

Validation of the Spanish Version of the Situational Motivation Scale (EMSI) in the Educational Context

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The purpose of the present research was to translate into Spanish and analyze the psychometric properties of the Situational Motivation Scale (SIMS). The participants were 373 undergraduate students (126 males and 247 females). Factor validity was tested via confirmatory factor analysis. Based on factor loadings and modification indexes, the SIMS was reduced to a 14-item model. This respecification showed adequate internal consistency and construct validity. The multistep analysis of invariance revealed that the factor structure of the SIMS is invariant across gender. Likewise, MANOVA revealed that amotivation was the only significant variable across gender. Predictive validity was assessed through path analysis. The results support the preliminary use of the Spanish version of the SIMS for the assessment of situational motivation in education.

Keywords: self-determination, college student, psychometric properties, situational motivation.

El objetivo de la presente investigación fue traducir al español y analizar las propiedades psicométricas del Situational Motivation Scale (SIMS) en una muestra de 373 estudiantes universitarios (126 hombres y 247 mujeres). La validez factorial fue probada a través de análisis factorial confirmatorio. Los pesos factoriales y los índices de modificación mostraron la necesidad de reespecificar el modelo eliminando dos ítems. La versión de 14 ítems mostró adecuada validez de constructo y consistencia interna siendo invariante respecto al género. Asimismo, el MANOVA mostró diferencias significativas de género en la dimensión amotivación. Además, se analizó la validez predictiva mediante un path análisis. Los resultados apoyan de forma preliminar la utilización de la versión española de la SIMS para evaluar la motivación situacional en educación.

Palabras clave: autodeterminación, estudiantes universitarios, propiedades psicométricas, motivación situacional.

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The self-determination theory (Deci & Ryan, 1985) constitutes a theoretical framework that helps to understand motivation within the educational setting (Deci, Vallerand, Pelletier, & Ryan, 1991). Self-determination implies the sense of freedom of choice and of feeling free to do what one has decided to do. This theoretical perspective proposes three dimensions of motivation depending on the level of self-determination: intrinsic motivation, extrinsic motivation, and amotivation.

Intrinsic motivation is the most self-determined motivation dimension and refers to performing a behavior just for the pleasure and satisfaction derived from doing it (Deci & Ryan, 1985).

Extrinsic motivation refers to carrying out an activity because of the incentives or consequences associated with it. Diverse types of extrinsic motivation have been proposed, arranged along a self-determination continuum. Thus, the least self-determined is called external regulation, and refers to performing a behavior to obtain reward or to avoid punishment; when an individual performs a behavior to avoid guilt or to enhance the ego, this is introjected regulation; identified regulation is more self-determined because it implies an option as it occurs when the behavior is considered important for the subject's goals; lastly, integrated regulation is the most self-determined kind of extrinsic motivation and occurs when the consequences of the behavior is congruent with the individual's values and needs.

The least self-determined dimension is amotivation, because individuals do not perceive the contingencies between the behavior and its consequences, so they feel incompetent; in this case, the behavior is not motivated either intrinsically or extrinsically.

These types of motivation are arranged along a continuum of self-determination ranging from intrinsic motivation to amotivation, and the correlations between these constructs follow an ordered structure, so that the dimensions that are adjacent on the continuum, such as, for example, amotivation and external regulation, are expected to have a more positive correlation than those that are more distant, such as amotivation and intrinsic motivation. Research in diverse domains, including education, have revealed the existence of these associations (Núñez, Martín-Albo, & Navarro, 2005; Núñez, Martín-Albo, Navarro, & González, 2006).

According to the self-determination theory, the diverse types of motivation lead to different consequences (Deci & Ryan, 1985). In this sense, research has shown that the more self-determined forms of motivation (i.e., intrinsic motivation and identified regulation) are more closely associated with positive consequences such as psychological well-being. On the other hand, the more negative consequences, for instance, a depressive state, are linked to lower levels of self-determination, such as amotivation and external regulation (Ryan, 1995; Vallerand, 1997).

Moreover, the self-determination theory postulates that social or environmental factors (e.g., excessively controlling environments, environments that enhance the subject's autonomy) affect motivation. However, this influence is mediated by three basic innate psychological needs: the need for autonomy, the need for competence, and the need for relatedness (Deci & Ryan, 1991). The type of motivation will be more self-determined to the extent that these needs are satisfied by social factors (Deci & Ryan, 1985; Richer, Blanchard, & Vallerand, 2002; Vallerand, 1997; Vallerand & Reid, 1988).

Based on the postulates of the self-determination theory, Vallerand (1997) proposed a hierarchical model of intrinsic/extrinsic motivation (HMIEM) that states that the three kinds of motivation, the environmental factors, the mediators, and the consequences are represented at the three hierarchical levels of generality: global, contextual, and situational. At the global level, the individual has developed a general motivational orientation to interact with the environment; in this case, the global level of motivation is more stable, acting as a personality trait. At the contextual level, the motivational disposition is relatively stable and is adopted in a specific area or life domain such as sport, education, or work. Lastly, at the situational level, it is assumed that motivation is unstable because of its great sensitivity to environmental factors; this refers to the motivation experienced while performing a specific activity (Vallerand, 1997).

It is important to develop measurement instruments of motivation at the diverse levels of generality proposed by Vallerand's (1997) HMIEM within the educational setting. Thus, Vallerand, Blais, Brière, and Pelletier (1989) developed the *Échelle de Motivation en Éducation* (EME, in English, the Educational Motivation Scale) to measure contextual motivation in education, subsequently validated in Spanish by Núñez et al. (2005). To assess situational motivation, Guay, Vallerand, and Blanchard (2000) developed the Situational Motivation Scale (SIMS). This scale comprises 16 items that assess the dimensions of intrinsic motivation, identified regulation, external regulation, and amotivation.

The validation studies of the SIMS in the educational context (Guay et al., 2000) revealed that the scale was adequate to measure the diverse types of motivation, both in the laboratory and in field studies, with satisfactory levels of internal consistency in all the subscales, ranging from .77 for amotivation to .95 for intrinsic motivation. The results of the confirmatory factor analysis (CFA) partially supported the four-factor structure of the SIMS, with fit indexes values of .89 in the nonnormed fit index (NNFI) and .90 in the comparative fit index (CFI). Moreover, construct validity was tested satisfactorily via the correlations of the four SIMS subscales, the correlations between the four SIMS subscales and the EME subscales, and the correlations between the four SIMS subscales and perceived competence, concentration, and behavioral intentions. The factor structure

of the scale was invariant across gender and a significant difference was only obtained in the amotivation subscale, where men scored higher than women. Lastly, positive relations were established between the subscales of intrinsic motivation and identified regulation with the determinants of autonomy and perceived competence and with the consequences of positive emotions and interest in the task.

According to the postulates of the HMIEM (Vallerand, 1997), the diverse levels of generality are related, so that, for example, the influence of contextual motivation on situational motivation and vice versa may be relevant to understand the motivational changes in a certain life domain. This reciprocal relation between contextual situational motivation has been studied by Chantal, Guay, and Vallerand (1996) in the educational context, finding that contextual motivation predicted situational motivation in an educational task.

As the SIMS has been shown to be an adequate instrument to assess situational motivation in the educational setting, and there is no Spanish version, the main purpose of this work was to translate it into Spanish and to assess its psychometric properties. Ultimately, we propose five goals in this work: (a) to translate the SIMS into Spanish using the appropriate cross-cultural procedures, (b) to analyze its construct validity, (c) to analyze its concurrent validity, (d) to analyze its discriminant validity as a function of gender, and (e) to analyze its predictive validity.

Method

Participants

In this study, a total of 373 students (126 men and 247 women), from the Universidad de Las Palmas de Gran Canaria (Spain), with a mean age of 22.27 years ($SD = 4.15$), were participants. To select the number of participants, we followed the criterion proposed by Ullman (1996), which establishes that the ratio between subjects and parameters should be 10:1 (10 subjects for each estimated parameter). As the number of parameters to be estimated in our study was 38, the number of participants should have been 380. However, we eliminated a total of 12 participants who did not complete the instruments.

Instruments

We used the “Escala de Motivación Situacional [EMSI, in English, the Situational Motivation Scale, SIMS], which has 16 items and assesses the dimensions of intrinsic motivation (Items 1, 5, 9, and 13), identified regulation (Items 2, 6, 10, and 14), external regulation (Items 3, 7, 11, and 15), and amotivation (Items 4, 8, 12, and 16) in a specific situation. Each one of the items responds to the question: “Why are you performing this task / activity at this time?” and is rated on a Likert-type scale, ranging from

1 (*does not correspond at all*) to 7 (*corresponds exactly*), with an intermediate score of 4 (*corresponds moderately*). The translation of the SIMS into Spanish was carried out following the cross-cultural scale translation procedure used in previous works (Núñez et al., 2005; Núñez et al., 2006). Firstly, the scale was translated from English into Spanish according to the *parallel back-translation* procedure (Brislin, 1986), in which a bilingual person translates the scale from its original language to the language under study. Another bilingual individual, who is unfamiliar with the original scale, re-translates this version back to the original language. To ensure a correct translation and avoid possible biases, the sequence just described was repeated twice, so that, in this study, four bilingual people carried out the parallel back-translation procedure, thus obtaining two pilot versions of the SIMS in Spanish. Secondly, the items thus obtained were assessed by a committee formed by the individuals who participated in the translation process and two psychology professors who were experts in psychology of motivation, who selected the items that had maintained the original meaning, and prepared the scale format and the instructions identically to the original version. The Spanish version of the SIMS was named the EMSI.

To assess concurrent validity of the EMSI, we used the Spanish version of the “Escala de Motivación Educativa” (EME, Núñez et al., 2005, in English, the Educational Motivation Scale), which has 28 items distributed in seven 4-item subscales. In the present study, we used four subscales: a subscale that measures intrinsic motivation, which grouped the 12 items from the three subscales of intrinsic motivation (to know, to accomplish, and stimulating experiences), two subscales that measure extrinsic motivation (identified regulation and external regulation), and a subscale that measures amotivation. The EME is rated on a 7-point Likert-type scale, ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*), with an intermediate score of 4 (*corresponds moderately*).

To measure perceived autonomy, we used 4 items adapted for this study from the Autonomy Perception in Life Context Scales (Blais & Vallerand, 1991).

To measure future intentions of persistence in the activity, we used the 2 items adapted from the Behavioral Intentions of Future Persistence toward the activity (BIFP) employed in the study of Guay et al. (2000). These items are rated in a 9-point Likert-type scale, ranging from 1 (*I'd do something else/low intensity*) to 9 (*I'd perform this activity/high intensity*).

Procedure

Participants were recruited by an investigator who was an expert in educational motivation, who administered the EMSI individually in the general library of the university within a 2-week period while students were carrying out some academic task (i.e., studying, performing an information

search). Individuals who, despite being in the library, were not performing academic tasks or who had already completed the instruments were ruled out. In order to avoid as much as possible the social desirability effect, students were informed that their participation was voluntary and confidential. They were requested to respond as honestly as possible, and there was no time limit. The approximate time needed to complete the instruments was 10 minutes. The investigators provided the necessary help and made sure that the participants had completed the questionnaires correctly. Lastly, the investigator thanked the participants for their collaboration.

Design and Data Analysis

The design of this investigation follows the guidelines of selective methodology. Various analyses were performed to assess construct validity. Firstly, we performed CFA, using the maximum likelihood estimate method and entering the item covariance matrix for data analysis. The fit of the model was assessed with a combination of absolute and relative indexes. The following indexes were included: (a) the incremental fit index (IFI), which is very consistent and indicates improvements in the fit of the model in degrees of freedom in comparison to the baseline of the independent model; it should have a value equal to or higher than .90 (Shumacker & Lomax, 1996); (b) the comparative fit index (CFI), which is easier to interpret than other indexes and indicates reductions in poor fits; to accept the model, its value should be equal to or higher than .90 (Shumacker & Lomax, 1996); (c) the standardized root mean square residual (SRMR), which minimizes the problem of the sample size, for which values of .06 or lower indicate excellent fit and

values of .08 or lower indicate good fit (Hu & Bentler, 1999); and (d) the root mean square error of approximation (RMSEA), which provides a measurement of discrepancy by degrees of freedom and, with values of .05 or lower, indicates that the model based on the sample used represents the population, and with values lower than .08, the fit is considered acceptable (Jöreskog & Sörbom, 1993). Secondly, we performed an analysis of invariance across gender. Thirdly, we analyzed internal consistency of the factors by means of Cronbach's alpha. And, lastly, we performed an analysis of bivariate correlations by means of Pearson's correlation coefficient between the four subscales of the EMSI in order to verify the continuum proposed by the self-determination theory. Concurrent validity was analyzed with a bivariate correlational analysis using Pearson's coefficient between the subscales of the EMSI and the EME. To analyze discriminant validity, we used multivariate analysis of variance (MANOVA) as a function of gender. Lastly, predictive validity was analyzed by means of path analysis.

Results

Descriptive Analyses and Internal Consistency of the Scales

The descriptive statistics (means, standard deviation, skewness, and kurtosis) of the items used in this study are shown in Table 1. As can be seen, all the skewness values were below 2, and the kurtosis values were below 7, which indicates similarity to the normal curve, as recommended by Curran, West, and Finch (1996). Likewise, Mardia's coefficient was 72.11, which indicates high multivariate

Table 1
Descriptive Statistics of the 16 items of the EMSI

EMSI items	<i>M</i>	<i>SD</i>	skewness	kurtosis
1. Porque creo que esta actividad es interesante	4.26	1.66	-.21	-.59
2. Por mi propio bien	5.51	1.58	-1.07	.58
3. Porque se supone que debo hacerlo	4.56	2.07	-.39	-1.12
4. Puede que haya buenas razones para realizar esta actividad. pero yo no veo ninguna	2.18	1.61	1.49	1.41
5. Porque disfruto con esta actividad	3.53	1.68	.24	-.76
6. Porque creo que esta actividad es buena para mí	5.05	1.68	-.68	-.28
7. Porque es algo que tengo que hacer	4.87	2.01	-.69	-.67
8. Realizo esta actividad. pero no estoy seguro de si vale la pena	2.47	1.69	1.02	.02
9. Porque esta actividad es divertida	2.85	1.61	.59	-.47
10. Por decisión personal	5.19	1.98	-.91	-.35
11. Porque no tengo otra alternativa	2.97	2.11	.72	-.87
12. No lo sé; no veo qué me aporta esta actividad	1.98	1.48	1.62	1.98
13. Porque me siento bien realizando esta actividad	4.15	1.77	-.18	-.86
14. Porque creo que esta actividad es importante para mí	5.11	1.68	-.86	.02
15. Porque creo que tengo que hacerlo	4.63	2.01	-.53	-.90
16. Hago esta actividad. pero no estoy seguro de que sea conveniente continuar con ella	1.96	1.47	1.65	1.99

Translator's note: The scale items were not translated because it is precisely the Spanish version of the scale.

abnormality. From these results, we used the maximum likelihood estimation method and the bootstrapping procedure to determine the robustness of the estimations (Byrne, 2001).

The internal consistency of the scale was assessed with Cronbach's alpha. Regarding the EME, the results showed values of .84 in the amotivation subscale, .80 in the external regulation subscale, .78 in the identified regulation subscale, and .91 in the intrinsic motivation subscale. The internal consistency of the items used to measure perceived autonomy was .70. Lastly, the items used to assess future intentions of persistence obtained an internal consistency of .71.

Confirmatory Factor Analysis

The factor structure of the EMSI was assessed with CFA in which we performed bootstrapping with a resampling of 500 samples and a 90% confidence interval to determine the bias between the values estimated in our sample and the values obtained when resampling. The differences among the estimators (regression weights, variances, covariances, and measurement errors) were nonsignificant and, when considering the confidence intervals of the bias, they were different from zero and significant, so we can assume the robustness of the indexes obtained by means of maximum likelihood estimation.

Each factor was made up of 4 items corresponding to each one of the four subscales.

The results of the CFA revealed that not all the goodness-of-fit indexes were satisfactory, as the values of SRMR and RMSEA were slightly higher than the cutoff value recommended (IFI = .90, CFI = .90, RMSEA = .09, and SRMR = .09). The factor loadings of the items ranged from .44 for Item 10 to .88 for Item 6, both corresponding to

the identified regulation subscale, and all the factor loadings were significant ($p < .05$). Likewise, the covariances among the items of the identified regulation and the intrinsic motivation subscales were positive, as were the covariances among the items of the amotivation and the external regulation subscales. In contrast, the items of the amotivation and external regulation subscales revealed negative covariances with the items from the intrinsic motivation subscale (see Table 2).

Because of the inadequate fit of the model, we explored various respecification possibilities. Firstly, Items 10 and 11 were the ones with the lowest factor loading in their respective dimensions; secondly, examination of the modification indexes revealed that Item 11, which was on the external regulation subscale, should be included in the amotivation subscale, so we decided to respecify the model, eliminating these two items.

We performed a new CFA with the new respecified 14-item model, the results of which showed better fit to the data with goodness-of-fit values of IFI = .93, CFI = .93, RMSEA = .08, and SRMR = .07.

Analysis of Invariance

The purpose of this analysis was to test the equivalence of the factor loadings, covariances, and variances of the 14-item structural model of the EMSI. The analysis of invariance was performed by means of multigroup analysis with a subsample of 184 males and another subsample of 266 females, in which four models were tested. Model 1 is an unconstrained model; in Model 2, the factor loadings of the measurement model are invariant; Model 3 is an invariant covariance model; and Model 4 is an invariant

Table 2
Covariance Matrix of the Items

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2.77	.72	-.62	-.69	1.74	1.13	-.63	-.69	1.24	.67	-.40	-.64	1.66	1.10	-.59	-.51
2		2.50	.24	-.69	.89	1.41	.25	-.69	.64	.84	.16	-.64	.85	1.37	.23	-.51
3			4.29	.44	-.76	.38	2.94	.44	-.54	.22	1.86	.41	-.73	.37	2.76	.32
4				2.60	-.86	-1.08	.45	1.50	-.61	-.64	.29	1.39	-.82	-1.05	.42	1.09
5					2.84	1.39	-.78	-.86	1.53	.83	-.49	-.79	2.05	1.36	-.73	-.63
6						2.85	.39	-1.08	.99	1.31	.25	-1.01	1.33	2.15	.36	-.79
7							4.04	.45	-.56	.23	1.92	.42	-.74	.38	2.84	.33
8								2.86	-.61	-.64	.29	1.39	-.82	-1.05	.42	1.09
9									2.59	.59	-.35	-.57	1.46	.97	-.52	-.45
10										3.93	.15	-.59	.79	1.27	.22	-.47
11											4.44	.26	-.47	.24	1.80	.21
12												2.21	-.76	-.98	.39	1.01
13													3.14	1.29	-.70	-.59
14														2.82	.35	-.77
15															4.04	.31
16																2.16

residual model. The results showed that all four models had good fit indexes (Table 3), and the differences between the unconstrained model (Model 1) and the models with invariant factor loadings (Model 2), invariant covariance (Model 3), and invariant residuals (Model 4) were nonsignificant ($p > .05$), which allows us to establish the invariance across gender (Byrne, Shavelson, & Muthen, 1989; Marsh, 1993).

Analysis of Internal Consistency

The internal consistency values of each one of the four subscales of the 14-item EMSI were .81 for the amotivation subscale, .87 for the external regulation subscale, .82 for the identified regulation subscale, and .84 for the intrinsic motivation subscale. We note that the internal consistency of the external regulation and identified regulation subscales in the 16-item version obtained alpha values that were lower than those of the 14-item version (.84 and .77, respectively).

Analysis of the Correlations of the four EMSI Subscales

We performed correlational analysis of the four subscales of the 14-item EMSI because we hypothesized that there should be an ordered pattern of interrelations among the subscales in which the ones that were near each other on the self-determination continuum would correlate more positively than the ones that were farther apart on this continuum (Table 4). Thus, intrinsic motivation correlated positively and significantly with identified regulation ($r = .49$), and negatively and significantly with amotivation ($r = -.39$). However, we observed a slight deviation from the model proposed by the self-determination theory insofar as amotivation presented a more negative correlation with identified regulation ($r = -.43$) than with intrinsic motivation ($r = -.39$).

Correlational Analysis of the Subscales of the EMSI and EME

We analyzed the relation between the subscales of the respecified version of the 14-item EMSI and the subscales of the EME because we hypothesized that there should be positive relations between comparable or similar subscales of both instruments, because the EME measures motivation in the academic context, and the EMSI was administered taking into account the performance of an academic activity. The results showed that the most positive correlations were between similar or comparable subscales of the EMSI and the EME (see Table 5). For example, intrinsic motivation of the EMSI correlated more positively with the intrinsic motivation subscale of the EME than with any of the other EME subscales ($r = .41$).

Gender Differences

The MANOVA revealed a significant gender effect in the four subscales, $F(4, 373) = 5.41, p < .01$. Univariate analysis showed that amotivation was the only subscale with significant differences, $F(1, 373) = 16.28, p < .01$, where the men obtained higher scores. The effect size for this difference was small ($\eta^2 = .04$).

Table 4
Correlations of the Four Subscales of the 14-item EMSI

Subscales	1	2	3	4
1. Amotivation	—	.15*	-.43*	-.39*
2. External regulation		—	.23*	-.25*
3. Identified regulation			—	.49*
4. Intrinsic motivation				—

* $p < .01$.

Table 3
Analysis of Invariance across Gender

	<i>df</i>	χ^2	IFI	CFI	SRMR
Model 1	142	341.20	.92	.92	.07
Model 2	152	349.45	.92	.92	.07
Model 3	162	359.06	.92	.92	.07
Model 4	176	382.69	.92	.92	.07
Comparisons of the Model	Difference in χ^2		<i>df</i>	<i>p</i>	
Model 1 vs. Model 2	8.25		10	.60	
Model 1 vs. Model 3	17.86		20	.60	
Model 1 vs. Model 4	41.49		34	.18	
Model 2 vs. Model 3	9.61		10	.47	
Model 2 vs. Model 4	33.24		24	.10	
Model 3 vs. Model 4	23.63		14	.05	

Table 5
Correlations among the Subscales of the 14-Item EMSI and the EME Subscales

EMSI subscales	EME	EME	EME	EME
	Amotivation	External regulation	Identified regulation	Intrinsic motivation
Amotivation	.54**	.10	-.24**	-.22**
External regulation	.13*	.18**	.16**	.09
Identified regulation	-.24**	.21**	.42**	.40**
Intrinsic motivation	-.21**	-.05	.24**	.41**

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

Path Analysis

We performed path analysis to examine the predictive validity of the EMSI. We used the maximum likelihood estimation method and bootstrapping. Skewness values ranged from -0.83 to 1.15 , and kurtosis values from -0.91 to 0.72 , and Mardia’s index had a value of 5.16 . Therefore, we proceeded to perform bootstrapping with 500 resampling runs and a 90% confidence interval to determine the bias between the values estimated in our sample and the mean values obtained in the resampling runs. The analysis showed that there were no significant differences between the estimators (regression weights, variances, covariances, and measurement errors), and the confidence intervals of bias were different from zero and significant, suggesting that the indicators were robust to deviations from multivariate normality. The results (see figure 1) showed adequate fit indexes ($IFI = .97$, $CFI = .97$, $SRMR = .03$); Moreover, all the parameters were significant except for external regulation \rightarrow future intentions, and identified regulation \rightarrow future intentions. Nevertheless, the correlations among the diverse variables of the model displayed the pattern hypothesized in the self-determination theory, in which perceived autonomy correlated positively with intrinsic motivation ($r = .47$) and identified regulation ($r = .30$), and negatively with external regulation ($r = -.39$) and amotivation ($r = -.51$). Moreover, perceived autonomy, intrinsic motivation, and identified regulation correlated positively and significantly with the variable future intentions ($r = .34$, $r = .52$, $r = .27$, respectively), whereas external

regulation and amotivation correlated negatively and significantly ($r = -.20$, $r = -.43$, respectively). Lastly, 34% of the variance of the variable future intentions was accounted for.

Discussion

The goal of this study was to analyze the psychometric properties of the EMSI in a sample of university students. The results support the psychometric adequacy of the EMSI in the academic setting. With regard to construct validity, the results confirm the four-factor structure that reflect the theoretical constructs of amotivation, external regulation, identified regulation, and intrinsic motivation proposed in the self-determination theory (Deci & Ryan, 1985). The results obtained are consistent with those obtained by Guay et al. (2000) in the academic setting and by Standage, Treasure, Duda, and Prusak (2003) in the area of physical activity.

Just as in the validation of Standage et al. (2003), the initial fit of the CFA was not acceptable, so we proceeded to respecify the model, from which we eliminated Items 10 and 11 from the subscales of identified regulation and external regulation, respectively. The elimination of these items also improved the internal consistency of these subscales. However, from a theoretical viewpoint, Items 10 and 11 could be more related to the construct of perceived autonomy than to that of regulation. In this sense, Item 10 (“By personal decision”) is similar to those used to assess perceived autonomy by other authors (i.e., Blais, Vallerand, & Lachance, 1990; Guay et al., 2000); Moreover, this item can be interpreted in a more self-determined way than the rest of the items of the identified regulation subscale, which indicate a need to perform an activity to achieve the person’s goals (“For my own good,” “It’s good for me,” “It’s important to me”). Item 11 (“Because I have no alternative”) would refer to a low degree of autonomy, in which the individual feels pressured externally to perform the behavior (Standage et al., 2003), which would justify that the modification indexes of the CFA would suggest including this item in the amotivation subscale, as less autonomy leads to lower levels of self-determination. Moreover, the

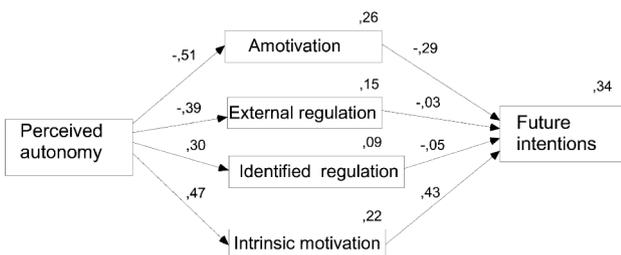


Figure 1. Figure 1. Structural model with path coefficients. Note. The standardized regression weights are placed over the arrows; the explained variances are over the observed variable.

term “alternative” is a key concept to understand and assess the construct of perception of autonomy (i.e., Kowal & Fortier, 1999, 2000; Vallerand, Fortier, & Guay, 1997). Therefore, the inclusion of these items in their current form could affect the analysis of the motivational sequence antecedents → motivation → consequences, so it would be necessary to redraft these two items in a way that is more congruent with the theoretical construct they evaluate.

Likewise, the covariances between the more distant factors on the self-determination continuum were negative (i.e., amotivation and intrinsic motivation) and the covariances between the adjacent factors were positive (i.e., external regulation with identified regulation), as hypothesized by the theory of self-determination (Deci & Ryan, 1985), thus confirming the findings of Guay et al. (2000) and Standage et al. (2003), which contributes construct validity to the EMSI.

With regard to the analysis of invariance across gender, multigroup analysis showed that the EMSI was invariant as a function of this variable, in accordance with the results of Guay et al. (2000), which supports the use of this instrument to assess the different types of situational motivation in men and women.

Regarding the correlational analysis of the EMSI subscales, the results revealed the presence of a continuum along the lines of the hypothesis derived from the self-determination theory (Deci & Ryan, 1985), where the subscales that are closer together on the continuum should present higher and more positive correlations than the ones that are further away on the continuum. Nevertheless, our results showed a slight deviation from the model, because amotivation correlated more negatively with identified regulation than with intrinsic motivation. The correlations among the EMSI and the EME subscales were more positive among the similar subscales of both scales, in line with the hypotheses proposed by Vallerand (1997) in the HMIEM, which stated that situational motivation in a specific activity is related to the relevant contextual motivation in that activity. These results agree with the findings of Guay et al. (2000) in the educational setting.

The analysis of the internal consistency of the 14-item version of the EMSI showed satisfactory values in all four subscales, providing partial support to the reliability of the instrument. These results were similar to those found by other authors (Guay et al., 2000; Ntoumanis & Blaymires, 2003; Standage et al., 2003; Taylor & Ntoumanis, 2007). With regard to gender differences, the results revealed the existence of significant differences in the amotivation subscale; specifically, the men scored higher than the women, in accordance with the findings of Guay et al. (2000).

The model proposed in path analysis supports the predictive validity of the EMSI. Moreover, the results provide support to the postulates of the self-determination theory

(Deci & Ryan, 1985), in the sense that perceived autonomy is positively related to more self-determined types motivation (identified regulation and intrinsic motivation) and negatively related to less self-determined types of motivation (amotivation and external regulation). In other words, individuals who felt more autonomous when performing the task sensed a greater feeling of freedom of choice and they appraised the behavior as important to achieve their goals, whereas the individuals who felt some pressure or obligation to carry out the activity either perceived it as pointless or else its performance was linked to external contingencies.

Moreover, the results showed that motivation generates consequences; in this sense, more self-determined motivation (intrinsic motivation) is related to more positive consequences, according to the postulates of the HMIEM (Vallerand, 1997), whereas the less self-determined kinds of motivation (amotivation and external regulation) lead to more negative consequences. According to this, people who feel pleasure and satisfaction when performing a task had higher levels of persistence to continue to carry out the task in the future. Nevertheless, we must emphasize that the dimensions of external regulation and identified regulation did not significantly predict the variable future intentions, although the correlations between future intentions and the two types of regulation were significant. It is important to note that the two items that were eliminated belonged to the regulation subscales, which could affect the predictive relations between these subscales and their consequences.

Nonetheless, it is also necessary to comment upon some limitations of the present study. Firstly, the sample used comprised students of higher education, so that future research should incorporate samples with other educational levels. Secondly, in the present study, we eliminated two items, which could affect the relations with the diverse subscales, as well as with antecedents and consequences, so that future research should draw up two new items to complete these subscales. Thirdly, future research should consider other motivational antecedents (i.e., perceived competence, motivational climate), as well as other cognitive and/or affective motivational consequences. Fourthly, it would also be important to verify the psychometric properties of the EMSI in different life domains, such as the work setting, sport settings, and health settings. Lastly, it is necessary to verify whether the inclusion of the dimensions of introjected regulation and integrated regulation allow us to further our understanding of situational behaviors.

To conclude, the present investigation contributes preliminary psychometric support for the use of the EMSI to assess the diverse dimensions of situational motivation in the educational context, which allows us to advance in the study of the relations between the different levels of generality proposed in the HMIEM.

References

- Blais, M. R., & Vallerand, R. J. (1991). *Échelle de perception d'autodétermination dans les domaines de vie (ÉPADV-16)*. Unpublished manuscript. Université du Québec.
- Blais, M. R., Vallerand, R. J., & Lachance, L. (1990). *The Perceived Autonomy in Life Domains Scale*. Unpublished manuscript. Université du Québec.
- Brislin, R. W. (1986). The wording and translation of research instruments. In W. Lonner & J. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137-164). Beverly Hills: Sage.
- Byrne, B. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Erlbaum.
- Byrne, B., Shavelson, R., & Muthen, B. (1989). Testing for the equivalence factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin*, *105*, 456-466.
- Chantal, Y., Guay, F., & Vallerand, R. J. (1996). *A structural analysis of the motivational consequences: A test of the specificity hypothesis*. Unpublished manuscript. Université du Québec.
- Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, *1*, 16-29.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.
- Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination theory perspective. *Educational Psychologist*, *26*, 325-346.
- Guay, F., Vallerand, R. J., & Blanchard, C. (2000). On the assessment of situational intrinsic and extrinsic motivation: The Situational Motivation Scale (SIMS). *Motivation and Emotion*, *24*, 175-213.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55.
- Jöreskog, K. G., & Sörbom, D. (1993). *Structural equation modeling with the SIMPLIS command language*. Chicago: Scientific Software International.
- Kowal, J., & Fortier, M. S. (1999). Motivational determinants of flow: Contributions from self-determination theory. *Journal of Social Psychology*, *139*, 355-368.
- Kowal, J., & Fortier, M. S. (2000). Testing relationships from the hierarchical model of intrinsic and extrinsic motivation using flow as a motivational consequence. *Research Quarterly for Exercise and Sport*, *71*, 171-181.
- Marsh, H. W. (1993). The multidimensional structure of academic self-concept: Invariance over gender and age. *American Educational Research Journal*, *30*, 841-860.
- Ntoumanis, N., & Blaymires, G. (2003). Contextual and situational motivation in education: A test of the specificity hypothesis. *European Physical Education Review*, *9*, 5-21.
- Núñez, J. L., Martín-Albo, J., & Navarro, J. G. (2005). Validación de la versión española de la Échelle de Motivation en Éducation. *Psicothema*, *17*, 344-349.
- Núñez, J. L., Martín-Albo, J., Navarro, J. G., & González, V. M. (2006). Preliminary validation of a Spanish version of the Sport Motivation Scale. *Perceptual and Motor Skills*, *102*, 919-930.
- Richer, S., Blanchard, C., & Vallerand, R. J. (2002). A motivational model of work turnover. *Journal of Applied Social Psychology*, *32*, 2089-2113.
- Ryan, R. M. (1995). The integration of behavioral regulation within life domains. *Journal of Personality*, *63*, 397-429.
- Shumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Erlbaum.
- Standage, M., Treasure, D. C., Duda, J. L., & Prusak, K. A. (2003). Validity, reliability, and invariance of the Situational Motivation Scale (SIMS) across diverse physical activity contexts. *Journal of Sport and Exercise Psychology*, *25*, 19-43.
- Taylor, I. M., & Ntoumanis, N. (2007). Teacher motivational strategies and student self-determination in physical education. *Journal of Educational Psychology*, *99*, 747-760.
- Ullman, J.B. (1996). Structural equation modelling. In B.G. Tabachnick & L. S. Fidell (Eds.), *Using multivariate statistics* (pp. 709-780). New York: HarperCollins.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology: Vol. 29* (pp. 271-360). San Diego: Academic Press.
- Vallerand, R. J., Blais, M. R., Brière, N. M., & Pelletier, L. G. (1989). Construction et validation de l'Échelle de Motivation en Éducation (EME). *Canadian Journal of Behavioral Sciences*, *21*, 323-349.
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, *72*, 1161-1176.
- Vallerand, R. J., & Reid, G. (1988). On the relative effects of positive and negative verbal feedback on males' and females' intrinsic motivation. *Canadian Journal of Behavioral Sciences*, *20*, 239-250.

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