ON THE ASSESSMENT OF INTRINSIC, EXTRINSIC, AND AMOTIVATION IN EDUCATION: EVIDENCE ON THE CONCURRENT AND CONSTRUCT VALIDITY OF THE ACADEMIC MOTIVATION SCALE

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A new measure of motivation toward education has been developed in French, namely the "Echelle de Motivation en Education" (EME). The EME is based on the tenets of self-determination theory and is composed of seven subscales assessing three types of intrinsic motivation (intrinsic motivation to know, to accomplish

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things, and to experience stimulation), three types of extrinsic motivation (external, introjected, and identified regulation), and amotivation. Extensive data support the reliability and validity of the EME. The EME has been translated recently in English. Initial data provided support for the reliability (internal consistency and temporal stability) and factorial validity of the English version of the scale now termed the Academic Motivation Scale (AMS). However, the concurrent and construct validity of the AMS has not been assessed. Such was the purpose of the current study. The subjects were 217 junior-college students who completed the AMS, other motivation-related constructs, as well as variables assessing motivational determinants and consequences. The concurrent validity of the AMS was assessed by correlating its subscales with known motivational scales, while the construct validity was ascertained through a series of correlational analyses among the seven AMS subscales, as well as between these scales and other psychological constructs deemed to represent motivational antecedents and consequences. Findings provided support for the concurrent and construct validity of the AMS. Future directions concerning the use of the AMS in theoretical and applied research are proposed.

MUCH research in education has dealt with the concept of intrinsic motivation. This conceptual approach has generally focused on students' interest as a determinant of school-related behavior and appears rather pertinent for the field of education. Recent developments in the field of motivation have led theorists (Deci and Ryan, 1985; Deci, Vallerand, Pelletier, and Ryan, 1991) to propose that a fuller understanding of human behavior in education must go beyond the mere study of intrinsic motivation and should include a more detailed analysis of the motivational forces in operation. Three such concepts are being proposed, namely intrinsic motivation (IM), extrinsic motivation (EM), and amotivation (Deci and Ryan, 1985).

Based on the above conceptualization, Vallerand, Blais, Brière, and Pelletier (1989) developed and validated in French the Echelle de Motivation en Education (EME) in order to assess IM, EM, and amotivation toward post-secondary studies. This scale is made up of 7 subscales of 4 items each assessing three types of IM, three types of EM, and amotivation. The three types of IM are the IM to know (to do something for the pleasure and satisfaction experienced while learning), to accomplish things (to do something for the pleasure and satisfaction experienced while trying to accomplish things), and to experience stimulation (to do something in order to experience stimulating sensations). The three types of EM are external regulation (e.g., to do something because one is pressured by someone to

do it), introjected regulation (to do something because one pressures him/herself to do it), and identified regulation (to do something because one has decided to do it although it is not fun). Finally, amotivation refers to the absence of intrinsic and extrinsic motivation. It should be noted that these different forms of motivation are posited to lie on a self-determination dimension which ranges from amotivation, to external, introjected, and identified regulation, and finally to intrinsic motivation.

The preliminary and validation studies, which involved more than three thousand students, revealed that the EME has more than satisfactory psychometric properties. For instance, satisfactory internal consistency levels (a mean alpha score of .80), high indices of temporal stability (a mean test-retest correlation of .75) over a one-month period, and a 7-factor structure (confirmed through LISREL) have been obtained. Finally, the construct validity of the scale was supported by a series of correlational analyses among the 7 subscales, as well as between these scales and other psychological constructs relevant to education. In addition, earlier versions of the EME were able to predict school dropout behavior (Vallerand and Bissonnette, 1992).

In light of its adequacy, the EME has been recently translated in English by Vallerand, Pelletier, Blais, Brière, Senécal, and Vallieres (1992). Results from this study revealed that the English form of the scale, now termed the Academic Motivation Scale (AMS) yielded almost identical findings as the French form of the scale with respect to the internal consistency, temporal stability, and factorial structure. However, the construct validity of the AMS was not assessed in that initial study. One approach to testing scale construct validity consists in assessing whether the relationships between the scale and various variables are in line with predictions with known theories and the pertinent literature. With respect to the AMS, this could imply assessing the relations between the present motivational scale and motivational consequences and determinants. Results in accord with predictions from Deci and Ryan's theoretical formulation would provide support for the construct validity of the scale. In the following paragraphs, motivational consequences and determinants are discussed.

Motivational Consequences

Because the various forms of motivation are posited to lie on a continuum from high to low self-determination, and because self-determination is associated with enhanced psychological function-

ing (Deci and Ryan, 1985), one would expect a corresponding pattern of consequences. Recent research supports the basic premises of the formulation in that the different types of motivation are associated with increasingly positive consequences as one progresses from amotivation to intrinsic motivation. These findings have been recently obtained in several domains such as interpersonal relationships, sports, leisure, and aging (see Blais, Sabourin, Boucher, and Vallerand, 1990; Vallerand and O'Connor, 1989). In the realm of education, results obtained with the various types of EM were confirmed with several educational outcomes such as effort, positive emotions experienced in class, psychological adjustment at school, quality of conceptual learning, persistence in school, and interest, concentration, and satisfaction with one's academic life. The most positive correlations were obtained with the various forms of IM (and especially the IM to know), while the most negative correlations were obtained with amotivation (see Vallerand et al., 1989).

Motivational Determinants

As previously noted, IM, EM, and amotivation are associated with a host of psychological consequences pertinent for the education domain. Just as important is the fact that Deci and Ryan's (1985) theory also identifies the nature of the determinants of these different types of motivation. According to cognitive evaluation theory, the person's motivation varies in line with changes in perceptions of competence and self-determination. Events (e.g., success in exams, or being given the choice of what type of term paper to do) that lead to gains in either one of these feelings should respectively lead to increases of IM, and identified regulation, but to decreases in introjection, external regulation, and amotivation. On the other hand, events that undermine one's feelings of competence (e.g., failing an exam) or self-determination (e.g., being forced to work on a project) will lead to a loss of IM, and identified regulation but to an increase in the other types of motivation.

Purpose of the Present Investigation

The purpose of the present study was to assess the concurrent and construct validity of the AMS. Concurrent validity was assessed through correlations between the AMS subscales and other motivational scales. Construct validity was tested by conducting correlations among the seven AMS subscales to assess the presence of the simplex pattern, where adjacent scales show positive correlations,

and the subscales at the opposite ends of the continuum display the highest levels of negative correlations. In addition, construct validity was tested by assessing the relations between the AMS subscales and variables deemed to represent motivational consequences and determinants. In line with self-determination theory (Deci and Ryan, 1985), a corresponding pattern of relations involving the AMS subscales from amotivation to intrinsic motivation with the various determinants and consequences was expected.

Method and Procedures

The AMS was completed by 217 CEGEP (junior college) students from the Montreal area. There were 107 males and 110 females who had an average age of 18.7 years. Alpha values ranged from .76 to .86, except for the identification subscale which had a value of .60. The alpha values appear on the diagonal in Table 1. Subjects also completed additional scales which assessed various variables thought to represent motivation-like constructs, as well as motivational antecedents and consequences deemed important in education. Scales used to assess motivation-like constructs were the general subscale of the Children's Academic Intrinsic Motivation Inventory (CAIMI, Gottfried, 1985; e.g., "I enjoy doing new work in school"; 18 items, alpha = .78), and two subscales from Nicholls' Personal Goals in School Scale (Nicholls, Patashnick, and Nolen, 1985), namely Work Avoidance (e.g., "I feel successful if I get out of some work"; 3 items, alpha = .74), and Task Orientation (e.g., "I feel successful if I learned something interesting"; 7 items, alpha = .84). All of the above scales were scored on a 7-point scale.

Subjects also completed a series of scales assessing constructs found in past research to represent motivational antecedents (see Deci and Ryan, 1985). These scales were: Perceived Competence (based on Vallerand et al., 1989; e.g., "I consider myself a good student," 5 items, alpha = .52), three subscales assessing perceived climate in the classroom based on Pelletier, Brière, Blais, and Vallerand (1988), the Informational Climate (e.g., "The feedback I get from my professors is constructive and helps me perform better in my courses"; 4 items, alpha = .69), the Autonomy Supportive Climate (e.g., "My professors provide me with opportunities to take personal decisions in my studies"; 4 items, alpha = .55), and the Impersonal Climate (e.g., "My professors are indifferent toward me"; 4 items, alpha = .64). Subjects also completed an Education Optimism Scale adapted from Dember and Brooks (1989, e.g., "At school, I generally look at the brighter side of things"; 12 items,

alpha = .75), as well as the Autonomy subscale from the Self-Actualization Scale (Jones and Crandall, 1986; e.g., "It is better to be yourself than be popular"; 6 items, alpha = .62). All of the above scales were assessed on a 7-point scale.

Finally, subjects also completed scales measuring various constructs thought to represent educational outcomes. These scales were: concentration in the classroom (from Vallerand et al., 1989; e.g., "In class, I'm absorbed by the subject"; 3 items, alpha = .64), positive emotions in the classroom (from Vallerand et al., 1989; e.g., "In class, I'm generally happy"; 2 items, $r = .61$), and academic satisfaction (Vallerand and Bissonnette, 1990; e.g., "I am satisfied with my academic life"; 5 items, alpha = .85). Students also reported cumulative grades up to this point in junior college, and future intentions with schooling.

Statistical Analyses

Statistical analyses involved four sets of correlations involving: (a) the AMS subscales and other motivational constructs, to assess concurrent validity; (b) the AMS subscales among themselves, (c) the AMS subscales and motivational antecedents; and finally (d) the AMS subscales and motivational consequences. These last three sets of correlations will serve to provide assessment on the construct validity of the AMS.

Assessment of Concurrent Validity: Correlations Between the AMS and Motivational Constructs

Gottfried's (1985) intrinsic motivation measure basically assesses intrinsic interest in learning. One would then predict a strong correlation with the three IM subscales, and especially the IM to Know subscale. In addition, a strong negative correlation was predicted with the Amotivation subscale which is the opposite of being intrinsically motivated to learn. The correlations appear in Table 1. It can be seen that the predictions were upheld. The strongest positive and negative correlations were respectively obtained with the IM to Know ($r = .67$) and Amotivation ($r = -.46$) subscales. The other two IM subscales were also strongly correlated with the Gottfried scale, although, as predicted, to a lesser extent.

Subjects also completed the Nicholl Task Orientation and Work Avoidance scales. The Task Orientation scale basically assesses one's value in learning something interesting. Thus, the highest correlations should be obtained with the IM subscales, and again

TABLE 1
Correlations Among the Seven Subscales of the AMS and with Motivational Variables

	AMS Subscales*							Intrinsic Interest** Gottfried	Nicholls Work Avoidance	Nicholls Task Orient- ation
	1	2	3	4	5	6	7			
Amotivation (1)	(.86)	−.16	−.22	−.36	−.43	−.41	−.22	−.46	.26	−.39
External Regulation (2)		(.76)	.29	.48	.16	.27	.07	−.01	.03	.01
Introjected Regulation (3)			(.81)	.44	.34	.59	.40	.21	−.03	.28
Identified Regulation (4)				(.60)	.47	.42	.31	.17	−.08	.28
Intrinsic Motivation- to Know (5)					(.79)	.58	.59	.67	−.15	.50
Intrinsic Motivation- Accomplishment (6)						(.78)	.62	.53	−.07	.47
Intrinsic Motivation- Stimulation (7)							(.81)	.39	−.19	.31

Note.—scores on the diagonal are the internal consistency (Cronbach alpha) values.
* Correlations among the AMS subscales of .11 and above are significant, $p < .05$
** Correlations between the AMS and other scales of .21 and higher are significant, $p < .05$

especially with the IM to Know subscale. In addition, moderate correlations should be obtained with the Introjection and Identification subscales because the Task Orientation scale does not merely tap interest but also one's involvement in educational work. Finally, a strong negative correlation should be obtained with the Amotivation subscale because this scale is the antithesis of wanting to learn things. Correlations are presented in Table 1. It can be seen that the predictions were supported.

The Work Avoidance scale assesses one's passivity in the classroom. Therefore, it should correlate positively with the Amotivation subscale. In addition, it should correlate negatively with the IM subscales. Correlations presented in Table 1 provide support for this hypothesis. The most positive correlation was indeed obtained with the Amotivation subscale ($r = .26$) while the correlations with the IM subscales were negative and marginally significant.

Assessment of the Construct Validity

Assessment of the construct validity of the AMS was performed in three ways, that is through correlations: (1) among the seven

AMS subscales, (2) between the AMS subscales and motivational antecedents, and (3) between the AMS subscales and motivational consequences. These results are discussed below in turn.

Correlations Among the Seven AMS Subscales. Pearson correlations were computed among the seven subscales in order to test for the presence of specific types of associations based on self-determination theory. First, strong positive correlations were expected among the three types of IM. Indeed, if they all assess a related construct (IM), they should display high levels of association. Second, correlations among the seven subscales were expected to display the presence of the self-determination continuum postulated by Deci and Ryan (1985). As indicated earlier, support for this self-determination continuum would be obtained through the display of a simplex pattern where adjacent subscales (e.g., introjected and identified regulation) have high positive correlations, and the subscales at the opposite ends of the continuum (i.e., amotivation and IM) have the most negative correlations.

The correlation matrix is displayed in Table 1. It can be seen that, in general, the hypotheses were supported. First, the three IM showed the highest positive correlations among themselves (rs of .58, .59, and .62). These correlations were very similar to those obtained by Vallerand et al. (1989) with the French version of the scale (rs of .52, .53, and .64). The correlations obtained in this study revealed that the three subscales assess a similar but not identical construct. Second, correlations among the 7 subscales generally displayed a simplex pattern. Indeed, adjacent subscales showed higher correlations (e.g., IM to Know and Identification, $r = .47$) than subscales farther apart (e.g., IM to Know and Introjection, $r = .34$). On the other hand, subscales at the opposite ends of the continuum (e.g., Amotivation and IM to Know, $r = -.43$) displayed more negative correlations than intermediate subscales (Introjection and Amotivation, $r = -.22$).

It should be noted that some deviations from the simplex model were obtained. These mainly involved the IM—Stimulation subscale. Thus, it was found that the relationship was stronger with the Introjection ($r = .40$) than with the Identification subscale ($r = .31$), and that the relationship with the Amotivation subscale was weaker ($r = -.22$) than that involving the Identification subscale ($r = -.36$). These results indicate that the IM—Stimulation subscale behaves somewhat differently than the other IM subscales.

Correlations Between the AMS Subscales and Motivational Antecedents. Correlations were also computed with a series of variables that are generally hypothesized to be motivational antecedents.

TABLE 2
Correlations with the AMS Subscales and Motivational Antecedents

| | Perceived Competence[a] | Classroom climate | | | Optimism in Education[b] | Self-Actualization[c] Autonomy |
		Informational[a]	Autonomy Supportive[a]	Impersonal[a]		
Amotivation	−.31	−.22	−.11	.25	−.54	−.32
External Regulation	.01	.07	.05	.12	.36	−.00
Introjected Regulation	−.01	.11	.14	.02	.18	−.04
Identified Regulation	.11	.20	.21	−.06	.53	.27
Intrinsic Motivation- to Know	.25	.19	.25	−.14	.57	.32
Intrinsic Motivation- Accomplishment	.20	.21	.16	−.09	.57	.24
Intrinsic Motivation- Stimulation	.10	.09	.17	−.08	.37	−.03

[a] Based on 220 subjects, $r > .11, p < .05$.
[b] Based on 63 subjects, $r > .21, p > .05$.
[c] Based on 64 subjects, $r > .21, p < .05$

A first variable is perceived competence. Past research has shown that it represents an important determinant of IM (Deci and Ryan, 1985; Vallerand and Reid, 1984, 1988) and other self-determined forms of motivation (Vallerand et al., 1989). More specifically, perceived competence should be expected to correlate positively and significantly with Identification and especially with the three forms of IM. On the other hand, it was expected to correlate negatively with the Amotivation subscale. Correlations involving the introjection and external regulation subscales should be in between these two extremes. Results appear in Table 2. It can be seen that the predictions were confirmed (correlations ranged from −.31 for Amotivation to .25 for IM to know), except for the IM—Stimulation subscale which showed a weaker correlation (.10).

The classroom climate also represents an important determinant of motivation. Past research (Deci, Nezlek, and Sheinman, 1981) reveals that an informational climate, which provides instances of competence, fosters self-determined forms of motivation while undermining amotivation. A similar effect has been found for an autonomy supportive climate where the student's sense of autonomy and self-initiatives are enhanced. On the other hand, an

impersonal climate where teachers do not care for students, undermines intrinsic motivation and identification, but fosters amotivation. Correlations involving these three motivational determinants appear in Table 2. Although the correlations were not very strong, it can be seen that the predictions were generally confirmed.

Another important motivational determinant is optimism. Much research (see Dember and Brooks, 1989) has shown that holding an optimistic orientation or having positive future expectancies represent a strong motivational force. It should therefore be expected that optimistic expectancies are positively related to all forms of motivation, but especially to those who are most powerful (or self-determined), namely the Identification and IM subscales. However, the Optimism Scale should be negatively correlated to the Amotivation subscale, which basically implies the absence of motivation. Correlations, which are presented in Table 2, support this reasoning. It can be seen that the most negative correlation involved Amotivation ($r = -.54$) while the most positive correlations were obtained with the IM to Know and to Accomplish subscales ($rs = .57$ for both of them), and the Identification ($r = .53$) subscale.

Finally a last construct which should serve as motivational determinant is that of self-actualization (Jones and Crandall, 1986). It is generally believed that individuals who are high self-actualizers will engage fully in the activities they select. Thus, for students, this would typically mean engaging fully in the learning process of education. In so doing, these individuals should find learning fun and become intrinsically motivated to learn. Thus, a positive correlation should be obtained with the IM to Know subscale, and to a lesser extent the Identification subscales. In addition, because these individuals are strongly motivated, a significant negative correlation should exist with the amotivation orientation. Correlations involving the AMS subscales and the Autonomy subscale appear in Table 2. As it can be seen, these hypotheses were generally supported. The strongest positive and negative correlations were obtained with the IM to Know (.32) and the Amotivation ($-.32$) subscales, respectively. Results with the External Regulation and Introjection subscales revealed values in between those obtained with the IM to Know and the Amotivation subscales.

Correlations Between the AMS and Motivational Consequences. Finally, correlations were conducted between the AMS subscales and variables thought to represent educational and psychological consequences. These consequences can be subdivided into four kinds: (a) cognitive consequences: concentration in the classroom, (b) affective consequences: positive emotions in the classroom, and

TABLE 3
Correlations between the AMS and Motivational Consequences

	Concen- tration in class	Positive Emotions in Class	Academic Satisfaction	Reported Grades	Schooling Intentions
Amotivation	−.33	−.33	−.29	−.23	−.33
External Regulation	−.04	.15	.02	.11	.05
Introjected Regulation	.15	.20	.11	−.04	.14
Identified Regulation	.17	.31	.21	.18	.21
Intrinsic Motivation- to Know	.34	.33	.25	.24	.23
Intrinsic Motivation- Accomplishment	.31	.30	.32	.13	.22
Intrinsic Motivation- Stimulation	.27	.24	.23	−.01	.12

Note. Based on 220 subjects, $r > .11, p < .05$.

academic satisfaction, (c) behavioral consequences: behavioral intentions of continuing schooling, and finally (d) academic performance: self-reported cumulative grades. Because the self-determination continuum ranges from amotivation to IM, and because higher levels of self-determination are associated with better psychological functioning (Deci and Ryan, 1985), it was expected that the various consequences would be progressively and positively associated as one moves from amotivation to IM.

Correlations appear in Table 3. As can be seen, the hypotheses were basically supported with all variables. The most negative correlations were obtained with the Amotivation subscale, while the most positive correlations were found with the IM subscales, and to a lesser degree the Identification subscale. The other subscales led to correlations ranging in between the values obtained by the Amotivation and Identification subscales. Of particular interest are the findings obtained with self-reported grades which replicate and extend past findings (see Deci and Ryan, 1985) on the role of IM in academic achievement. Overall, these findings are directly in line with findings obtained by Vallerand et al. (1989) with the French-Canadian version of the AMS, and with those obtained with similar scales in other life domains (e.g., Blais et al., 1990; Vallerand and O'Connor, 1989).

Discussion

The purpose of this study was to assess the concurrent and construct validity of the AMS. The results revealed that the AMS

has adequate levels of concurrent and construct validity, very much in line with those of the original French-Canadian version (EME). This was evident in several ways. First, correlations between the AMS subscales and various motivational scales yielded results generally in line with predictions from self-determination theory (Deci and Ryan, 1985), thereby supporting the concurrent validity of each subscale. Second, correlations among the seven AMS subscales revealed a pattern in line with the self-determination continuum (Deci and Ryan, 1985) where adjacent subscales (e.g., introjection and identification) had high positive correlations, and the subscales at the opposite ends of the continuum (i.e., amotivation and IM) had the most negative correlations. Third and final, correlations between the AMS subscales and various variables deemed to represent motivational antecedents and consequences, led to a pattern of results in line with theoretical predictions from cognitive evaluation theory (Deci and Ryan, 1985) and with findings obtained in other life domains (Blais et al., 1990; Vallerand and O'Connor, 1989).

When considered in conjunction with the results reported by Vallerand et al. (1992) on the reliability (internal consistency and temporal stability) and factorial validity of the AMS, the present findings provide adequate support for the psychometric adequacy of the AMS. However, as is the case with all steps of scale development, a complete assessment of the psychometric properties of the AMS will necessitate additional research. For instance, the relationship between the IM—Stimulation subscale and various other variables which was somewhat weaker than that involving the other two IM subscales should be further scrutinized. Is this weaker relationship due to the fact that this type of IM seems less relevant than the other two for the field of education (as intimated by the pattern of means)? Or does it reflect a less precise assessment of this type of IM construct? Past research of ours in other life domains such as sports, interpersonal relationships, and leisure has shown that the IM to experience stimulation was an extremely important source of motivation in these contexts. It is thus plausible that the present findings reflect a lack of importance of this type of IM in education rather than a faulty measurement. In any event, future research is needed on this issue.

Future research could also focus on both theoretical and applied issues. From a theoretical perspective, it now becomes possible to test hypotheses derived from extant theories such as cognitive evaluation theory (Deci and Ryan, 1985). For instance, an important postulate of intrinsic motivation research is that intrinsic and

extrinsic motivation should interact such that when one is high, the other is low. The use of a multidimensional assessment approach should enable us to test this hypothesis in field situations. Do variables that undermine IM (e.g., a controlling teacher, failure experiences, etc.) also enhance nonself-determined forms of motivation such as external regulation and amotivation? Future research is needed on this and related issues as it should further our knowledge on the interaction between motivational forces in real-life environments, such as education. Furthermore, it would appear important to pursue research on the determinants and consequences of the three types of IM. What are the psychological processes that lead to the experience of the different types of IM? Can we identify different consequences associated with each of the three types of IM? These and similar questions could lead to theoretical advances for the field of motivation.

From an applied perspective, research with the AMS could also lead to important insights on important educational issues. For instance, our own research has shown that the EME can help predict school dropout behavior (Vallerand and Bissonnette, 1992). Such research reveals that individuals with low levels of IM and identification, but with high levels of amotivation are at risk. Future research should assess students' motivation at multiple points in time during their studies in order to better understand the danger zone points where students' motivation may drop. In addition, the AMS could be of great help in program evaluation endeavors where researchers and practitioners might be interested in assessing the motivational changes produced by various educational programs. Future research along these lines would therefore appear promising.

In sum, the results of the present study and that of Vallerand et al. (1992) provide support for the reliability and validity of the AMS. Undoubtedly, much research remains to be done on the scale. However, because it is multidimensional in nature and conceptually-based, it is felt that the AMS should prove useful in leading to a better understanding of the motivational forces at work in this area.

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