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Adolescents' Motivation Toward the Environment: Age-Related Trends and Correlates

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From a self-determination perspective, we attempted to replicate previous findings suggesting that higher autonomous environmental motivation (i.e., acting out of choice and pleasure) is associated with the frequency of environmental behaviours such as recycling, paper reuse, and energy conservation. We also compared students' level of autonomous environmental motivation with their level of autonomous academic motivation. We then examined age effects on autonomous environmental motivation and compared them to age effects on autonomous academic motivation. A total of 200 high school students grouped into 5 age cohorts filled out a questionnaire. Results showed that (1) adolescents' autonomous environmental motivation was associated with more frequent environmental behaviours, (2) autonomous motivation was higher in the environmental than the school domain, and (3) autonomous environmental motivation was higher in older than younger students, whereas autonomous motivation toward school was equivalent across age groups.

Keywords: motivation, environment, school, development

Environmental protection is a growing concern in our society (Oskamp, 2000; Séguin, Pelletier, & Hunsley, 1999; Villacorta, Koestner, & Lekes, 2003). Schools have been actively promoting the importance of positive environmental behaviours (i.e., recycling, paper reuse, energy conservation). Given the emphasis that schools have placed on environmental issues, it is important to examine whether adolescents are motivated to adopt environmental behaviours. An interesting perspective from which to explore motivational resources associated with positive environmental behaviours is self-determination theory (SDT; Deci & Ryan, 1985). SDT posits that individuals who engage in environmental behaviours have developed autonomous motivation toward these behaviours (i.e., the behaviour reflects individual interests and originates from the self).

SDT and Environmental Behaviours

SDT proposes different types of motivation reflecting different levels of autonomy. On a continuum from the lowest to the highest levels of autonomy, these are external regulation, introjected regulation, identified regulation, and intrinsic motivation. *Intrinsic motivation* refers to the incentive to perform an activity for its own sake, for the inherent interest in that activity (Ryan & Deci, 2000). *Extrinsic motivation* refers to the incentive to perform an activity for instrumental reasons that are separate from the activity (Deci, Vallerand, Pelletier, & Ryan, 1991). SDT specifies three types of extrinsic motivation: external, introjected, and identified regulation.[1] Externally regulated behaviours are engaged in to obtain reward or to avoid punishment. Introjected regulation occurs when an individual takes in a regulation but does not fully accept it, therefore acting out of guilt or shame. Identified regulation occurs when an individual performs an activity that is considered personally meaningful and valuable.

In this study, instead of investigating each type of motivation separately, we grouped them into a relative autonomy index (RAI) to capture the level of autonomous motivation. This score reflects levels of intrinsic and identified regulation compared to introjected and extrinsic regulation. The main advantage of using this index over separate examinations of motivation types is the possibility of obtaining more parsimonious analyses.

Past research has demonstrated that autonomous motivation toward the environment in adults is related to various environmen-

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[1] SDT also considers integrated regulation and amotivation. Integration is the most autonomous form of extrinsic motivation, and it occurs when a person has internalized into his self core values and behaviours. Amotivation is the absence of motivation. The integrated and amotivation subscales were not included in the questionnaire for purposes of brevity. The integrated scale of the environment motivation measure was also excluded because there was no matching scale in the academic motivation measure.

tal behaviours, including their frequency (Green-Demers, Pelletier, & Ménard, 1997; Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998), the difficulty of environmental behaviours (Green-Demers et al., 1997), stable pro-environmental attitudes over time (Villacorta et al., 2003), resistance to critiques on the importance of recycling (Koestner, Houlfort, Paquet, & Knight, 2001), and greater information seeking on environmental health risks (Séguin et al., 1999). In this study, we attempt to replicate these past findings in adolescents between the ages of 12 and 18.

In addition, we examine whether young people feel greater autonomous motivation toward the environment than toward their academic activities. SDT proposes that motivation is more autonomous for individuals who experience choice in their actions rather than pressure or control (Ryan & Deci, 2000). We hypothesise that adolescents are exposed to less control from adults regarding environmental than academic behaviours. Indeed, environmental behaviours are not compulsory such as school ones. Students may choose to recycle or not without any negative consequences. In contrast, not going to school may lead parents, the school principal, and teachers to issue sanctions. Moreover, previous research reports that teachers and parents use a variety of controlling and pressuring tactics such as evaluation, surveillance, competition, and the promise of rewards, to "motivate" youth to achieve in school (Grolnick, 2003; Reeve, 1998).

Age-Related Trends in Motivation

Numerous studies investigating age-related patterns in autonomous motivation toward school have provided evidence for a general decrease across the elementary and middle-school grades (Harter, 1981; Lepper, Sethi, Dialdin, & Drake, 1997; Sansone & Morgan, 1992). Recent research on the development of autonomous academic motivation also found a motivational decline from middle childhood through the late high school years (Gottfried, Fleming, & Gottfried, 2001). This decrease in autonomous motivation was explained by the prevalence of extrinsic contingencies that increase over the school years (Lepper, Corpus, & Iyengar, 2005). However, no study to date has investigated whether there are age-related trends in adolescents' autonomous motivation to engage in environmental behaviours. Studying age effects on autonomous environmental motivation could uncover different developmental patterns than those observed for autonomous academic motivation.

Adolescence is characterised by the development of moral beliefs and values as well as sustained moral commitment (Damon & Gregory, 1997). Past research has revealed that one's moral identity is by far the best predictor of commitment to moral action. For instance, moral identity allows individuals to engage in behaviours that are congruent with their "true" self (Damon & Gregory, 1997; Ryan & Deci, 2002). Given the largely moral nature of environmental behaviours and the emergence of moral beliefs during adolescence, we would expect to find increasing levels of autonomous motivation toward the environment as adolescents approach adulthood.

The Present Study

The present study addresses three hypotheses. First, we hypothesised that higher autonomous environmental motivation would be related to more frequent environmental behaviours (e.g., Green-Demers et al., 1997). Second, we predicted that autonomous motivation would be greater toward the environment than toward education. Third, we expected to find higher autonomous environmental motivation in older than younger students, but lower autonomous academic motivation in older than younger students. All hypotheses were tested while considering gender, because some studies have shown that women are more autonomously regulated than men in education (Vallerand, Fortier, & Guay, 1997). However, no study has examined gender differences in adolescents' motivation toward the environment.

Method

Participants and Procedure

A total of 200 students attending a French-speaking high school in suburban Montreal participated in this study. The breakdown of students per age cohorts was as follows: 30 (12 years), 59 (13 years), 30 (14 years), 29 (15 years), 26 (16 years), and 26 (17 years). The sample was composed of 96 boys (48%) and 104 girls (52%). In addition, 74 of the 200 participants had completed the academic and environmental motivation measures a year earlier. This subsample was used to conduct prospective analyses.[2] All students were given a consent form to be signed by their parents and returned to the school prior to the administration of the questionnaire. The questionnaire was filled out during class time on a computer and two well-trained research assistants were present to answer students' questions.

Measures

MTES. The Motivation Toward the Environment Scale (MTES; Pelletier et al., 1998) consisted of 16 items on which participants rated the degree to which various statements corresponded to their reasons for engaging in environmental behaviours. On a 1 to 7 Likert-type scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*), participants rated the degree to which they agreed with intrinsic ($\alpha = .91$), identified ($\alpha = .94$), introjected ($\alpha = .88$), and externally regulated items ($\alpha = .84$). The summary index of autonomous motivation toward the environment was calculated using the following formula: ((2 * intrinsic mean) + identified mean – introjected mean – (2 * external mean)); Grolnick & Ryan, 1987). Scores ranged from −18 to +18. A higher score was associated with higher autonomous motivation toward the environment.

[2] A multivariate analysis of variance indicated that these students ($n = 74$) did not differ from those who did not participate on the following measures: age, gender, general grade average, parents' education level, autonomous motivation toward school, and autonomous motivation toward the environment Ω (6, 436) = 0.48, $p = .089$. We can therefore assume that this subsample is similar to the overall sample.

AMS. The French version of the Academic Motivation Scale (AMS; Vallerand, Blais, Brière, & Pelletier, 1989) was used to measure students' autonomous academic motivation. This scale was composed of 16 items falling under the four subscales proposed by SDT. The items provided possible answers to the question "Why do you go to school?". They were intrinsic motivation ($\alpha = .84$), identified regulation ($\alpha = .74$), introjected regulation ($\alpha = .87$), and external regulation ($\alpha = .68$). Respondents rated their agreement with each reason for going to school on a 7-point Likert-type scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). The summary index of autonomous motivation toward school was calculated using the formula presented above for environmental motivation.

Frequency of environmental behaviours. Adapted from Pelletier et al. (1998), this scale consisted of nine items measuring the extent to which students engaged in environmental behaviours. Students indicated how often they engaged in the environmental behaviours on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*always*). The internal consistency of this scale was .66.

Results

Descriptive Statistics

Preliminary analyses indicated that 8.03% of values were missing. We estimated missing values with a maximum likelihood estimator using the expectation maximisation (EM) algorithm as suggested by Schafer and Graham (2002). Means, standard deviations, and correlations are presented in Table 1. Analyses revealed a positive but weak correlation between adolescents' autonomous academic motivation and autonomous environmental motivation ($r = .15$). As expected, results demonstrate that motivation toward the environment was moderately and positively correlated with frequency of environmental behaviours ($r = .46$). There was no significant relation between motivation toward school and frequency of environmental behaviours ($r = .12$), thereby providing support for the specificity of motivation toward a specific life context.

Gender Effects, Domain Effects, and Age-Related Trends

We conducted a repeated analysis of variance (ANOVA) with age and gender as between-subject factors and domain (academic/environment) as a within-subject factor (see Table 2). A significant main effect for gender, $F(1, 193) = 14.16$, $p < .001$, indicated that girls reported greater autonomous motivation than boys. This gender difference was apparent in both the academic (Ms $= -1.28$ and -2.44, respectively) and environmental domains (Ms $= 7.71$ and 5.87, respectively). Furthermore, a significant main effect for domain, $F(1, 193) = 668.79$, $p < .001$, revealed that adolescents reported greater autonomous motivation toward environmental than academic behaviours (Ms $= 6.93$ and -1.86, respectively). It is interesting to note that there is a large mean difference between adolescents' motivation toward school versus the environment. Indeed, for the academic domain the autonomy index was negative—indicating that controlled motivations are more prominent than autonomous motivations.

A significant Age (12, 13, 14, 15, 16, 17) $\times$ Domain (academic/environment) interaction effect, $F(5, 193) = 3.07$, $p = .011$, indicated different age-related trends. A second repeated ANOVA was then conducted where age was now considered as a continuous variable. In this repeated ANOVA, polynomial contrasts (see Table 2) revealed a quadratic tendency for the environmental domain, $F(1, 93) = 9.73$, $p = .002$. A linear tendency for the academic domain was assumed because higher order contrasts were nonsignificant. In other words, adolescents' autonomous environmental motivation remains relatively stable at ages 12 and 13 and then follows an ascending trajectory (see Figure 1). In contrast, adolescents' motivation toward school follows a decreasing trend, but it fails to reach statistical significance. The total effect size of the model is 0.65, and domain explains most of the variance.

Prospective Analyses of Environmental and Academic Motivation

Because there was data available from a pilot study 1 year earlier, it was possible to examine the extent to which levels of environmental and academic motivation changed over one year in a subsample of 74 participants. A repeated-measures ANOVA with two repeated factors (time and domain) was performed. Gender and age were used as control variables. The model revealed a significant main effect for domain ($p < .001$) and gender ($p = .008$). A significant Time $\times$ Domain interaction effect ($p = .005$) indicated that autonomous environmental motivation increased significantly over the year from a mean of 11.49 to a mean of 14.00, $p = .02$. Autonomous academic motivation decreased slightly over the year from a mean of 4.98 to a mean of 4.27, but this decrease did not approach significance ($p = .24$).

Table 1
Means, Standard Deviations, and Intercorrelations Between Measures

Variable	1	2	3	4	5	*M*	*SD*
1. Age	—					14.20	1.64
2. Gender	.05	—				—	—
3. Motivation toward school	–.06	.27**	—			1.81	2.23
4. Motivation toward the environment	.21**	.18*	.15*	—		6.81	4.51
5. Environmental behaviours frequency	.18*	.10	.12	.46**	—	4.03	0.58

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

Table 2
Repeated-Measures Analysis of Variance and Polynomial Contrasts

Variable	Num *df*	Den *df*	*F* value	*Pr* > *F*
Effect				
1. Domain	1	193	668.79	<.001
2. Age	5	193	1.69	.139
3. Gender	1	193	14.16	<.001
4. Domain × Age	5	193	3.07	.011
5. Domain × Gender	1	193	0.29	.589
Polynomial contrasts				
1. Quadratic (academic)	1	193	0.75	.386
2. Quadratic (environment)	1	193	9.73	.002
3. Cubic (academic)	1	193	0.00	.966
4. Cubic (environment)	1	193	2.66	.104

Note. DEN = denominator degrees of freedom.

Discussion

As expected, results demonstrate that higher autonomous motivation toward the environment was associated with more frequent environmental behaviours. Specifically, the more a student felt a sense of choice and volition for engaging in environmental behaviours, the more he or she was likely to perform environmental behaviours such as recycling, reusing paper, and conserving energy. Our findings therefore extend previous research findings on the positive consequences of autonomous motivation in the environmental domain to a sample of youth aged 12 to 18 years (Green-Demers et al., 1997; Pelletier et al., 1998; Séguin et al., 1999).

Furthermore, adolescents reported noticeably higher autonomy in their environmental than academic behaviours. In other words, they identified primarily intrinsic and identified reasons rather than external or introjected reasons for engaging in environmental behaviours. Youth therefore appear to be more successfully internalizing the importance of environmental than academic behaviours. As previously mentioned, these results may stem from the fact that students experience more choice and less control when engaging in environmental behaviours. The academic domain is replete with controlling motivational factors such as evaluation, surveillance, imposed goals, competition, symbolic rewards, and tangible rewards (Reeve, 1998, 2004).

Age differences were observed in adolescents' motivation toward the environment. Adolescents' motivation for engaging in environmental behaviours was higher in older students, whereas motivation for academic behaviours appeared to remain the same with age. We find it interesting that this finding was also observed prospectively over time, which means that these effects are attributable not only to cohort effects but also to genuine developmental effects. It would be important in future research to replicate this developmental pattern with a larger sample and across a longer time span.

Environmental behaviours may become more autonomous as adolescents grow older due to the emergence of environmental values and beliefs. During adolescence, moral values become an integral part of adolescents' sense of self (Damon & Gregory, 1997). Because controlling strategies are less prevalent in the environmental domain, it is likely that most teenagers naturally develop motivation to behave in positive environmental ways because of personal interest and meaning rather than because of other's approval or disapproval. Thusly, with increasing environmental identification, adolescents act in accordance with their own moral values and their true self, rather than responding to external pressures and incentives.

It is reasonable to presume that adolescents have received the essential nutriments, such as autonomy support from significant others, that they need to integrate positive environmental behaviours. Autonomy support involves the capacity of others to provide choices to adolescents, acknowledge their feelings, and avoid the use of pressure and control (Ryan & Deci, 2000). Parents and teachers are liable to be more autonomy supportive on environmental than academic behaviours. As previously discussed, parents and teachers may use more controlling motivational strategies for school than environmental issues. Excessive pressure and external incentives have been shown to undermine students' motivation (Lepper et al., 2005).

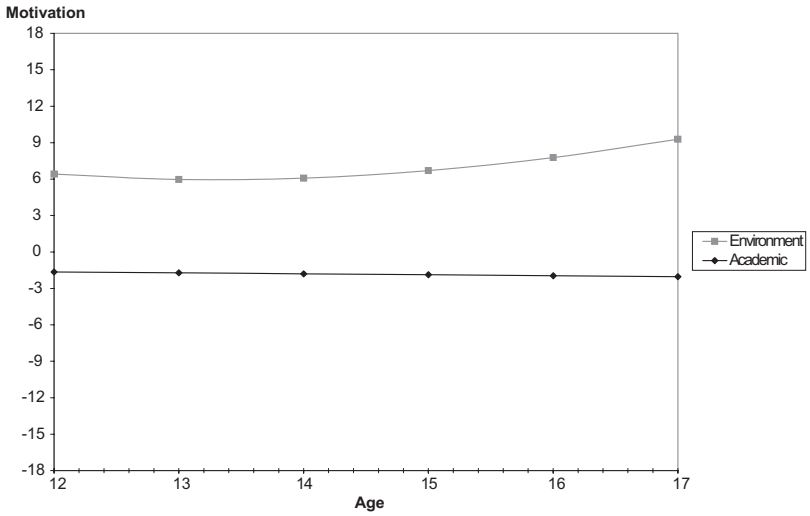

Figure 1. Adolescents' motivation toward the environment and school by domain and age.

The present study also found gender differences in motivation toward the environment, matching the pattern observed in the academic domain. Specifically, females reported greater autonomous motivation than males toward both the academic and environmental domains. The gender difference in the academic domain has been previously established in the literature (Vallerand et al., 1997), but the present findings suggest the importance of examining gender differences in autonomous motivation in other life domains.

Limitations

When interpreting the results of this study, certain limitations need to be considered. First, although the results were corroborated in a subsample of 74 participants for which we had longitudinal data, a cross-sectional design provided most of our data. In addition, our sample was composed mainly of middle-class White students. Future studies should consider sampling more diverse populations to provide a representative portrait of this age-related trend.

Conclusions

The current findings are promising with respect to Canada's environmental future, because they suggest that youth have internalised environmental values in a way that is likely to lead to active, resilient pro-environmental behaviours (Pelletier, 2002). By contrast, the results on academic motivation echo other findings that point to youth's increasing alienation and disengagement from school (Gottfried et al., 2001). Perhaps one lesson from these findings is that parents and teachers should decrease the emphasis on extrinsic motives to do well in school and instead try to nurture students' individual interest in learning as well as highlight the opportunities for personal meaning. Reeve (1998) provided guidelines for how teachers and coaches can shift from controlling to more autonomy-supportive motivational methods, and Joussemet, Landry, and Koestner (2008) outlined how parents can behave in autonomy supportive ways.

Résumé

Dans une perspective d'autodétermination, nous avons tenté de répliquer des résultats antérieurs suggérant qu'une plus grande motivation environnementale autonome (c.-à-d., agir par choix et par plaisir) est associée à la fréquence de comportements environnementaux comme le recyclage, la réutilisation du papier et la conservation de l'énergie. Nous avons aussi comparé le niveau de motivation environnementale autonome chez des étudiants. Nous avons ensuite examiné les effects de l'âge sur la motivation scolaire. Un total de 200 étudiants de l'école secondaire regroupés en 5 cohortes d'âge ont rempli des questionnaires. Les résultats ont montré que (1) le niveau de motivation environnementale autonome est associé à des comportements environnementaux plus fréquents, (2) la motivation autonome est plus élevée dans le domaine environnemental que scolaire et (3) la motivation environnementale autonome est plus élevée chez les étudiants plus ĝés que chez les plus jeunes, alors que la motivation scolaire est équivalente dans les différents groupes d'âge.

Mots-clés : motivation, environnement, école, développement

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