

Less Time, Better Quality. Shortening Questionnaires to Assess Team Environment and Goal Orientation

Saül Alcaraz, Carme Viladrich and Miquel Torregrosa

Universitat Autònoma de Barcelona (Spain)

Abstract. When assessing team environments in youth sport, participants often spend substantial time responding to lots of items in questionnaires, causing a lack of efficiency (i.e. time and effort) and a decrease of data quality. The purpose of this work was to create short-forms of the questionnaires PeerMCYSQ, SCQPeer, TEOSQ, and also to analyse the existing short-form of the SCQCoach. In Study 1 we developed the short-forms of the instruments. We shortened the questionnaires by using both theory driven and data-driven criteria. In Study 2, we used also qualitative and quantitative data with the aim of validating the short-forms. Finally, in Study 3 we tested the last version of the short-forms and sought evidences concerning their criterion validity. The results showed evidence that supports the psychometric merit of these short-forms: (a) significantly less missing values were obtained; (b) all the factors obtained alpha values above .70; (c) confirmatory factor analyses demonstrated that the short-forms fitted the hypothesized models well; (d) correlations between variables were coherent with expectations, and (e) structural equation modeling results showed significant paths consistent with previous literature. On average, our participants only spent a third of the time used to complete the original questionnaires.

Received 7 February 2012; Revised 14 April 2012; Accepted 27 June 2012

Keywords: Achievement Goal Theory, Self-Determination Theory, data quality, questionnaire short-forms, youth sport.

The sport environment is a context of competence and achievement where motivational factors generated by significant others play an important role in the effects of sport participation on children and youths' psychosocial development (Smith, Smoll, & Cumming, 2009). During childhood, parents' influence seem to be a crucial factor in the athletes' sport experience. However, during adolescence, influences from coaches and peers, especially on young people's perceptions of competence, become more significant, while the parents' impact decreases (Boixadós, Valiente, Mimbreno, Torregrosa, & Cruz, 1998; Chan, Lonsdale, & Fung, 2012). In this line, previous literature has taken interest in analyzing the influence of the team environment created by coaches and team-mates on youth athletes (e.g., Keegan, Spray, Harwood, & Lavallee, 2010; Reinboth & Duda, 2006). Two major motivational theories, Achievement Goal Theory (AGT; e.g., Duda & Hall, 2001) and Self-Determination Theory (SDT; e.g., Deci & Ryan, 2000), have focused on this issue.

Within the study of team environment, AGT is aimed particularly at motivational climate (e.g., Vazou,

Ntoumanis, & Duda, 2006) and SDT at autonomy support (e.g., Adie, Duda, & Ntoumanis, 2008). Motivational climate refers to a person's perceptions of the environment motivational indicators and expectancies (Ames, 1992). According to this author, motivational climates are defined in terms of mastery and performance. Later studies used the terms task-involving and ego-involving to describe mastery and performance climates respectively (e.g., Newton, Duda, & Yin, 2000). In a mastery (or task-involving) climate, success is defined as individual effort and improvement. In contrast, in a performance (or ego-involving) climate, the focus of learning is on interpersonal comparison and evaluation is based on normative standards (for a review, see Ntoumanis & Biddle, 1999). Vazou et al. (2006) studied the relation between ego and task climates promoted by both coaches and peers. Their results showed that ego and task coach-created climates were positively related to ego and task peer-created climates.

Within the AGT, some studies have selected goal orientation as a personal variable in which team environment has an influence (e.g., Balaguer, Castillo, Duda, & García-Merita, 2011). Goal orientation is defined as the predominant dispositional goal in achievement situations, depending on how people evaluate their success and interpret their ability (Nicholls, 1989). Two major goal dispositions have been proposed: task orientation and ego orientation. When task-oriented, individuals perceive their ability as self-referenced and focus on personal improvement, task mastery and

Correspondence concerning this article should be addressed to Saül Alcaraz. Facultad de Psicología. Departamento de Psicología Básica, Evolutiva y de la Educación. Universidad Autónoma de Barcelona. 08193 Bellaterra, Barcelona (Spain). Phone: +34-93586 83 95. Fax: +34 93 581 33 29. E-mail: saul.alcaraz@uab.cat

This research was supported in part by the DEP2010-15561 grant. The authors would like to thank Yago Ramis, Alex Latinjak, Fernando Azócar, and Luana Prato for their collaboration in this manuscript.

exerted effort. When ego-oriented, perceptions of ability are other-referenced and individuals need to show superiority to feel competent (for a review, see Duda & Ntoumanis, 2003). Nicholls (1989) viewed task and ego orientations as orthogonal and later studies confirmed this aspect (e.g., Balaguer, Castillo, & Tomás, 1996). Moreover, repeated exposure to certain climates can lead to subsequent modifications of task and ego orientations. In fact, previous research has shown how athletes' task and ego orientation were respectively influenced by coaches' (e.g., Smith et al., 2009) and peers' (e.g., Vazou, 2010) task-involving and ego-involving climates. Also, earlier studies related these constructs to the regulations defined in the SDT (e.g., Deci & Ryan, 2000) and found that task orientation predicted intrinsic motivation and identified regulation, and ego orientation predicted introjected and external regulations (e.g., Ntoumanis, 2001).

In the framework of SDT, autonomy support defines how the others allow and encourage initiative and freedom of decision, and share the players' vision in solving problems (Gagné, Ryan, & Bargmann, 2003). Usually, research has focused on coaches' autonomy support and has found that it positively predicts athletes' self-determined motivation (e.g., Álvarez, Balaguer, Castillo, & Duda, 2009). However, to the best of the authors' knowledge previous works have not studied peers' autonomy support (for an exception, see Ramis, Torregrosa, Viladrich, & Cruz, 2013). In Ramis et al. study (2013), peers' autonomy support only had a slight effect on self-determined motivation. Moreover, results showed that coaches' and athletes' autonomy support were moderately correlated.

In this context, a number of questionnaires have been developed to assess the influence of team environment on athletes' performance, affect or cognition. However, studies have increasingly needed more items as theories and analyses have become more complex (see results of our review below). This requirement lengthens the time participants spend on completing the questionnaires, and it can lead to fatigue, boredom and apathy, especially in children and youths. For this reason, the time used filling in the instruments might affect the quality of data obtained (e.g., the number of missing values). This issue has appeared not only in the study of the team environment but also in the whole arena of sport psychology research, as we will refer to later.

Given this scenario, it is clear that there is a need to improve the methodology for obtaining quantitative data in sport psychology research. To this end, short-forms of questionnaires appear to be useful in this field, where shortening has not been a common practice (for an exception, see Terry, Lane, Lane, & Keohane, 1999). In addition, it is worthwhile noting that shortening an existing questionnaire has some advantages over

creating a new shorter instrument (Coste, Guillemin, Pouchot, & Fermanian, 1997) because: (a) it enables phases of instrument development (e.g., item pool composition) to be bypassed; and (b) the instrument will appear familiar to users of the original form.

Although not common in sport psychology, within the field of clinical and health psychology shortening has been a widespread practice (e.g., Cox et al., 2006; Mühlan, Bullinger, Power, & Schmidt, 2008) and has helped to obtain a more economical and efficient diagnosis. The economy of diagnosis refers to the length reduced and time saved with the short-form compared with its original. Thus, short-forms make the response process more amenable, decreasing the burden on participants and lessening the resources spent on the study. From our point of view, research in sport psychology should learn from this perspective. An analysis of the quantitative papers about Sport Psychology published in 2010 in the four Sport Psychology journals with the highest impact factor (i.e., *Journal of Sport & Exercise Psychology*, *Psychology of Sport and Exercise*, *The Sport Psychologist* and *Journal of Applied Sport Psychology*) and in the four Spanish journals with the highest impact factor (i.e., *The Spanish Journal of Psychology*, *Psicothema*, *Anales de Psicología* and *Revista de Psicología del Deporte*) showed that researchers usually ask young athletes to respond to big amounts of items (e.g., athletes under 18 years old answered an average of 64 items in the international journals; detailed information about this review is available from the first author).

Efficiency balances economic effort with the loss of information or validity (Mülhan et al., 2008). When using instruments assessing health-related quality of life, efficiency is particularly important to ease clinical trials and clinical practice (Moran, Guyatt, & Norman, 2001). However, shortening per se could entail losses in questionnaires' psychometric properties, especially in terms of reliability and content validity (for a review on the *sins* of short-forms development, see Smith, McCarthy, & Anderson, 2000). Thus, the shortening process should include a careful selection of items in order to minimize these potential losses. As recommended by Coste et al. (1997), this selection should mainly consider content-driven criteria, and data-driven criteria should only be regarded when theory arguments are not enough to make a choice. Watson and Clark (1997) addressed the issue of how much a questionnaire might be shortened by and reported that less than four items per factor would yield an insufficient internal reliability (see also rationale by Jokovic, Locker, & Guyatt, 2006). However, our review of the papers published in 2010 in the Sport Psychology journals and in the Spanish research journals with highest impact factor revealed that participants had to respond to many more items than just four per factor.

Developing economical and efficient questionnaires (i.e., short-forms) is important not only because it reduces the resources participants and researchers spend in the study, but also because shortening questionnaires might help to improve the quality of quantitative data, in terms of: (a) decreasing the number of missing values; (b) diminish the number of aberrant response patterns (i.e., “persons with item score patterns that are unexpected”; Meijer & Sijtsma, 1995, p. 262), and (c) improving response rate (Edwards, Roberts, Sandercock, & Frost, 2004).

Considering the benefits that shortening can bring to sport psychology research and the fact that no previous works in sport psychology have aimed to study how short-forms could help to improve data quality, our purpose was to develop short-forms to assess motivational climate, autonomy support and goal orientation. We wanted these short-forms to retain the core of the main dimensions of the AGT constructs (i.e., task and ego). According to Vazou et al. (2006), focusing on the main points of the task (e.g., effort) and ego (e.g., social comparison) dimensions, instead of assessing the specific aspects of each climate, would enable the comparison between goal orientation and motivational climates, which could not be done with the original instruments (see also Whitehead, Andrée, & Lee, 2004).

In summary, the main goal of this work was to develop short-forms of four instruments assessing motivational factors from the AGT (i.e., peer-created motivational climate and goal orientation) as well as the SDT (i.e., coach and peer autonomy support) and provide evidence of their psychometric properties. Specifically, our study focused on the Peer Motivational Climate in

Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005), the Sport Climate Questionnaire (SCQ; Deci, 2001) and the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989). We also wanted to find out if these short-forms could improve data quality (i.e., less missing values and aberrant response patterns), as hypothesized.

We carried out three different studies. Study 1 describes the development of the short-forms and includes the selection of items (version 1 of the short-forms), judgmental validation and adjustment (i.e., expert meetings and focus groups; version 2). Study 2 focuses on the validation of these instruments and their iterative improvement (versions 3 and 4). Study 3 validates version 4 in a new sample and also includes structural equation modeling (SEM) in order to assess criterion validity. Figure 1 describes the entire process.

Study 1: Short-form development

The main purpose of Study 1 was to develop the short-forms of the PeerMCYSQ and the TEOSQ. To do so, we used both qualitative (i.e., expert meetings and focus groups) and quantitative (i.e., sample of young athletes) data sources. Also, we wanted to test the existing short-form of the SCQCoach and to see if the same structure could be applied to the SCQPeer.

Method

Participants

We obtained qualitative and quantitative data from participants in Study 1 to develop the short-forms. The qualitative stage involved an expert committee and two focus groups. On one side, the expert committee

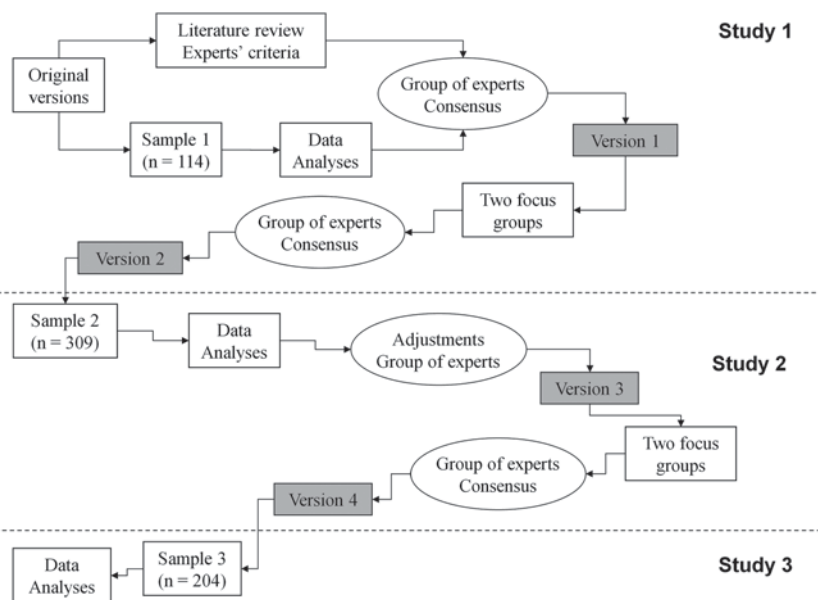


Figure 1. Flowchart describing the process followed in the studies 1, 2, and 3.

included one female methodologist, two male applied sport psychologists, one female and five male researchers in sport psychology, and two male and one female youth sport coaches. On the other, 17 male athletes (age range: 12–16 years old) participated in the focus groups.

Quantitative data were obtained from 114 youth athletes ($M_{age} = 14.65$, $DT_{age} = 2.10$, age range: 10–19) from the Barcelona area. This sample included more male athletes (61%). All of them played team sports, either in local or regional competitions. We will refer to these participants as Sample 1.

Instruments

We administered the original versions of the questionnaires with the aim of obtaining the quantitative data that would help us to develop the short-forms.

Peer motivational climate

To assess the peer-created motivational climate, the Sample 1 responded to the Spanish version (Moreno et al., 2011) of the Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005). Twelve items belonged to the task factor and nine to the ego factor. The original study provided evidence for their reliability and internal structure (Ntoumanis & Vazou, 2005), confirmed in a Spanish sample (Torregrosa et al., 2011). An average of 8 minutes was needed to respond to the PeerMCYSQ.

Autonomy support

We assessed coach autonomy support using the 15-item Sport Climate Questionnaire (SCQ; Deci, 2001) in its Spanish version (Balaguer, Castillo, Duda, & Tomás, 2009). Reliability evidence was provided in previous studies (e.g., Balaguer et al., 2009). To assess peer autonomy support, we administered the 15-item SCQ adaptation for peers (SCQ Peers; Ramis et al., 2013). Ramis et al. (2013) provided evidence for its reliability. The participants (Sample 1) spent an average of 5 minutes to complete each SCQ.

Achievement goal orientations

To assess the participants' disposition to task and ego, they responded to the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989), which has been adapted into Spanish by Balaguer et al. (1996). Seven items belonged to the task factor and six to the ego factor. Previous studies provided evidence for the TEOSQ psychometric properties in different cultures (e.g., Li, Harmer, Chi, & Vongjaturapat, 1996), and in the Spanish population (e.g., Balaguer et al.). An average of 5 minutes was necessary to fill in this questionnaire.

Procedure

The development of the short-forms followed five steps (see upper part of Figure 1): (1) we generated theory-driven criteria to obtain content validity; (2) we administered the original questionnaires and we analyzed the data to get data-driven criteria; (3) we selected the items to generate the short-forms due to the theory-driven and data-driven criteria (version 1); (4) we conducted focus groups to know participants' views of the questionnaires, which is a source of validity evidence based on the response process (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999); and (5) experts analyzed focus groups results and consensus was reached about the items wording (version 2).

Our shortening process of the PeerMCYSQ and the TEOSQ was initially based on the methodological tips proposed by Coste et al. (1997). On the selection of the items that would be included in the short-forms, we firstly considered theory-driven criteria, and we used data-driven criteria to refine this selection. Our theory-driven criteria came from a literature review and the advice of a group of experts. Literature review included highly-cited papers in this field (e.g., Duda & Nicholls, 1992) and the number of times an item had been previously used as example item in relevant papers. The development of the theory-driven criteria was led by the first author, advised by the heterogeneous group of experts. Two important decisions were made: (1) to create short-forms with four items per factor; and (2) to choose the items belonging to the core of the dimensions task and ego, with the aim of allowing comparisons between goal orientation and motivational climates. The group of experts considered task dimension in terms of (a) skills improvement, (b) mastery and (c) effort, and ego dimension as (a) outplaying the others, (b) showing better skills and (c) comparison to the others. Consequently, although original PeerMCYSQ includes five lower order factors, short-form was not expected to retain all the breadth of the construct. Based on the theory-driven criteria, experts selected between five and six items that were considered most relevant to define each construct (i.e., peer-created motivational climate and goal orientation).

Simultaneously, we collected data from Sample 1. At least two researchers attended each administration session. The participants were told that participation in the study was voluntary, were assured about confidentiality and were instructed to respond as honestly as possible (for more details, albeit in Spanish language, see Ramis, Torregrosa, Viladrich, & Cruz, 2010). Data were collected during the last two months of the season, to ensure that goal orientation and perceptions of the motivational climates and autonomy support had been established.

Once data were collected, data-driven criteria were obtained from results of internal reliability and internal structure. More information about these analyses can be found in results section. The data-driven criteria helped us determine which combination of items worked better (version 1 of the short-forms). Version 1 contained eight items for both the PeerMCYSQ and the TEOSQ, including four items assessing each ego and task factors. SCQPeer adopted the structure of the short SCQCoach and included six items assessing only one dimension.

The shortening process continued with two focus groups that were conducted in order to find out the opinion of our target population. First, focus group participants completed Version 1 of all the short-forms and marked sentences or words that they did not understand. Then, we ensured that participants knew the meaning of each item and we helped them to propose changes in the items wording to make them easier to understand. After the focus groups, we met with the experts and they discussed the changes the young players had proposed until consensus was reached (Version 2). Version 2 had only little differences compared to Version 1 (i.e., refinements in the items wording; more information is available from the first author). These changes (e.g., synonyms) did not modify the original meaning of the items.

Results

We assessed reliability (i.e., Cronbachs' alpha coefficients, alpha without the item and correlation between items) and internal structure (i.e., results from exploratory and confirmatory factorial analyses) in Sample 1. For the sake of brevity, details of these results are available from the corresponding author. However, Cronbachs' Alpha values are presented in Table 2.

Discussion

In Study 1 we developed the short-forms by using theory-driven as well as data-driven criteria. Short-forms for the PeerMCYSQ, the SCQPeer and the TEOSQ were created. We also worked with the SCQCoach short-form. A future study was needed to validate these short-forms.

Study 2: Preliminary psychometric validation of the short-forms

The main purpose of Study 2 was to validate the short-forms. Thus, we wanted to assess their internal structure, reliability and concurrent validity. As a consequence of this assessment, we found that short-forms needed some improvement, and then we conducted expert meetings and focus groups to do so.

Method

Participants

In Study 2 we collected quantitative and qualitative data. Sample 2 comprised 309 young athletes ($M_{age} = 14.19$, $DT_{age} = 1.73$, age range: 11–19) from the Barcelona area and was used to validate the short-forms. The higher proportion of boys (66%) was consistent with the sport context where our work was placed (García Ferrando & Llopis, 2006). As we wanted to study peer autonomy support and motivational climate, all selected participants regularly played team sports (35% basketball, 35% futsal, 16% volleyball and 14% handball). Participants took part either in local or regional competitions. Qualitative data were obtained from the same group of experts as in Study 1 and from two focus groups with seven female (age range: 10–12) and eight male (age range: 12–13) athletes.

Instruments

Our participants responded to Version 2 of our short-forms. The PeerMCYSQ included eight items, containing four items assessing task motivational climate and four assessing ego motivational climate. Both the SCQCoach and the SCQPeer included six items. The TEOSQ comprised eight items, with four of them assessing task orientation and four ego orientation.

All the instruments were answered on a 7-point Likert scale (1 = *strongly disagree / completamente falso*; 7 = *strongly agree / completamente verdadero*), although the TEOSQ originally had a 5-point scale. We changed its response range according to the tips proposed by

Table 1. Response Time and Data Quality Comparison (Study 2)

	Number of items		Average time (minutes)		% missing values	
	Original version	Short-form	Original version	Short-form	Original version	Short-form
PeerMCYSQ	21	8	8	3	0.55	0
SCQCoach	15	6	5	2	2.33	0
SCQPeer	15	6	5	2	2.37	0.16
TEOSQ	13	8	5	2	0.65	0.04

Note: Average time indicates how many minutes a participant usually needs to complete each questionnaire. It was calculated as the completion time needed by 95% of participants averaged across the administration sessions.

Streiner and Norman (2008) for the construction of continuous scales. By giving the scales the same range we wanted to improve the quality of the results by easing the participants' answering process. Additionally, as Spanish language has minor changes when referring to a female or a male (e.g., adjective suffix), a version for each gender was administered.

In order to assess concurrent validity of the short-forms, participants from the Sample 2 also responded to questionnaires concerning coach-created motivational climate (Newton et al. 2000; adapted to Spanish by Balaguer, Guivernau, Duda, & Crespo, 1997), perceived competence (retrieved from McAuley, Duncan, & Tammen, 1989; adapted to Spanish by Balaguer, Castillo, & Duda, 2008) and autonomy (adapted to Spanish from Standage, Duda, & Ntoumanis, 2005), as well as intrinsic motivation and introjected regulation (Lonsdale, Hodge, & Rose, 2008; adapted to Spanish by Viladrich, Torregrosa, & Cruz, 2011). Further information about these instruments and their psychometric properties in our sample is available from the corresponding author upon request.

Procedure

First, the Sample 2 completed the Version 2 of the short-forms. Data collection followed the same protocol as in Study 1. Confidentiality was guaranteed throughout. After the data analyses (see middle part of Figure 1), experts were consulted in order to clarify the issues that did not work well in the analyses and they proposed changes to improve the short-forms (Version 3). Then, we conducted two focus groups to ask the target population about the changes we made and to look at the items wording. The experts met again and accepted the changes (Version 4).

Results

Data quality comparison

The data quality was assessed in terms of the number of missing values and aberrant response patterns (e.g., alignment errors). Table 1 shows a comparison

between the quality of the data obtained with the original versions of the PeerMCYSQ, the SCQPeer, the SCQCoach, and the TEOSQ, and with their short-forms (Sample 2). Although athletes in Study 1 had responded to the complete versions, those 114 participants were not enough to do this comparison. Consequently, data were obtained from previous studies of our research group that had used the same administration protocol with samples that were considered equivalent to those of this work. A total of 648 cases had responded to the complete questionnaires. Analyses showed that short-forms had less missing values, with some of the constructs having all values completed. Results of a *t* test revealed that using the short-forms we obtained significantly less missing responses per item: $t(655) = -4.01$, $p < .001$, $d = -0.13$, 95% CI [-0.19, -0.01]. The analyses of the aberrant response patterns did not show relevant results and consequently are not presented. Moreover, Table 1 shows the time needed to respond to the original instruments and to the short-forms. On average, participants completed the short-forms in a third of the time spent on the complete versions.

Descriptive statistics and reliability

Table 2 presents the descriptive statistics and Cronbach's Alpha coefficients for the scales in Study 2 (Sample 2). Also, we offer reliability coefficients from the Study 1 sample (α_{study1}) to facilitate comparison. The mean value of the variables displays a desirable pattern of a positive sports experience: high peers' task climate, moderate-to-high coach and peer autonomy support, and high task goal orientation. All of these means were well above the midpoint of the scale range. The scales did not present any relevant skewness or kurtosis, indicating relative normality. The only exception was task goal orientation, which showed slight negative skewness and small positive kurtosis. All the internal reliability coefficients from Sample 2 ranged from .70 to .85, thus achieving Nunnally's (1978) above .70 criterion for psychological scales. Additionally, nearly all the items contributed to the Alpha coefficient for their dimensions. Only deletion of Item 4 from the PeerMCYSQ

Table 2. Descriptives (Sample 2) and Internal Consistency for each Measure

Variable	M	SD	Skewness	Kurtosis	α_{Study2}	α_{Study1}
MC peers task	5.04	1.19	-.50	-.24	.83	.80
MC peers ego	4.36	1.30	-.44	-.15	.70	.69
Autonomy support coaches	4.65	1.11	-.53	.36	.81	.86
Autonomy support peers	5.10	1.12	-.65	.67	.85	.83
Task goal orientation	5.92	.90	-1.10	1.88	.73	.80
Ego goal orientation	3.55	1.52	.16	-.85	.78	.73

Note: Range for all variables is 1-7. MC = motivational climate. α_{study2} = α of data from Study 2; α_{study1} = α of data from Study 1.

(i.e., "Criticize their team-mates when they make mistakes") made the Alpha coefficient increase.

For the imputation of missing values, we replaced them with the participant's mean on the factor that included each particular missing value. According to Graham's criterion (2009), this approach should not have consequences on the data analyses because missing values were less than 5% of all data points.

Confirmatory Factor Analyses (CFA)

Confirmatory Factor Analyses (CFA) were conducted with MPlus 5.2 to assess the adequacy of the data to the a priori models, using the *Weighted Least Squares Means and Variance Adjusted* (WLSMV), which utilizes a diagonal weight matrix with robust standard errors and a χ^2 -test adjusted by mean and variance (Muthén & Muthén, 2008). We present the following fit indices: the χ^2 , the *Root Mean Square Error of Approximation* (RMSEA), the *Comparative Fit Index* (CFI), and the *Tucker-Lewis Index* (TLI). According to Jackson, Gillaspay and Purc-Stephenson's criterion (2009), a good fit to the model might be considered when CFI and TLI values are close to .90 and the RMSEA value is close to .08. In the best scenario, the χ^2 test is also expected not to be statistically significant. CFA using data from Sample 2 were conducted. The results in Sample 2 were not satisfactory and led us to work in the improvement of the short-forms. The two-factor model did not fit to the PeerMCYSQ data well: $\chi^2(19) = 146.18, p < .001, CFI = .87, TLI = .88, RMSEA = .20$. The CFA for the SCQCoach also revealed inadequate factor structure: $\chi^2(9) = 88.17, p < .001, CFI = .94, TLI = .89, RMSEA = .17$. The SCQPeer was found to have an acceptable factor structure: $\chi^2(9) = 35.43,$

$p < .001, CFI = .98, TLI = .97, RMSEA = .08$. The two-factor model showed a correct fit to the TEOSQ data, except for RMSEA: $\chi^2(19) = 74.28, p < .001, CFI = .93, TLI = .94, RMSEA = .13$. All the factor loadings were statistically significant and above .40. Modification indices revealed two issues: (1) Item 4 from PeerMCYSQ (i.e., "Criticize their team-mates when they make mistakes"), which was predicted to be an item of the ego factor, was inversely related to the task factor (i.e., had a negative factor loading on task dimension); and (2) the TEOSQ items from the ego factor grouped in pairs, differentiating those referring to myself from those referring to the peers. Exploratory Factor Analyses (EFA) results led to the same conclusions. These results are not reported here but are available from the corresponding author. Due to these results and the qualitative data obtained from expert meetings and focus groups, we chose a different item from the original instrument and we included it in Version 4 of the PeerMCYSQ (i.e., "Complaint when the team doesn't win") in replacement of Item 4.

Correlations between variables

First, analysis of the bivariate correlations between short-forms dimensions showed that: (a) Task and ego peer-created motivational climates were moderately correlated ($r = .33, p < .01$) and (b) task and ego goal orientations were almost not correlated, although the coefficient was significant ($r = .11, p < .05$), supporting the TEOSQ orthogonal structure.

Table 3 contains the bivariate correlations between factors of the short-forms and variables that were hypothesized to be related to. All the expected correlations were

Table 3. Bivariate Correlations between Study 2 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. GO task	–											
2. GO ego		–										
3. MC peers task	.33**	–.16**	–									
4. MC peers ego		.44**	–.33**	–								
5. Autonomy support coaches	.32**		.33**		–							
6. Autonomy support peers	.34**		.58**	–.24**	.43**	–						
7. MC coaches task	.19**		.30**		.49**	.25**	–					
8. MC coaches ego		.31**		.34**	–.22**			–				
9. Intrinsic Motivation	.43**		.28**		.30**	.30**	.25**		–			
10. Introjected regulation		.20**		.22**						–		
11. Autonomy	.28**	.18**			.33**	.22**	.22**	.28**	.17**		–	
12. Competence	.27**	.36**		.19**	.36**	.26**	.18**	.38**	.16**	.31**		–

Note: Correlations with $p > .01$ are not shown. Correlations showing evidence of concurrent validity of the short-forms are presented in bold. GO = goal orientation; MC = motivational climate. Line separates between short-forms and other measures.

** $p < .01$.

positive, statistically significant ($p < .01$) and ranged from .19 to .58, with most of the values being above .30. It may be considered that all these correlations were low ($.20 < r < .40$) or moderate ($.40 < r < .60$). Specifically, task goal orientation had a low correlation to perceived coach's and peers' task-involving climates and to perceived competence, and had a moderate correlation with intrinsic motivation. Ego goal orientation, in turn, had a low correlation with perceived coach-created ego climate, introjected regulation and competence, and a moderate correlation with peer-created ego-involving climate. Also, low correlations appeared between coach's task-involving climate and his/her autonomy support, and between peers' task-involving climate and their autonomy support. Finally, perceived autonomy correlated slightly to coach and peer autonomy support.

Discussion

In Study 2 we began the process of validating the short-forms developed in Study 1. Evidence concerning their reliability, concurrent validity and improvement of data quality was obtained. However, the results of their internal structure were not entirely satisfactory. Thus, experts meetings and focus groups were used with the aim of improving the short-forms. A future study was then necessary to test the last version of the short-forms (Version 4).

Study 3: Psychometric validation and criterion validity

The main purpose of Study 3 was to test the psychometric properties of Version 4 in a new sample. Moreover, we wanted to assess criterion validity using Structural Equation Modeling (SEM).

Method

Participants

Sample 3 comprised 204 participants ($M_{age} = 12.48$, $DT_{age} = 1.72$, age range: 9–18). One-hundred and ten of them were female athletes (54%). Athletes' competed in football (53 %) or synchronized swimming (47 %).

Instruments

Participants responded to Version 4 of our short-forms, including the PeerMCYSQ, the SCQPeer, the SCQCoach, and the TEOSQ. We also assessed motivational regulations using the Spanish Version (Viladrich et al., 2011) of the Behavioral Regulations in Sport Questionnaire (BRSQ; Lonsdale et al., 2008).

Procedure

Data from Sample 3 were obtained with the aim of validating Version 4 of the short-forms (see lower part

of Figure 1). The data collection procedure remained the same as those outlined in the previous studies.

Results

Confirmatory Factor Analyses (CFA)

Table 4 presents the fit indices for all the short-forms. All of them showed a better fit to the models compared to the previous CFA in Study 2 and were found to have an acceptable factor structure. Only the CFA for the PeerMCYSQ did not meet the RMSEA criteria proposed by Jackson et al. (2009). All the items had statistically significant factor loadings above .50 and can be found in Table 5.

Criterion validity

Analyses of Structural Equation Modeling (SEM) were performed in order to explore the criterion validity of our short-forms. Specifically, we examined two different models, one for the Achievement Goal Theory and other for the Self-Determination Theory. The first one studied the effect of the peer-created motivational climate on goal orientation, which in turn had an effect on motivational regulations (Figure 2). According to the previous literature, we expected task and ego peer-created motivational climates to correlate and to have an influence on both task and ego orientations. The task orientation was hypothesized to positively predict self-determined types of motivation (i.e., intrinsic motivation, integrated regulation and identified regulation). The ego orientation was expected to have a positive effect on controlled motivation (i.e., introjected and external regulations) and amotivation. The second model examined the influence of peers' and coaches' autonomy support on motivational regulations (Figure 3). In this model, we expected perceptions of peers' and coaches' autonomy support to correlate. We hypothesized that the positive effect of coaches' autonomy support on self-determined types of motivation and negative effect on controlled regulations and amotivation would be

Table 4. Fit Indices for the CFA (Sample 3)

Latent factors	χ^2	<i>df</i>	RMSEA	CFI	TLI
PeerMCYSQ	67.29**	19	.11	.97	.95
SCQCoach	16.06	9	.06	.99	.98
SCQPeer	20.46**	9	.08	.99	.98
TEOSQ	35.05**	19	.06	.99	.98

Note: *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Robust Comparative Fit Index; TLI = Tucker-Lewis Index.

** $p < .01$.

Table 5. Items and Factor Loadings that Comprise the Short-forms (Sample 3, Version 4)

Scale	Factor Loading
PeerMCYSQ (ego)	
3. ...intentan hacerlo mejor que sus compañeros (<i>try to do better than their team-mates</i>).	.52
4. ... se quejan de sus compañeros cuando el equipo no gana (<i>complain when the team doesn't win</i>).	.79
6. ...se alegran cuando superan a sus compañeros (<i>look pleased when they do better than their teammates</i>).	.56
7. ...quieren estar con los mejores jugadores (<i>want to be with the most able teammates</i>).	.54
PeerMCYSQ (task)	
1. ...se ayudan unos a otros para mejorar (<i>help each other improve</i>).	.88
2. ...trabajan juntos para mejorar las habilidades que no dominan bien (<i>work together to improve the skills they don't do well</i>).	.83
5. ...animan a sus compañeros a esforzarse al máximo (<i>encourage their teammates to try their hardest</i>).	.77
8. ...animan a sus compañeros a seguir intentándolo después de cometer un error (<i>encourage their teammates to keep trying after they make a mistake</i>).	.80
SCQCoach	
1. ...me ofrece distintas alternativas y opciones (<i>provides me choices and options</i>).	.55
2. ...hace que me sienta comprendido (<i>I feel understood by my coach</i>).	.62
3. ...hace que yo confíe en mi habilidad para hacerlo bien en mi deporte (<i>conveyed confidence in my ability to do well in at athletics</i>).	.73
4. ...me anima a que le pregunte lo que quiera saber (<i>encouraged me to ask questions</i>).	.63
5. ...se interesa por saber la forma en que me gusta hacer las cosas (<i>listens to how I would like to do things</i>).	.68
6. ...trata de entender cómo veo las cosas antes de sugerirme una nueva manera de hacerlas (<i>tries to understand how I see things before suggesting a new way to do things</i>).	.75
SCQPeer	
1. ...aceptan que en el equipo cada uno pueda tener su manera de jugar y de hacer las cosas (<i>accept that within the team everyone has his own way to play and manage things</i>).	.62
2. ...hacen que me sienta comprendido (<i>I feel understood by my peers</i>).	.80
3. ...hacen que yo confíe en mi habilidad para hacerlo bien en mi deporte (<i>conveyed confidence in my ability to do well in my sport</i>).	.68
4. ...dejan que les pregunte lo que quiera saber (<i>let me ask what I want to know</i>).	.56
5. ...aceptan la forma en que me gusta hacer las cosas (<i>accept the way I would like to do things</i>).	.84
6. ...tratan de entender cómo veo las cosas (<i>try to understand how I see things</i>).	.81
TEOSQ (ego)	
1. ... los otros no pueden hacerlo tan bien como yo (<i>the others cannot do as well as me</i>).	.94
2. ...otros fallan y yo no (<i>others "mess up" and I do not</i>).	.80
5. ... soy imprescindible para el equipo (<i>I score the most points/goals/hits, etc.</i>)	.63
7. ... soy el mejor (<i>I am the best</i>).	.72
TEOSQ (task)	
3. ... aprendo una nueva habilidad esforzándome mucho (<i>I learn a new skill by trying hard</i>).	.71
4. ... entreno a tope (<i>I work really hard</i>).	.53
6. ... algo que he aprendido me impulsa a practicar más (<i>something I learn makes me want to go practice more</i>).	.66
8. ... pongo todo lo que está de mi parte (hago todo lo que puedo) (<i>I do my very best</i>).	.58

Note: Contains Spanish and English wording of the items included in Version 4 of the short-forms. The Spanish wording is not a direct translation, as both experts and focus groups participants proposed changes to make the items more understandable.

bigger than peers'. In both models self-determined types of motivation were expected to correlate highly. Also, controlled regulations and amotivation were hypothesized to have high correlations.

Both models displayed a good fit to the data: AGT model, $\chi^2(708) = 1003.01$, $p < .001$, CFI = .93, TLI = .93, RMSEA = .05; SDT model, $\chi^2(566) = 756.20$, $p < .001$, CFI = .95, TLI = .95, RMSEA = .04. As can be seen in the Figures 2 and 3, the models showed most of the

hypothesized paths. However, there were some exceptions. In the AGT model, peer-created task climate moderately predicted adopting an ego orientation. Also, ego orientation positively predicted identified regulation, a type of self-determined motivation. In the SDT model, perceptions of coach' autonomy support did not have a negative effect on controlled regulations or amotivation. Moreover, peers' autonomy support did not predict self-determined types of motivation.

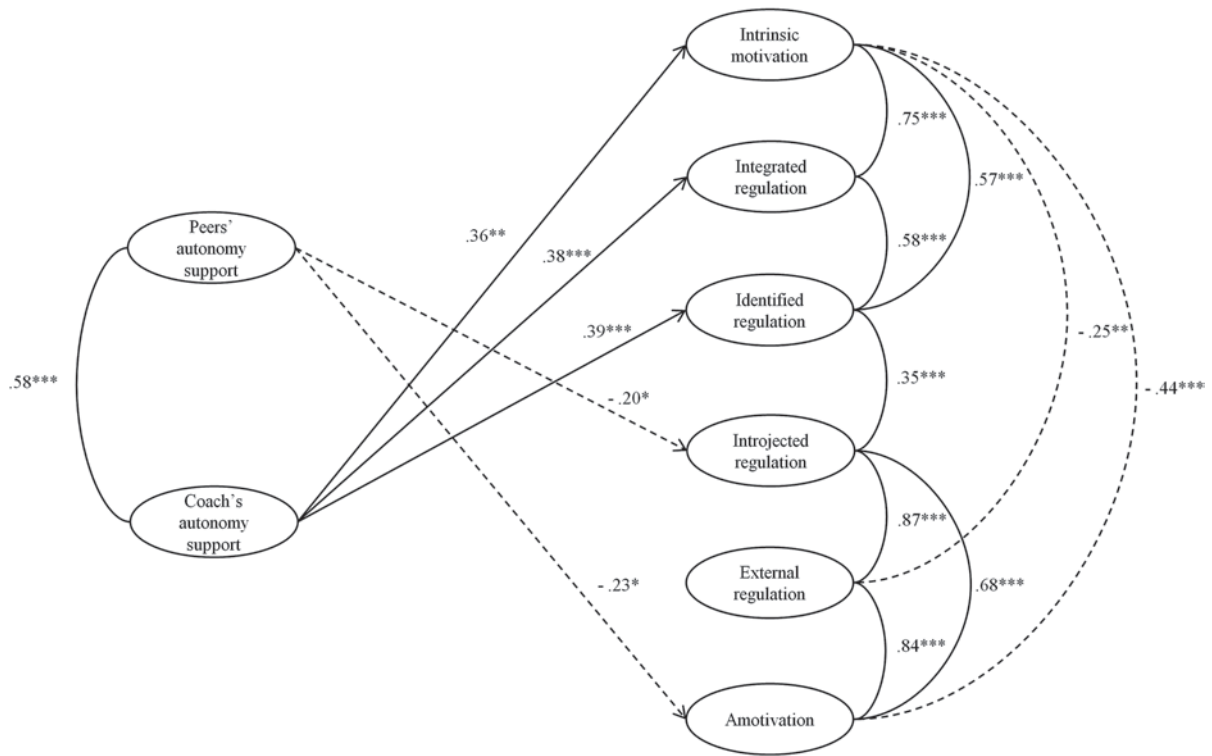


Figure 2. Structural Equation Model Based on the Achievement Goal Theory

Note. For presentation simplicity purposes only significant paths and correlations are shown, and item indicators are not presented. Discontinuous lines show negative paths. * $p < .05$; ** $p < .01$; *** $p < .001$.

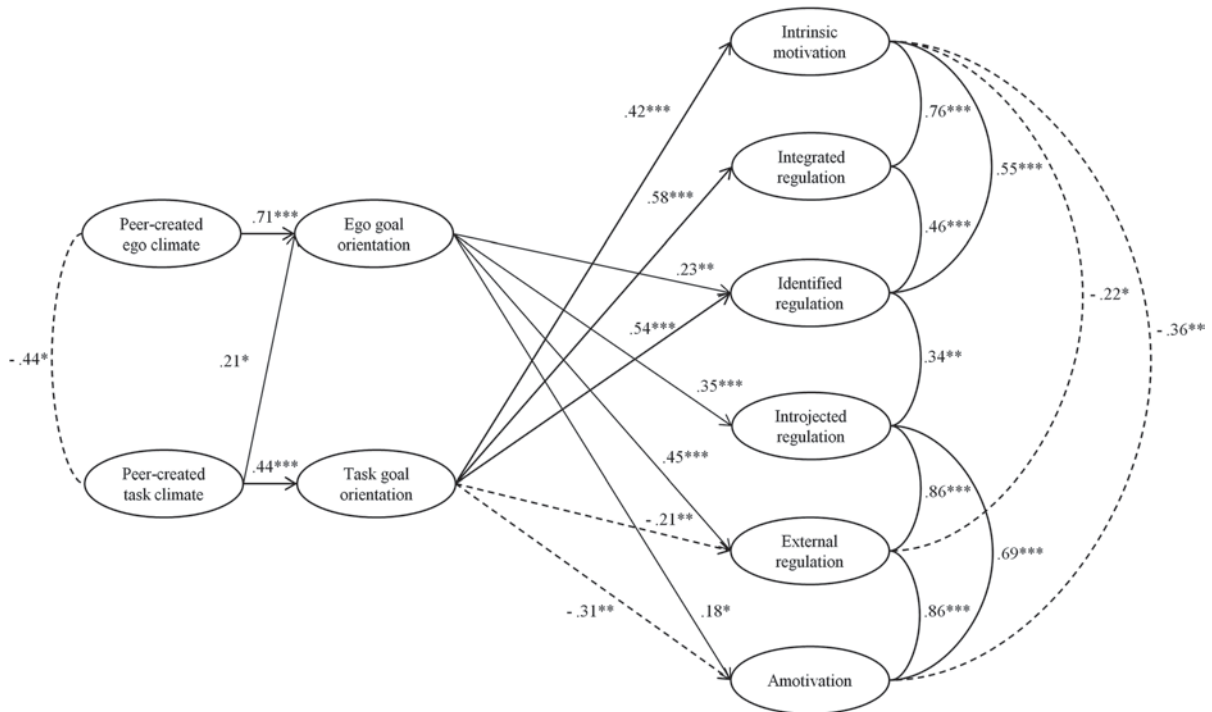


Figure 3. Structural Equation Model Based on the Self-Determination Theory

Note. For presentation simplicity purposes only significant paths and correlations are shown, and item indicators are not presented. Discontinuous lines show negative paths. * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

Study 3 had two purposes: On the one side, results from the CFA in Study 3 demonstrated that the internal structure of the short-forms improved due to the changes made in Study 2. On the other, results from structural equation modeling analyses provided evidence concerning the short-forms criterion validity.

General Discussion

We have developed short-forms of the PeerMCYSQ, the SCQPeer and the TEOSQ and we also have tested the SCQCoach. Some areas of research such as Health and Clinical Psychology have been making use of the benefits of shortening questionnaires for a number of years. However, within Sport Psychology few researchers have focused on this issue. Regarding this point, we discuss the evidence supporting the merit of these short-forms, the limitations of our work and propose future lines of research.

Our short-forms have some advantages over the original instruments because: (a) they place less burden on athletes and researchers, (b) are economical (i.e., length reduced and time saved), (c) are efficient (i.e., little loss of information or validity compared to the resources saved) and (d) help to improve the data quality. Our results showed that our participants only needed a third of the time used to respond to the original questionnaires to fill in the short-forms. Also, the number of missing values decreased significantly when using the short-forms.

Psychometric merit of the short-forms

Shortening per se could induce losses in the psychometric properties of questionnaires, especially in terms of reliability and content validity (Coste et al., 1997; Smith et al., 2000). Consequently, Coste et al. (1997) recommended that content validity and reliability should particularly be assessed. In this work we also provided validity evidence based on the response process and we assessed internal structure and external validity. Our item selection included theory-driven criteria obtained from literature review and experts' advice, which are sources of validity evidence based on test content (American Educational Research Association et al., 1999). Following Patton's (2002) recommendation that in order to show diversity, as many opinions as possible have to be considered, the experts meetings included applied sport psychologists, researchers in Sport Psychology, methodologists and youth sport coaches. This heterogeneity also enhanced decisions about the representation and relevance of items. As stated by the American Educational Research Association et al. (1999), participants' views of the questionnaires are a source of validity evidence based on the response process.

Thus, we conducted two focus groups so as to reassure that participants' responses stick on the meaning of the constructs. That is, the wording of the items was revised to ensure that the participants understood their meaning. Also, adapting items' wording probably helped to reduce the time participants spent on responding to the short-forms, because completion time is influenced by items' comprehensibility (Terry et al., 1999).

The analyses of reliability and internal structure also presented evidence supporting the merit of our short-forms. With regard to reliability, all the short-forms reached Nunnally's criterion (1978) with Cronbach's alpha values being above .70. These results are quite interesting because a lower internal consistency could have been expected due to the shortening. Moreover, Streiner and Norman (2008) argued that constructs' heterogeneity could diminish their own internal consistency. However, all our short-forms presented a satisfactory internal consistency.

Referring to the internal structure, the CFA presented an acceptable fit to the hypothesized models. Initially, the results from data in Study 2 did not reach the criteria proposed by Jackson et al. (2009). Then, we made changes to the short-forms (Version 4). The CFA conducted with data from Study 3 confirmed that the short-forms have an acceptable internal structure. It must be said that although the PeerMCYSQ did not show a poor fit to the model, it only reached two of three criteria proposed by Jackson et al. As said by Ntoumanis and Vazou (2005) "validation is an ongoing process" (p. 19) and consequently we recommend future studies to work on and improve the short-form of the PeerMCYSQ. We propose the same process that we previously followed in Study 2 to improve the short-forms (i.e., expert meetings and focus groups).

Results also provided evidence supporting short-forms criterion validity (i.e., analyses of correlations and structural models). In Study 2, evidence supporting the concurrent validity of the instruments came from the low to moderate bivariate correlations between short-forms and variables that they were hypothesized to be related to. As we expected, we did not find high correlations because those other variables were constructs in the nomological network (i.e., the interlocking system of laws that constitute a theory; see Cronbach & Meehl, 1955) not conceptually equivalent to the short-forms constructs. In Study 3, we performed two different structural models. In the model from the AGT, task and ego peer-created motivational climates predicted athletes' goal orientation, which is congruent with previous studies (e.g., Vazou, 2010). This goal orientation, in turn, had an effect on motivational regulations. In line with Barkoukis, Ntoumanis, and Nikitaras (2007), task orientation positively predicted experiencing self-determined motivation and had a

negative effect on external regulation and amotivation. Moreover, ego orientation positively predicted identified regulation and both types of controlled motivation (i.e., introjected and external regulations). In our study, ego orientation also had a small effect on amotivation. Viewed globally, these results support the “adaptive role of high task goal orientation in promoting self-determination in sport” (Ntoumanis, 2001, p. 407). In the model from the SDT, results showed that coaches’ autonomy support positively predicted athletes’ self-determined motivation, as hypothesized (e.g., Pelletier, Fortier, Vallerand, & Brière, 2001). However, paths of peers’ autonomy support were not totally congruent with previous literature (Ramis, Torregrosa, Viladrich, & Cruz, 2013).

Inevitably, short-forms cannot include the whole content of a construct. Thus, our short-forms cannot assess the specific aspects of peer-created motivational climate, autonomy-support or goal orientation. Consequently, they should be used carefully. We propose that our short-form would be useful for those who want a quick measure (i.e., applied practitioners) or those who work with a model with multiple variables, and consequently need efficient measures. If the purpose is to study the peer-created motivational climate, the autonomy-support or the goal orientation in detail, researchers should work with the complete versions.

We recommend future studies to focus on two issues. Firstly, it would be interesting to use the short-forms to construct other models with multiples variables. As structural equation modeling results did not totally support SCQPeer criterion validity, researchers could compare results from short and complete versions. They could generate a model including other dependent variables expected to be related to it (e.g., psychological needs satisfaction) and compare results with the ones obtained with the complete version. Secondly, researches could continue testing how these short-forms can improve data quality. As completing short-forms requires less time, a lower number of missing values and aberrant response patterns and a higher response rate are expected (Edwards et al., 2004). In this work, results revealed that the short-forms had significantly less missing values. However, no aberrant response patterns were found. Independent confirmation about the improved quality of data could be obtained if all users of these short-forms took a simple habit: To report percentage of observed missing values, possible aberrant response patterns and response rates in their samples.

Conclusion

We have shown the benefits of using the short-forms of the PeerMCYSQ, the SCQPeer, the SCQCoach and the TEOSQ and we have provided evidence supporting

their psychometrical merit. We have also confirmed that these short-forms can help to improve the quality of the data, as less missing values were obtained. Therefore, these short-forms might facilitate better understanding of the team environment, both in research and applied practice, although further research is needed to demonstrate their efficiency in studying the team environment and its relations with other variables. In short, these short-forms show: (a) similar psychometric properties to those from the original questionnaires can be obtained, while placing less of a burden on athletes and psychologists; (b) ease in data management; and (c) improvement in data quality by registering less missing values. We hope our results will encourage others in the Sport Psychology field to focus on the shortening practice, in order to improve the quality of research and applied practice.

References

- Adie J. W., Duda J. L., & Ntoumanis N. (2008). Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion*, 32, 189–199. <http://dx.doi.org/10.1007/s11031-008-9095-z>
- Álvarez M. S., Balaguer I., Castillo I., & Duda J. L. (2009). Coach autonomy support and quality of sport engagement in young soccer players. *The Spanish Journal of Psychology*, 12, 138–148. <http://dx.doi.org/10.1017/S1138741600001554>
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education (1999). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- Ames C. (1992). Achievement goals and classroom motivational climate. In J. Meece & D. Schunk (Eds.), *Students’ perceptions in the classroom* (pp. 327–348). Hillsdale, NJ: Erlbaum.
- Balaguer I., Castillo I., & Duda J. L. (2008). Apoyo a la autonomía, satisfacción de las necesidades, motivación y bienestar en deportistas de competición: Un análisis de la Teoría de la Autodeterminación [Autonomy support, need satisfaction, motivation and well-being among competitive athletes: A Self-determination Theory analysis]. *Revista de Psicología del Deporte*, 17, 123–139.
- Balaguer I., Castillo I., Duda J. L., & García-Merita M. (2011). Asociaciones entre la percepción del clima motivacional creado por el entrenador, orientaciones disposicionales de meta, regulaciones motivacionales y vitalidad subjetiva en jóvenes jugadoras de tenis [Associations between perceptions of coach-created motivational climate, goal orientations, behavioral regulations and subjective vitality in young female tennis players]. *Revista de Psicología del Deporte*, 20, 133–148.
- 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 Sport Climate Questionnaire Spanish version]. *Revista de Psicología del Deporte*, 18, 73–83.
- Balaguer I., Castillo I., & Tomás I.** (1996). Análisis de las propiedades psicométricas del Cuestionario de Orientación al Ego y a la Tarea en el deporte (TEOSQ) en su traducción al castellano [Analysis of the psychometric properties of the Task and Ego Orientation Questionnaire (TEOSQ) in its Spanish translation]. *Psicológica*, 17, 71–81.
- Balaguer I., Guivernau M., Duda J. L., & Crespo M.** (1997). Análisis de la validez de constructo y de la validez predictiva del Cuestionario de Clima Motivacional Percibido en el Deporte (PMCSQ-2) con tenistas españoles de competición [Analysis of the construct validity and predictive validity of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2) in competitive Spanish tennis players]. *Revista de Psicología del Deporte*, 6, 41–58.
- Barkoukís V., Ntoumanis N., & Nikitaras N.** (2007). Comparing dichotomous and trichotomous approaches to achievement goal theory: An example using motivational regulations as outcomes variables. *British Journal of Educational Psychology*, 77, 683–702. <http://dx.doi.org/10.1348/000709906X171901>
- Boixadós M., Valiente L., Mimbreno J., Torregrosa M., & Cruz J.** (1998). Papel de los agentes de socialización en deportistas en edad escolar [Role of agents of socialization in school-age athletes]. *Revista de Psicología del Deporte*, 7, 295–310.
- Chan D. K., Lonsdale C., & Fung H. H.** (2012). Influences of coaches, parents, and peers on the motivational patterns of child and adolescent athletes. *Scandinavian Journal of Medicine & Science in Sports*, 22, 558–568. <http://dx.doi.org/10.1111/j.1600-0838.2010.01277.x>
- Coste J., Guillemin F., Pouchot J., & Fermanian J.** (1997). Methodological approaches to Shortening Composite Measurement Scales. *Journal of Clinical Epidemiology*, 50, 247–252. [http://dx.doi.org/10.1016/S0895-4356\(96\)00363-0](http://dx.doi.org/10.1016/S0895-4356(96)00363-0)
- Cox T., Oliver A., Rial-González E., Tomás J. M., Griffiths A., & Thompson L.** (2006). The development of a Spanish language version of the Worn Out Scale of the General Well-Being Questionnaire (GWBQ). *The Spanish Journal of Psychology*, 9, 94–102.
- Cronbach L., & Meehl P.** (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281–302. <http://dx.doi.org/10.1037/h0040957>
- Deci E. L.** (2001). *The sport climate questionnaire*. Unpublished instrument. Retrieved from http://www.psych.rochester.edu/SDT/measures/auton_sport.html
- Deci E. L., & Ryan R. M.** (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227–268. http://dx.doi.org/10.1207/S15327965PLI1104_01
- Duda J. L.** (1989). Relationship between task and ego orientation and the perceived purpose of sport among high school athletes. *Journal of Sport & Exercise Psychology*, 11, 318–335.
- Duda J. L., & Hall H.** (2001). Achievement goal theory in sport: Recent extensions and future directions. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of sport psychology* (2nd ed., pp. 417–443). New York, NY: Wiley.
- Duda J. L., & Nicholls J. G.** (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology*, 84, 290–299. <http://dx.doi.org/10.1037//0022-0663.84.3.290>
- Duda J. L., & Ntoumanis N.** (2003). Correlates of achievement goal orientations in physical education. *International Journal of Educational Research*, 39, 415–436. <http://dx.doi.org/10.1016/j.ijer.2004.06.007>
- Edwards P., Roberts I., Sandercock P., & Frost C.** (2004). Follow-up by mail in clinical trials: Does questionnaire length matter? *Controlled Clinical Trials*, 25, 31–52. <http://dx.doi.org/10.1016/j.cct.2003.08.013>
- Gagné M., Ryan R. M., & Bargmann K.** (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology*, 15, 372–390. <http://dx.doi.org/10.1080/714044203>
- García Ferrando M., & Llopis R.** (2006). *Encuesta de hábitos deportivos de los Españoles 2005* [Spanish population sport habits survey 2005]. Retrieved from Consejo Superior de Deportes website: <http://www.csd.gob.es/csd/sociedad/encuesta-de-habitos-deportivos/encuesta-de-habitos-deportivos-2005/encuesta-de-habitos-deportivos/>
- Graham J. W.** (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, 60, 549–576. <http://dx.doi.org/10.1146/annurev.psych.58.110405.085530>
- Jackson D. L., Gillaspay J. A., & Purc-Stephenson R.** (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Methods*, 14, 6–23. <http://dx.doi.org/10.1037/a0014694>
- Jokovic A., Locker D., & Guyatt G.** (2006). Short forms of the Child Perceptions Questionnaire for 11–14-year-old children (CPQ_{11–14}): Development and initial evaluation. *Health and Quality of Life Outcomes*, 4(4). <http://dx.doi.org/10.1186/1477-7525-4-4>
- Keegan R., Spray C., Harwood C., & Lavalley D.** (2010). The motivational atmosphere in youth sport: Coach, parent, and peer influences on motivation in specializing sport participants. *Journal of Applied Sport Psychology*, 22, 87–105. <http://dx.doi.org/10.1080/10413200903421267>
- Li F., Harmer P., Chi L., & Vongjaturapat N.** (1996). Cross-cultural validation of the Task and Ego Orientation in Sport Questionnaire. *Journal of Sport & Exercise Psychology*, 18, 392–407.
- Lonsdale C., Hodge K., & Rose E. A.** (2008). The behavioral regulation in Sport Questionnaire (BRSQ): Instrument development and initial validity evidence. *Journal of Sport & Exercise Psychology*, 30, 323–355.
- McAuley E., Duncan T., & Tammen V. V.** (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, 60, 48–58. <http://dx.doi.org/10.1080/02701367.1989.10607413>
- Meijer R. R., & Sijtsma K.** (1995). Detection of aberrant item score patterns: A review of recent developments. *Applied Measurement in Education*, 8, 261–272. http://dx.doi.org/10.1207/s15324818ame0803_5
- Moran L. A., Guyatt G. H., & Norman J. R.** (2001). Establishing the minimal number of items for a responsive, valid, health-related quality of life instrument. *Journal of Clinical*

- Epidemiology*, 54, 571–579. [http://dx.doi.org/10.1016/S0895-4356\(00\)00342-5](http://dx.doi.org/10.1016/S0895-4356(00)00342-5)
- Moreno J. A., Conte L., Martínez C. Alonso N., González-Cutre D., & Cervelló E.** (2011). Propiedades psicométricas del Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ) con una muestra de deportistas españoles [Psychometric properties of the Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ) with a sample of Spanish athletes]. *Revista de Psicología del Deporte*, 20, 101–118.
- Mülhan H., Bullinger M., Power M., & Schmidt S.** (2008). Short forms of subjective quality of life assessments from cross-cultural studies for use in surveys with different populations. *Clinical Psychology and Psychotherapy*, 15, 142–153. <http://dx.doi.org/10.1002/cpp.573>
- Muthén L. K., & Muthén B. O.** (2008). Mplus Editor (version 5.2) [Computer software]. Los Angeles, CA: Muthen & Muthen.
- Newton M., Duda J. L., & Yin Z.** (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences*, 18, 275–290. <http://dx.doi.org/10.1080/026404100365018>
- Nicholls J. G.** (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.
- Nunnally J. C.** (1978). *Psychometric Theory*. New York, NY: McGraw-Hill.
- Ntoumanis N.** (2001). Empirical links between achievement goal theory and self-determination theory in sport. *Journal of Sports Sciences*, 19, 397–409. <http://dx.doi.org/10.1080/026404101300149357>
- Ntoumanis N., & Biddle S.** (1999). A review of motivational climate in physical activity. *Journal of Sports Sciences*, 17, 643–665. <http://dx.doi.org/10.1080/026404199365678>
- Ntoumanis N., & Vazou S.** (2005). Peer motivational climate in youth sport: Measurement development and validation. *Journal of Sport & Exercise Psychology*, 27, 432–455.
- Pelletier L. G., Fortier M. S., Vallerand R. J., & Brière N. M.** (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion*, 25, 279–306. <http://dx.doi.org/10.1023/A:1014805132406>
- Patton M. Q.** (2002). *Qualitative Research & Evaluation Methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Ramis Y., Torregrosa M., Viladrich C., & Cruz J.** (2010). Adaptación y validación de la versión española de la Escala de Ansiedad Competitiva SAS - 2 para deportistas de iniciación [Adaptation and validation of the Spanish Version of the Sport Anxiety Scale-2 for young athletes]. *Psicothema*, 22, 1004–1009.
- Ramis Y., Torregrosa M., Viladrich C., & Cruz J.** (2013). El apoyo a la autonomía generado por entrenadores, compañeros y padres y su efecto sobre la motivación autodeterminada de deportistas de iniciación [Coaches', peers' and parents' autonomy support and their effect in youth athletes' self-determined motivation]. *Anales de Psicología*, 29, 243–248. <http://dx.doi.org/10.6018/analesps.29.1.124011>
- Reinboth M., & Duda J. L.** (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise*, 7, 269–286. <http://dx.doi.org/10.1016/j.psychsport.2005.06.002>
- Smith G. T., McCarthy D. M., & Anderson K. G.** (2000). On the sins of short-form development. *Psychological Assessment*, 12, 102–111. <http://dx.doi.org/10.1037//1040-3590.12.1.102>
- Smith R. E., Smoll F. L., & Cumming S. P.** (2009). Motivational climate and changes in young athletes' achievement goal orientations. *Motivation and Emotion*, 33, 173–183. <http://dx.doi.org/10.1007/s11031-009-9126-4>
- Standage M., Duda J. L., & Ntoumanis N.** (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology*, 75, 411–433. <http://dx.doi.org/10.1348/000709904X22359>
- Streiner D. L., & Norman G. R.** (2008). *Health measurement scales* (4th ed.). Gosport, Hampshire: Oxford University Press.
- Terry P. C., Lane A. M., Lane H. J., & Keohane L.** (1999). Development and validation of a mood measure for adolescents. *Journal of Sports Sciences*, 17, 861–872. <http://dx.doi.org/10.1080/026404199365425h>
- Torregrosa M., Viladrich C., Ramis Y., Azócar F., Latinjak A., & Cruz J.** (2011). Efectos en la percepción del clima motivacional generado por los entrenadores y compañeros sobre la diversión y el compromiso. Diferencias en función de género [The effect of coach-created and peer-created motivational climate on enjoyment and commitment: gender differences]. *Revista de Psicología del Deporte*, 20, 243–255.
- Vazou S.** (2010). Variations in the perceptions of peer and coach motivational climate. *Research Quarterly for Exercise and Sport*, 81, 199–211. <http://dx.doi.org/10.5641/027013610X13088554297279>
- Vazou S., Ntoumanis N., & Duda J. L.** (2006). Predicting young athletes' motivational indices as a function of their perceptions of the coach- and peer-created climate. *Psychology of Sport and Exercise*, 7, 215–233. <http://dx.doi.org/10.1016/j.psychsport.2005.08.007>
- Viladrich C., Torregrosa M., & Cruz J.** (2011). Calidad psicométrica de la adaptación española del Cuestionario de Regulación Conductual en el Deporte [Psychometric quality of the Spanish adaptation of the Behavioral Regulation in Sport Questionnaire]. *Psicothema*, 23, 786–794.
- Whitehead J., André K. V., & Lee M. J.** (2004). Achievement perspectives and perceived ability: How far do interactions generalize in youth sport? *Psychology of Sport and Exercise*, 5, 291–317. [http://dx.doi.org/10.1016/S1469-0292\(03\)00016-5](http://dx.doi.org/10.1016/S1469-0292(03)00016-5)
- Watson D., & Clark L. A.** (1997). Measurement and mismeasurement of mood: Recurrent and emergent issues. *Journal of Personality Assessment*, 68, 267–296. http://dx.doi.org/10.1207/s15327752jpa6802_4