
Vocational Exploration in Middle School: Motivational Characteristics of Students and Perceptions of the Learning Climate

Exploration vocationnelle au début du secondaire : caractéristiques motivationnelles des élèves et perceptions du climat d'apprentissage

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ABSTRACT

The goal of this study was twofold: first, to identify vocational exploration profiles in the second year of middle school (Grade 8), and second, to distinguish these profiles in terms of sociomotivational variables. The sample included 521 students (255 boys, 266 girls) attending middle schools in Quebec. Results revealed three vocational exploration profiles: high exploration, exploration through discussion, and low exploration. Students in the high exploration profile were distinguished by their perceptions of the classroom climate as performance-oriented, their personal achievement goals, and their personal motivations. Results are discussed in light of their implications for the vocational and motivational literature.

RÉSUMÉ

Cette étude a pour objectif d'identifier les profils d'exploration vocationnelle (EV) chez des élèves de deuxième secondaire et d'examiner ces profils en fonction de caractéristiques sociomotivacionnelles. L'échantillon se compose de 521 élèves (255 garçons, 266 filles) fréquentant une école secondaire du Québec. Les résultats révèlent trois profils d'EV: exploration élevée, exploration par la discussion, et faible exploration. Les élèves avec un profil d'exploration élevée se distinguent par une perception du climat de la classe comme orientée vers la performance, par leurs buts individuels d'accomplissement, et par leurs motivations personnelles. Les résultats sont discutés à la lumière de la littérature consacrée à l'EV et à la motivation.

In a society where career choices are driven not only by familial predisposition (Francequin, Descamps, Ferrand, & Cuvillier, 2004) and where a good proportion of people follow precarious and atypical career paths (Fournier, Bourassa, & Béji, 2003), questions about career constraints and choices have become a reality, even for youth. However, as many youth do not feel an urgent need to think about their futures (Gati, Krausz, & Osipow, 1996), they tend to delay making career-related decisions, resulting in delayed entry into the labour market (Ministère de

l'Éducation, du Loisir et du Sport¹ [MELS], 2007). Some vocational theorists (e.g., Super, 1990) proposed that in order to promote vocational development, youth should be placed in social situations that allow them to explore different aspects of both their personality and the workplace.

In 2005, a new training program was introduced into Quebec's secondary school system.² The program was intended to encourage students to explore different vocations by integrating vocation-related activities through complementarity and interaction between general education and training in the workplace (MELS, 2002). The idea behind this program was that students would become aware of the importance of engaging in vocational exploration to learn more about themselves and the world of work to help them make better choices about their futures (Hartung, Porfeli, & Vondracek, 2005). School-guided exploration could relieve some of the stress of uncertainty surrounding vocational choice (Blustein, 1997).

Although the relevance of fostering vocational exploration in secondary school has been recognized (MELS, 2002; Savickas, 2002), no studies to date have addressed students' vocational exploration profiles. Considering that Quebec's education system has introduced three education paths (General Education Path, Applied General Education Path, and Work-Oriented Training Path³) starting in the third year of middle school (Grade 9), students' vocational exploration needs to be better identified at the time they are preparing to make choices that could impact future career opportunities (MELS, 2007). Accordingly, this study aimed to identify the presence of different vocational exploration profiles in second-year middle school students (Grade 8) to determine whether these profiles vary according to certain sociomotivational variables (academic motivation, achievement goal orientation, and perceptions of classroom climate) that are currently associated with learning.

EXPLORATION: A CRITICAL COMPONENT OF VOCATIONAL DEVELOPMENT

Many authors view vocational development as a complex process that unfolds in a series of steps: (a) exploring vocational interests, (b) gaining self-knowledge, and (c) learning about the labour market (e.g., Bryant, Zvonkovic, & Reynolds, 2006). Although the vocational development process can span a lifetime, theories on career development have long stressed the importance of vocational development during adolescence (see Hartung et al., 2005, and Watson & McMahon, 2005).

Vocational exploration is a key catalyst for individual vocational development (Blustein, Murphy, Coutinho, Catraio, & Backus, 2011; Porfeli, 2008). Generally, vocational exploration is conceptually defined as a set of cognitive components and processes that act to make individuals aware of themselves (their interests and aptitudes) and the working world (Blustein & Flum, 1999; Porfeli, Hartung, & Vondracek, 2008). Many researchers contend that engagement in vocational exploration is determined by a set of individual, relational, cultural, and economic factors (Blustein & Flum, 1999; Grotevant & Cooper, 1988; Hartung et al., 2005). At the same time, it has been proposed that motivation is a driver for vocational development (Janeiro, 2010). However, the motivational characteristics

associated with vocational exploration have rarely been addressed beyond theoretical propositions. In the past two decades, studies on motivation in education have largely stemmed from two theoretical approaches: self-determination theory (SDT) and achievement goal theory (AGT). Both offer promising explanations as to why young adolescents would be inclined to engage in vocational exploration.

SELF-DETERMINATION THEORY

Self-determination theory (SDT) (Deci & Ryan, 2009; Ryan & Deci, 2002) addresses the processes that underlie human motivation. According to SDT, motivation is a multidimensional concept that can be situated along a continuum of self-determination that includes intrinsic and extrinsic motivation. The most self-determined motivation is intrinsic motivation (IM), which is a volitional, inherent tendency to engage in an action out of interest and pleasure.

Extrinsic motivation (EM) describes four forms of regulation: (a) *integrated regulation*, the most self-determined form of EM, is observed when the action is pursued because of its consistency with the person's values and needs, even if it is not pleasurable; (b) *identified regulation* applies to actions undertaken because one finds them important or because one chooses to do so; (c) *introjected regulation* is a controlled (i.e., not self-determined) form of EM where the action is carried out under internal pressure such as guilt, shame, or a need to obtain approval or a feeling of self-worth; and (d) *external regulation*, the most controlled form of EM, occurs when an action is taken solely in order to obtain a reward or avoid punishment. The least self-determined (or most controlled) type of motivation is *amotivation*, or the absence of motivation, which is observed in individuals who do not see the underlying reasons for their behaviour.

A number of studies have shown that the more self-determined motivations (intrinsic motivation, integrated regulation, and identified regulation) are associated with positive academic outcomes such as persistence (Patrick, Skinner, & Connell, 1993; Vallerand, Fortier, & Guay, 1997), performance (Grolnick, Ryan, & Deci, 1991; Guay & Vallerand, 1997; Vansteenkiste, Zhou, Lens, & Soenens, 2005), a preference for challenging tasks (Boggiano, Main, & Katz, 1991), the use of effective learning strategies (Vansteenkiste et al., 2005), concentration during task performance, and classroom participation (Patrick et al., 1993). These motivations were also related to lower dependence on teachers (Patrick et al., 1993) and the expression of positive emotions (Ryan & Connell, 1989). In contrast, the more controlled motivations (introjected and external regulation, and amotivation) usually show the inverse relationship with these educational aspects (Guay, Ratelle, & Chanal, 2008; Patrick et al., 1993; Ryan & Connell, 1989).

ACHIEVEMENT GOAL THEORY

Achievement goals are based on a set of beliefs and attributions concerning intelligence, ability, and success. They determine why and how students engage

in learning (Anderman & Patrick, 2012; Elliot, 2005). Achievement goal theory (AGT) proposes a three-dimensional model: mastery goals, performance-approach goals, and performance-avoidance goals (Elliot & Church, 1997; Kaplan & Maehr, 1999; Middleton & Midgley, 1997). *Mastery goals* place the emphasis on developing competence. This goal orientation reflects a desire to learn and understand based on self-referenced standards, to make an effort, persevere, and improve. *Performance-approach goals* reflect a desire to outshine others and gain social recognition for one's performance. Students motivated by *performance-avoidance goals* seek to demonstrate that their performance is not worse than others and to avoid the negative consequences of poor performance.

The outcomes of these achievement goals for education have been well documented. The pursuit of mastery goals has been consistently associated with a variety of positive outcomes, including feelings of self-efficacy, the use of effective metacognitive strategies, intrinsic motivation, and academic performance (e.g., Church, Elliot, & Gable, 2001; Poulin, Duchesne, & Ratelle, 2010; Shim, Ryan, & Anderson, 2008). On the other hand, endorsing performance-avoidance goals has been negatively associated with these same outcomes (e.g., Church et al., 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Middleton & Midgley, 1997; Urdan & Schoenfelder, 2006). It is important to note, however, that the overall results on performance-approach goals are inconsistent. Although these goals have been positively related to motivation and academic performance at the end of high school and in university, they have also been associated with negative learning and motivation patterns (Church et al., 2001; Midgley, Kaplan, & Middleton, 2001).

A central tenet of AGT is that students' goal orientation is influenced by the learning climate established by the teacher (Anderman & Patrick, 2012). Two types of climate have been identified: a mastery-oriented climate and a performance-oriented climate (Meece, Anderman, & Anderman, 2006). Teachers who establish a mastery-oriented climate encourage autonomy in their students and give them opportunities to make choices. They recognize and value students' efforts and organize learning activities that are suitable for students' interests and needs. They also encourage their students to assess their own learning based on personal standards. In contrast, teachers who establish a performance-oriented climate tend to grant their students little autonomy. They value students who get good marks over students who do not and use assessment methods to measure students' competencies compared to their classmates. Studies showed that certain motivational and academic characteristics of students vary according to the learning climate (Kaplan, Middleton, Urdan, & Midgley, 2002). Like mastery goals, a mastery-oriented climate has been associated with a range of positive outcomes, often the same as for mastery goals (Anderman & Patrick, 2012; Urdan, 2004; Wolters, 2004). On the other hand, a performance-oriented climate has been related to performance-approach goals, performance-avoidance goals, low persistence, and procrastination (Wolters, 2004), as well as test anxiety (Skaalvik, 1997) and cheating (Anderman, Griesinger, & Westerfield, 1998).

SOCIOMOTIVATIONAL CHARACTERISTICS AND VOCATIONAL EXPLORATION

In the literature on youths' vocational exploration, few empirical studies were found that considered motivation. Nevertheless, two studies consistent with SDT have suggested that vocational exploration could be linked to motivational orientation in young adults. In a study with a sample of 154 students aged 18 and 19, Blustein (1988) showed that self-exploration and the perception that it is useful to engage in vocational exploration were associated with both autonomy and controlled motivational orientation. Thus, engaging in vocational exploration was associated with being generally motivated by choice and interest, but also by external pressure. More recently, Kiener (2006) found that intrinsically motivated students aged 18 to 26 were more aware of their needs and the steps they had to take to achieve their professional goals. This awareness in turn promoted a more active engagement in vocational exploration.

The present study joins this research stream, but with four distinctions. First, vocational exploration profiles are empirically examined in early adolescence, a developmental age that has rarely been considered. Studies have stressed that not all youths engage in vocational exploration at the same time, in the same manner, or with the same intensity (e.g., Blustein, 1997; Blustein & Flum, 1999; Brown, Darden, Shelton, & Dipoto, 1999). This suggests that exploration profiles should be heterogeneous. The most appropriate method to identify vocational exploration profiles would be to use a person-centred approach (Magnusson & Bergman, 1990; Muthén & Muthén, 2000). Some empirical research in career indecision (e.g., Kelly & Pulver, 2003; Wanberg & Muchinsky, 1992) has shown that person-centred approaches (cluster analytic techniques) allow identification of distinct profiles of university students according to their similarities and differences on a set of vocational (e.g., indecisiveness), aptitude (e.g., mathematical ability), and personality (e.g., neuroticism) variables.

The second distinction concerns the method used to examine the relationship between motivations and vocational exploration. Unlike the two above-cited studies (Blustein, 1988; Kiener, 2006), which used global scores of motivation or a self-determination index, the present study proposes an in-depth analysis of each type of motivation. This approach appears to be an advantage, as middle school students have been found to endorse more than one type of motivation simultaneously (Ratelle, Guay, Vallerand, Larose, & Sénécal, 2007; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009).

The third distinction is that achievement goals are taken into account. These goals orient exploration in learning situations (Elliot, 2005) and it appears useful to examine whether they are associated with other exploration factors at school, in this case, vocational exploration.

Finally, the present study examines students' perceptions of the learning climate. Considering that the classroom climate influences students' school experience, including their motivations and the goals they pursue, the aim is to determine the extent to which mastery or performance environments relate to vocational exploration in the second year of middle school. Although no studies to our knowledge

have found an association between the learning climate and vocational exploration, some studies outside of the AGT and SDT umbrella have suggested that teachers can influence vocational development in youth. Generally, students who are supported by their teachers show greater feelings of self-efficacy in performing tasks related to vocational development, invest more in planning for a future career (Kenny & Bledsoe, 2005), have positive expectations about their future career choices (Gushue & Whitson, 2006; Metheny, McWhirter, & O'Neil, 2008), and express greater desire to choose careers that would make their lives meaningful (McWhirter, Hackett, & Bandalos, 1998).

THE PRESENT STUDY

This study has two objectives. The first is to identify and describe the vocational exploration profiles of students in their second year of middle school using cluster analysis (for details, see the Results section). Because this is an exploratory objective, no specific hypothesis was formulated with respect to the number of profiles expected. However, assuming that not all youths begin exploring their career options at the same age (e.g., Blustein, 1997), and knowing that cluster analysis allows identifying distinct career indecision status among university students (Kelly & Pulver, 2003), we expected more than one profile to emerge in our sample. There could be a portrait for students who were actively engaged in several dimensions of vocational exploration (information seeking, reflection, and discussions with parents, peers, and school counsellors), another for students who were more specifically engaged in one exploration dimension (e.g., information seeking), and a third for students who were little or not at all engaged in these pursuits.

The second objective is to determine whether the profile of students who are more actively engaged in vocational exploration will be distinguished from other profiles in terms of certain sociomotivational characteristics. It is expected that more engaged students will present a more self-determined motivational orientation toward school (i.e., higher scores on the self-determined motivations and lower scores on controlled motivations) and will adopt attitudes and behaviours based more on understanding and the attempt to surpass oneself (mastery goals). This exploration profile should also be positively associated with perceptions of being exposed to mastery teaching practices. In contrast, students could also be engaged in vocational exploration for more controlled than self-determined reasons, such as fear of disappointing others, the desire to demonstrate one's self-worth, to meet expectations, or to outshine others. Students in such a profile should perceive being exposed to more performance-oriented teaching practices.

Adolescents' gender was included as a control variable in this study. Previous studies have found that girls are more self-determined (Vallerand et al., 1997) and mastery-oriented than boys (Meece, Bower Glienke, & Burg, 2006). Moreover, it seems that girls respond more negatively to performance-oriented teaching practices (Meece, Bower Glienke, et al., 2006) and tend to engage in less vocational exploration than boys (McMahon & Patton, 1997).

METHODS

Participants and Procedure

Data were obtained from a longitudinal study on school transition, adaptation, and perseverance. Data collection began in the 2005–2006 academic year. In the first phase of the study (Time 1; Grade 6), the sample comprised 521 students (255 boys, 266 girls). Students were selected randomly from an address list generated by the MELS and were stratified according to gender, region of residence (rural vs. urban), and socioeconomic status. Thus, a sample of French-speaking students representing the Grade 6 population in Quebec was constructed at Time 1. Participation in this study required prior parental approval. In the spring of 2006 (Grade 6), 2007 (first year middle school or Grade 7), and 2008 (second year middle school or Grade 8), students were invited to fill out an online or mailed questionnaire.

In the present study, only data from Time 3 (second year of middle school) were used. This is the first year when students were asked about various aspects related to vocational development. The sociodemographic data collected about one parent of the students at Time 1 reveal that most of the students were born in the province of Quebec (92%) and speak French at home (97%). With respect to the familial situation, 73% live with both biological parents. Median gross family income is \$66,666 (CAN), and approximately 90% of fathers and 88% of mothers have at least a high school diploma. At Time 3, participating students were aged 13.72 years on average ($SD = .46$).

Missing Data

To preserve the original sample of 521 participants, missing data at Time 3 were estimated using an expectation-maximization (EM) algorithm. This iterative procedure produces estimations of maximum likelihood. It comprises two steps (expectation and maximization) that are repeated alternately until convergence is reached and the missing data can be incorporated (Graham, 2009). This imputation of missing data has been demonstrated as preferable to exclusion (listwise deletion) and other ad hoc methods such as average substitution, which reduce statistical power and the accuracy of estimates and lead to results bias (Davey, Shanahan, & Schafer, 2001; Peugh & Enders, 2004).

Measures

VOCATIONAL EXPLORATION

Vocational exploration was self-reported by adolescents using a measure developed for this study and inspired by the Career Exploration Scale (Tracey, Lent, Brown, Soresi, & Nota, 2006). This 13-item scale assessed the degree to which students were engaged in exploring career markets by measuring the frequency of behaviours such as “Over the last three months I have read information about specific jobs or careers, met with a guidance counselor, and talked about jobs or careers with my parents and friends.” For each item, students were asked to respond

on a 5-point Likert scale (1 = *never*; 5 = *often*). We performed an exploratory factor analysis with oblimin orthogonal rotation to verify the scale's factor structure. An item analysis revealed three distinct dimensions: Reading (e.g., "I read information on specific jobs or careers"), Information Seeking (e.g., "I attended a job fair"), and Reflection and Discussion (e.g., "I thought about what I want to do as a job or career"; "I have talked with my family about jobs or careers"). Results also revealed a saturation coefficient inferior to .30 for one item, which was excluded from subsequent analyses. The internal consistency coefficients for each factor were .81, .82, and .77 for Reading, Information Seeking, and Reflection and Discussion, respectively.

ACADEMIC MOTIVATIONS

The Academic Motivation Scale (AMS; Vallerand, Blais, Brière, & Pelletier, 1989) was used to assess students' types of motivation toward school. The scale comprised five subscales (four items each) to assess the different reasons students go to school, which correspond to the different types of motivation identified by SDT: intrinsic motivation (IM), identified regulation (IdR), introjected regulation (InR), external regulation (ER), and amotivation (AM). Thus, to the question, "Why do you go to school?" participants answered with one item, such as, "For the pleasure of learning about new things that I have never seen before" (IM), "Because it will help me choose a good job or career later on" (IdR), "To prove to myself that I am intelligent" (InR), "To earn a better salary later on" (ER), or "I don't know. I don't understand what I'm doing at school" (AM). Students indicated their degree of agreement with each statement on a 5-point Likert scale (1 = *completely disagree*; 5 = *completely agree*). Previous studies have supported the internal consistency of the AMS (Vallerand et al., 1989; Vallerand et al., 1997). In the present study, the Cronbach's alphas varied from .78 (ER) to .91 (IM).

STUDENTS' ACHIEVEMENT GOALS

Mastery goals, performance-approach goals, and performance-avoidance goals were assessed with a short version of the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000). The mastery goals dimension comprised five items that assessed the degree to which students aimed to develop their competencies and thoroughly understand the tasks they must accomplish (e.g., "It is important to me that I improve my skills this year"). Five items also assessed performance-approach goals by measuring the degree to which students wanted to demonstrate to others that they were competent in their schoolwork (e.g., "One of my goals is to show others that I'm good at my class work"). The performance-avoidance goals subscale contained four items to assess the degree to which students wanted to avoid looking incompetent in their schoolwork (e.g., "It's important to me that my teacher doesn't think that I know less than others in class"). Participants were asked to indicate on a 5-point Likert scale (1 = *very little or not at all*, 5 = *extremely*) the degree to which each statement applied to them. Midgley et al. (2000) reported consistency coefficients of .85 (mastery), .89 (performance-approach),

and .74 (performance-avoidance). In the present study, these coefficients were .88 (mastery), .89 (performance-approach), and .85 (performance-avoidance).

PERCEIVED LEARNING CLIMATE

Two subscales of the PALS were used to assess students' perceptions of the classroom climate as either mastery-oriented or performance-oriented. The mastery-oriented climate subscale contained four items to assess the degree to which students perceived that their teacher encouraged them to develop their competencies (e.g., "My teacher gives us time to really explore and understand new ideas"). The performance-oriented climate subscale contained four items to assess students' perceptions that their teacher encouraged them to perform and demonstrate their competencies (e.g., "My teacher tells us how we compare to other students"). Students had to indicate the degree to which each statement applied to their mathematics and French teachers on a 5-point Likert scale (1 = *very little or not at all*, 5 = *extremely*). The psychometric qualities of this scale have been previously supported (Midgley et al., 2000). In the present study, coefficients were .65 (performance-oriented climate) and .82 (mastery-oriented climate) for the mathematics teacher, and .67 (performance-oriented climate) and .87 (mastery-oriented climate) for the French teacher.

Bivariate correlations revealed a strong relationship between performance-oriented climate for French and mathematics classes ($r = .70$), with a moderate relationship between mastery climate ($r = .35$). In order to limit the number of variables for subsequent analyses, an average score was calculated for performance-oriented climate ($\alpha = .80$) and mastery climate ($\alpha = .83$).

RESULTS

The results are presented in three sections. First, correlations among variables of interest were examined. Next, cluster analyses were conducted to identify vocational exploration profiles. Finally, analyses were performed to compare profiles in terms of perceived classroom climate, academic motivations, and academic goal orientations.

Preliminary Analyses

Table 1 presents the mean and standard deviation for all variables as well as the correlations among all variables. Results showed that the majority of variables were significantly correlated. Except for performance-avoidance goals, which were positively related to each dimension of vocational exploration, all relationships were in the expected direction. These results showed that, whereas dimensions of vocational exploration were correlated with many sociomotivational variables, the magnitude of the associations was generally lower than .30.

Vocational Exploration Profiles

To identify vocational exploration profiles, a cluster analysis was performed using the three dimensions of vocational exploration (Reading, Information Seeking,

Table 1
Correlations, Means (M) and Standard Deviations (SD) for All Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Reading	-													
2. Information seeking	.52	-												
3. Reflection & discussion	.54	.28	-											
4. Intrinsic motivation	.09	.05	.17	-										
5. Identified regulation	.12	.01	.22	.44	-									
6. Introjected regulation	.13	.16	.22	.56	.40	-								
7. External regulation	.06	-.02	.04	-.19	.38	.15	-							
8. Amotivation	-.04	.13	-.14	-.52	-.48	-.22	.06	-						
9. Mastery goals	.10	.04	.21	.67	.54	.58	.04	-.47	-					
10. Performance approach goals	.15	.13	.13	.22	.13	.51	.13	.01	.33	-				
11. Avoidance goals	.17	.18	.13	.10	.06	.38	.19	.12	.19	.84	-			
12. Mastery climate	-.02	.01	.07	.31	.26	.17	.07	-.23	.30	.01	.01	-		
13. Performance climate	.20	.32	.12	.04	-.03	.21	.07	.18	.03	.23	.27	-.04	-	
14. Gender	.02	.07	.03	.13	.01	.08	-.21	-.27	.14	-.13	-.18	.05	-.10	-
M	1.76	1.35	3.18	3.26	4.33	2.95	3.92	1.54	3.79	2.27	2.28	3.83	2.06	
SD	0.83	0.49	0.90	0.94	0.60	1.02	0.81	0.74	0.77	0.86	0.92	0.68	0.68	

Note. Variable scores vary from 1 to 5. Girls serve as the reference group for gender. Correlations $\geq .09$ are significant at $p < .05$ and correlations $\geq .12$ are significant at $p < .01$.

Reflection and Discussion). Ward's (1963) method combined with a Euclidean squared distance (Chulef, Read, & Walsh, 2001) created profiles by maximizing variability between clusters and minimizing variability within each cluster. Given the exploratory nature of these analyses, models with two to four clusters were estimated. The cubic clustering criterion, pseudo F, pseudo T^2 , and R^2 were used as indicators for the optimal number of clusters. Results revealed that the three-cluster model best fit the data ($R^2 = .56$).

The first profile, labeled "low explorers" (32% of the sample), included students who were the least actively engaged in vocational exploration. Of the three identified groups, these students scored the lowest on all dimensions. The second profile, labelled "students who explored through discussion" (41% of the sample), included those who were active on only one dimension, Reflection and Discussion (with parents, friends, or school counsellors). These students scored relatively low on the dimensions Reading and Information Seeking. The third profile, labeled "high explorers" (27% of the sample), included students who most actively explored across the three dimensions. They scored very high on the Reflection and Discussion dimension and moderately high on Reading. Although these students appeared to be less oriented toward Information Seeking, they still scored higher on this dimension than the other two groups.

Sociomotivational Characteristics Associated with Vocational Exploration Profiles

Our second objective was to verify whether the most active vocational exploration profile (high explorers) could be distinguished from the other profiles in terms of sociomotivational variables. To meet this objective, three series of multivariate analyses of covariance (MANCOVA) were performed with an inter-subject factor (vocational exploration profile) and a covariable (student's gender). Interactions between gender and profiles were also examined. The first analysis addressed motivation type, the second analysis looked at achievement goals, and the third analysis examined students' perceptions of the learning climate. Results are presented in Table 2.

A significant effect of profiles was obtained on types of motivation (Wilks's $\lambda = 0.94$; $dl = 10, 1022$; $p < .01$), suggesting that students in the three profiles differed on several motivational types. The post hoc analyses revealed that students in the high explorers profile were more intrinsically motivated than those in the low explorer profile. High explorers also reported higher identified regulation and introjected regulation than low explorers. High explorers were also less amotivated than students who explored through discussion. No univariate effect was detected for external regulation, and there were no significant interactions between gender and exploration profile.

The second analysis, performed on achievement goals, also revealed a multivariate effect of vocational exploration profiles (Wilks's $\lambda = 0.96$; $dl = 6, 1026$; $p < .01$), which suggests that students in the three profiles differed in their endorsement of achievement goals. Post hoc analyses showed that high explorers endorsed mastery goals to a greater extent than did low explorers. In addition, high explorers

endorsed performance-approach goals more strongly than low explorers, and marginally more strongly than students who explored through discussion. High explorers also pursued more performance-avoidance goals than low explorers. Generally, the more active explorers had higher scores on the three achievement goals than did students in the other profiles. There were no significant gender X profile interactions.

The final analysis addressed students' perceptions of the learning climate. A significant multivariate effect was found (Wilk's $\lambda = 0.97$; $dl = 4, 1028$; $p < .05$), suggesting that the classroom climate was perceived differently by students in the three profiles. Post hoc analyses revealed that high explorers perceived their teachers as more performance-oriented than did low explorers. No significant differences between profiles were obtained for mastery-oriented climate, and there were no gender X profile interactions.

DISCUSSION

This study had two objectives: to identify vocational exploration profiles in second year middle school students, and to examine whether these profiles were associated with different sociomotivational variables. The results supported a heterogeneous pattern of vocational exploration, with a subgroup of students who were the most actively engaged in exploration and other subgroups who were less engaged. Moreover, these high-exploring students distinguished themselves from their less exploratory peers in terms of certain motivation types, achievement goals,

Table 2
Results of the Multivariate Analysis of Covariance (MANCOVA)

Sociomotivational characteristics	LE	ED	HE	F	Partial η^2
<i>Types of Motivation</i>					
Intrinsic	3.08 ^a	3.29	3.41 ^b	5.17**	.02
Identified regulation	4.22 ^a	4.35	4.43 ^b	4.97**	.02
Introjected regulation	2.70 ^a	3.00	3.17 ^b	8.66**	.03
External regulation	3.90	3.92	3.94	0.11	.00
Amotivation	1.32	1.37 ^a	1.23 ^b	3.69*	.01
<i>Achievement Goals</i>					
Mastery	3.65 ^a	3.80	3.91 ^b	4.39*	.02
Performance-approach	2.10 ^a	2.28	2.48 ^b	7.46**	.03
Performance-avoidance	2.09 ^a	2.29	2.48 ^b	7.16**	.03
<i>Learning Climate</i>					
Mastery-oriented	3.81	3.87	3.79	0.74	.00
Performance-oriented	1.92 ^a	2.07	2.19 ^b	5.95**	.02

Note. LE = low exploring students; ED = students who explore through discussion; HE = high exploring students.

^{a,b} Different letters indicate mean differences between groups.

* $p < .05$; ** $p < .01$

and perceptions of the learning climate. Overall, these findings suggest that there is a subset of middle school students who engage early on in vocational exploration. These students appear to be more highly motivated and goal-oriented, and they report higher levels of both high- and low-quality motivations and goals. These students also perceive their teachers as performance-oriented.

Vocational Exploration Profiles

As expected, the results revealed different profiles according to the intensity of engagement in vocational exploration. One profile (low explorers) included students who engaged the least in vocational exploration, a second profile included students who engaged in more Reflection and Discussion about their career choices, and a third profile (high explorers) included the students who most actively engaged in exploring their career options. These profiles, which included an equal proportion of boys and girls, are consistent with studies proposing that not all individuals explore vocational choices in the same way (e.g., Blustein & Phillips, 1988; Brown et al., 1999), or begin to explore them at the same time (Blustein, 1997; Blustein & Flum, 1999; Grotevant & Cooper, 1988; Super, 1990).

Two major conclusions may be drawn. First, the results suggest that not all youth appear to find vocational exploration meaningful, at least in the second year of middle school. Even as they make decisions about their academic pathway, many may not yet perceive the importance of these choices for their future, or the urgency of exploring their options. This hypothesis is in line with the idea that individuals may become more engaged when they experience the anxiety of having to make a key career decision, a not infrequent event in adult life (Blustein & Phillips, 1988). Second, in the most engaged students, exploration appeared to be accomplished primarily by Reflection and Discussion with friends and family. Other studies (Blustein, Prezioso, & Schultheiss, 1995; Felsman & Blustein, 1999; Kracke, 1997) have demonstrated the importance of friends and family for youth who are considering career options. Unlike the dimensions Reading and Information Seeking, which imply more proactive behaviours, youth engage in Reflection and Discussion from time to time with people who are close to them, perhaps feeling no urgent need to think carefully about their future at this point.

Exploration Profiles and Types of Motivation

The results showed that, in contrast to their less engaged peers (i.e., low explorers), the students who explored most actively reported higher levels of self-determined academic motivations. Paradoxically, these same students also reported high introjected regulation, a controlled form of academic motivation. On the one hand, these highly engaged students were more self-determined, such that they placed more importance on schooling and were more interested in it, which appears to transfer to the vocational sphere through Reflection and Discussion on future career choices. This exploration might in turn inform them about potential job choices and help them become aware of their own interests and abilities. In addition, they learn about the different steps involved in choosing

a career (e.g., Kiener, 2006). On the other hand, the finding that students in the high explorers profile were also introjected suggests that more controlled types of motivation can coexist with other, more self-determined motivations without short-circuiting vocational exploration. This combination of self-determined and controlled motivations is not atypical in middle and high school students (Ratelle et al., 2007; Vansteenkiste et al., 2009). It is therefore likely that the reasons for which students invest themselves in a task (whether academic or vocational) would also nurture the pleasure associated with the task, the value given to the task, and the desire to prove something to others or to oneself, and to avoid feeling guilty or ashamed. Therefore, faced with the need to choose an educational path (General Education, General Vocational Studies, or Work-oriented Training) as early as second year of middle school (MELS, 2007), students could be pressured into vocational exploration in order to avoid making a choice they will later regret or which might disappoint others (e.g., friends and family).

The results also revealed that students who were highly engaged in vocational exploration differed in terms of motivation from those who began their exploration solely by reflecting and discussing with friends and family: high explorers showed less amotivation than students who engaged in more Reflection and Discussion. Compared to these students, high explorers tended to more actively engage in vocational exploration and in more diversified ways, perhaps because they tended to better understand what they were doing in school, in addition to being more aware of the long-term consequences.

Exploration Profiles, Achievement Goals, and Learning Climate

The results indicated that high explorers were more oriented toward the pursuit of mastery and performance goals than their less engaged peers in the low profile. Researchers have proposed that these two types of goals are complementary, and that in combination they produce positive academic outcomes (Kaplan et al., 2002; Poulin et al., 2010). Recall that mastery goals involve placing importance on acquiring new knowledge, understanding tasks well, and improving, whereas performance goals mainly involve validating competencies (Elliot, 2005). It is arguable that students who are guided by both mastery and performance-approach goals would gradually become orientated toward vocational exploration in the aim of obtaining maximum information, analyzing it, and validating it in order to make an informed decision. At the same time, these students could aim for excellence in hopes of getting good marks, which would expand their opportunities in terms of educational paths and career choices.

These students are also more inclined to perceive that their teachers fostered a performance environment. An analogous argument has been proposed in other studies (Urdu, 2004; Wolters, 2004). Students who perceive that their teachers value competition and convey the idea that success results from individual aptitudes could interpret these messages as encouragement to pursue or maintain high performance. Moreover, they would be more receptive to performance-based messages, considering that they appear to be disposed to engage in actions in order

to demonstrate their self-worth and avoid feeling guilty or disappointing others (introjected regulation).

Furthermore, the results revealed that students who spent more time and energy exploring vocational options were more inclined to pursue performance-avoidance goals. Given that these goals are currently associated with more negative academic outcomes, this finding is difficult to interpret. Like Urdan and Mestas (2006), we propose as a partial explanation that young adolescents have difficulty making clear distinctions between wanting to perform better than others (performance-approach goals) and not wanting to perform worse than others (performance-avoidance goals). This hypothesis gains credence when we consider the strong correlation between these two goal types in the present study and correlations reported in other studies (Duchesne & Ratelle, 2010; Elliot & Muruyama, 2008; Poulin et al., 2010). Nevertheless, we cannot completely exclude the idea that some students who begin exploring vocational notions might fear negative judgements by their friends and family, for instance by admitting their ignorance about career options. Further studies are needed to validate this hypothesis.

Practical Implications

The results of this study have two main implications for educational practices. Although efforts have been made in recent years to better meet students' educational and professional orientation needs, fewer than a third of the second year middle school students assessed in this study seemed very interested in exploring vocational options. Those who had begun to think about their futures, however, preferred to talk it over with friends and family. Practitioners wishing to encourage youths to explore career options at a time when they must choose among education paths (starting in first year high school or Grade 9) could ensure that parents are properly informed about these paths and the consequences. In this way they could help their children discover, through means such as discussion, what they like best at school and what they hope to do in the future.

Furthermore, the results suggest that by emphasizing pedagogical practices that encourage and sustain motivation, teachers could contribute to their students' vocational exploration at the beginning of high school. The correlations obtained in the present study are consistent with studies showing that student perceptions of a mastery-oriented climate are associated with more positive motivational states than perceptions of a performance climate (Kaplan et al., 2002; Wolters, 2004). Thus, teachers who make an effort to provide varied and appropriate tasks, to recognize students' efforts, and support student autonomy (mastery-oriented climate) could indirectly promote vocational exploration by encouraging students to take an interest in their school work, be curious about school tasks, and try to surpass themselves. On the other hand, valuing good marks (performance-oriented climate) could foster or strengthen in some students a feeling of having to prove their self-worth, to perform, and to avoid being viewed as incompetent. This motivational pattern could encourage students to explore, but for more extrinsic reasons (e.g., under pressure), and without fully appreciating the value or

consequences of their actions. In light of the psychological costs associated with controlled motivations, it would be inadvisable to rely solely on this approach.

Limitations and Suggestions for Future Research

Because this study is one of the few to address vocational exploration in second year middle school students, the results should be interpreted with caution. First, using a correlational design does not allow causal inferences between the measured constructs. This method presents a snapshot of a particular period in the students' academic pathway. Therefore, the direction of the relationship between sociomotivational characteristics and vocational exploration cannot be determined. In this respect, a longitudinal study could examine the predictive power of these characteristics to explain vocational exploration. Second, the subscales used to assess the motivations and goals did not specifically address vocational exploration. Instead, they focused on the reasons for going to school and for engaging in educational tasks. This focus could explain the generally moderate relationships found. The predictive power of the motivational variables is higher when the variables are assessed in relation to a specific activity (Elliot, 2005); therefore, it would be useful in future studies to measure motivational orientation with specific reference to vocational exploration.

Third, the use of exclusively student-reported measures increases the risk of shared method variance bias. To reduce the subjective effect of self-reports, it would be useful to gather data from diverse sources, such as from teachers regarding the learning climate and from parents regarding vocational exploration behaviour. Finally, this study focused on the learning climate in French and mathematics classes in an attempt to document students' vocational exploration. Future studies could include assessments of the school's support system for vocational exploration, for example, guidance counselling, including information on college and university programs and the job market.

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Notes

1. Quebec's department of education, leisure, and sports.
2. In Québec, the academic pathway in high school is divided into two cycles: middle school (secondary I–II or grades 7–8) and high school (secondary III–V or grades 9–11).
3. The General and Applied General Education Paths lead to vocational training, college-level studies, or university. The Work-Oriented Training Path may lead directly to the job market (MELS, 2007).

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