

# Validation of the Group Environment Questionnaire in Croatian: Measuring Group Cohesion in Professional Football

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*The main aim of this study was to determine the factor structure and psychometric properties of the Group Environment Questionnaire in the Croatian sport context among professional football players and examine whether cohesion factors predict theoretically assumed conceptual outcomes of group cohesion. The sample consisted of 177 professional football players aged between 18-30 years. Several alternative models were tested using confirmatory factor analysis. Carron's original four-factor model did not fit the data. Modified version resulted in a good fit of three-factor model distinguishing task and social group integration, and individual attraction to the group. Team satisfaction and perception of team success were positively predicted by Individual Attraction to the Group, while Task and Social Group Integration factors effect was not significant. The results encourage us to assume the theoretical cohesion factors in the specific context of professional sport in Croatia, though further psychometric testing is needed to improve Croatian GEQ.*

KEY WORDS: group cohesion, professional football, team satisfaction, team success

## Introduction

Sports athletes can often be heard emphasising their group relations and unity as a significant determinant of their success after an important achievement. That concept of team spirit and togetherness sports psychologists operationally define as cohesion or cohesiveness (Carron & Eys, 2012; Moran, 2012). One of the most widely accepted definitions depicts the group cohesion as a dynamic process that is reflected in the tendency of the group to (1) maintain unity and uniqueness in the achieving goals and (2) satisfy members' emotional needs (Carron, Brawley, & Widmeyer, 1998). As such,

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the definition emphasises a conceptual model of group cohesion made by Carron (1982), created as a response to the absence of a theoretical framework for the group cohesion conceptualisation and operationalisation. The model assumes that members' beliefs about their group are centred around personal and collective concerns (Carron, Widmeyer, & Brawley, 1985). Those beliefs are gathered around two main dimensions – Group Integration and Individual Attraction to the Group. Group Integration reflects the perception of the group closeness, similarity and unity, while Individual Attraction to the Group reflects the personal motivation to be the part of the group and needs and goals which the group satisfies. Within both dimensions, the model assumes members' perception of group togetherness in achieving goals and objectives as task cohesion, and members perception of group relationship and team members enjoyment of being with teammates as social cohesion (Carron et al., 1985; Carron & Brawley, 2000).

Thus, the model sees cohesion as a multidimensional construct with four dimensions: Group Integration - Social (GI-S; perception of members equality and unification of the group as a social unit), Group Integration - Task (GI-T: perception of members uniqueness and unification of the group as a whole in carrying out tasks and achieving goals), Individual Attraction to the Group - Social (ATG-S; members' feelings about their social interaction with the group), and Individual Attraction to Group - Task (ATG-T; member's feeling of his involvement in group tasks) (Carron et al., 1998). To operationalise the described dimensions, the authors developed the Group Environment Questionnaire (GEQ, Brawley, Carron, & Widmeyer, 1987; Carron et al., 1985).

### **Adaptation and validation challenges in measuring group cohesion**

Earlier attempts of measuring group cohesion relied on numerous instruments such as the Sports Cohesiveness Questionnaire (SCQ; Martens, Landers, & Loy, 1972), the Team Cohesion Questionnaire (TCQ; Gruber & Gray, 1982), and the Multidimensional Sport Cohesion Instrument, (MSCI; Yukelson, Weinberg, & Jackson, 1984). Although their application yielded some empirical findings (for an overview see Mullen & Copper, 1994), these studies lacked sufficient clarity as well as a firm theoretical foundation. On the other hand, the GEQ (Carron et al., 1985) is based upon the aforementioned conceptual model (Carron, 1982) and measures four theoretically assumed dimensions of group cohesion.

In his theoretical and methodological overview of multidimensional conceptualisation and operationalisation of group cohesion, Dion (2000)

pointed out that the psychometric properties of the four GEQ subscales are very good, reliability in particular. A number of recent contributions confirmed the four-factor structure and indicated acceptable psychometric characteristics of GEQ, labelling it as a promising approach in cohesion measurement (Eys, Carron, Bray, & Brawley, 2007; Eys, Loughead, Bray, & Carron, 2009; Li & Harmer, 1996; Steca, Pala, Greco, Monzani, & D'Adario, 2013).

However, numerous other studies failed to support the theoretically postulated clear and interpretable four-factor solution suggesting different factor structures (e.g. Blanchard, Poon, Rodgers, & Pinel, 2000; Carless & De Paola, 2000; Dyce & Cornell, 1996; Schutz, Eom, Smoll, & Smith, 1994; Sullivan, Short, & Cramer, 2002). First studies that used confirmatory factor analysis in testing the GEQ's structure questioned the original dimensionality and factorial invariance of GEQ and suggested one second-order factor structure (Schutz et al., 1994). Furthermore, Sullivan et al. (2002) found a two-factor solution with no interpretable pattern that questioned the validity and applicability of GEQ in co-acting and interacting sports. On the other hand, using a modified scale, Careless and De Paola (2000) identified a three-factor solution. In response to the various GEQ psychometric challenges to date, Brawley and Carron (2003; Carron & Brawley, 2000) argued that some teams may not exhibit every aspect of cohesiveness and that all dimensions may not be equally present simultaneously in the group life cycle. Because of that, a priori hypothesis about the number of factors should be made for the particular groups in a given social context. Although this standpoint reflects the dynamic nature of group cohesion, and its dependence on group type and group developmental phase (Carron & Brawley, 2000), mixed findings on dimensionality, as well as discriminant validity challenges, clearly suggest the need for possible adjustments in order to refine the questionnaire further.

Room for improvement is indicated by the authors themselves when the effect of positively worded items on the internal consistency of the GEQ was found (Eys, Carron, Bray, & Brawley, 2007). Altering the items into positively oriented ones proved to be of paramount importance for Spanish adaptation and validation of GEQ as well (Leo, González-Ponce, Sánchez-Oliva, Pulido, & García-Calvo, 2015). Namely, after Inurbide, Elsua, and Yanes (2010) failed to confirm the four-factor model in the Spanish context, the authors confirmed the original first-order four-factor structure on shortened GEQ with all items being positively oriented.

Having in mind these empirical findings on the effect of wording and suggestions for taking language and contextual aspects into consideration, it seems useful to consider whether translated versions had even bigger or dif-

ferent challenges in the validation process. Generally, it could be said that validation studies on translated GEQ versions faced challenges even if they confirmed the theoretically assumed four-factor structure. Namely, GEQ translated into Italian confirmed four-factor structure on a large group of professional Italian football and basketball players (Steca et al., 2013). However, six items, all positively worded, were removed from the questionnaire. Their results also indicated good or acceptable internal consistency coefficients, except Individual Attraction to the Group – Task dimension ( $\alpha = .37$ ).

On the other hand, to confirm the theoretical structure, authors of the aforementioned study on GEQ validation in Spanish (Leo et al., 2015) oriented all items positively. The analysis resulted in four theoretically assumed factors (three items per each factor) with an acceptable fit and high levels of internal consistency. Wording adjustment characterised the French version as well. Relying on the original GEQ questionnaire, authors developed the instrument called *Questionnaire sur l'Ambiance du Groupe* (QAC). Some GEQ phrases were not translated literally but adapted to the specific French wording (phrases) without semantic loss, keeping the original meaning. In addition to that, a few additional items were added to the three subscales. This modification resulted in QAC consistent with the original theoretical model. The Portuguese validation based on a sample of Brazilian athletes coming from various collective sports has revealed a good fit of the original four-factor model, albeit with two items excluded (Nascimento Junior, Vieira, Rosado, & Serpa, 2012). Withal, satisfactory internal consistency and acceptable test-retest reliability coefficients were also found. Testing the GEQ in a Greek culture has shown the acceptable fit of the theoretically assumed four-factor model with high internal reliability coefficients and without the need for scale modification through removing and/or altering negatively oriented items (Ntoumanis & Aggelonidis, 2004). However, this uncovered substantial inter-factor correlations which consequently hindered the discriminant validity of the questionnaire.

Studies that tested GEQ's characteristics in English seemed to face similar challenges. Solutions different from the original four-factor structure were suggested, as highlighted in the aforementioned non-English studies. On a large sample of high school varsity athletes, Schutz et al. (1994) questioned the theoretical structure, suggesting further empirical assessment. A similar suggestion was made by Sullivan et al. (2002). The authors questioned the factor structure, internal validity and the face validity of parts of the GEQ for co-acting and interactive sports.

By measuring group cohesion in workgroups, Careless and De Paola (2000) did not meet theoretical expectations either. They have identified the three-dimensional structure of the GEQ using a modified scale. On the other

hand, by measuring group cohesion in exercise settings and with a slight modification on the GEQ items, Spink, and Carron (1994) found an adequate fit of a theoretically expected four-factor model. However, using that modified version on another exercise group sample, Blanford, Poon, and Pinel (2000) found an inadequate fit. To attain the theoretically assumed four-factor model with an appropriate fit index, the authors removed five items.

From this brief overview, it can be concluded that challenges to find the adequate fit of the original model in the specific groups are quite common both to the studies that tested GEQ's characteristics in different languages and those who tested it in the original English form. Results of these studies vary from inadequate fit to modified versions that exhibit theoretically similar or original four-factor structure, whether by adopted wording or by removal of items.

Although this may seem a shortcoming of the GEQ that questions its construct validity, the results should be interpreted as a knowledge-gaining step forward in regards to GEQ adaptation to the specific groups and contextual characteristics. This explanation is in line with the Carron and Brawley's (2000) suggestion that the specifics of the situation, as well as the nature and the type of groups, may determine the conception of the cohesion in the specific groups. Furthermore, the effect of wording (Eys et al., 2007) implies how important it is for the group participants to accurately perceive the construct the item represents, as well as the group they are part of. This accurate perception should be considered with extra caution within validation research in a foreign language or within a specific group or culture context.

Thus, the aim of this research was to adapt and validate the GEQ in Croatian measuring cohesion among professional football players. By having a professional sample in the study, we endeavoured to acknowledge the importance of examining GEQ among professional athletes and expand a relatively small number of empirical studies on the psychometric characteristic of the questionnaire in professional sports teams to date (Leo et al., 2015; Ntoumanis & Aggelonidis, 2004; Steca et al., 2013).

In line with other studies (e.g. Carless & DePaola, 2000; Li & Hamer, 1996), different models specified on theoretically hypothesised structure (Carron, 1982, Carron et al., 1985; Widmeyer et al., 1985) were tested. In addition to examining the factor structure and psychometric characteristics of GEQ among the professional football teams in the context of Croatia, the association between cohesion factors and satisfaction with the team and team success perception as theoretically assumed cohesion outcomes, were also investigated. According to the conceptual model (Carron, 1982), group cohesion should positively predict these outcomes.

## Method

### *Participants*

A total of 177 adult, professional players from 9 football clubs playing in the Croatian First Football League aged between 18-30 years ( $M = 23.9$ ,  $SD = 4.7$ ), participated in the study. Majority of the participants were playing for the club for three or more seasons, while 21.5% and 33.9% of them were in the club within two and one season time span, respectively.

### *Procedure*

Prior to data collection, the soccer clubs' Management Boards were approached. They were informed about the study purpose and procedure, and their approval was requested after which club meetings were arranged. Questionnaire administration took place before the end of the season. Players filled in the questionnaires before their scheduled training session in order to avoid potential distraction caused by after-practice fatigue and exhaustion. Club Management Boards were asked to provide a separate room to ensure the same questionnaire administration conditions. The players were informed about the study purpose, the way the protocol should be administrated, and the anonymity of their data was guaranteed. After that, scale points were explained, and they were prompted to read each item carefully and rate it.

### *Measures*

**Group cohesion.** Data on players' group cohesion estimates were collected using the Group Environment Questionnaire, GEQ (Carron et al., 1985). GEQ is based on self-assessment, includes 18 items overall, and measures four assumed latent dimensions of group cohesion in sport: Individual Attraction to the Group - Task (4 items), Individual Attraction to the Group - Social (5 items), Group Integration - Task (5 items) and Group Integration - Social (4 items). For each item, participants rated the extent to which they agree upon using a nine-point Likert scale (1 - *completely disagree*, 9 - *fully agree*). The higher overall score on each dimension, after recoding and summing individual responses, indicates a higher perception of group cohesion. The Croatian adaptation of GEQ was conducted using the complete forward and back-translation method from the original English version. Trained psychologist translated the questionnaire to Croatian in the first step of the procedure. After that, bilingual speaker, English teacher, back-translated the scale to English, and another bilingual English teacher compared the two English versions of the questionnaire against the Croatian one. Discrepancies between original and back-translated English versions were solved, and final Croatian version was fine-tuned in the last step.

**Perception of team success.** Subjective team success, that is, the players' self-perceived success of their team, was measured using the question: «How do you rate the success of your team?», with a nine-point rating scale (1 - *extremely poor*, 9 - *extremely good*).

**Team Satisfaction.** Data on team satisfaction estimates were collected using the question: «How satisfied are you with your team?», which participants assessed on a nine-point rating scale (1 - *extremely unsatisfied*, 9 - *extremely satisfied*).

## Results

### METRIC CHARACTERISTICS OF GEQ



The factor structure of the Group Environment Questionnaire was explored using confirmatory factor analysis (CFA). Theoretically assumed first-order four-factor model of the GEQ was tested using maximum likelihood estimation method (MLR), with robust Huber-White standard errors, correcting for the lack of multivariate normality (Mardia Skewness = 1925.70,  $p < .01$ ; Mardia Kurtosis = 12.02,  $p < .01$ ). In order to examine the fit of the data, the following fit indices were used: Chi-Square, Comparative Fit Index (CFI), Tucker-Lewis index (TLI), Standardized Root Mean Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA).

As it can be seen in Table 1, all used indices revealed poor fit (see Hu & Bentler, 1999) of the theoretically assumed first-order four-factor model. Also, it was shown that four GEQ dimensions were highly correlated (Figure 1), indicating the potential existence of a general group cohesion factor or higher-order group cohesion factor structure. Hence, first-order one-factor, second-order one-factor, two first-order two-factor (ATG and GI / Task and Social) and two second-order two-factor (ATG and GI / Task and Social) models were tested additionally, all of which also fitted poorly to the data (Table 1). Given the results and having in mind Carron and Brawley (2000) comment that questionnaire refinement is an ongoing process, five items (no. 2, 5, 14, 15 and 16) that had low saturation estimates in each tested model were removed, and the aforementioned models were re-specified and tested without them (Table II). As can be seen, the fit of these models was not much improved. Given that ~~highest correlation between four GEQ dimensions was between ATG-Task and ATG-Social factors~~ (Figure 1), first-order three-factor model (ATG, GI-Social, GI-Task) was also specified and tested within

Table 1  
*Fit indices of different first and second-order group cohesion models (original GEQ)*

	$\chi^2$ (df)	CFI	TLI	RMSEA	SRMR
Four first-order factors	229.249 (129)	0.798	0.760	0.073	0.077
One second-order factor	233.088 (131)	0.793	0.758	0.073	0.078
One first-order factor	265.254 (135)	0.729	0.693	0.083	0.082
Two first-order factors (Task and Social)	266.465 (134)	0.726	0.687	0.083	0.082
Two first-order factors (GI and ATG)	251.909 (134)	0.758	0.723	0.078	0.080
Two second-order factors (GI and ATG)**	229.401 (130)	0.798	0.763	0.073	0.077
Two second-order factors (Task and Social)*	229.713 (130)	0.799	0.763	0.073	0.077

*Note.* \* models with the non-positive definite covariance matrix of latent variables;  
\*\* models with the negative variance estimates

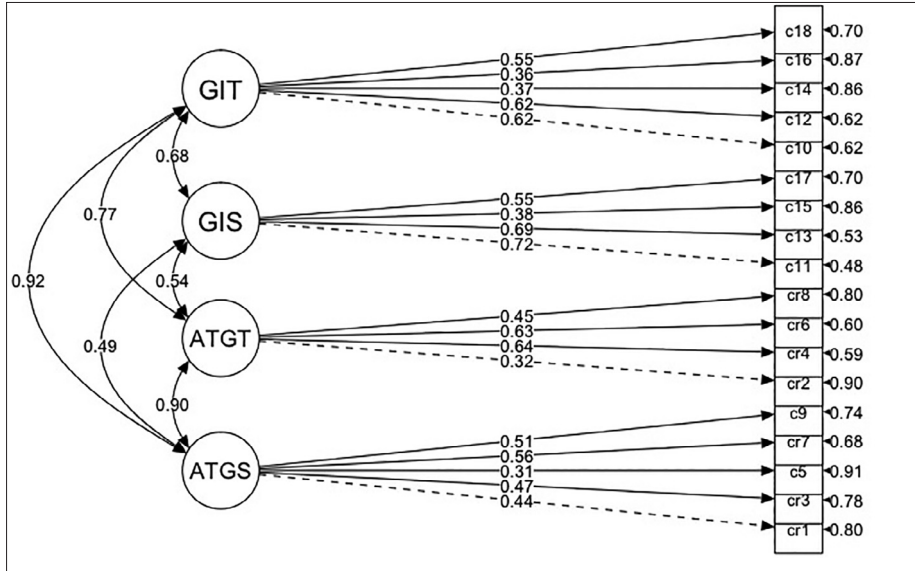


Fig. 1. Maximum likelihood estimation (MLR) of the first-order four-factor model.

13 item - GEQ version (Figure 2). Out of the all tested models, this model showed to fit the data the best indicating three - dimensional nature of the group cohesion perception. The internal consistency reliability indicators of the three GEQ dimensions also showed to be satisfyingly high ( $\alpha = .71$ [95% CI: .64 -.78],  $\alpha = .68$ [95% CI: .6 -.77],  $\alpha = .61$ [95% CI: .5 -.71]; for ATG, GIS and GIT subscales, respectively) for research purposes, having in mind lower number of items per factor (see Field, 2013).

Table 2  
Fit indices of different first and second-order group cohesion models (shortened GEQ)

	$\chi^2$ (df)	CFI	TLI	RMSEA	SRMR
Four first-order factors*	92.149 (59)	0.907	0.877	0.063	0.064
One second-order factor**	97.328 (61)	0.898	0.869	0.065	0.068
One first-order factor	128.413 (65)	0.816	0.780	0.084	0.075
Two first-order factors (Task and Social)*	129.416 (64)	0.812	0.771	0.086	0.075
Two first-order factors (GI and ATG)	115.471 (64)	0.854	0.822	0.076	0.072
Two second-order factors, (GI and ATG)**	92.198 (60)	0.909	0.882	0.062	0.065
Two second-order factors (Task and Social)*	94.010 (60)	0.905	0.876	0.063	0.065
Three first-order factors (ATG, GIS and GIT)	93.750 (62)	0.910	0.887	0.060	0.065

Note. \* models with the non-positive definite covariance matrix of latent variables;  
\*\* models with the negative latent variable variance estimates



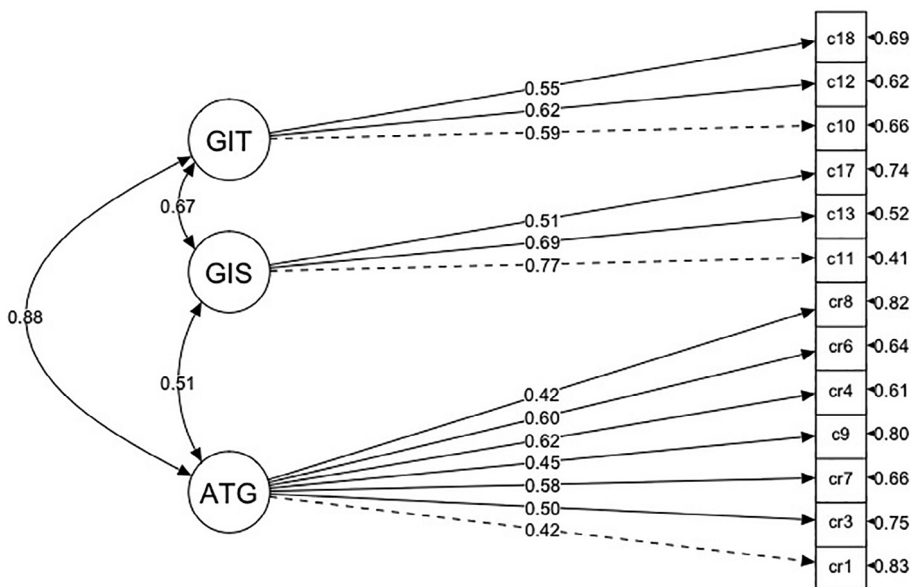


Fig. 2. Maximum likelihood estimation (MLR) of the first-order three-factor model.

**The relationship between group cohesion, self-perceived success and team satisfaction**

In order to acknowledge potentially nested, that is, the hierarchical structure of the data across the club level, multilevel modelling analysis was conducted with four models being specified: fixed intercept-only model, random intercept-only model, fixed slope and random slope model (Table III). This was true for testing the relationship between group cohesion dimensions and self-perceived success of the club outcome, as well as between group cohesion dimensions and team satisfaction outcome.

Table 3  
Fit indices for the multilevel models across club level

	Subjective Success			Team Satisfaction		
	AIC	BIC	loglik	AIC	BIC	loglik
Fixed Intercept-only	704.409	710.5842	-350.2045	708.861	715.0239	-352.4305
Random intercept-only	605.4545	614.7173	-299.7272	689.0693	698.3136	-341.5347
Fixed slope/random intercept	592.7366	611.2621	-290.3683	683.8547	702.3431	-335.9273
Random slope/random intercept	600.4533	646.7672	-285.2266	699.3209	745.542	-334.6604

In the first model, it was shown that intercept was significantly different from zero in both self-perceived success ( $b = 6.19$ ;  $SE = 0.17$ ;  $t = 37.41$ ;  $p < .01$ ) and club satisfaction outcome models ( $b = 6.07$ ;  $SE = 0.17$ ;  $t = 35.57$ ;  $p < .01$ ). This was also true for the two random intercept-only models with self-perceived success ( $b = 6.31$ ;  $SE = 0.57$ ;  $t(153) = 11.15$ ;  $p < .01$ ), that is, team satisfaction ( $b = 6.09$ ;  $SE = 0.35$ ;  $t = 17.18$ ;  $p < .01$ ) outcomes. Furthermore, those models, in comparison to fixed intercept models, were better fitting models, for both the self-perceived success ( $\chi^2(1) = 100.96$ ,  $p < .01$ ) and team satisfaction ( $\chi^2(1) = 21.79$ ,  $p < .01$ ) outcomes. Adding three predictors into the equation within the fixed slope model, while keeping intercept random across the club levels, also yielded better fitting self-perceived success ( $\chi^2(3) = 18.72$ ,  $p < .01$ ), as well as team satisfaction ( $\chi^2(3) = 11.21$ ,  $p < .05$ ) outcome models, in comparison to random intercept-only counterparts. In contrast, allowing for random slopes at the club level, ~~has not improved~~ the fit of random intercept-fixed slopes models [ $\chi^2(9) = 10.28$ ,  $p > .05$ ;  $\chi^2(9) = 2.53$ ,  $p > .05$ ]; for self-perceived success and team satisfaction outcome models, respectively). In short, intercepts varied across participants playing for different clubs regarding the relationship between group cohesion factors and self-perceived success of the club ( $SD = 1.54$ ), that is, group cohesion factors and team satisfaction ( $SD = 0.95$ ). However, the slopes did not vary across club level in the self-perceived success of the club ( $SD = 0.18$ ,  $SD = 0.13$ ,  $SD = 0.13$ ; for ATG, GIS and GIT cohesion factors, respectively), that is, team satisfaction outcome model ( $SD = 0.25$ ,  $SD = 0.00$ ,  $SD = 0.22$ , for ATG, GIS and GIT cohesion factors, respectively). Table IV contains regression coefficients from final fixed slope multilevel models.

As can be seen, only the individual attraction to the group cohesion factor significantly predicted both self-perceived team success and team satisfaction. Those players who felt more inclined to be a part of the group and perceived that on individual level group satisfy their personal concerns also perceived their club as a more successful and were more satisfied with their team. On the other hand, both task and social group integration cohesion factors, that is, perceiving group unity in achieving goals and being close on a broad social plan did not affect subjective success, nor team satisfaction

Table 4  
Fixed slope/random intercept multilevel regression model summaries

	Subjective Success				Team Satisfaction			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
ATG	0.33	0.09	3.59	.000	0.36	0.13	2.85	.005
GIS	-0.06	0.06	-1.04	.300	0.05	0.08	0.55	.581
GIT	0.03	0.07	0.42	.676	-0.06	0.10	-0.54	.589

estimates. Aforementioned (un)significant group cohesion effects, as well as club-level intercept variability in both subjective success and team satisfaction, can also be seen in Figure 3.

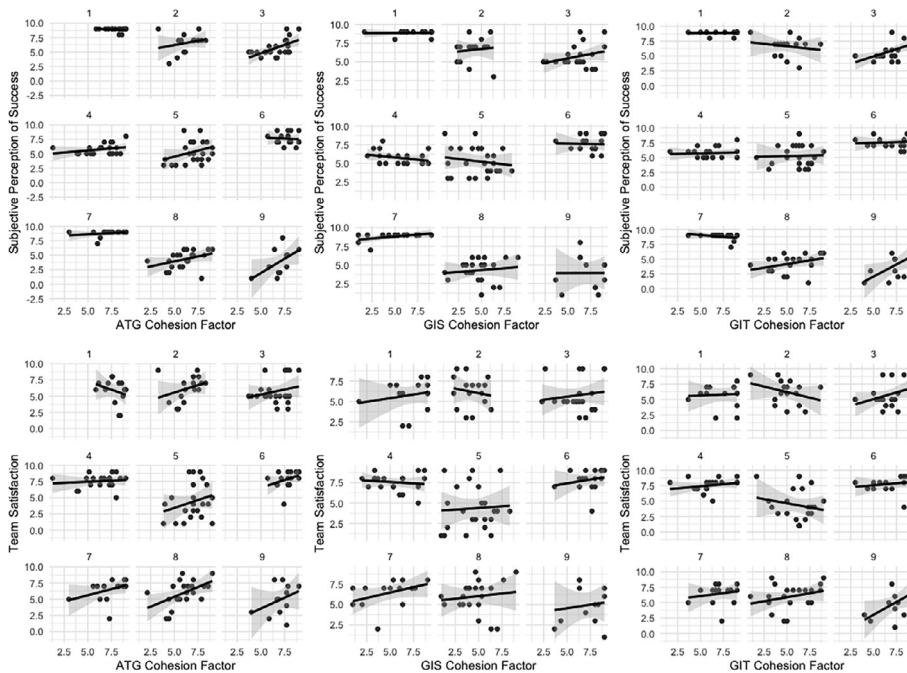


Fig. 3. Relationship between three cohesion factors and self-perceived success of the club/team satisfaction outcomes.

## Discussion and Conclusion

The main purpose of this study was to examine the factor structure and psychometric properties of GEQ in Croatian professional sports context. As the second aim, the relationship between group cohesion factors and perception of team success, as well as team satisfaction in professional football context was examined. Confirmatory factor analysis did not show an acceptable fit of the original four-factor model. This was also true for the first-order one-factor, second-order one-factor, two first-order two-factor (ATG and GI / Task and Social) and two second-order two-factor (ATG and GI / Task and Social) models. However, by removing five items with low factor loadings, the three-factor model has shown to be the best-fitting model. The three fac-

tors found were the Group Integration-Social factor, as athletes' perception of team's togetherness and closeness in regards to social activities, the Group Integration-Task factor as a reflection of one's perception on team's uniqueness and togetherness in accomplishing team tasks, and the Individual Attraction to the Group factor, as an individual member's feelings about personal social interaction with the group and involvement in group tasks. Thus, the results suggest that professional football players in our study distinguish between group integration and individual attraction to the group aspects. Furthermore, they perceive social and task subdimensions within the group integration but not within the individual attraction to the group dimension. More closely, their individual feelings on attraction to the group are not differentiated by the attraction to the task and the attraction to the personal social interaction.

Comparing our results to the adaptations in other languages that included professional football players, we could say that we did not manage to show all cohesion factors in the context of Croatian professional football. One of the reasons why all assumed factors are not distinguished can be found in the explanation of Carron and Brawley (2000). The authors stressed how all cohesion dimensions are not necessarily present in an equally weighted fashion in all types of groups and throughout the stages of group development. This is especially possible if a relatively homogenous sample of groups is tested or if groups are tested at one point in their history, what is the case in our research.

The other reason may be found in the understanding and the wording of the items. Interestingly, two items removed, Items 5 ("Some of my best friends are on this team") and 15 ("Our team would like to spend time together in the offseason") were also the items removed in the GEQ validation in the Italian language with a sample of professional basketball and football players (Steca et al., 2013). As the authors stated, "all players were professional, and they were not part of the team for friendship or other social reasons; these aspects are at the core of Items 5 and 15" (pp. 268). Presumably, the same can be said for the Item 16 ("If members of our team have problems in practice, everyone wants to help them so we can get back together again") which highlight togetherness focused on group tasks. However, in professional team training, it is not possible to practice every particular skill the individual is challenged with, or at least there are not many situations where the team is involved in problem-solving; that is the job of the staff. Professionalism also means striving for high performance and best results, consequently determining the success of each team member, which may in return be a possible reason for the low discriminant validity of Item 14 ("Our team members have conflicting aspirations for the team's perfor-

mance”). Related to that, performance could also be the underlying construct of Item 2 (“I’m not happy with the amount of playing time I get”). The effect of positively worded items found by Eys et al. (2007), also shown as crucial in the validation in Spanish (Leo et al., 2013), posits another source of Item 2 weakness. To elaborate, it is interesting to notice that the validated Italian and Spanish versions resulted in all items oriented in the same way, positively or negatively. Possibly, no need for altering perception in response to the items enabled the participants to perceive correctly the meaning of the items easily and chose the right scale value.

With this modification, the revised questionnaire has shown good discriminative validity with a moderate to slightly higher intercorrelations between cohesion factors. Also, acceptable internal consistency coefficients were shown. Although the original four-factor structure has not been shown, the results allow us to assume the theoretical factors in the specific context of professional sport in Croatia. More specifically, the factor structure, intercorrelations between factors, and the empirical insight into the items’ psychometric properties provide us with the potential factor manifestation and with the evidence of items applicability, as well as the potential construct-relevant rewording in this specific professional context. Positively oriented items in future research is a promising venue for refining and improving the Croatian version of GEQ (Eys et al., 2007; Leo et al., 2015).

The results on the prediction of team satisfaction and team success perception with a group cohesion factors partly confirm the model’s prediction (Carron, 1982; Carron & Eys, 2012). In line with Brawley, Carron, and Widmeyer (1993) finding, Individual Attraction to the Group positively predicted team satisfaction. On the other side, group integration dimensions were shown as insignificant predictors of team satisfaction. ~~In the result explanation,~~ it seems relevant to consider again the professional context where the group is mainly oriented to the relevant tasks, goals and team performance. However, aware of single-item operationalisation drawback we call for caution in making conclusions, as well as for future research to address the cohesion and team satisfaction relationship. The same relationship pattern was shown in the prediction of team success perception. Individual Attraction to the Group positively predicted the perception of team success. In contrast, the Group Integration – Social and Group Integration – Task factors did not predict this subjective team outcome. Construct that dominate in research on the relationship between group cohesion, perceived team success and efficacy is collective efficiency. Significant prediction of subjectively perceived team success is in line with the findings on a close relationship between cohesion and collective efficiency (e.g. Heuze, Raimbault, & Fontayne, 2006; Kozub & McDonnell, 2000; Leo, Gonzalez-Ponce,

Sanchez-Oliva, Amado, & Garcia-Calvo, 2016; Paskevich, Brawley, Dorsch, & Widmeyer 1999, Spink, 1990). Furthermore, it supports the empirical findings on higher importance of task cohesion in perceived collective efficiency in comparison to social cohesion (Boughattas & Kridis, 2017; Kozub & McDonnell, 2000; Leo et al., 2016; Paskevich, 1999; Ramzaninezhad, Keshtan, Shahamat, & Kordshooli, 2009). However, some studies did not show that tendency (e.g. Heuze et al., 2006). Also, ambiguous results exist regarding the relationship between all cohesion factors and collective efficiency (e.g. Heuze et al., 2006; Leo et al., 2016; Ramzaninezhad et al., 2009) suggesting the need for more empirical insights. In such, the limited measure of perceived team success with one item in our research should be enriched with more theoretically based items and questionnaires.

Overall, the study was the first to assess sports team group cohesion in Croatia, adding valuable empirical insights for overall GEQ validation, along with other studies in countries utilising different languages (Heuzé & Fontayne, 2002; Leo et al., 2015; Ntoumanis & Aggelonidis, 2004; Steca et al. 2013). Additionally, as one of the very few studies among professional sports teams (Leo et al., 2015; Ntoumanis & Aggelonidis, 2004; Steca et al., 2013) this study aims to be a valuable building block in understanding group cohesion and psychometric properties of GEQ in professional group sports, which is in line with both authors suggestions (Brawley & Carron; 2003; Carron & Brawley, 2000) and the studies that perceive those empirical steps as a fruitful venue for measuring professional teams' cohesion (e.g. Leo et al., 2015; Ntoumanis & Aggelonidis, 2004).

However, we are well aware that a number of professional athletes included in the sample were smaller in comparison to, for example, Leo et al. (2015), Ntoumanis and Aggelonidis (2004) or Steca et al. (2013) studies, which one could argue as a potential limitation for conducting factor analysis. Nevertheless, the smaller sample size was conditioned by a smaller number of clubs playing in the Croatian First Football League. Future endeavours in this specific sport context should also emphasise different samples throughout several measuring points of the season to test the stability and invariance of the model. Also, more comprehensive operationalisations of team satisfaction, as well as team success and efficiency should be used (e.g. specific performance scales or Collective efficacy questionnaire for sports (Short, Sullivan, & Feltz, 2005))

Thus, high heuristic value of this paper in the context of professional sport in Croatia should be followed by further empirical work. All of that would be of immense importance for practitioners and professionals in the field doing team diagnostics, working on team unity and improving their overall performance.

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