequacy of the tested model is obtained when there are no significant differences between the proposed model and the saturated model. Results of the analyses revealed that only one model, namely that including gender and RAI as main effects, did not significantly differ from the saturated model, likelihood ratio $\chi^2(1) = .24$, $p < .62$. All other models were significant, $p < .05$. These findings reveal that gender and motivation (RAI) are significant and independent contributors to behavioral persistence. Thus, females persist more than males in part because of their more self-determined profile but also because of some unknown psychological characteristic associated with their gender.

DISCUSSION

The present study yielded several noteworthy findings. A first interesting finding deals with the relationship between intrinsic, extrinsic, and amotivational styles and behavioral persistence. To the best of our knowledge, the present study represents the first test of such a relationship. As expected, it was found that students who persisted and finished the course had higher initial levels of intrinsic motivation toward academic activities in general than students who dropped out of the course. This result is consistent with past laboratory research, which reveals that experimentally induced intrinsic motivation leads to greater persistence in a subsequent free-choice period (see Deci & Ryan, 1985a). Such persistence in free-choice periods is typically measured in the immediate context of the laboratory experiment and rarely goes beyond 30 minutes following the intrinsic motivation manipulation. By showing that intrinsic motivation can be used to predict behavioral persistence in a prospective fashion, the present findings extend past research and show that past findings obtained in the laboratory can be generalized to important consequences in real-life domains.

Also of interest is the relationship between extrinsic motivation and behavioral persistence. Past research in the field has led one to assume that extrinsic motivation is generally negatively related to behavior and other outcomes. In line with Deci and Ryan's (1985a) theorizing, results from this study reveal that this assumption needs to be substantially qualified: The relationship between extrinsic motivation and outcomes depends on the type of extrinsic motivation involved. In the context of this study, nonself-determined types of extrinsic motivation, namely external and introjected regulation, were not related to persistence in behavior. This is consonant with recent research in education (Ryan & Connell, 1989; Vallerand et al., 1989, in press) on the correlates and consequences of these two motivational styles. However, self-determined types of extrinsic motivation (integration and identification) were found to be positively related to behavioral persistence. This finding is in line with predictions from Deci and Ryan's (1985a) self-determination theory as well as with recent research (Blais, Sabourin, Boucher, & Vallerand, 1990; Ryan & Connell, 1989; Vallerand et al., 1989), which suggests that self-determined forms of extrinsic motivation are expected to have *positive* effects on behavior and other outcomes. Thus, extrinsic motivation need not lead to negative effects. It can also be beneficial for the individual, depending on the type of extrinsic motivation involved. Much of past laboratory research has focused on one type of extrinsic motivation, namely external regulation. We know very little about the other types of extrinsic motivation and the effects they may have on behavior. Future research would do well to focus on this issue as it may lead to significant advances in our understanding of extrinsic motivation and its consequences.

The role of amotivation in behavioral persistence is also noteworthy. Amotivation was a very important predictor of behavior in this study, being negatively related to persistence. The present findings support Deci and Ryan's analysis of its effect on behavior and are congruent with recent findings on the relation between amotivation and other outcomes (Blais et al., 1990a, 1990b; Vallerand et al., 1989; Vallerand & O'Connor, 1989, 1991). Thus, amotivation seems to represent a strong antecedent of negative consequences which should be the subject of future research.

A second aspect of this study that deserves comment is the fact that the present results were obtained while using scales assessing motivational styles rather than through experimental manipulations. Most studies on the intrinsic/extrinsic motivation paradigm have been performed in the laboratory, where experimental manipulations have been used to induce the various motivational states. Recent research in the field has started to study motivational styles and their relationship with various antecedents (Boggiano, Main, & Katz, 1988; Deci,

Nezlek, & Sheinman, 1981; Ryan & Grolnick, 1986) and consequences (Blais et al., 1990a, 1990b; Boggiano & Barrett, 1985; Grolnick & Ryan, 1987; Harter & Connell, 1984; Vallerand et al., 1989). Results from studies using situational variables and motivational styles reveal that they lead to similar effects. For instance, performing a learning task under controlling contingencies or with a predominantly low self-determined regulatory style both lead to poor conceptual learning (Grolnick & Ryan, 1987). This state of affairs leads to the interesting conclusion that motivation, and the consequences which ensue, can be produced situationally by various environmental factors as well as by the person's predominant motivational style (see also Deci & Ryan, 1985b, 1987). Because of the potential theoretical advances that may be gained from studying the interplay between these two types of behavioral antecedents, future research on this issue is encouraged.

The above discussion on the role of situationally and dispositionally induced motivation in behavior leads to a third interesting topic, the nature of the motivation that determines behavior. Scant attention has been given to this question in the literature. We feel that this is a very complex question which may involve several factors, including level of task interest, the context within which the task is emitted, and the psychological meaning of the behavioral measure. For the time being, and in line with the present study, we will focus on this last factor. The behavior to be performed can reflect several meanings. However, two appear important within the present context: (*a*) whether the behavior is performed freely or (*b*) whether the behavior is constrained in some way. To the extent that the behavior is performed relatively freely, one would expect individuals who are intrinsically motivated (i.e., those who like the task) to engage in the activity again (or to persist more). This is in fact one major finding of the experimental literature on intrinsic motivation (see Deci & Ryan, 1985a). However, the results of the present study extended these findings in showing that not only intrinsic motivation, but also self-determined forms of extrinsic motivation, namely integration and identification, can influence relatively free persistent behavior in a field setting. Thus, when the behavior to be performed is relatively free and unconstrained, intrinsic motivation, integration, and identification should be the main movers.

However, when behavior is constrained (that is, coerced in some way, through rewards or punishment), the situation is more complex. On one hand, individuals who are self-determined, that is, those who either like the task or have chosen to perform it (because it is meaningful to them) will perform the behavior. On the other hand, individuals who are not self-determined toward the activity (those motivated out of external and introjected regulation) will also engage in it because they have to (they are being coerced into performing it). Thus, with respect to constrained behavior, all forms of motivation (except amotivation, which represents the absence of motivation) would be expected to influence subsequent behavior (see Deci, 1971). In this vein, it is interesting to note that in the context of this study, external regulation and introjection did not relate to behavior, thereby reinforcing our initial assessment of persistence in the French course as being relatively free.

In sum, the motivation-behavior relation is complex and may differ depending on whether the behavior to be performed is constrained or free. While freely chosen behavior would be expected to be influenced mainly by intrinsic motivation, integration, and identification, constrained behavior should be determined by all forms of behavior. Future research on these issues is needed and may lead to important advances in our understanding of the motivation-behavior relationship.

Also of interest are the findings which revealed that females reported being more intrinsically motivated, integrated, and identified as well as less externally regulated and amotivated toward academic activities than males. These findings are intriguing because they run contrary to past research which has found females to display higher levels of learned helplessness than males in educational settings (e.g., Dweck & Goetz, 1978). However, it is noteworthy that these last findings have not been replicated with consistency in the literature and that much research reveals that females appear to display lower levels of external control but higher levels of internal control than males (see Cooper, Burger, & Good, 1981). Thus, one would expect females to display a more self-determined motivational profile than males. In addition, the present findings appear robust since they have been replicated with elementary schoolchildren in the United States (Ryan & Connell, 1989), one high-school sample (Daoust, Vallerand, & Blais, 1988), two samples of junior-college students (Vallerand et al., 1989), and with one sample of elderly individuals (Vallerand & O'Connor, 1989), all from the Province of Quebec. Thus, these gender differences appear well supported and seem to extend across the life span. Because these gender differences in motivational styles seem to lead to important consequences, research on their antecedents would appear to represent an important issue for the future.

A final aspect of the present findings worth mentioning deals with

the results obtained with the scale (AMS) used to assess motivational styles. Results showed an acceptable level of reliability (Cronbach alpha) as well as preliminary evidence of validity through the pattern of correlations obtained among the motivational subscales. These findings showed that the concepts of amotivation, external regulation, introjection, identification, integration, and intrinsic motivation ordered themselves as predicted in a simplex structure. Overall, these results make three important points. First, in line with recent research (Blais et al., 1990b; Ryan & Connell, 1989), they provide support for Deci and Ryan's (1985a) theory which postulates the presence of a self-determination continuum ranging from low to high levels of self-determination as one moves from amotivation to intrinsic motivation. Second, the present results also underscore the fact that motivational styles can lead to important and predictable consequences. And third, the present findings underscore the utility of instruments, such as the present one, to assess intrinsic, extrinsic, and amotivational styles. Future research on motivational styles using similar scales is encouraged since it may lead to significant advances in our understanding of the role of motivation in human functioning in various life domains. We are currently pursuing such research in other domains, including leisure (Pelletier, Vallerand, Blais, & Brière, 1990), interpersonal relationships (Blais et al., 1990b), work (Blais, Lacombe, Vallerand, & Pelletier, 1990), sports (Brière, Vallerand, Blais, & Pelletier, 1990), and the elderly (Vallerand & O'Connor, 1989, 1991). In general, results to date are in line with those obtained in the present study and attest to the fact that motivational styles can be reliably measured and can lead to important consequences.

In closing, it seems appropriate to underscore two limitations of this study. First, the present study did not use an experimental design. Thus, it is inappropriate to interpret the present results in terms of causality. That is, the present prospective design cannot rule out the effects of a third variable on both motivational styles and persistence. For instance, it is possible that students who entered the course had a pretty good idea as to whether they would complete the course. Consequently, intention to remain in (or to quit) the course may have influenced both persistence behavior and answers on the motivational styles questionnaire. Thus, within the confines of the present study, we should limit ourselves to the conclusion that motivational styles can predict persistent behavior. However, as indicated previously, one cannot help but compare the present findings with those of laboratory experiments which

showed that situationally induced motivation does affect persistent behavior very much in line with the present findings (see Deci & Ryan, 1985a, for a review). In any event, future research is called for in order to more clearly determine the causal effects of motivational styles on behavior.

A second limitation of this study pertains to the level of generality at which motivation was assessed. We assessed motivation toward school and doing homework in general. It could be argued that a more specific measure assessing motivation toward going to the French course and doing homework in that particular subject should have been used. However, two points are in order here. First, because first-term junior-college students were used in this study, it is likely that a large overlap took place between motivation toward a first-term course and motivation to go to school. This is especially likely to have occurred because motivation was assessed in students' second week in the junior-college program. Thus, it is plausible that motivation toward the French course and motivation as assessed in this study might have been very similar. Second, if anything, a more specific measure of motivation should have enhanced prediction of persistent behavior rather than diminished it. In this light, the present findings should therefore be considered a relatively conservative assessment of the relation between motivational styles and persistent behavior. Future research should take into consideration the level of generality of the motivation measure in assessing its link with behavior.

In conclusion, results from the present study revealed that intrinsic, extrinsic, and amotivational styles are sufficiently powerful to predict behavior in an important real-life domain, namely education. These findings underscore the importance of motivation in the everyday life of individuals and provide potential insights for the conduct of future research in this area.

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