

Toward a New Measure of Intrinsic Motivation, Extrinsic Motivation, and Amotivation in Sports: The Sport Motivation Scale (SMS)

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A new measure of motivation toward sport has been developed in French, namely the Echelle de Motivation vis-à-vis les Sports. Two studies were conducted to translate and validate this new measure in English. The Sport Motivation Scale (SMS) consists of seven subscales that measure three types of Intrinsic Motivation (IM: IM to Know, IM to Accomplish Things, and IM to Experience Stimulation), three forms of regulation for Extrinsic Motivation (Identified, Introjected, and External), and Amotivation. The first study confirmed the factor structure of the scale and revealed a satisfactory level of internal consistency. Correlations among the subscales revealed a simplex pattern confirming the self-determination continuum and the construct validity of the scale. Gender differences were similar to those obtained with the French-Canadian version. The more self-determined forms of motivation were associated with more positive responses on related consequences. In a second study, the SMS was administered on two occasions and revealed adequate test-retest reliability.

Key words: perceived competence, self-determination, scale development, scale validation, motivational consequences

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Motivation is at the heart of many of sport's most interesting problems, both as a developmental outcome of social environments such as competition and coaches' behaviors, and as a developmental influence on behavioral variables such as persistence, learning, and performance (Duda, 1989; Vallerand, Deci, & Ryan, 1987). In light of the importance of these consequences for athletes, one can easily understand researchers' interest in motivation as it pertains to sport settings. Several conceptual perspectives have been proposed to better understand athletes' motivation (see Roberts, 1992). One perspective that has been found to be useful in this area posits that behavior can be intrinsically motivated, extrinsically motivated, or amotivated (Deci, 1975; Deci & Ryan, 1985, 1991). This theoretical approach has generated a considerable amount of research and appears pertinent to the field of sports (Brière, Vallerand, Blais, & Pelletier, in press; Deci & Ryan, 1985, chap. 12; Fortier, Vallerand, Brière, & Provencher, in press; Vallerand, Deci, & Ryan, 1987). Recently, a new measure of motivation toward sport was developed that is based on the tenets of Deci and Ryan's theory. The scale, written in French, is entitled l'Echelle de Motivation vis-à-vis les Sports (EMS; Brière et al., in press). The purpose of this paper is to present the results of two studies dealing with the validation of this scale into English. The scale is composed of seven subscales that measure the different forms of motivation outlined in Deci and Ryan's theory.

Intrinsic Motivation

In general, intrinsic motivation (IM) refers to engaging in an activity purely for the pleasure and satisfaction derived from doing the activity (Deci, 1975). When a person is intrinsically motivated he or she will perform the behavior voluntarily, in the absence of material rewards or external constraints (Deci & Ryan, 1985). Athletes who go to practice because they find it interesting and satisfying to learn more about their sport, or athletes who practice their sport for the pleasure of constantly trying to surpass themselves are considered intrinsically motivated toward their sport. Deci and Ryan posit that IM stems from the innate psychological needs of competence and self-determination. Thus, activities that allow individuals to experience feelings of competence and self-determination will be engaged in because of IM.

Although most researchers posit the presence of a global IM construct, certain theorists (Deci, 1975; White, 1959) have proposed that IM could differentiate into more specific motives. Recently, a tripartite taxonomy of IM has been postulated (Vallerand et al., 1992). This taxonomy is based on the IM literature that reveals the presence of three types of IM that have been researched on an independent basis. These three types of IM have been identified as IM to Know, IM to Accomplish Things, and IM to Experience Stimulation.

Intrinsic Motivation to Know

This type of IM relates to several constructs such as exploration, curiosity, learning goals, IM to learn, and the epistemic need to know and understand. Thus, it can be defined as performing an activity for the pleasure and the satisfaction that one experiences while learning, exploring, or trying to understand something

new. For instance, athletes are intrinsically motivated to know when they try to discover new training techniques for the sheer pleasure they experience while learning something new.

Intrinsic Motivation Toward Accomplishments

This second type of IM has been studied in developmental psychology, as well as in educational research, under such terms as *mastery motivation*, *efficacy motivation*, and *task-orientation*. In addition, other authors have postulated that individuals interact with the environment in order to feel competent and to create unique accomplishments (Deci, 1975; Deci & Ryan, 1985, 1991). Thus, IM toward accomplishments can be defined as engaging in an activity for the pleasure and satisfaction experienced when one attempts to accomplish or create something. Trying to master certain difficult training techniques in order to experience personal satisfaction represents an example of intrinsic motivation to accomplish things in the sport domain.

Intrinsic Motivation to Experience Stimulation

Finally, IM to Experience Stimulation occurs when someone engages in an activity in order to experience stimulating sensations (e.g., sensory pleasure, aesthetic experiences, as well as fun and excitement) derived from one's engagement in the activity. Research on the dynamic and holistic sensation of flow, on feelings of excitement in IM, on aesthetic stimulating experiences, and peak experiences is representative of this form of IM. Athletes who participate in their sport in order to live exciting experiences are intrinsically motivated to experience stimulation.

Extrinsic Motivation

Contrary to intrinsic motivation, extrinsic motivation (EM) pertains to a wide variety of behaviors that are engaged in as a means to an end and not for their own sake (Deci, 1975). It was originally thought that extrinsic motivation referred to non-self-determined behavior, behavior that could only be prompted by external contingencies (e.g., rewards). More recently however, Deci and Ryan, along with their colleagues (e.g., Ryan, Connell, & Grolnick, 1990), have proposed that there are, in fact, different types of extrinsic motivation that can be ordered along a self-determination continuum. From lower to higher levels of self-determination, they are: external regulation, introjection, identification.¹

External Regulation

This type of motivation corresponds to extrinsic motivation as it generally appears in the literature. That is, it refers to behavior that is controlled by external sources, such as material rewards or constraints imposed by others (Deci & Ryan, 1985). Athletes who participate in sport in order to receive praise from their coach or because they feel urged to do so by their parents are motivated by

external regulation. In this case, the sport is performed not for fun but to obtain rewards (e.g., praise) or to avoid negative consequences (e.g., criticisms from parents).

Introjection

With introjection, the formerly external source of motivation has been internalized such that its actual presence is no longer needed to initiate behavior. Instead, these behaviors are reinforced through internal pressures such as guilt or anxiety. Athletes who participate in sports because they feel pressure to be in good shape for aesthetic reasons, and feel embarrassed or ashamed when they are not in best form, represent an example of introjected regulation.

Identification

This last type of extrinsic motivation is in operation when the individual comes to value and judge the behavior as important and, therefore, performs it out of choice. The activity is still performed for extrinsic reasons (e.g., to achieve personal goals); however, it is internally regulated and self-determined. Athletes who participate in sport because they feel their involvement contributes to a part of their growth and development as a person represent an example of identified motivation.

Amotivation

This seventh and final form of motivation is quite similar to the concept of learned helplessness (Abramson, Seligman, & Teasdale, 1978). That is, amotivated individuals do not perceive contingencies between their actions and the outcomes of their actions. They experience feelings of incompetence and lack of control (Deci & Ryan, 1985). They are neither intrinsically motivated nor extrinsically motivated. When athletes are in such a state, they no longer identify any good reasons for why they continue to train. Eventually they may even decide to stop practicing their sport.

In the last decade, Deci and Ryan's motivational approach has grown in importance because the different types of motivation have been associated with important psychological consequences (e.g., learning, performance), and because their theory identifies determinants of these different types of motivation.

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 functioning (Deci, 1980; Deci & Ryan, 1985), one would expect a corresponding pattern of consequences. Research supports this premise 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 obtained in laboratory settings (for reviews see Vallerand, 1993; Vallerand & Reid, 1990), as well as in several life domains such

as interpersonal relationships, leisure, education, and aging (see Blais, Sabourin, Boucher, & Vallerand, 1990; Pelletier, Vallerand, Blais, Brière, & Green-Demers, in press; Vallerand & Bissonnette, 1992; Vallerand & O'Connor, 1989). As for the sport domain, the various self-determined forms of motivation (three types of IM and identification) have been associated with greater persistence (Pelletier, Brière, Blais, & Vallerand, 1988), positive emotions (Vallerand & Brière, 1990), and greater interest and sport satisfaction (Brière et al., in press).

Motivational Determinants

According to cognitive evaluation theory (Deci & Ryan, 1985, 1991), people's motivation varies in line with changes in their perceptions of competence and self-determination. Events that lead to gains in either one of these feelings should increase IM and identification while decreasing introjection, external regulation, and amotivation. On the other hand, events that undermine one's feelings of competence or self-determination should lead to a loss of IM and identification, but to an increase in introjection, external regulation, and amotivation. Over the last two decades, a substantial amount of laboratory and field research has supported this theory (for reviews see Deci & Ryan, 1985, 1991; Vallerand, 1993). Accordingly, in the realm of sport, Brière et al. (in press) found that the more athletes perceived themselves as competent and self-determined, the more they exhibited self-determined forms of motivation toward sport.

Interpersonal behaviors also represent important determinants of motivation. Past research involving perception of teachers' behaviors (Ryan & Grolnick, 1986), coaches' behaviors (Pelletier et al., 1988), and parents' behaviors (Grolnick, Ryan, & Deci, 1991) have shown that informational behaviors, those providing feedback of competence and a clear structure or rationale for doing an activity, foster self-determined forms of motivation and undermine amotivation. A similar effect has been found for autonomy supportive behaviors and interpersonal behaviors providing opportunities for choice where the individual's sense of autonomy is enhanced. On the other hand, impersonal behaviors where, for example, coaches do not care for athletes, have been shown to undermine IM and identification, and to foster amotivation.

To study the different relations between determinants, motivation, and consequences in the sport domain, it is necessary to have an instrument that can reliably and validly measure the different forms of motivation toward sport. Existing measures of intrinsic and/or extrinsic sport motivation present conceptual problems and do not assess all seven constructs. Weiss, Bredemeier, and Shewchuk's (1985) instrument pits IM against EM on the same continuum, whereas Dwyer's (1988) Sports Intrinsic Motivation Scale and McAuley, Duncan, and Tammen's (1989) instrument assesses solely intrinsic motivation. Furthermore, these measures have weak factorial structures.

In light of the importance of conducting research on sport motivation with an instrument based on a valid theoretical conceptualization, and given that no existing scale adequately assesses intrinsic motivation, extrinsic motivation, and amotivation toward sport, Brière et al. (in press) developed and validated the EMS. This scale was originally constructed in French and is made up of seven subscales of four items each, which assess the three different types of IM (IM

to Know, to Accomplish Things, and to Experience Stimulation), three types of EM (External Regulation, Introjection, and Identification), and Amotivation. In the EMS, motivation is operationalized as the underlying "why" of behavior (Deci & Ryan, 1985) and focuses on the perceived reasons for engaging in the activity. Thus, athletes are asked, "Why do you practice your sport?" and items represent possible answers to that question, thus reflecting the different types of motivation.

The preliminary and validation studies, which involved approximately 600 athletes (mean age of 18.4 years) recruited from different athletic teams (basketball, volleyball, swimming, ice hockey, football, handball, soccer, and badminton), revealed that the EMS has satisfactory internal consistency levels (a mean alpha score of .82), as well as moderate to high indices of temporal stability (a mean test-retest correlation of .69) over a 1-month period. Results of a confirmatory factor analysis (with LISREL) also confirmed the seven-factor structure of the EMS. Finally, the construct validity of the scale was supported by a series of correlational analyses among the seven subscales, as well as between these scales and other psychological constructs relevant to the sports domain, such as interest toward sport, sport satisfaction, and positive emotions experienced during sport practice. In addition, the EMS was able to predict sport dropout (Pelletier et al., 1988). The French version of the EMS therefore appears to represent a reliable and valid measure of IM, EM, and amotivation in sports.

Because the EMS was initially validated in French, it was not available to researchers conducting research with English-speaking athletes. In light of the psychometric qualities of the EMS, the findings it has yielded, and the importance of assessing motivation from a sound theoretical perspective, it was decided to validate the EMS in English. In Study 1, The EMS was translated from French to English using the procedures outlined by Vallerand (1989). The English version of the scale, The Sport Motivation Scale (SMS), was then completed by a sample of athletes from various sports to ascertain the internal consistency of the seven subscales and to provide an exploratory assessment of the seven-factor structure. In addition, correlations were conducted among the seven subscales to test for the presence of a simplex pattern, and between the seven motivational subscales and several psychological scales representing motivational antecedents and consequences to assess the construct validity of the subscales. Finally, a confirmatory factor analysis (with LISREL) was conducted to provide a further assessment of the seven-factor structure. We hypothesized that the results from these two studies would replicate past findings obtained with the French-Canadian version of the SMS (the EMS) and should show that the SMS is a reliable and valid measure of sport motivation.

Study 1

The first study had several purposes. A first purpose was to translate the EMS into English following adequate translation procedures. A second purpose was to examine the factor structure of the SMS through confirmatory factor analysis (CFA) with LISREL 7. A third purpose was to assess the internal consistency of the seven subscales. A fourth purpose was to assess the construct validity of the scale. To achieve this task, correlations among the seven subscales

were conducted to test the presence of a self-determination continuum (Deci & Ryan, 1985; Ryan & Connell, 1989). Construct validity of the scale was also assessed by conducting correlations between the SMS and various sport and psychological variables representing antecedents and consequences relevant to sport. A fifth and final purpose of the study was to verify if the gender differences on the subscale means observed with the French-Canadian sample would also be observed with the English sample. Results obtained with the French-Canadian sample revealed that females had higher levels of IM to know but lower level of external regulation than males.

Translation of the EMS to English

In line with procedures outlined by Vallerand (1989), the translation of the EMS into English involved the following three steps: preparation of two preliminary English versions of the Sport Motivation Scale (SMS), the evaluation of the preliminary versions, and preparation and pretesting of the final experimental version of the scale.

Preparation of Preliminary English Versions of SMS. The procedure used in this study followed the parallel back-translation procedure. This procedure involves translating the scale from the original to the target language by a bilingual individual. The translated version is then translated back to the original language by another bilingual individual without the help of the original scale. Two independent translators initiated separate back translation sequences, and four bilingual individuals (one social psychologist and three graduate students in social psychology) conducted the parallel back-translation procedure. These individuals were all very familiar with Deci and Ryan's theory of intrinsic motivation and self-determination.

Evaluation of Preliminary English Versions of SMS. The second phase provides an initial assessment of the adequacy of the translated versions of the scale and a final experimental English version of the SMS. A committee formed of the individuals who participated in the back-translation procedures and some of the authors of the original version of the scale (the EMS) scrutinized each item from both the original scale and the two versions retranslated into French to see if the original items had been retranslated appropriately in the original language. When an original item had been appropriately retranslated back into French, the English item was considered adequate. The committee then focused on the quality of the English language of the item in question, with the meaning conveyed by the items being more important than the word-for-word translation. Following the assessment of each item, an experimental version of the SMS composed of 28 items was prepared. The same procedures were used to prepare the scale format and instructions because different format presentations of the same scale can lead to different results (Converse & Presser, 1986).

Pretest of Experimental Scale. The final step involved pretesting the experimental version of the SMS to verify that the experimenters' perspective and language corresponded to that of the target population. Eight junior-college athletes were asked to read the English version of the SMS and to indicate any questions they had with respect to the instructions or the items. This step led to some minor modifications to the scale instructions. The English version of the SMS was then ready to be used in research (see Appendix).

Method

The experimental version of the SMS was completed by 593 university athletes (319 males and 274 females) with a mean age of 19.2 years. Athletes were recruited from different athletic teams (basketball, volleyball, swimming, ice hockey, football, track and field, cross country running, soccer, and rugby) from the province of Ontario, Canada. All athletes had at least 2 years of competitive experience at either the high school or college level. Subjects completed the SMS, along with several scales measuring related constructs in small groups at the beginning of a workout. Scales used to assess motivational antecedents included perceived competence² (based on Vallerand, Blais, Brière, & Pelletier, 1989; e.g., "I consider myself to be a good athlete"; five items, $\alpha = .59$) and four subscales assessing the coach's interpersonal style (CIS). The CIS subscales were: the Autonomy Supportive Climate (e.g., "My coach accepts that mistakes I make are part of a learning process"; four items, $\alpha = .76$), Caring (e.g., "My coach cares about me"; four items, $\alpha = .79$), Providing Structure (e.g., "When my coach asks me to do something, he or she gives me a rationale for doing it"; four items, $\alpha = .75$), and Competence Feedback (e.g., "The feedback I receive from my coach is constructive in helping me make improvements"; four items, $\alpha = .80$).

Scales measuring various constructs thought to represent sport outcomes were: Distraction in Training (adapted from Sarason, Sarason, Keefe, Hayes, & Shearin, 1986; three items, $\alpha = .43$), Effort (adapted from Ryan & Connell, 1989; three items, $\alpha = .51$), and Future Intention to Practice Their Sport (adapted from Pelletier et al., 1988; four items, $\alpha = .60$). All of the above scales were assessed on a 7-point scale anchored by the end points *does not correspond at all* (1) and *corresponds exactly* (7) with the midpoint *corresponds moderately* (4).

Subjects were informed that we were interested in better understanding the reasons why they practiced their sport. They were told they did not have to complete the questionnaire but that their collaboration would be very much appreciated. Finally, athletes were told not to put their names on the questionnaire, that data from the study would only serve scientific purposes and would therefore remain strictly confidential.

Analyses

First, the factor structure of the SMS was examined with confirmatory factor analysis. Second, correlations among the subscales are computed to test for the presence of a simplex pattern. Third, internal consistency of the subscales was assessed using Cronbach alphas. Fourth, gender differences for the different subscales were examined. Finally, correlations between the seven subscales and the related antecedent and consequence variables were conducted to establish the construct validity of the SMS.

Results and Discussion

Confirmatory Factor Analysis (CFA). The initial analysis examined separately the univariate distributions of all the variables and verified that all were normally distributed with low degrees of skewness and kurtosis. Then, the covariance matrix was subjected to a confirmatory factor analysis with LISREL 7

(Jöreskog & Sörbom, 1989) using a maximum likelihood method of estimation. A confirmatory factor model that allowed free loadings on the items within each of the seven factors postulated by the theory and observed in the analyses of the French scale, was tested. Factor variances were fixed at unity, and all factors were allowed to correlate freely. The adequacy of fit for the model was based on the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the root-mean-square residual (RMR) (Jöreskog & Sörbom, 1989), the normed fit index (NFI; Bentler & Bonett, 1980), the χ^2/df ratio (Byrne, 1989), and the chi-square statistic (Bentler, 1980; Newcomb & Bentler, 1988).

We tested a CFA model that evaluated the adequacy of the measurement or factor structure and that specified how the measured variables were hypothesized to reflect the underlying latent factors. This was necessary to verify the adequacy of the hypothesized latent constructs. In this model, seven factors were postulated. These factors corresponded to the seven subscales and were made up of the four corresponding items. No cross-loadings were postulated. As expected, the model did not fit very well according to the chi-square statistic p value, $\chi^2(329, N = 593) = 637.49, p \leq .001$. However, the χ^2/df ratio was 1.94, the GFI was .94, the AGFI was .92, the RMR was .048, and the value for the NFI was .92, indicating that a majority of the variation was accounted for by the model, and given that a large sample was used, this model is considered acceptable. Finally, all items had loadings over .70.

Correlations Among the Seven Subscales. Pearson correlations computed among the seven subscales are presented above the diagonal in Table 1. The factor intercorrelations obtained with the CFA are presented below the diagonal. The correlations among the latent constructs presented below the diagonal are considered disattenuated for measurement error and thus may be conceptualized as representing the true associations among these latent variables. We expected to find strong positive correlations among the three types of IM. Indeed, if they all assess a related construct (intrinsic motivation), they should display high

Table 1 Internal Consistency Values: Cronbach Alpha (On the Diagonal), Pearson's Correlations (Over the Diagonal), and Phi Values (Below the Diagonal) for SMS Subscales

Subscales	Subscales						
	1	2	3	4	5	6	7
1. Amotivation	(.75)	.11	.10	-.01	-.10	-.11	-.10
2. External regulation	.13	(.77)	.31	.16	.14	.11	.10
3. Introjected regulation	.14	.40	(.74)	.23	.18	.18	.15
4. Identified regulation	.04	.46	.38	(.63)	.20	.20	.14
5. IM-to know	-.16	.22	.29	.40	(.80)	.48	.53
6. IM-accomplishment	-.18	.18	.26	.39	.72	(.80)	.41
7. IM-stimulation	-.17	.22	.30	.41	.56	.65	(.74)

Note. $N = 593$. All of the subscales are made up of four items. Correlations of .13 and above are significant, $p < .001$. Phi value of .10 and above are significant, $p < .01$.

levels of association. In Table 1, the three IM showed the highest positive correlations among themselves (r_s above .50). These correlations were very similar to those obtained by Brière et al. (in press) with the French version of the scale (r_s above .44). Such correlations reveal that the three subscales assess similar but not identical constructs.

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 continuum would be obtained through the display of a simplex pattern where adjacent subscales (e.g., External Regulation and Introjection) have positive correlations, and the subscales at the opposite ends of the continuum (i.e., IM and Amotivation) have the most negative correlations. Correlations among the seven subscales generally displayed a simplex pattern. Adjacent subscales showed higher correlations than subscales farther apart. Subscales at the opposite ends of the continuum displayed more negative correlations than immediate subscales. Overall, the present results are in agreement with those obtained with the French-Canadian version of the scale (Brière et al., in press) and provide some support for the construct validity of the English version of the SMS.

Internal Consistency of the Seven Subscales. The internal consistency of the subscales was assessed using Cronbach's alpha, presented along the diagonal of Table 1. As can be seen, values varied from .74 to .80, except for the Identification subscale, which had an alpha value of .63. The mean alpha score for the SMS was .75. These values are slightly lower than the values obtained with the original version of the scale (EMS), where values were all above .71 and the mean alpha score was .82. Overall, considering that these subscales are made up of 4 items, they appear to show adequate levels of internal consistency and are considered equivalent to those obtained with the original scale.

Gender Differences Between the Subscale Means. A Gender \times Scale analysis of variance with repeated measures on the scale factor was conducted. This analysis revealed the presence of a main effect for scale, $F(6, 582) = 279.29, p < .001$. This effect indicated that most of the subscale means differed significantly from each other except for the Introjection, Identification, IM to Know, IM to Experience Stimulation, and the IM to Achieve subscales. As can be seen in Table 2, the most representative forms of motivation for the athletes in this sample were, in decreasing order: IM to Experience Stimulation, IM to Accomplish Something, Identification, IM to Know, Introjection, External Regulation, and Amotivation.

The main effect for gender was not significant, $F(1, 582) = .32, p = .57$, although a Gender \times Scale interaction, $F(6, 582) = 4.34, p < .001$, was significant. Results from the simple main effect analysis revealed that female athletes scored higher than males on the IM to Know and the IM to Accomplish Something subscales, but scored lower on the External Regulation subscale.

Globally, these results replicate the results obtained with the French-Canadian version of the SMS by Brière et al. (in press). The only difference between the two studies is that in the Brière et al. study, no significant difference was observed for the IM to Accomplish Something subscale. This difference could be the result of several factors, including the type of activities practiced by the subjects of both samples or the cultural differences between French and English Canadians.

Table 2 Means and Standard Deviations of the Motivation Subscales for Females and Males

Motivation subscales	Females		Males	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Amotivation	6.89	3.00	6.98	3.10
External regulation*	10.82	3.59	11.56	3.72
Introjected regulation	12.46	4.04	12.29	3.70
Identified regulation	13.13	3.24	12.90	3.15
IM-to know*	13.05	3.73	12.42	3.47
IM-accomplishment*	14.88	3.40	14.17	3.30
IM-stimulation	14.57	3.49	14.76	2.99

* $p < .05$.

Correlations With Motivational Antecedents and Consequences. Correlations between the motivation subscales and a series of psychological variables that are considered motivational antecedents or consequences appear in Table 3. Perceived competence and four forms of coaches' interpersonal behaviors (i.e., being supportive of autonomy, caring, providing clear structure, and providing competence feedback) were expected to correlate strongly with the three forms of IM and the Identification subscale and to correlate negatively with the Amotivation subscale. Correlations with the External Regulation and the Introjection subscales should fall between these two extremes. It can be seen that the predictions were generally confirmed.

Finally, correlations were computed between the SMS subscales and motivational consequences (distraction during the activity, effort, and future intentions of practicing the activity). It was expected that the various positive motivational consequences would be progressively and positively associated as one moves from amotivation to IM (Vallerand et al., 1993) and that an opposite pattern would be observed for the negative consequences (such as distraction).

The hypotheses were basically supported with all the outcome variables. The positive consequences were correlated positively with the more self-determined forms of motivation and negatively correlated with the Amotivation subscale. The opposite pattern was observed with the negative consequence, distraction. Overall these results are very much in line with findings reported by Brière et al. (in press) with the French-Canadian version of the SMS and with those obtained with similar scales in other life domains.

In sum, the results with the different types of sport antecedents and consequences confirmed the basic hypotheses and offered support for the self-determination continuum. In line with past research, perceptions of competence were related positively to the most self-determined forms of motivation but negatively to the least self-determined forms of motivation. Similar findings were obtained with the different forms of informational interpersonal behaviors, as well as those supportive of autonomy. Finally, the hypotheses were also supported for the

Table 3 Correlations With the Sport Motivation Scale Subscales Motivational Antecedents and Consequences

Subscales	Perceived competence ^b	Coaches' behaviors ^a				Feedback of competence	Consequences ^b		
		Autonomy support	Caring	Structure	Effort		Sport intentions	Distraction	
Amotivation	-.36	-.38	-.40	-.33	-.45	-.26	-.51	.28	
External regulation	.15	.09	.07	.08	.06	.03	.01	.09	
Introjected regulation	-.05	.13	.10	.09	.09	.05	.05	-.04	
Identified regulation	.12	.14	.19	.13	.06	.13	.10	-.05	
IM-to know	.20	.20	.22	.21	.20	.36	.34	-.33	
IM-accomplishment	.24	.11	.21	.14	.13	.30	.37	-.31	
IM-stimulation	.26	.32	.34	.25	.24	.30	.36	-.31	

^aBased on 296 subjects, $r > .10$, $p < .05$. ^bBased on 593 subjects, $r > .08$, $p < .05$.

motivational consequences. On a general basis, the most positive correlations were obtained with the IM and Identification subscales, while the most negative correlations were found with the Amotivation subscale.

Study 2

The purpose of this last study was to assess the temporal stability of the SMS. Brière et al. (in press) reported test-retest correlations varying between .54 and .82 over a 1-month period. Similar values were expected with the English version. The internal consistency of the subscales was also reassessed.

Method

Fifty soccer players of provincial level from the Ottawa region (31 females and 19 males), with a mean age of 18.4 years, completed the SMS twice 5 weeks apart. The questionnaire was completed during a workout using the same procedures described in the first study, except that athletes were told that they would be asked to complete the scale twice. To prevent social desirability biases, athletes were asked to put down their date of birth instead of their name. This way, the two questionnaires could be linked without using the subject's name.

Results and Discussion

Results from the test-retest correlations and the internal consistency for the pretest and posttest appear in Table 4. It can be seen that the correlations are acceptable, ranging from .58 to .84 with a mean test-retest correlation of .70. These results are once again very close to those observed with the French-Canadian version (mean $r = .69$) and offer support for the temporal stability of the English version of the scale. The alpha values for the pretest and the posttest are also acceptable varying from .71 to .85 at the pretest, and from .69 to .85 at

Table 4 Internal Consistency Values (Cronbach Alpha) and Test-Retest Correlations of the SMS Subscales

	Alpha pretest	Alpha posttest	Test-retest correlations
Amotivation	.81	.73	.58
External regulation	.80	.85	.78
Introjected regulation	.71	.73	.66
Identified regulation	.71	.69	.84
IM-to know	.85	.73	.62
IM-accomplishment	.78	.79	.75
IM-stimulation	.81	.76	.66

Note. $N = .50$.

the posttest. These values are very similar to those obtained in the first study and are consistent with those observed by Brière et al. (in press), thereby offering further support for the reliability and internal consistency of the subscales.

Conclusion

The purpose of the two studies reported in this article was to validate the Sport Motivation Scale (SMS) in English. Results from the two studies revealed that the SMS has adequate levels of validity and reliability. Results from the confirmatory factor analysis supported the seven-factor structure of the SMS and provided some support for the construct validity of the scale. Second, correlations among the seven subscales, as well as between the subscales of the SMS and variables thought to represent motivational antecedents and consequences, led to a pattern of results in line with theoretical predictions, with findings obtained in other life domains (see Vallerand, 1993), and with findings similar to those obtained with the French-Canadian version of the SMS. Third, results from the CFA, patterns of means for the IM subscales, and correlations among the IM subscales yielded support for the discriminant validity of the three IM subscales. With respect to the reliability of the scale, results from the two studies indicated that all subscales had adequate levels of internal consistency and displayed acceptable levels of temporal stability over a 5-week period. The values obtained are also very similar to those obtained with the French-Canadian version.

Thus, these results are encouraging. Additional research will be necessary to further establish the psychometric properties of the scale. For instance, relations between the SMS subscales and various scales used to assess motivation-like constructs in sport (e.g., Dwyer, 1988; McAuley et al., 1989; Weiss et al., 1985) could be analyzed to further establish the concomitant validity of each subscale. In addition, contrary to other instruments, the SMS assesses seven types of motivation on an independent basis. Theoretically, this should allow for a finer analysis of motivational forces than these other instruments, which should lead to better discriminant, as well as predictive, validity.

Additional research could also focus on theoretical and applied issues. From a theoretical perspective, it now becomes possible to test some hypotheses derived from cognitive evaluation theory (CET; Deci & Ryan, 1985). Athletes' motivation can be enhanced or undermined by factors in the home and sport environments. In this respect, CET has proposed some dimensions as being important for facilitating self-determination in athletes: autonomy support versus control, and involvement. That is, the degree to which parents and coaches encourage children to initiate and make their own choices rather than apply pressure to control the children's behavior, and the degree to which parents and coaches are interested in and spend time relating to the children concerning experiences and activities, should facilitate self-determination in children. Results from correlations among the SMS subscales in Study 1, as well as previous research (e.g., Blais et al., 1990; Pelletier et al., 1988; Vallerand et al., 1989), would tend to support these hypotheses with respect to coaches. Future research is needed to better understand (a) whether parents' interpersonal behaviors also affect athletes' motivation and (b) the nature of the psychological processes responsible for such effects. Finally, it would be interesting to better understand how parents' and coaches' behaviors combined in affecting athletes' motivation.

From an applied perspective, self-determination has been linked to important outcomes in sport, such as dropout. For example, Pelletier et al. (1988) indicated that athletes' perceptions of the autonomy support was positively associated with self-determined forms of motivation (i.e., intrinsic motivation and identified regulation) and athletes' perceptions of control was positively associated with less self-determined forms of motivation (i.e., external regulation and amotivation). In turn, the swimmer's level of motivation predicted persistence in the sport a year later. Future research should try to replicate these results with other activities. Research should also attempt to assess motivation at different points in time to better understand the specific circumstances leading to a drop in athletes' motivation.

Implicit in the preceding discussion is the assumption that intrinsic motivation and self-determination are advantageous in sports. In several studies, it has been found that controlling events (e.g., competition, deadlines, imposed goals) led to poorer performance and less creativity than informational events. Apparently, when people are intrinsically motivated and self-determined, they are more fully involved in the activity itself and, therefore, display better performance. For instance, it has been shown that self-determined goal setting leads to enhanced performance relative to imposed goal-setting (Alexander & Schuldt, 1982). Research also reveals that, when extrinsically motivated, people generally do the minimum work that will allow them to receive the reward, avoid the punishment, or defeat an opponent (Kruglanski, Stein, & Riter, 1977; Pittman, Emery, & Boggiano, 1982). Thus low levels of self-determination may create a passive set such that the behavior will occur only when the individual is prodded by the environment. The extra effort that may be needed for optimal performance would, therefore, not be forthcoming. There is, however, little evidence that directly links intrinsic motivation and self-determination to athletic performance. Further research on this issue is needed as it should further knowledge on the interaction between real-life environments, motivational orientation, and performance.

In sum, the SMS represents not only an adequate adaptation of the French-Canadian version, but a reliable and valid scale in its own right that should be useful for research on sport motivation. Although results of the present studies provide support for the adequacy of its psychometric properties, further evaluation should be pursued in future research.

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Appendix

Why Do You Practice Your Sport?

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

	Does not correspond at all		Corresponds moderately		Corresponds exactly		
1. For the pleasure I feel in living exciting experiences.	1	2	3	4	5	6	7
2. For the pleasure it gives me to know more about the sport that I practice.	1	2	3	4	5	6	7
3. I used to have good reasons for doing sports, but now I am asking myself if I should continue doing it.	1	2	3	4	5	6	7
4. For the pleasure of discovering new training techniques.	1	2	3	4	5	6	7
5. I don't know anymore; I have the impression that I am incapable of succeeding in this sport.	1	2	3	4	5	6	7
6. Because it allows me to be well regarded by people that I know.	1	2	3	4	5	6	7
7. Because, in my opinion, it is one of the best ways to meet people.	1	2	3	4	5	6	7
8. Because I feel a lot of personal satisfaction while mastering certain difficult training techniques.	1	2	3	4	5	6	7
9. Because it is absolutely necessary to do sports if one wants to be in shape.	1	2	3	4	5	6	7
10. For the prestige of being an athlete.	1	2	3	4	5	6	7
11. Because it is one of the best ways I have chosen to develop other aspects of myself.	1	2	3	4	5	6	7
12. For the pleasure I feel while improving some of my weak points.	1	2	3	4	5	6	7
13. For the excitement I feel when I am really involved in the activity.	1	2	3	4	5	6	7
14. Because I must do sports to feel good about myself.	1	2	3	4	5	6	7
15. For the satisfaction I experience while I am perfecting my abilities.	1	2	3	4	5	6	7
16. Because people around me think it is important to be in shape.	1	2	3	4	5	6	7

17. Because it is a good way to learn lots of things which could be useful to me in other areas of my life.	1	2	3	4	5	6	7
18. For the intense emotions that I feel while I am doing a sport that I like.	1	2	3	4	5	6	7
19. It is not clear to me anymore; I don't really think my place is in sport.	1	2	3	4	5	6	7
20. For the pleasure that I feel while executing certain difficult movements.	1	2	3	4	5	6	7
21. Because I would feel bad if I was not taking time to do it.	1	2	3	4	5	6	7
22. To show others how good I am at my sport.	1	2	3	4	5	6	7
23. For the pleasure that I feel while learning training techniques that I have never tried before.	1	2	3	4	5	6	7
24. Because it is one of the best ways to maintain good relationships with my friends.	1	2	3	4	5	6	7
25. Because I like the feeling of being totally immersed in the activity.	1	2	3	4	5	6	7
26. Because I must do sports regularly.	1	2	3	4	5	6	7
27. For the pleasure of discovering new performance strategies.	1	2	3	4	5	6	7
28. I often ask myself; I can't seem to achieve the goals that I set for myself.	1	2	3	4	5	6	7

Notes

¹Deci and Ryan (1985) also include integrated regulation as one type of extrinsic motivation. However, integrated regulation was not initially included in the EMS and therefore is not assessed in the SMS. Pilot data revealed that integrated regulation did not come out as a perceived reason for participating in sport. Future research would appear necessary on this issue.

²Although the alpha reliability values of some of determinants and consequences are low, it was decided to use these measures since they were also used with the French version.

Acknowledgments

This paper was prepared while the first author was supported by research grants from the Tri-Council of Canada (SSHRC-NSRC-MRC) and le Fonds pour la Formation des Chercheurs et l'Aide à la Recherche (FCAR Québec). The third author was supported by grants from SSHRC, FCAR Québec, Le Conseil Québécois de la Recherche Sociale, and the Université du Québec à Montréal, while the second and fourth authors were supported by SSHRC fellowships.

Manuscript submitted: November 30, 1993 *Revision received:* August 24, 1994