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Psychometric properties of the Spanish version of the Controlling Coach Behaviors Scale in the sport context

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Abstract

Background: The purpose of this research was to translate into Spanish and examine the psychometric properties of the Spanish version of the Controlling Coach Behaviors Scale (CCBS) in male soccer players. The CCBS is a questionnaire designed to assess athletes' perceptions of sports coaches' controlling interpersonal style from the perspective of the self-determination theory. **Method:** Study 1 tested the factorial structure of the translated scale using confirmatory factor analysis (CFA) and provided evidence of discriminant validity. Studies 2 and 3 examined the invariance across time and across competitive level via multi-sample CFA. Reliability analyses were also conducted. **Results:** The CFA results revealed that a four-factor model was acceptable, indicating that a controlling interpersonal style is a multidimensional construct represented by four separate and related controlling coaching strategies. Further, results supported the invariance of the CCBS factor structure across time and competitive level and provided support for the internal consistency of the scale. **Conclusions:** Overall, the CCBS demonstrated adequate internal consistency, as well as good factorial validity. The Spanish version of the CCBS represents a valid and reliable adaptation of the instrument, which can be confidently used to measure soccer players' perceptions of their coaches' controlling interpersonal style.

Keywords: Self-determination theory, rewards, negative conditional regard, intimidation, personal control, scale adaptation.

Resumen

Propiedades psicométricas de la versión española de la Escala de Conductas Controladoras del Entrenador en el contexto deportivo. **Antecedentes:** el objetivo del trabajo consistió en traducir al castellano y examinar las propiedades psicométricas de la versión española de la Escala de Conductas Controladoras del Entrenador (CCBS) en futbolistas varones. La CCBS fue diseñada para medir la percepción que los deportistas tienen del estilo interpersonal controlador del entrenador, desde la Teoría de la Autodeterminación. **Método:** el Estudio 1 analizó la estructura factorial utilizando el Análisis Factorial Confirmatorio (AFC) y ofreció evidencia de validez discriminante. El Estudio 2 y 3 examinaron la invarianza a través del tiempo y del nivel competitivo. También se realizaron análisis de fiabilidad. **Resultados:** los resultados del AFC revelaron que el modelo de cuatro factores era aceptable, lo que indica que un estilo interpersonal controlador es un constructo multidimensional representado por cuatro diferentes estrategias controladoras de entrenamiento, relacionadas entre sí. Además, los análisis apoyaron la replicabilidad de la estructura factorial a través del tiempo y del nivel competitivo, así como la consistencia interna de la escala.**Conclusiones:** la CCBS mostró adecuada consistencia interna y validez factorial. La versión española de la CCBS representa una adaptación válida y fiable para medir la percepción que los jugadores de fútbol tienen de los estilos interpersonales controladores de sus entrenadores.

Palabras clave: Teoría autodeterminación, recompensas, atención condicional negativa, intimidación, control personal, adaptación escala.

Research conducted in the context of youth sport has shown that the behaviour and interpersonal style of the coach can have significant influence on the psychological experiences of young athletes (e.g., Quested et al., 2013). The Self-Determination Theory (SDT; Ryan & Deci, 2002) suggests that a coach's behavior can be viewed in terms of two interpersonal styles: autonomy supportive and controlling. Research has primarily focused on coaches' autonomy supportive behaviors (Mageau & Vallerand, 2003), whereas the empirical evidence concerning coaches' use of controlling behaviors is scarce (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010).

Drawing from the theoretical framework of the SDT, Bartholomew, Ntoumanis and Thøgersen-Ntoumani (2009) presented an overview of controlling behaviors that coaches might employ in sport. On the basis of this review, Bartholomew et al. (2010) developed the Controlling Coach Behaviors Scale (CCBS), a multidimensional self-report measure designed to assess coaches' controlling interpersonal style by tapping the extent to which athletes perceive their coach to engage in four separate but related controlling behaviors considered salient in the sport domain: the controlling use of rewards, negative conditional regard, intimidation, and excessive personal control during coach-athlete interactions.

The controlling use of rewards refers to the use of tangible and verbal rewards as an incentive for engaging with and completing

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a task or for reaching certain performance standards (Deci, Koestner, & Ryan, 1999).

The use of *negative conditional regard* refers to the withholding of love, attention, and affection by those in a position of authority when desired attributes or behaviors are not displayed by their subordinates (Assor, Roth, & Deci, 2004).

Intimidation refers to the use of strategies to control behaviors in order to humiliate and belittle, such as verbal abuse and threats, yelling, and the threat or use of physical punishment (Bartholomew et al., 2010).

Finally, the use of *excessive personal control* refers to the use of intrusive behaviors that attempt to interfere with aspects of the athletes' lives that are not directly associated with their sport participation (Bartholomew et al., 2010).

Psychometric tests on the scores obtained from the CCBS have provided substantial evidence of internal reliability and validity for the English version of the scale. Specifically, the CCBS has a four-dimensional factor structure that taps the extent to which athletes perceive their coach to engage in each of the controlling strategies outlined above and has demonstrated good internal reliability and concurrent validity, as well as invariance across gender and sport type (see Bartholomew et al., 2010).

As far as the authors are aware, the translation and psychometric properties of a Spanish version of the scale are yet to be established [preliminary analyses were presented in the VII Iberoamerican Congress of Psychology (Castillo et al., 2010)]. Therefore the aim of the present study was twofold: (1) to translate the CCBS items into Spanish and examine the factor structure and reliability the Spanish version of the CCBS, and (2) to test its invariance across time and competitive level, using samples of youth male soccer players. Grassroots soccer was the targeted sport setting in this study due to the huge popularity of youth soccer around the world (Kunz, 2007).

From a practical perspective, the development of a Spanish version of the CCBS will provide the Spanish-speaking research community with an adequate instrument for measuring athletes' perceptions of sports coaches' controlling interpersonal style. From a theoretical perspective, it will contribute to the construct validation and cross-national generalizability of the instrument. Moreover, testing measurement invariance of the CCBS across time and competitive level will provide further support for the reliability and factorial validity of the scale. Indeed, test translation and adaptation is a major concern in psychometric research (Balluerka, Gorostiaga, Alonso-Arbiol, & Haranburu, 2007; Muñiz, Elosua, & Hambleton, 2013) that will facilitate cross-cultural comparative research and should help to understand diverse cultural variations.

Method

Participants

Study 1. Responses to the CCBS were obtained from 373 volunteer male youth soccer players representing 21 different soccer schools from the Valencian Soccer Federation. The data were collected in October 2009, and we obtained a response rate of 80.7%. Respondents were between 12 and 13 years old (M = 12.7, SD = 0.47). On average, participants had played competitively with their respective club development programs for more than 3 years (M = 3.19, SD = 1.67). The factorial validity and reliability of the Spanish version of the CCBS were tested using this sample.

Studies 2 and 3. Two samples were used to assess the invariance of the translated scale. To analyze factorial invariance across time, 433 male youth soccer players aged 12 to 15 at baseline (M = 13.6, SD = 0.56) completed the questionnaire on two occasions over the course of one season (October 2010-May 2011). We obtained a response rate of 60.5%, and the dropout rate was 14.6%. To examine factorial invariance across competitive level, 650 male youth soccer players aged 11 to 14 (M = 12.9, SD = 0.69) completed the questionnaire. The data were collected in May 2010, and we obtained a response rate of 73.9%. Participants represented 40 different league teams with 505 players participating at regional level and 145 players participating at the autonomic level of the Valencian Community Youth Soccer League in Valencia, Spain. Regional league represents a lower level of competition, and autonomic league represents a higher level.

Instruments

The Controlling Coach Behaviors Scale (CCBS) is a 15-item questionnaire designed by Bartholomew et al. (2010) to assess athletes' perceptions of four controlling motivational strategies in the sport domain: the controlling use of rewards (4 items), negative conditional regard (4 items), intimidation (4 items), and excessive personal control (3 items). The instruction in the questionnaire is, "please indicate how much you agree or disagree with each statement" and the questionnaire begins with the stem, "In my soccer team . . ." Responses are provided on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Players' perceptions of the degree of autonomy support provided by their coach were assessed via the 15-item Spanish version (Balaguer, Castillo, Duda, & Tomás, 2009) of the Sport Climate Questionnaire (www.selfdeterminationtheory.org). Each item starts with the phrase: "On my soccer team…" and the responses are rated on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). An example item is "I feel that my coach provides me with choices and options".

Procedure

After selecting the teams randomly by area (simple random sampling) within the Valencian Community from the list provided by the Valencian Soccer Federation, a letter was sent to the sports directors of the soccer schools, informing them about the goals of the investigation and requesting their collaboration. All the schools contacted expressed interest in participating in the investigation. All participants and their parents provided informed consent before data collection. The questionnaires were responded to anonymously and voluntarily, and were completed by the players during a 10-minute interval, before their normal training session, in a room made available for this purpose. The questionnaires were administered by at least one investigator simultaneously to all the team members who participated in the study. Neither the coach nor the sports director of the club was present at any time during questionnaire administration. Players were encouraged to answer honestly and ask the investigator present if they had any questions. The Time 1 questionnaire pack was administered approximately two months into the season, so the players had enough time to develop their views regarding their coaches' prevailing interpersonal style. Time 2 questionnaires were completed at the end of the season.

The source English version of the CCBS was translated to Spanish following the back-translation procedure widely described in the literature (e.g., Hambleton & Kanjee, 1995).

Data analysis

To calculate the descriptive statistics the program SPSS 19.0 was used.

Reliability, factorial and discriminant validity

The examination of the scale psychometric properties included reliability (Cronbach's alpha and test-retest) and factorial validity analysis. CCBS items were subjected to confirmatory factor analysis, using LISREL 8.80 (Jöreskog & Sörbom, 2006) to test whether the four-factor CCBS structure proposed by Bartholomew et al. (2010) adequately fit data collected from Spanish youth soccer players.

Considering the ordinal nature of the items, weighted least squares was used to estimate model parameters, and the polychoric correlation matrix and the asymptotic covariance matrix were used as input for the analyses. We considered the root mean square error of approximation (RMSEA), the non-normed fit index (NNFI), and the comparative fit index (CFI) to evaluate goodness of fit as well an evaluation of parameter estimates.

Discriminant validity was investigated through inspection of the correlations between athletes' perceptions of their coach's controlling and autonomy-supportive behaviors.

Measurement invariance

A sequential model testing approach was employed via multi-sample CFA to examine whether the CCBS displayed invariance across time (repeated measures) and across competitive level (independent samples).

Prior to any invariance analysis, four-factor CFAs were applied to each group separately (models M0a, M0b; see Tables 2 and 3). In both cases (invariance over time and across competitive level), a baseline model testing the structural invariance was established. Then increasingly constrained models were specified to examine the equality of measurement (i.e., invariance of factor loadings, intercepts and uniqueness; this last parameter was not used to test for invariance across time as error invariance is not expected in longitudinal measurement invariance testing; see Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012) and structural parameters (i.e., invariance of factor variances and covariances, and latent means) across Time 1 and Time 2 and across Regional and Autonomic competitive level groups.

In order for the test of latent mean differences to be interpretable, it is essential that there is support for the invariance of factor loadings and item intercepts, but not the invariance of item uniqueness or the factor variance-covariance matrix (e.g., Meredith, 1993). In all the models, for identification purposes and to establish the scale of measurement, one measured variable for each of the four CCBS factors was selected to be a reference indicator, and its factor loading was fixed to be 1.

In order to test invariance hypotheses using CFA, the covariance and the asymptotic covariance matrices, and the vector of means were used as input for the analysis. Considering that item scores were non-normally distributed (most of the items having skew and kurtosis out of the range ± 1), robust maximum likelihood estimator was used, and the Satorra and Bentler (1994) scaled corrected chi-square statistic was reported. With the aim of assessing the fit for the models, a modeling rationale was used (Marsh, Hau, & Grayson, 2005). Differences not larger than .01 between NNFI and CFI values are considered an indication of negligible practical differences (Cheung & Rensvold, 2002). Chen (2007) suggests that when the RMSEA increases by less than .015, one can also claim support for the more constrained (parsimonious) model.

Results

Descriptive statistics and reliability

The descriptive statistics and Cronbach's alpha coefficient of the four CCBS factors for all the groups are presented in Table 1. Male soccer players in our research did not perceive their coaches to be overly controlling. The estimates of internal consistency for the four CCBS scales were adequate in all the samples of the study, ranging between .66 and .83. As alpha values can become inflated with increased items (Hair, Black, Babin, Anderson, & Tatham, 2006), it has been argued that alpha coefficients of 0.6 can be considered acceptable in the case of established scales comprised of a low number of items (Hair et al., 2006).

Test-retest reliability results revealed significant (p<.001) correlations between the scales' scores across time (controlling use of rewards r = .32, negative conditional regard r = .44, intimidation r = .44, excessive personal control r = .41).

Table 1
Means, standard deviations, and reliability for all the samples and variables of the study

	Study 1 N = 373			Study 2 Time 1 N = 433			Study 2 Time 2 N = 433			Study 3 Regional N = 505		Study 3 Autonomic N = 145		α
Scale	**Mean**	**SD**	**α**	**Mean**	**SD**	**α**	**Mean**	**SD**	**α**	**Mean**	**SD**	**Mean**	**SD**	
Controlling use of rewards	2.43	1.43	.78	2.33	1.27	.79	2.45	1.33	.83	2.50	1.07	2.40	.97	.78
Negative conditional regard	2.74	1.27	.74	2.71	1.34	.77	2.72	1.30	.81	2.35	1.33	2.39	1.30	.70
Intimidation	2.36	1.23	.74	2.31	1.30	.78	2.42	1.35	.82	2.89	1.32	2.76	1.29	.74
Excessive personal control	2.07	1.20	.70	2.08	1.19	.69	2.31	1.31	.77	2.53	1.36	2.24	1.24	.66

Note: Range 1-7. α = Cronbach's alpha coefficient

Study 1. Factorial and discriminant validity

Descriptive statistics of the CCBS's items in the sample of Study 1 are shown in Table 2. CFA were conducted to test the four-factor structure of the CCBS established by Bartholomew et al. (2010). The proposed factorial structure adequately fitted the data (χ^2 (84) = 152.57, p<.01, RMSEA = .047, NNFI = .964, CFI = .971) confirming the validity of the four-factor model. The findings showed that all the indicators loaded significantly on their respective constructs (factor loadings > .40). Finally, the range of inter-factor correlations was between .23 and .52 (see footnote Table 2).

Soccer players' perceptions of their coaches' autonomy-supportive behaviors (α = .89, M = 5.41, SD = 0.93) were correlated with the four CCBS subscales of controlling behavior. The results revealed a nonsignificant correlation with two of the subscales (controlling use of rewards r = .04, excessive personal control r = –.05) and moderate negative correlations (p<.05) with the other two subscales (negative conditional regard r = –.35, intimidation r = –.40).

Studies 2 and 3. Measurement Invariance

The CFA results revealed that the proposed factorial structure was acceptable for each group (Time 1 and Time 2 and Regional and Autonomic competitive level). As can be seen in Table 3 and Table 4, the results provided a good fit to the data in all four groups considered separately (Models M0a and M0b). For these models, all parameter estimates were statistically significant.

With regard to the multi-sample baseline model (Model 1), in which no equality constraints were imposed, results showed that

Table 2
Means, standard deviations, factor loadings, Skewness and Kurtosis values for all the CCBS items (n = 373)

CCBS Subscale and Items	M	SD	Factorial Loading	Skewness	Kurtosis
Controlling Use of Rewards (CUR)					
3. Mi entrenador solo utiliza premios y/o halagos para conseguir que me centre en las tareas durante el entrenamiento [My coach only uses rewards/praise so that I stay focused on tasks during training]	2.46	1.80	.75	1.04	-.04
7. Mi entrenador trata de animarme (motivarme) prometiéndome premios si lo hago bien [My coach tries to motivate me by promising to reward me if I do well]	2.95	2.14	.66	.67	-.99
11. Mi entrenador solo utiliza premios y/o halagos para conseguir que termine todas las tareas que ha puesto durante el entrenamiento [My coach only uses rewards/praise so that I complete all the tasks he/she sets in training]	2.11	1.63	.95	1.44	1.17
14. Mi entrenador solo utiliza premios y/o halagos para hacerme entrenar más duro [My coach only rewards/praises me to make me train harder]	2.20	1.75	.90	1.35	.69
Negative Conditional Regard (NCR)					
1.Mi entrenador es poco amistoso conmigo cuando no me esfuerzo en ver las cosas a su manera [My coach is less friendly with me if I don't make the effort to see things his/her way]	3.19	1.95	.53	.42	-.95
4. Mi entrenador me apoya menos cuando no estoy entrenando o jugando bien en los partidos [My coach is less supportive of me when I am not training and competing well]	2.80	1.94	.60	.78	-.58
8. Mi entrenador me presta menos atención cuando está disgustado conmigo [My coach pays me less attention if I have displeased him/her]	2.73	1.82	.71	.79	-.39
12. Mi entrenador me acepta menos, si le he decepcionado [My coach is less accepting of me if I have disappointed him/her]	2.24	1.65	.88	1.29	.73
Intimidation (INT)					
2. Mi entrenador me grita delante de los otros para que haga determinadas cosas [My coach shouts at me in front of others to make me do certain things]	3.37	2.10	.51	.40	-1.14
6. Mi entrenador amenaza con castigarme para "mantenerme a raya" durante el entrenamiento [My coach threatens to punish me to keep me in line during training]	2.43	1.91	.71	1.17	.12
9. Mi entrenador me acobarda (me intimida) para conseguir que haga lo que él quiere que haga [My coach intimidates me into doing the things that he/she wants me to do]	1.89	1.57	.87	1.90	2.73
13. Mi entrenador me avergüenza delante de los demás si no hago las cosas que él quiere que haga [My coach embarrasses me in front of others if I do not do the things he/she wants me to do]	1.77	1.40	.89	2.11	3.95
Excessive Personal Control (EPC)					
5. Mi entrenador intenta controlar lo que hago en mi tiempo libre [My coach tries to control what I do during my free time]	2.07	1.68	.71	1.54	1.38
10. Mi entrenador trata de entrometerse en aspectos de mi vida fuera del fútbol [My coach tries to interfere in aspects of my life outside of my sport]	1.67	1.47	.91	2.42	4.96
15. Mi entrenador espera que toda mi vida se centre en el fútbol [My coach expects my whole life to center on my sport participation]	2.47	1.85	.66	1.11	.14

Note: All factor loadings are statistically significant (p<.01). Correlation between factors: CUR-NCR = .40; CUR-INT = .52; CUR-EPC = .67; NCR-INT = .84; NCR-EPC = .62; INT-EPC = .76. All the correlations are statistically significant p<.01

Table 3
Goodness of fit indices for tested invariance models over time

Model	Model description	df	SBχ^2	RMSEA	(90% CI)	NNFI	CFI	ΔRMSEA	ΔNNFI	ΔCFI
M0a	Baseline Model Time 1	84	158.58**	0.046	(0.035-0.057)	0.990	0.992			
M0b	Baseline Model Time 2	84	218.68**	0.061	(0.051-0.071)	0.987	0.990			
M1	Baseline Model Structural Invariance	362	619.18**	0.041	(0.036-0.047)	0.989	0.991			
M2	FL Invariance	373	677.56**	0.044	(0.039-0.049)	0.988	0.989	0.003	0.001	0.002
M3	FL + INT Invariance	384	710.99**	0.045	(0.040-0.050)	0.987	0.989	0.004	0.002	0.002
M4	FL + INT + FVC Invariance	394	744.84**	0.046	(0.041-0.051)	0.986	0.988	0.005	0.003	0.003
M5	FL + INT + FVC + LM Invariance	398	772.08**	0.047	(0.042-0.052)	0.986	0.987	0.006	0.003	0.004

Note: df = degrees of freedom; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval for the RMSEA; NNFI = non-normed fit index; CFI = comparative fit index; FL = factor loadings; INT = intercepts; FVC = factor variances and covariances; LM = latent mean. All the Δ index comparisons are made with respect to the baseline model (M1)
** = $p<.01$

Table 4
Goodness of fit indices for tested invariance models over competitive level

Model	Model description	df	SBχ^2	RMSEA	(90% CI)	NNFI	CFI	ΔRMSEA	ΔNNFI	ΔCFI
M0a	Baseline Model Regional Group	84	178.82**	0.048	(0.038-0.058)	0.987	0.989			
M0b	Baseline Model Autonomic Group	84	134.75**	0.066	(0.045-0.087)	0.970	0.976			
M1	Baseline Model Structural Invariance	168	314.99**	0.053	(0.044-0.062)	0.983	0.987			
M2	FL Invariance	179	347.90**	0.055	(0.046-0.063)	0.982	0.985	0.002	0.001	0.002
M3	FL + INT Invariance	190	396.82**	0.059	(0.051-0.067)	0.979	0.981	0.006	0.004	0.006
M4	FL + INT + Uniq Invariance	205	443.42**	0.061	(0.053-0.068)	0.978	0.978	0.008	0.005	0.009
M5	FL + INT + Uniq + FVC Invariance	215	465.57**	0.061	(0.053-0.068)	0.978	0.977	0.008	0.005	0.01
M6	FL + INT + Uniq + FVC + LM Invariance	219	478.70**	0.061	(0.054-0.069)	0.977	0.977	0.008	0.006	0.01

Note. df = degrees of freedom; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval for the RMSEA; NNFI = non-normed fit index; CFI = comparative fit index; FL = factor loadings; INT = intercepts; Uniq = uniqueness; FVC = factor variances and covariances; LM = latent mean. All the Δ index comparisons are made with respect to the baseline model (M1)
** = $p<.01$

the fit was acceptable for the Time invariance (Table 3) and for the Competitive level invariance (Table 4). Thus, it could be concluded that the same factor model was able to fit the data from each group. Consequently, Model 1 was used as the baseline against which all remaining models were compared in the process of determining evidence of invariance. The results of the other models (M2 to M6) showed an acceptable fit for the invariance tested across time and across competitive level. And, when compared with the baseline model (M1), the ΔNNFI and ΔCFI values obtained did not exceed the criterion value .01, and also the ΔRMSEA did not exceed the .015 criterion value.

Discussion

The aim of the present work was to translate into Spanish and examine the psychometric properties of the Spanish version of the Controlling Coach Behaviors Scale (CCBS) in male soccer players. Overall, the CCBS exhibited good psychometric properties in the Spanish samples. Results of the CFA provided support for the hypothesized four-factor structure and the correlation values between those factors were similar to those reported in previous work examining the English version of the scale (Bartholomew et al., 2010).

The multisample CFA supported the structural invariance of the scale, indicating that the hypothesized four-factor structure of the CCBS was invariant across samples. Strong factorial invariance (i.e., invariance of factor loadings and intercepts; Meredith, 1993), was also supported. Thus, it was concluded that no important differences were found on the item parameters across time and competitive level, suggesting that youth soccer players responded in a similar fashion independently of the data collection time and the different competitive level. When strong factorial invariance is supported, average item and scale scores are comparable across groups. Indeed, we also found support for the uniqueness invariance, providing evidence for strict factorial invariance (Meredith, 1993) across competitive level, thus item and scale variances are comparable across groups.

Our findings have a number of theoretical and practical implications. First, results have substantive importance for self-determination theory, as they provide evidence for the cross-cultural validation of the CCBS, a questionnaire designed to assess sports coaches' controlling interpersonal style from the perspective of self-determination theory (Ryan & Deci, 2002). Second, this study strengthens the utility of the CCBS in sport and exercise research and applied settings in Spanish-speaking countries.

Despite the strengths of the present research in the construct validation approach, some shortcomings should be noted. First, although our results support the appropriateness of the CCBS for Spanish male soccer players, they do not guarantee it for other settings and other groups. Further research is needed in

different Spanish settings and groups (such as other sports) in order to contribute to the growing body of knowledge about CCBS validation. Second, future multisample invariance studies including data gathered with the English version of the CCBS could also be developed to test the cross-cultural invariance of the CCBS, and thus strengthen the results obtained in the present research.

In summary, results from multi-sample analyses supported the invariance of CCBS factor structure across time and competitive level, indicating that the scale has good construct validity and temporal stability. The present study supported the validity and reliability of Spanish CCBS with male soccer players. The results of the study provide further evidence that a controlling interpersonal style is a multidimensional construct represented by four separate and related controlling coaching strategies.

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References

Assor, A., Roth, G., & Deci, E.L. (2004). The emotional costs of parents' conditional regard: A self-determination theory analysis. *Journal of Personality, 72*, 47-88.

Balaguer, I., Castillo, I., Duda, J.L., & Tomás, I. (2009). Análisis de las propiedades psicométricas de la versión española del Cuestionario de Clima en el Deporte [Analysis of the psychometric properties of the Spanish version of the Sport Climate Questionnaire]. *Revista de Psicología del Deporte, 18*, 73-83.

Balluerka, N., Gorostiaga, A., Alonso-Arbiol, I., & Haranburu, M. (2007). La adaptación de instrumentos de medida de unas culturas a otras: una perspectiva práctica [Test adaptation to other cultures: A practical approach]. *Psicothema, 19*, 124-133.

Bartholomew, K.J., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2009). A review of controlling motivational strategies from a Self-Determination Theory perspective: Implications for sports coaches. *International Review of Sport and Exercise Psychology, 2,* 215-233.

Bartholomew, K.J., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2010). The controlling interpersonal style in a coaching context: Development and initial validation of a psychometric scale. *Journal of Sport & Exercise Psychology, 31*, 193-216.

Castillo, I., Fabra, P., Marcos, D., González, L., Bartholomew, K. J., Fuentes, A., & Balaguer, I. (2010). El Estilo Controlador del Entrenador: análisis de las propiedades psicométricas [The coach controlling interpersonal style: Psychometric properties analyses]. In J. Cruz (Chair), *Adaptation and validation of questionnaires in Sport Psychology*. Symposium conducted at the VII Iberoamerican Congress of Psychology. Oviedo, Asturias (Spain).

Chen, F.F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464-504.

Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233-255.

Coertjens, L., Donche, V., De Maeyer, S., Vanthournout, G., & Van Petegem, P. (2012). Longitudinal measurement invariance of Likert-type Learning Strategy Scales: Are we using the same ruler at each wave? *Journal of Psychoeducational Assessment, 30*, 577-587.

Deci, E.L., Koestner, R., & Ryan, R.M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*, 627-668.

Hair, J., Black, B., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis (6th edition)*. Upper Saddle River, NJ: Prentice-Hall.

Hambleton, R.K., & Kanjee, A. (1995). Increasing the validity of cross-cultural assessments: Use of improved methods for test adaptations. *European Journal of Psychological Assessment, 11*, 147-157.

Jöresbog, K.G., & Sörbom, D. (2006). *LISREL 8.80: A guide to the program and applications*. Chicago, IL: SPSS, Inc.

Kunz, M. (2007, July). 265 Million playing football. *FIFA Magazine*, 10-15.

Mageau, G.A., & Vallerand, R.J. (2003). The coach-athlete relationship: A motivational model. *Journal of Sports Sciences, 21*, 883-904.

Marsh, H.W., Hau, K-T., & Grayson, D. (2005). Goodness of Fit Evaluation in Structural Equation Modeling. In A. Maydeu-Olivares & J. McCardle (Eds.), *Contemporary Psychometrics. A Festschrift to Roderick P. McDonald* (pp. 275-340). Mahwah NJ: Erlbaum.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika, 58*(4), 525-543.

Muñiz, J., Elosua, P., & Hambleton, R.K. (2013). Directrices para la traducción y adaptación de los tests: segunda edición [International Test Commission guidelines for test translation and adaptation: Second edition]. *Psicothema, 25*(2), 151-157.

Quested, E., Ntoumanis, N., Viladrich, C., Haug, E., Ommundsen, Y., Van Hoye, A., …, Duda, J.L. (2013). Intentions to drop-out of youth soccer: A test of the basic needs theory among European youth from five countries. *International Journal of Sport and Exercise Psychology*, *11*, 395-407.

Ryan, R.M., & Deci, E.L. (2002). Overview of self-determination theory: An organismic dialectical perspective. In E.L. Deci & R.M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33). Rochester, NY: University of Rochester Press.

Satorra, A., & Bentler, P.M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C.C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399-419). Thousand Oaks, CA: Sage.