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Adapting BRSQ to Assess Coach's Perception of Athletes' Motivation: Internal Structure Analysis

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Abstract

This study was aimed to adapt the Behavioral Regulation in Sport Questionnaire to assess coach's perception of athletes' motivation in a sample of 153 Spanish coaches of both genders. This questionnaire is made up of 24 items that measure the behavioral regulation factors expected by the self-determination theory developed by Deci and Ryan. Results showed that a model of four factors provided the best fit to the data in the confirmatory factor analysis. The factors were: (1) intrinsic regulation, (2) integrated regulation, (3) identified regulation, (4) controlled regulation. Three out of four subscales have acceptable internal consistency coefficients. The accumulation of evidence leads to the conclusion that this version of BRSQ shows an internal structure according to the theoretical predictions, and the autonomous regulation factors show discriminant validity whereas the controlled regulations form a single factor.

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1. Introduction

Self-determination theory assumes that different motivational regulations exist, each reflecting varying levels of self-determination (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). The most basic principle of SDT, when applied to physical activities, is that they can be both intrinsically and extrinsically motivated. Intrinsic motivation pertains to engagement in an activity because of the inherent pleasures and satisfactions it provides. Many physical activities are enjoyable in their own right, and require no exogenous rewards or incentives to be performed (Ryan & Deci, 2000). In contrast, extrinsic motivation characterizes activities that are performed in order to obtain some separable

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outcome, whether that be a tangible reward, an avoidance of a punishment, or the attainment of recognition, or approval.

Behavioral regulation is characterized by two regulatory styles. External, introjected regulations, and amotivation are considered *controlled* regulatory styles, whereas identified, integrated, and intrinsic regulations are considered *autonomous* regulatory styles. Across these two broad categories, six different types of behavioral regulation are thought to exist and can be ordered on a self-determination continuum. Beginning with the most self-determined, intrinsic motivation involves pursuing an activity out of interest and enjoyment and without external contingencies (Ryan & Deci, 2000). Secondly, extrinsic motivation refers to partaking in an activity to attain an outcome separate from the activity itself. Extrinsic motivation can be further divided, in a descending order of self-determination, into *integrated* (pursuing an activity because it is congruent with other aspects of the self), *identified* (undertaking an activity because one accepts the value of the activity), *introjected* (partaking in an activity because of internal pressures such as guilt or shame), and *external* (doing an activity because of external pressures or incentives) *regulations* (Ryan & Deci, 2000). Finally, amotivation refers to a perception that no worthwhile reasons for pursuing an activity exist and hence a complete absence of self-determination (Ryan & Deci, 2000).

At all levels of sport participation, the coach is considered the architect of the motivational climate and is subsequently key to facilitating adaptive forms of motivation to enhance the quality of sport performance (Mallett & Hanrahan, 2004; Mclean & Mallett, 2012). Although many factors may impact athletes' intrinsic and extrinsic motivation, the coach-athlete relationship is one of the most important influences on athletes' motivation and subsequent performance (Mageau & Vallerand, 2003). Amorose and Horn (2001) argue that one important factor that deserves more attention and appears to affect motivation in sport is coaches' behaviors towards their athletes.

Some studies in a coaching context have explored how coaches' expectancy behaviors affect athletes' motivation to practice or play their sport and also supported the idea that coach expectancies, play a role in determining the outcome of athlete's performance (Schinke & Tabakman, 2001; Short & Short, 2005; Smith, Smoll, & Barnett, 1995). Also many investigations in the academic domain have found evidence that a relationship exists between teachers' perceptions of their students' self-determination and their use of autonomy support, and this relationship may be mediated by the teachers' self-determination (Mageau & Vallerand, 2003; Ntoumanis, 2005; Pelletier, Se'guin-Lévesque, & Legault, 2002; Pelletier & Vallerand, 1996). Taylor and Ntoumanis (2007) indicated that physical education classes perceived by teachers to be high in self-determination may contribute to enhanced teacher self-determined motivation. Subsequently, the self determined teachers try more to understand their students and offer them meaningful rationale, compared with low self-determined teachers. (Taylor, Ntoumanis, & Standage, 2008).

The Behavioral Regulation Questionnaire in Sport (Lonsdale, Hodge, & Rose, 2008) is a measure of competitive sport participants' motivation from the perspective of the SDT. The BRSQ is developed due to the mixed support for previous scales assessing different motivations for sport participation, such as the Sport Motivation Scale (SMS; Pelletier, Tuson, Fortier, Vallerand, Brière, & Blais, 1995). The Spanish-version of BRSQ (Viladrich, Torregrosa, & Cruz, 2011) has been shown to have adequate to excellent psychometric properties. Previous researches (Holland, Sharp, Woodcock, Cumming, & Duda, 2010; Lonsdale et al., 2008; Viladrich et al., 2011) have supported the validity and reliability of the six-factor version of BRSQ with adult and youth populations as a measure of the behavioral regulation styles proposed by SDT, including intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, amotivation. In Regard to the result of studies (Taylor et al., 2008; Taylor, Ntoumanis, & Smith, 2009; Sarrazin & Tessier, 2006; Mallett, 2005) that emphasized on teachers' expectations about students self-determined motivation and the relationship between teachers' and coaches' behaviors towards students and athletes, thus the goal of the present study was to adapt the Spanish version of Behavioral Regulation in Sport Questionnaire as an instrument for assessing the coach's perception of athletes' self-determined motivation.

2. Method

2.1. Participants

The participants were 153 Spanish coaches (144 males, 9 females). The average age was 28.65 years ($SD = 8.84$, $range = 15-52$). They were drawn from four sports, football ($n = 124$), basketball ($n = 27$), handball ($n = 1$), skiing ($n = 1$). Their coaching experience ranged from 1 to 26 years ($M = 4.97$; $SD = 4.81$), and they had spent between 1 month and 7 years ($M = .99$ years; $SD = 1.16$) working with their current team.

2.2. Instrument

The Behavioral Regulation Questionnaire in Sport (BRSQ, Lonsdale et al., 2008), was designed to assess motivation in a sport context based on self-determination theory (SDT) and consist of 6 subscales (24 items), each subscale comprises four items which were designed to measure the intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. All the responses are given in a Likert scale, ranging from 1 (completely false) to 7 (completely true). The questionnaire was first adapted for Spanish athletes (Viladrich et al., 2011) and subsequently to the coaches' perceptions of their athletes' behavioral regulations (see below). Complete item wording is included in Table 1.

2.3. Procedure

The Spanish version of the BRSQ items were adapted to coach's perception of athletes' motivation context by two sport psychologists and a methodologist with experience in questionnaire adaptation. Then for meaning correspondence and relevance of the items, the adapted version was reviewed by five sport coaches. Finally, the author collaborated with the experts to ensure that the true meaning of the items was preserved in the last version. The coaches from clubs and sport schools that we contacted agreed to participate in the study were made aware of the purpose of study and data confidentiality. After completing the consent form, participants were asked to complete the questionnaires in 25 minutes sessions.

2.4. Data Analysis

The preparatory data analysis, descriptive statistics, and estimation of internal consistency were performed by SPSS 19 and analysis of the internal structure of the questionnaire has been examined through performing confirmatory factor analysis by Mplus 7. The statistical estimators and structural analysis are explained in detail in the corresponding subsections of results.

3. Results

Data were first screened for missing data and outlier detection. The normality of the scores from items was tested for each item by calculating skewness and kurtosis. As it is shown in Table 1, the multivariate normality condition is not satisfied, the skewnesses being between .35 and 2.75 in absolute value, and the kurtosis between .24 and 11.20 in absolute value. The means of autonomous regulation items (intrinsic regulation, integrated regulation, identified regulation) are higher than means of controlled regulation items (introjected regulation, external regulation, amotivation). Autonomous items show mean values around 5 or 6, whereas controlled items show mean values around 1 or 2.

Table 1
Content of items and descriptive statistics

Subscale	Item	Content	Mean	SD	Sk	K
Intrinsic regulation	1	because they enjoy it / porque disfrutan	5.82	1.21	-1.46	3.30
	11	because they like it / porque les gusta	6.54	.86	-2.75	11.20
	16	because it's fun / porque les es divertido	6.21	.88	-1.17	1.37
	19	because they find it pleasurable / porque lo encuentran agradable	5.76	1.10	-1.25	2.50
Integrated regulation	2	because it's a part of who they are / porque forma parte de ellos	5.74	1.18	-1.06	1.50
	3	because it's an opportunity to just be who they are / porque es una oportunidad de ser quién realmente son	4.92	1.47	-.57	.30
	8	because what they do in sport is an expression of who they are / porque lo que hacen en el deporte es una expresión de lo que son	4.61	1.68	-.54	-.43
	24	because it allows them to live in a way that is true to their values / porque les permite vivir de acuerdo con sus valores	5.43	1.31	-.80	.62
Identified regulation	9	because the benefits of sport are important to them / porque para ellos son importantes los beneficios que implica el deporte	5.20	1.55	-.80	.24
	17	because it teaches them self-discipline / porque les enseña autodisciplina	4.88	1.50	-.50	-.05
	20	because they value the benefits of their sport / porque valoran los beneficios de este deporte	5.39	1.28	-.77	.57
	22	because it is a good way to learn things which could be useful to them in their life / porque es una buena manera de aprender cosas que podrían resultarles útiles en la vida	5.06	1.43	-.35	-.33
Introjected regulation	4	because they would feel ashamed if they quit / porque les avergonzaría dejarlo	2.07	1.33	1.20	.70
	6	because they would feel like a failure if they quit / porque se sentirían fracasados(as) si lo dejaran	1.92	1.36	1.64	2.19
	12	because they feel obligated to continue / porque se sienten obligados/as a continuar	2.07	1.40	1.37	1.36
	18	because they would feel guilty if they quit / porque se sentirían culpables si lo dejaran	2.07	1.34	1.30	1.16
External regulation	10	because if they don't, other people will not be pleased with them / porque si no lo hacen, los demás estarán descontentos de ellos(as)	2.34	1.54	1.10	.42
	14	because they feel pressure from other people to play / porque se sienten presionados/as por los demás para seguir haciéndolo	1.91	1.17	1.28	.85
	15	because people push them to play / porque los demás les exigen hacerlo	1.79	1.14	1.72	2.81
	23	in order to satisfy people who want them to play / para satisfacer a las personas que quieren que lo practiquen	2.95	1.72	.44	-.87
Amotivation	5	but the reasons why are not clear to them anymore / a pesar de que ya no tienen muy claro por qué lo hacen	2.15	1.40	1.08	.24
	7	but they wonder what's the point / a pesar de que se preguntan para qué sirve	1.94	1.33	1.49	1.67
	13	but they question why they continue / a pesar de que se preguntan por qué continúan	1.93	1.30	1.54	1.71

21	but they question why they are putting themselves through this / a pesar de que se preguntan por qué pasan por eso	2.20	1.35	.82	-.51
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Note. SD = Standard deviation; Sk = Skewness; K= Kurtosis

Due to the categorical nature of the data, the weighted least squares mean and variance adjusted (WLSMV) estimator was used with pairwise deletion for missing values (Asparouhov & Muthén, 2010; Graham, 2009). Following Hu and Bentler (1999) recommendations, a two-index presentation strategy has been adopted, comparative fit index (CFI), and Tucker-lewis index (TLI) compare the measurement model with a null model and provide scores ranging from 0.00 to 1.00 (0.00 indicating poor fit, 1.00 indicating perfect fit). The root mean square error of approximation (RMSEA) compare the measurement model with a predicted model and provide a scores ranging from 0.00 to 1.00 (0.00 indicating perfect fit, 1.00 indicating poor fit). Guided by suggestions provided in Hu and Bentler (1999), acceptable model fit was defined by the following criteria: CFI and TLI values close to .95 or greater, RMSEA values close to .06 or below. However, some investigators have proposed RMSEA value below .08 represent a good fit (Marsh, Hau, & Wen, 2004). “Steiger (1989) and Browne and Cudeck (1993) suggest guidelines for the interpretation of RMSEA: values in the range of 0.00 to 0.05 indicate close fit, those between 0.05 and 0.08 indicate fair fit, and those between 0.08 and 0.10 indicate mediocre fit. RMSEA values above 0.10 indicate unacceptable fit” (MacCallum, Widaman, Preacher, & Hong, 2001, p.621). In order to test the structure of the BRSQ for assessment of coach’s perception of athletes’ motivation, two models: (1) M1, six-factor model and (2) M2, four-factor model were tested through confirmatory factor analysis. Table 2 shows the M1, M2 models with all fit indices.

Table 2
Goodness of fit indices for each of the models

Model	χ^2	df	CFI	TLI	RMSEA
M1. Six factors	534.046	237	.938	.928	.091
M2. Four factors	586.609	246	.929	.920	.095

Note. χ^2 = chi-square test of model fit; df = degrees of freedom; CFI= comparative fit index; TLI= Tucker-Lewis index; RMSEA= root mean square error of approximation; χ^2 value is significant at $P < 0.001$

A revision of the fit indexes reveals that M1 (CFI=.938, TLI=.928) fits the data better than M2 (CFI=.929, TLI=.920) as it would be expected due to the greater number of factors, but in M1, the latent factor covariance matrix was not positive definite due to an extreme correlation between introjected regulation subscale and amotivation subscale. Therefore, it was decided to test the fit for a four-dimension model which was defined by intrinsic, integrated, identified, and controlled regulation subscales. As it is shown in Figure 1, the correlation among the autonomous regulation subscales (intrinsic, integrated, identified regulations) were statistically significant ($p < .001$) and also, the correlation between controlled regulation subscale and other three subscales was low. The root mean square error of approximation was: M1 (RMSEA=.091, 90% CI), M2 (RMSEA=.095, 90% CI). So two models in this study did satisfy the marginally acceptable cut-off for the RMSEA. The factor loadings of items in the four-factor model are presented in Figure 1. The factor loadings indicated that all factors, with loading values ranging from .472 to .903, were statistically significant ($p < .001$) and all of them were acceptable.

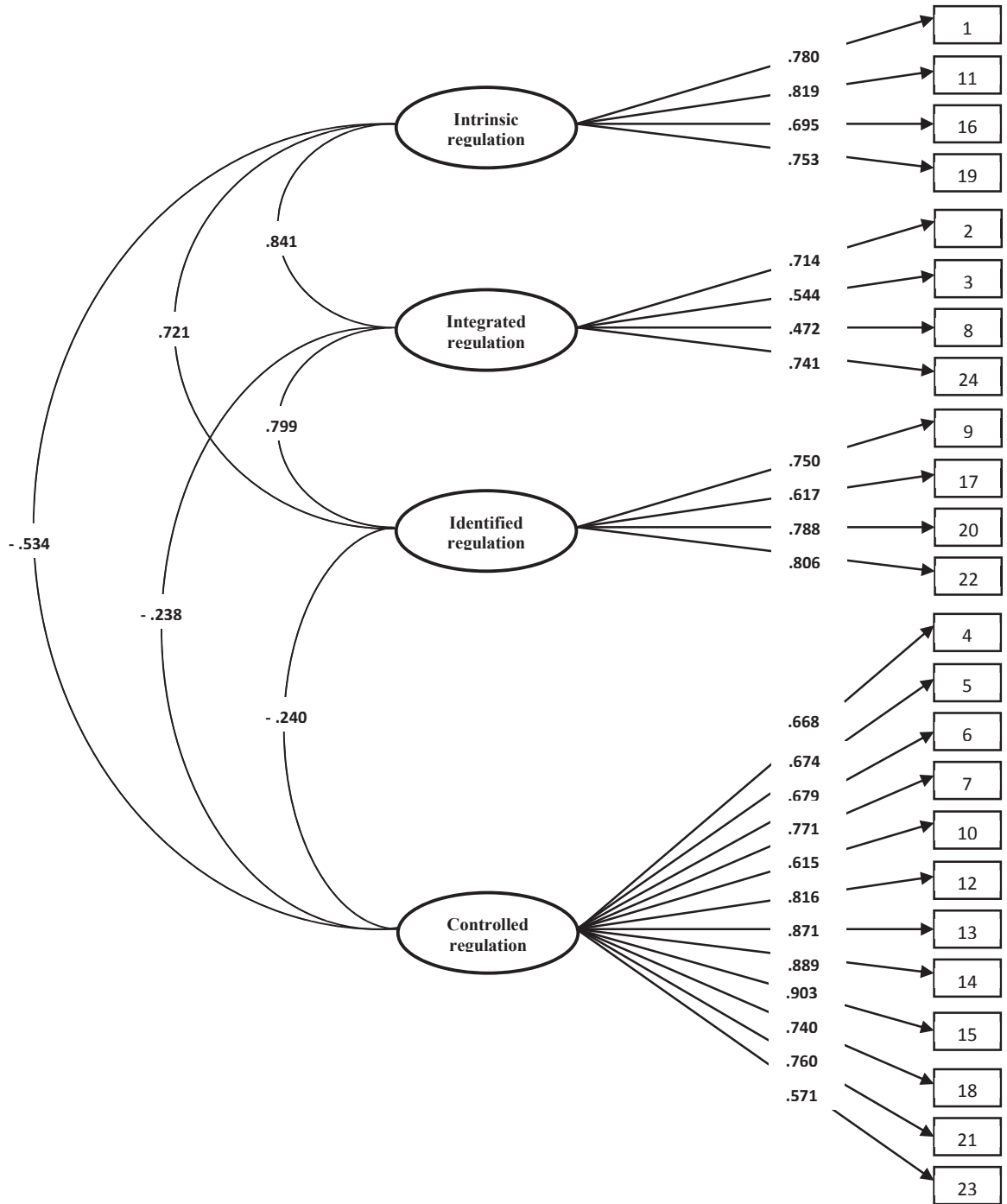


Figure 1. Factor structure of four-factor model in adapting BRSQ to assess coach's perception of athletes' motivation
 Note. correlation values are significant at $P < 0.001$

Using Cronbach's alpha coefficient the internal consistency reliability of the scores obtained from items on the adapted Spanish version of BRSQ for assessing the coach's perception of athletes' motivation with the present sample was .78. The values of the internal consistency of subscales ranged from an alpha coefficient of .66 - .89. Thus, three out of four subscales have acceptable internal consistency coefficients (Nunnally, 1978). The internal consistency coefficients are shown in Table 3. The scores of the subscales are distributed along possible values of 1-7 and skewness being between .89 and 1.37 in absolute value. All subscales have inter-item correlations mean above .30 and the mean value of controlled regulation subscale is 2.08 that corresponding to the categories that express disagreement with the statements. The other three subscales show mean values above 5.

Table 3
Descriptive statistics and internal consistency

Subscale	M	α	r	Sk	Observed range
Intrinsic regulation	6.08	.758	.451	-1.37	1-7
Integrated regulation	5.18	.666	.339	-.483	1-7
Identified regulation	5.14	.789	.489	-.538	1-7
Controlled regulation	2.08	.891	.417	.895	1-7

Note. M = mean; α = Cronbach's alpha coefficient; r = inter-item correlations mean; Sk = skewness; Cronbach's alpha total = .78

4. Discussion

The present study aimed to adapt the Behavioral Regulation in Sport Questionnaire to assess coach's perception of athletes' self-determined motivation. To the best of our knowledge, this is the first study to examine the basic psychometric properties of BRSQ adapted to coaches' perceptions about their pupils in Spanish language. Therefore, we expect that our study might provide quantitative evidence relative to the use of this questionnaire in order to better understand athletes' motivation in coach's point of view and clarify the coach's expectations about athletes' self-determined motivation.

Regarding the factorial validity of the previous versions of BRSQ, six-factor model was specified and tested by confirmatory factor analysis. The fit indexes (CFI, TLI) were fitted and RMSEA, 90% CI was marginally acceptable but a high correlation between introjected regulation subscale and amotivation subscale was observed, this was not in line with theoretical principal of self determination theory (SDT): factors should be more highly correlated to those factors more closely located to them on the continuum (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). The BRSQ has some difficulties in meeting these expectations. In the original version (Lonsdale et al., 2008) it was difficult to distinguish between external regulation and introjected regulation, in addition identified and integrated regulation factor scores had similar correlation with the other factors. But, in Spanish version (Viladrich et al., 2011) the athletes could distinguish well between external and introjected regulations. Regarding our results, our conclusion was that in this sample the coaches could not distinguish well between introjected regulation and amotivation. This result could be understood attending to the SDT proposal that the behavioral regulations can be placed along a continuum reflecting the degree to which behaviors are more autonomous or controlled (Deci & Ryan, 1985, 2000). Maybe our coaches were able to clearly distinguish autonomous regulations, but they didn't discriminate among controlled regulations. Thus, based on this point we tested four-factor model through confirmatory factor analysis. The results showed acceptable fit indexes and in accordance with SDT and as it would be expected, the correlation between controlled regulation subscale and other autonomous subscales (intrinsic, integrated, and identified regulation) was low. Reliability analysis demonstrated that the original and Spanish version of BRSQ (six-factor model) achieved good levels of internal consistency with Cronbach's alpha coefficients exceeding .70 (Holland et al., 2010; Lonsdale et al., 2008; Viladrich et al., 2011). Also in our study, the internal consistency coefficient was .78. In result, the adapted Spanish version of BRSQ for assessing the coach's

perception of athletes' motivation (four-factor model) showed to have adequate to acceptable reliability (Nunnally, 1978). Moreover, only one subscale (integrated regulation) had a Cronbach's alpha value lower than .70. In sum, results from this study indicate that the adapted Spanish version of Behavioral Regulation in Sport Questionnaire for assessing the coach's perception of athletes' motivation has acceptable reliability and good validity structure in a four-factor model.

Taking this evidence into consideration, it is also possible to suggest that these acceptable internal structures for present study support the application of this questionnaire in some applied settings for the purpose of assessment of athletes' motivation in coach's point of view. The current study has provided basic psychometric properties of adapted Spanish version of BRSQ for assessing the coach's perception of athletes' motivation such as internal consistency and factor structure. Future researchers will do well to conduct other types of reliability and validity studies, such as test-retest reliability, concurrent and predictive validity in a larger sample size.

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