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Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games.

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26

**Abstract**

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The present manuscript extends previous research on the reciprocal relation between team confidence and perceived team performance in two ways. First, we distinguished between two types of team confidence; process-oriented collective efficacy and outcome-oriented team outcome confidence. Second, we assessed both types not only before and after the game, but for the first time also during half-time, thereby providing deeper insight into their dynamic relation with perceived team performance. Two field studies were conducted, each with 10 male soccer teams ( $N = 134$  in Study 1;  $N = 125$  in Study 2). Our findings provide partial support for the reciprocal relation between players' team confidence (both collective efficacy and team outcome confidence) and players' perceptions of the team's performance. Although both types of players' team confidence before the game were not significantly related to perceived team performance in the first half, players' team confidence during half-time was positively related to perceived team performance in the second half. Additionally, our findings consistently demonstrated a relation between perceived team performance and players' subsequent team confidence. Considering that team confidence is a dynamical process, which can be affected by coaches and players, our findings open new avenues to optimize team performance.

*Keywords:* winning confidence, in-game measurements, continuous measurements, team dynamics, sport psychology

## 45 **Introduction**

46 Coaches, players and other team sport enthusiasts often mention team confidence as a  
47 key to success; “What you believe, you can achieve” (Quinn, 2012, p. 90). Research findings  
48 confirmed these on-field perceptions by demonstrating that athletes who were more confident  
49 in their team’s abilities exerted more effort (Greenlees, Graydon, & Maynard, 1999), set more  
50 challenging goals (Silver & Bufanio, 1996), were more resilient when facing adversities  
51 (Morgan, Fletcher, & Sarkar, 2013), and ultimately performed better (Stajkovic, Lee, &  
52 Nyberg, 2009).

53 Although these findings stress the importance of team confidence, the existing  
54 literature is characterized by inconsistencies in the way in which the construct of team  
55 confidence has been conceptualized, operationalized, and measured (Shearer, Holmes, &  
56 Mellalieu, 2009). Overall, two distinct types of team confidence can be identified (Collins &  
57 Parker, 2010; Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014). The first type has  
58 been termed collective efficacy and was originally defined by Bandura (1997, p. 477) as “a  
59 group’s shared belief in its conjoint capability to organize and execute the courses of action  
60 required to produce given levels of attainment”. In other words, collective efficacy comprises  
61 athletes’ confidence in the process of their own team, rather than comparing their own  
62 abilities with those of the opposing team. Consequently, collective efficacy has been  
63 measured as athletes’ confidence in the skills of their team required to accomplish a certain  
64 task (e.g., “I believe that my team will demonstrate a strong work ethic during this game”).

65 In contrast, the second type of team confidence focuses on outperforming the  
66 opponent and comprises athletes’ confidence in their team’s abilities to obtain a certain  
67 outcome (e.g., “I believe that my team will win this game”). Collins and Parker (2010) termed  
68 this construct ‘team outcome efficacy’. In sports, this outcome-oriented confidence in winning  
69 or performing better than the opponent has been termed ‘competitive efficacy’ or

70 ‘comparative efficacy’ (Myers & Feltz, 2007). However, this outcome-oriented measure does  
71 not capture the process-oriented nature of collective efficacy as described by Bandura (1997).  
72 As such, an ‘efficacy’ label seems inappropriate. Moreover, several authors emphasized the  
73 difference between the confidence in outperforming the opponent (i.e., performance  
74 judgments) and outcome expectations (Myers & Feltz, 2007; Myers, Paiement, & Feltz,  
75 2007). Bandura (1997, pp. 22-23) noted that “an outcome is the consequence of a  
76 performance, not the performance itself.” Performance accomplishments can take the form of  
77 letter grades in academia or a final game score in sports. A trophy, praise from the coach, or  
78 self-satisfaction are examples of outcomes that might ensue from a performance  
79 accomplishment (Myers & Feltz, 2007). Given the conceptual differences between efficacy  
80 beliefs and outcome expectations, the outcome-oriented measure of team confidence has  
81 recently been labeled ‘team outcome confidence’ (Fransen, Kleinert, et al., 2014). We adopt  
82 this recent conceptualization in the current research and distinguish between ‘process-oriented  
83 collective efficacy’ on the one hand and ‘outcome-oriented team outcome confidence’ on the  
84 other hand.

85 Although a number of studies have confirmed the reciprocal relation between team  
86 confidence and performance (for a meta-analysis see Stajkovic et al., 2009), the difference  
87 between process- and outcome-oriented team confidence has been disregarded. Moreover, a  
88 number of studies used the outcome-oriented measurement to allegedly assess collective  
89 efficacy (e.g., Chen et al., 2002; Fransen et al., 2012; Spink, 1990; Tasa, Taggar, & Seijts,  
90 2007; Vargas-Tonsing & Bartholomew, 2006). Therefore, the present manuscript will go one  
91 step further by examining the reciprocal relation between performance and both collective  
92 efficacy and team outcome confidence.

93 In order to ground our hypotheses on the existing literature, previous studies had to be  
94 interpreted with regard to the measurements they used to assess the team

95 confidence–performance relation. Based on the distinction described earlier, we classified  
96 previous studies as targeting either collective efficacy or team outcome confidence. First, with  
97 regard to collective efficacy, the literature review revealed inconsistent results regarding its  
98 relation with team performance. Bandura (1997, p. 470) stated: “the higher the sense of  
99 collective efficacy, the better the team’s performance”. A meta-analytic review including  
100 studies, confirmed this statement and revealed that collective efficacy is significantly related  
101 to group performance (Stajkovic et al., 2009). In line with these findings, Keshtan,  
102 Ramzaninezhad, Kordshooli, and Panahi (2010) demonstrated that professional volleyball  
103 teams with high levels of collective efficacy were positioned higher in the ranking than  
104 professional teams with low levels of collective efficacy. In contrast, a study with university  
105 basketball teams revealed no significant relation between a team’s collective efficacy and the  
106 team’s performance, measured by shooting percentage and difference in rebounds taken  
107 (MacLean & Sullivan, 2003). Likewise, Chen et al. (2002) revealed that in more recreational  
108 basketball teams players’ collective efficacy did not predict the team’s performance, assessed  
109 by the season winning percentage and the point difference.

110         Second, with regard to team outcome confidence, the literature consistently revealed a  
111 positive relation with performance. In the experiment of Stanimirovic and Hanrahan (2004),  
112 teams of secondary school students were assigned to either a repeated success or repeated  
113 failure condition. Success and failure were manipulated by having participants compete  
114 against a respectively lower or higher score of an imaginary opponent. The results  
115 demonstrated the positive impact of performance on team outcome confidence; teams in the  
116 repeated success condition reported higher confidence in winning the game than teams  
117 competing in the repeated failure condition. On the other hand, two laboratory studies  
118 revealed that the reversed causal direction also holds since they observed that teams with a  
119 higher team outcome confidence performed better than teams who lost confidence in their

120 winning chances (Chen et al., 2002; Hodges & Carron, 1992). Additionally, field studies in  
121 intercollegiate ice hockey teams delivered further support for the reciprocal relation between  
122 team outcome confidence and team performance, measured by official game statistics (Feltz  
123 & Lirgg, 1998; Myers, Paiement, & Feltz, 2004).

124 Besides the inconsistencies in how team confidence has been assessed, another  
125 shortcoming in the current literature relates to the timing of the measurement. Team  
126 confidence has been conceptualized as a dynamic construct, rather than as a trait-like  
127 characteristic showing strong cross-temporal stability (Myers & Feltz, 2007). In other words,  
128 players' confidence in their team's abilities may change in the course of the game, and these  
129 changes may impact on winning or losing. Therefore, Bandura (1997, p. 67) stated that the  
130 relation between team confidence and performance is revealed most accurately when both  
131 constructs are measured in close temporal proximity.

132 Myers, et al. (2007) tested the importance of this temporal proximity by examining the  
133 relation between team confidence, measured before the game, and three cumulative  
134 performance intervals within ice hockey games. Their results revealed that team confidence  
135 before the game was a significant predictor of team performance at each of the three  
136 performance intervals. However, the magnitude of this relationship did not change  
137 significantly as the temporal proximity between team confidence and performance decreased.  
138 It should be noted though that team confidence was only measured once within the 24 hours  
139 before the game. In the time span between the measurement of team confidence and the  
140 team's performance, intervening experiences may have impacted on the players' confidence  
141 (e.g., a coach's motivational speech or the playing level of the team). As a consequence, it has  
142 been suggested that the best way to minimize this problem is to measure players' team  
143 confidence during performance (Myers & Feltz, 2007).

144           Despite these guidelines and disregarding the dynamic nature of team confidence, the  
145 concept of team confidence has traditionally been measured as a trait concept or, at best,  
146 before or after a game, but not during a game. The only exception is a study by Edmonds,  
147 Tenenbaum, Kamata, and Johnson (2009) in which team confidence was measured at three  
148 time points during an adventure race. Their results partially supported the dynamic view on  
149 the team confidence–performance relation; the higher athletes’ confidence before each  
150 discipline, the better they performed at it. However, because the race consisted of five  
151 different disciplines (i.e., trekking, canoeing, mountain biking, climbing, and orienteering),  
152 the effects of a previous performance on the team’s confidence in successfully accomplishing  
153 a subsequent task were very small. This variety in the disciplines involved in the adventure  
154 race makes it dangerous to generalize the results to sport teams in which players perform a  
155 similar task during the entire game (e.g., soccer).

156           In line with previous recommendations (Bandura, 1997; Myers & Feltz, 2007), the  
157 present research took a first step toward a more dynamic in-game measurement of players’  
158 team confidence. Therefore, we measured players’ team confidence at different time points,  
159 but, in contrast to Edmonds et al. (2009), within the same task (i.e., a soccer game). In Study  
160 1, both types of team confidence (i.e., collective efficacy and team outcome confidence) were  
161 measured before the game and at the start and the end of the half-time break. In this way, we  
162 tried to account for the speech of the coach during half-time, because it has already been  
163 argued that verbal persuasion is one of the most effective methods for coaches to build team  
164 confidence (Fransen et al., 2012; Vargas-Tonsing & Bartholomew, 2006; Vargas-Tonsing,  
165 Myers, & Feltz, 2004). In Study 2, measurements of team confidence after the game were  
166 added, thereby aiming at a deeper insight in the dynamics of the reciprocal relation between  
167 team confidence and team performance.





193 Before the warming-up, players and coaches were informed in detail about when the  
194 different parts of the questionnaire had to be completed. The researcher was present in the  
195 locker room to answer any questions. The APA ethical standards were followed in the  
196 conduct of the study and players could withhold their participation at any time. No rewards  
197 were given for participation in the study. Informed consent was obtained from all participants  
198 and confidentiality was guaranteed.

### 199 **Participants**

200 **Study 1.** Ten soccer teams participated in the present study, including 134 male  
201 players. Seven teams played at U17 regional level (i.e., youth teams playing at regional level  
202 and only including players younger than 17 years old at the start of the season), two teams at  
203 U17 provincial level, and one team at U19 national level. The players were on average 15.9  
204 years old ( $SD = 0.8$ ), had an average soccer experience of 9.5 years ( $SD = 2.4$  years) of which  
205 6.2 years in their current team ( $SD = 3.7$  years). All participants filled out the questionnaires,  
206 once before the game (i.e., before the warming-up) and both at the start and at the end of the  
207 half-time break.

208 **Study 2.** This study also involved 10 teams, containing 125 male players. Seven teams  
209 played at U17 regional level, one team at U21 regional level, and two teams participated in  
210 the regional competition for adults. Participants were on average 17.3 years old ( $SD = 3.6$ ),  
211 played soccer for 10.0 years on average ( $SD = 4.7$ ) of which 7.5 years in their current team  
212 ( $SD = 4.5$ ).

### 213 **Measures**

214 **Team confidence.** In line with previous research (Collins & Parker, 2010; Feltz &  
215 Chase, 1998), Fransen, Kleinert, and colleagues (2014) conceptually distinguished between  
216 outcome-oriented team confidence and process-oriented collective efficacy. We adopted this  
217 conceptualization in our research, and assembled both concepts under the general term ‘team

218 confidence'. Each study assessed both forms of team confidence at three different time points.  
219 Study 1 assessed team confidence (i.e., both collective efficacy and team outcome confidence)  
220 before the warming-up, at the beginning of half-time, and at the end of half-time. Study 2  
221 assessed players' team confidence before the warming-up, at the beginning of half-time, and  
222 after the game. Because there was no break between the warming-up and the start of the  
223 game, the nearest moment at which players' team confidence could be measured was right  
224 before the warming-up. As such, previous recommendations to measure team confidence at  
225 least within 24h prior to the performance were taken into account (Feltz & Lirgg, 2001).

226         For the measurement after the game, each of the items began with the stem "If you  
227 would compete once more against the same team, to what extent do you believe that your  
228 team, during this new game, would ..." The hypothetical situation of playing against the same  
229 opponent was believed to be the most valid measure, because of its similarity with the  
230 previous measures of team confidence before and during the game. If we had measured  
231 players' team confidence after the game with regard to the next game (i.e., competing against  
232 a different opponent), the ranking of that specific opponent could have led to a biased  
233 response.

234         *Collective efficacy.* The Collective Efficacy Questionnaire for Sports (CEQS; Short,  
235 Sullivan, & Feltz, 2005) included five subscales; Ability (e.g., "play more skillfully than the  
236 opponent"), Effort (e.g., "demonstrate a strong work ethic"), Persistence (e.g., "persist when  
237 obstacles are present"), Preparation (e.g., "devise a successful strategy"), and Unity (e.g.,  
238 "keep a positive attitude"). Each of the items began with the stem "To what extent do you  
239 believe that, during the upcoming game period, your team has the abilities to ..." Fransen and  
240 colleagues (2014) conducted an exploratory factor analysis which revealed that the CEQS  
241 consisted of two factors; (1) the Ability subscale of the CEQS, and (2) the other four  
242 subscales of the CEQS (i.e., Effort, Persistence, Preparation, and Unity). This factor analysis

243 demonstrated that the Ability subscale focused on the confidence in outplaying the opponent,  
244 and as such is outcome-oriented, in contrast to the process-oriented nature of collective  
245 efficacy, as originally defined by Bandura (1997). Therefore, in the present research, we will  
246 focus on the subscales of Effort, Persistence, Preparation, and Unity that have been shown to  
247 represent a valid measure of process-oriented collective efficacy (Fransen, Kleinert, et al.,  
248 2014).

249 Both collective efficacy and team outcome confidence were measured at three  
250 different time points in each study. Given the time constraints during half-time, it was not  
251 possible to administer the full CEQS scale. As a consequence, to minimize the impact on the  
252 team and to avoid concentration losses of the players, we only used the item with the highest  
253 factor loading of each of the collective efficacy subscales (i.e., the example items as indicated  
254 earlier). Participants assessed the items on a 7-point scale anchored by -3 (*not at all confident*)  
255 and 3 (*extremely confident*). In the first study we administered the full CEQS scale before the  
256 game as well. Our results revealed a strong correlation ( $r = .93$ ;  $p < .01$ ) between the 16-item  
257 scale (including all items from subscales Effort, Persistence, Preparation, and Unity) and the  
258 4-item scale (including only the highest loading item of each of these four subscales). The 4-  
259 item scale revealed a high internal consistency throughout all measurement points (both in  
260 Study 1 and Study 2, before, during, and after the game), demonstrated by Cronbach's alpha's  
261 ranging from .81 to .91.

262 **Team outcome confidence.** In line with previous guidelines (Fransen, Kleinert, et al.,  
263 2014), players assessed the item "To what extent do you believe that your team will win this  
264 game?" on a 7-point scale anchored by -3 (*not at all confident*) and 3 (*extremely confident*).

265 **Performance.** Previous studies that examined the relation between team confidence  
266 and performance mostly used objective measures such as scoring percentage, number of  
267 turnovers, or game outcome to measure the team's performance (Feltz & Lirgg, 1998; Myers,

268 Paiement, et al., 2004; Watson, Chemers, & Preiser, 2001). However, Raglin and Morgan  
269 (1988) pointed to the advantages of subjective measures of performance. These subjective  
270 measures might be more accurate because they can account for performance indicators that  
271 objective measures such as the game outcome cannot. To measure the team's performance,  
272 we assessed players' subjective perceptions of the team's performance during half-time and  
273 after the game. More specifically, players assessed the item "How well did your team play  
274 during the previous half?" on a 7-point scale anchored by -3 (*very bad*) and 3 (*very well*). By  
275 evaluating players' perceptions of the quality of their team's play, the present measure  
276 focuses on the process, rather than on the outcome.

### 277 **Data Analysis**

278 The obtained data were analyzed with Stata version 13. For both Study 1 and Study 2,  
279 the means, standard deviations, and bivariate correlations among collective efficacy, team  
280 outcome confidence, and team performance measures were calculated. Due to the nesting of  
281 the players within teams, we also calculated for each variable the proportion of variance  
282 attributed to the team level.

283 Subsequently, the hypothesized relations were tested via structural equation modeling  
284 using the maximum likelihood estimation method. The fit of the models was assessed using  
285 the chi-square fit statistic ( $\chi^2$ ), the goodness of fit index (*GFI*), the non-normed fit index  
286 (*NNFI*), and the standardized root mean squared residual (*SRMR*). A non-significant  $\chi^2$   
287 indicates a good fit of the data to the proposed model. Incremental fit indices (*GFI* and *NNFI*)  
288 had to be larger than 0.95. The *SRMR*, an absolute fit index had to be smaller than 0.06 to  
289 accept a good fit (Hu & Bentler, 1999).

290 In addition, the hypothesized structural equation models were analyzed in a multilevel  
291 analysis to test the variance in intercepts and slopes that might be attributed to the nesting of  
292 players within teams. This was done by comparing the likelihood ratios of the fixed model

293 with a  $\chi^2$  estimation when allowing for random intercepts, and a  $\chi^2$  estimation when allowing  
294 for random slopes.

## 295 **Results**

296 Descriptive statistics and correlations among the variables are provided in Table 1 for  
297 both studies. The measurements of players' team confidence before the game, during the  
298 game, and after the game were only moderately correlated, illustrating the dynamic nature of  
299 team confidence and its variation within a single game. This was found for collective efficacy  
300 ( $r = .42$  in Study 1;  $r = .27 - .67$  in Study 2) as well as for team outcome confidence ( $r = .48$   
301 in Study 1;  $r = .36 - .48$  in Study 2). Furthermore, the correlations between process-oriented  
302 collective efficacy and outcome-oriented team outcome confidence before the game (.46 in  
303 Study 1; .49 in Study 2) are clearly lower than the correlations between both constructs during  
304 and after the game (respectively .75 and .82 in Study 1; .67 and .69 in Study 2). In addition, it  
305 is noteworthy that these correlations were only moderately correlated at all three measurement  
306 time-points (i.e., before, during, and after the game), indicating that collective efficacy and  
307 team outcome confidence, although related, are two distinct constructs.

308 When the total variance was partitioned into variance at the team level and into  
309 variance at the individual level, the results revealed that the proportion of variance at the team  
310 level ranged between 20% and 57% in Study 1 and between 8% and 62% in Study 2. For  
311 every variable the likelihood ratios with and without the team-level variance component was  
312 significantly different ( $p < .05$ ). This finding indicates that for all variables the variance  
313 proportion at the team level cannot be disregarded. The team variance proportions are  
314 provided in the first column of Table 2.

315 **Table 1.** Means, standard deviations, and correlations across all measures of team outcome  
 316 confidence (TOC), collective efficacy (CE), and players' perceived team performance for both  
 317 studies.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
<b>Study 1</b>										
1. TOC before the game	2.28	1.11	1	.48**	.52**	.46**	.41**	.47**	-.10	.16
2. TOC start half-time	1.98	1.18		1	.81**	.37**	.75**	.73**	.28**	.39**
3. TOC end half-time	2.02	1.15			1	.31**	.72**	.82**	.23**	.39**
4. CE before the game	1.87	.94				1	.42**	.40**	.06	.18*
5. CE start half-time	2.09	.93					1	.81**	.33**	.41**
6. CE end half-time	2.12	.89						1	.27**	.44**
7. Team performance first half	.74	1.27							1	.40**
8. Team performance second half	1.22	1.36								1
<b>Study 2</b>										
1. TOC before the game	1.72	1.26	1	.36**	.37**	.49**	.32**	.28**	.01	-.13
2. TOC half-time	1.75	1.10		1	.48**	.26**	.67**	.53**	.38**	.01
3. TOC after the game	1.81	1.20			1	.36**	.49**	.69**	.20**	.13
4. CE before the game	1.62	.94				1	.34**	.27**	.15	-.03
5. CE half-time	1.84	.91					1	.67**	.31**	.25**
6. CE after the game	1.79	.97						1	.29**	.34**
7. Team performance first half	.45	1.67							1	.18
8. Team performance second half	.86	1.53								1

318 \*  $p < .05$ ; \*\*  $p < .01$

319

320 **Table 2.** Variance partition coefficients of team outcome confidence (TOC), collective  
 321 efficacy (CE), and players' perceived team performance for both studies.

	Null model	Structural equation model		
	Variance at team level	Explained variance at team level (%)	Explained variance at individual level (%)	Unexplained (residual) variance (%)
<b>Study 1</b>				
TOC before the game	57%*	-	-	-
TOC start half-time	26%*	3%	34%	63%
TOC end half-time	26%*	0%	69%	31%
CE before the game	34%*	-	-	-
CE start half-time	23%*	8%*	25%	67%
CE end half-time	20%*	0%	66%	34%
Performance 1 <sup>st</sup> half	38%*	-	-	-
Performance 2 <sup>nd</sup> half (a)	39%*	23%*	28%	49%
Performance 2 <sup>nd</sup> half (b)	39%*	25%*	26%	49%

**Study 2**

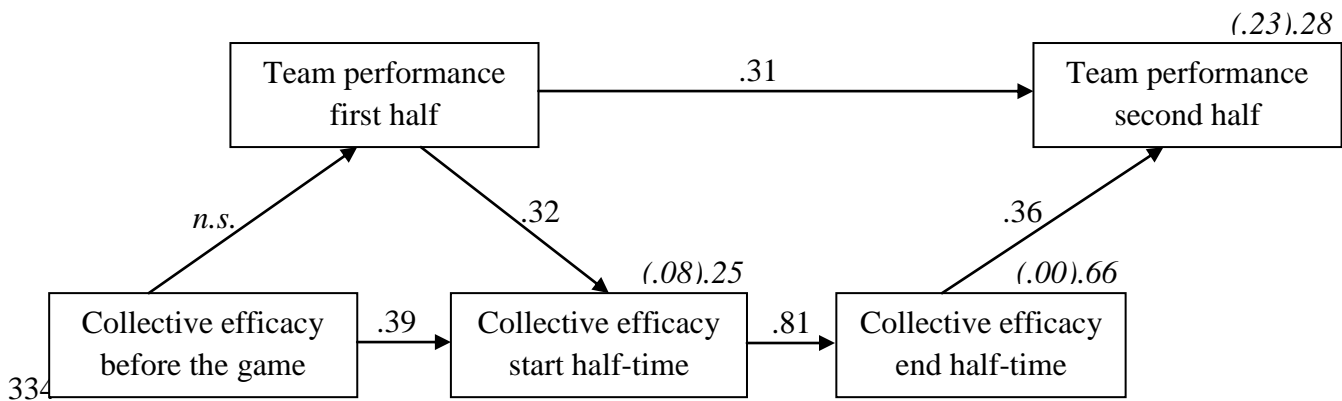
TOC before the game	28% *	-	-	-
TOC half-time	9% *	1%	26%	73%
TOC end of the game	11% *	0%	32%	68%
CE before the game	8% *	-	-	-
CE half-time	9% *	7%	17%	76%
CE end of the game	18% *	0%	48%	52%
Performance 1 <sup>st</sup> half	62% *	-	-	-
Performance 2 <sup>nd</sup> half (a)	59% *	61% *	7%	32%
Performance 2 <sup>nd</sup> half (b)	59% *	62% *	4%	34%

322 \* Team-level variance component adds significantly to the model's likelihood ratio ( $p < .05$ ).

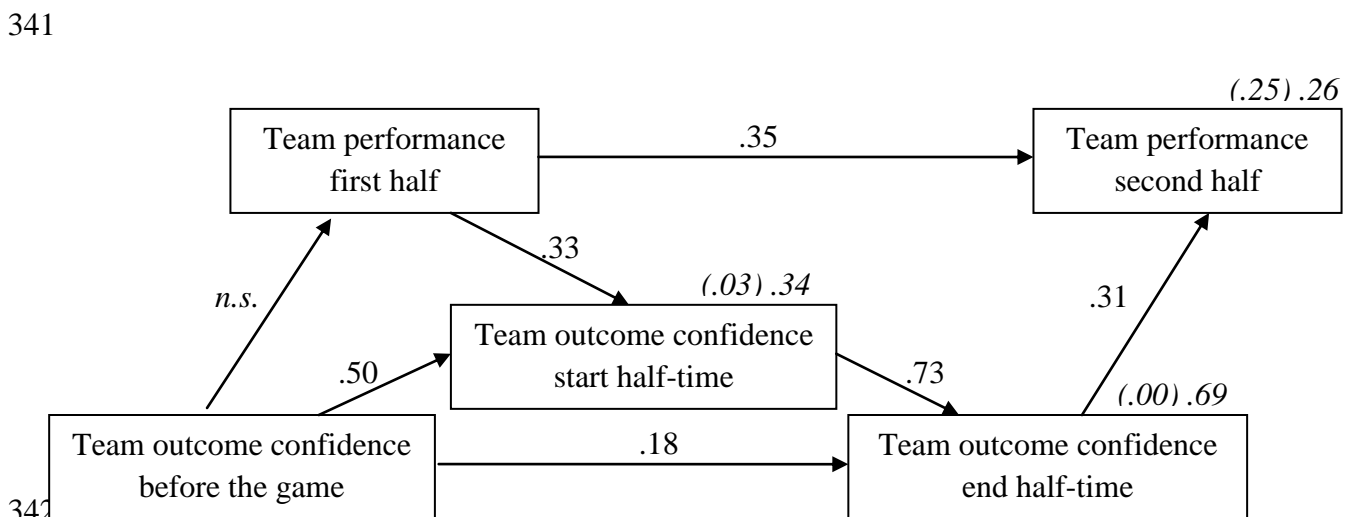
323

324 **Study 1**

325 For Study 1, the hypothesized relations between both types of team confidence (i.e.,  
 326 collective efficacy and team outcome confidence) and the team's perceived performance in  
 327 the first and second half were modeled in a structural equation model, which is shown in  
 328 Figure 1 for collective efficacy and Figure 2 for team outcome confidence. The dotted  
 329 pathways were hypothesized, but failed to show significant regression weights at the  $p < .05$   
 330 level. Additionally, modification indices suggested that subsequent assessments of collective  
 331 efficacy, team outcome confidence, and team performance were also directly predicted by  
 332 their prior measures. These additional suggested pathways were added and both models  
 333 provided evidence of a good fit to our data.



334  
335 **Figure 1.** The structural model of Study 1 for the reciprocal relation between players'  
336 process-oriented collective efficacy and their perceived team performance. All regression  
337 coefficients are standardized, significant ( $p < .001$ ), and presented along the pathways. The  
338 proportion of predicted variance is noted above the predicted variables. The team-level  
339 variance is shown between parentheses. Goodness-of-fit indices are:  $\chi^2(df = 4) = 3.73$ ,  $p =$   
340  $.44$ ,  $CFI = 1.00$ ,  $NNFI = 1.00$ , and  $SRMR = .03$ .



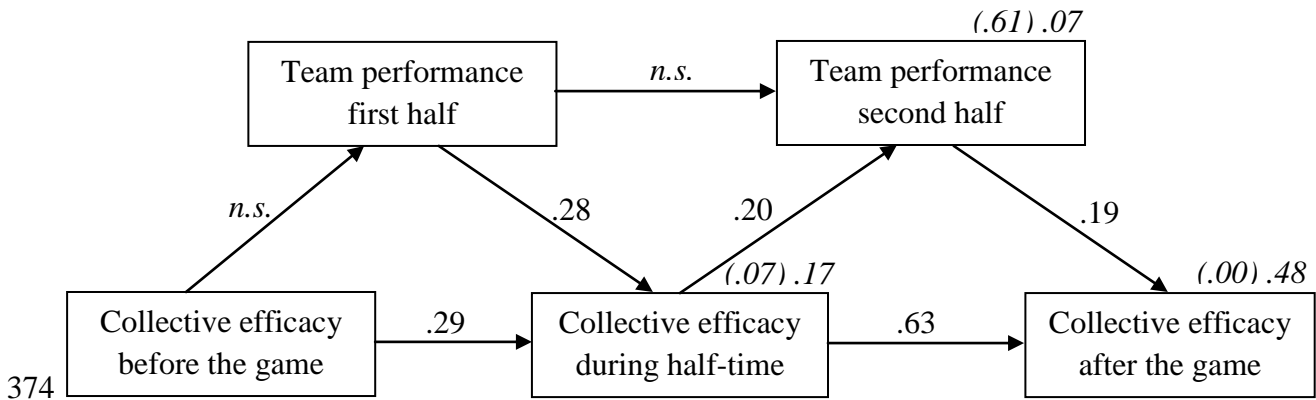
341  
342  
343 **Figure 2.** The structural model of Study 1 for the reciprocal relation between the players'  
344 outcome-oriented team outcome confidence and their perceived team performance. All  
345 regression coefficients are standardized, significant ( $p < .01$ ), and presented along the  
346 pathways. The proportion of predicted variance is noted above the predicted variables. The  
347 team-level variance is shown between parentheses. Goodness-of-fit indices are:  $\chi^2(df = 3) =$   
348  $1.51$ ,  $p = .68$ ,  $CFI = 1.00$ ,  $NNFI = 1.02$ , and  $SRMR = .02$ .



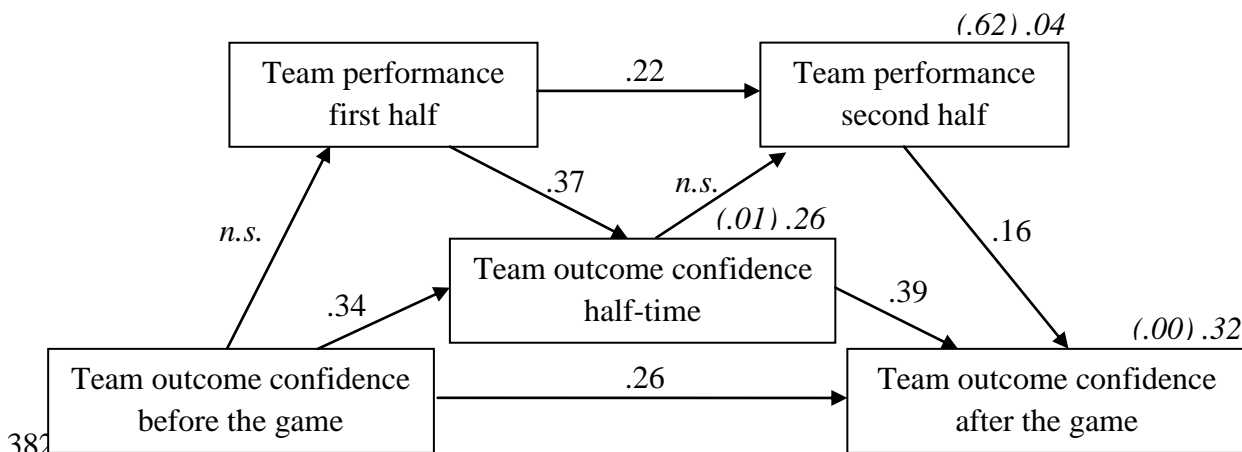
349 Partial support for the reciprocal relations between players' team confidence and  
350 perceptions of the team's performance was found. In contrast to H1, no significant relation  
351 was found between the team's confidence before the game and its performance during the  
352 first half (according to the perceptions of the players), neither for collective efficacy (H1a;  $p =$   
353  $.99$ ), nor for team outcome confidence (H1b;  $p = .46$ ). By contrast, the measures obtained  
354 during games confirmed the reciprocal relation between players' team confidence and the  
355 team's performance; a positive relation was found between the team's confidence at the end  
356 of half-time and the team's perceived performance in the second half (for collective efficacy  
357 (H2a):  $\beta = .36, p < .001$ ; for team outcome confidence (H2b):  $\beta = .31, p < .001$ ). These  
358 findings confirm H2; the more confident the players were in the capacities of their team  
359 during half-time, the better they perceived their performance in the second half. Furthermore,  
360 in line with H3, a positive relation appeared between the team's perceived performance  
361 during the first half and both types of players' confidence at the beginning of half-time (for  
362 collective efficacy (H3a):  $\beta = .32, p < .001$ ; for team outcome confidence (H3b):  $\beta = .33, p <$   
363  $.001$ ). The better the team performed, the more confident the players were (a) in the capacities  
364 of their team to successfully complete the process-oriented tasks and (b) in winning the game.

## 365 **Study 2**

366 Similar to the analysis in Study 1, the reciprocal relations between players' team  
367 confidence and perceived team performance were tested in a structural equation model but  
368 Study 2 included a measurement of team confidence after the game. Again, dotted lines  
369 indicate that the predicted relations were not significant ( $p > .05$ ). As suggested by  
370 modification indices, subsequent measures of the same construct were connected. The  
371 resulting models, including the standardized regression path coefficients and the proportions  
372 explained variance, are shown in Figure 3 for collective efficacy and Figure 4 for team  
373 outcome confidence. Both models showed a good fit to our data.



374  
 375 **Figure 3.** The structural model of Study 2 for the reciprocal relation between the players’  
 376 process-oriented collective efficacy and their perceived team performance. All regression  
 377 coefficients are standardized, significant ( $p < .01$ ), and presented along the pathways. The  
 378 proportion of predicted variance is noted above the predicted variables. The team-level  
 379 variance is shown between parentheses. Goodness-of-fit indices are:  $\chi^2(df = 3) = 4.40$ ,  $p =$   
 380  $.22$ ,  $CFI = .99$ ,  $NNFI = .95$ , and  $SRMR = .04$ .  
 381



382  
 383 **Figure 4.** The structural model of Study 2 for the reciprocal relation between the players’  
 384 outcome-oriented team outcome confidence and their perceived team performance. All  
 385 regression coefficients are standardized, significant ( $p < .05$ ), and presented along the  
 386 pathways. The proportion of predicted variance is noted above the predicted variables. The  
 387 team-level variance is shown between parentheses. Goodness-of-fit indices are:  $\chi^2(df = 2) =$   
 388  $1.12$ ,  $p = .57$ ,  $CFI = 1.00$ ,  $NNFI = 1.06$ , and  $SRMR = .02$ .

389 In contrast to H1, but in line with the findings of Study 1, no significant regression  
390 was found between both forms of players' team confidence before the game and the team's  
391 perceived performance during the first half (for collective efficacy  $p = .22$ ; for team outcome  
392 confidence  $p = .84$ ). Our expectation that the team's confidence during half-time would be a  
393 predictor of the team's perceived performance during the second half (H2) was confirmed for  
394 collective efficacy (H2a;  $\beta = .20, p < .01$ ), but not for team outcome confidence (H2b;  $p =$   
395  $.40$ ). In other words, players' confidence in the game's outcome did not affect the team's  
396 performance in the next half. However, players who were confident during half-time in the  
397 team's abilities to demonstrate a strong work ethic, to persist when encountering difficulties,  
398 to devise a successful strategy, and to keep a positive attitude, perceived their team as  
399 performing better in the second half.

400 In line with H3 and the findings of Study 1, a positive relation existed between the  
401 team's perceived performance during the first half and players' team confidence during half-  
402 time (for collective efficacy (H3a)  $\beta = .28, p < .01$ ; for team outcome confidence (H3b)  $\beta =$   
403  $.37, p < .05$ ). Specifically in Study 2, H4 was confirmed by demonstrating a significant  
404 positive association between the team's perceived performance during the second half and the  
405 players' team confidence after the game (for collective efficacy (H4a)  $\beta = .19, p < .01$ ; for  
406 team outcome confidence (H4b)  $\beta = .16, p < .05$ ). In other words, perceptions of a better team  
407 performance during the previous half went hand in hand with a stronger confidence in the  
408 team's abilities to fulfill the required processes and to win the game.

#### 409 **Multilevel Analysis**

410 Testing the same models in a generalized structural model with random intercepts  
411 across teams revealed a significant proportion of variance at team level (for collective efficacy  
412 in Study 1:  $\Delta\chi^2 (\Delta df = 2) = 22.99, p < .001$ ; for collective efficacy in Study 2:  $\Delta\chi^2 (\Delta df = 2) =$   
413  $89.79, p < .001$ ; for team outcome confidence in Study 1:  $\Delta\chi^2 (\Delta df = 2) = 22.13, p < .001$ ; and

414 for team outcome confidence in Study 2:  $\Delta\chi^2 (\Delta df = 2) = 77.66, p < .001$ ). However, an  
415 intercept by intercept analysis revealed that the initial values of collective efficacy and team  
416 outcome confidence predicted more variance of respective subsequent measures than the  
417 portion of variance at team level. For these measures, the variance at team level decreased as  
418 prior measures were taken into account. Only for the team's performance in the second half,  
419 in both models in both studies, a substantial random team effect remained. The predicted  
420 variances at team and individual level are provided in Table 2.

421 Adding random slope effects to the random intercept models failed to show significant  
422 added variance (all  $p > .05$ ). An exception was found with respect to the pathway from  
423 collective efficacy before the game to collective efficacy during half-time in Study 2 ( $\Delta\chi^2 (\Delta df$   
424  $= 2) = 9.05, p < .05$ ). This random slope effect of .08 did not covary significantly with the  
425 respective random intercept coefficient ( $p > .05$ ) and was the only significant random slope  
426 detected among all regressions in the four models.

## 427 **Discussion**

428 The present research extended previous research in two ways. First, within a field  
429 context, players' team confidence was assessed in a quantitative way, not only before and  
430 after the game, but for the first time also during the game. Our findings highlight the dynamic  
431 nature of team confidence, demonstrated by the variation of players' team confidence within a  
432 single game. This observation contrasts with previous assumptions that team confidence prior  
433 to the competition is relatively stable throughout the competition (Myers et al., 2007). Second,  
434 we conceptually distinguished between process-oriented collective efficacy and outcome-  
435 oriented team outcome confidence and examined their relation with perceived team  
436 performance. Our findings provide partial support for the reciprocal relation between players'  
437 team confidence (including both team outcome confidence and collective efficacy) and  
438 players' perceptions of the team's performance.

439           Neither within Study 1, nor within Study 2, a significant relation emerged between  
440 players' team confidence before the game (both collective efficacy and team outcome  
441 confidence) and the team's perceived performance during the first half (H1). With regard to  
442 the second half of the game (H2), inconsistent results were found for team outcome  
443 confidence; Study 1 revealed that players' team outcome confidence during half-time  
444 positively predicted the perceptions of the team's performance during the second half, but this  
445 was not confirmed by Study 2. Regarding collective efficacy, both studies provided support  
446 for a significant association between players' collective efficacy during half-time and the  
447 team's perceived performance during second half. The abovementioned results thus partially  
448 confirmed Hypotheses 1 and 2 stating that players' team confidence is a significant predictor  
449 of the team's performance in the subsequent half.

450           Having confidence in the team's abilities to successfully perform the required process  
451 (i.e., collective efficacy) was more strongly associated with the team's subsequent  
452 performance perceptions than the confidence in winning the game (i.e., team outcome  
453 confidence). A plausible underpinning of this finding is the concordance between the  
454 measures of team confidence and the way in which performance was measured. As outlined  
455 by Myers, et al. (2007), assessments of team confidence and team performance are concordant  
456 when both tap similar capabilities (e.g., confidence in winning the game and performance  
457 measured by game outcome). The relation between confidence and performance is expected  
458 to be the strongest when the two constructs are not only measured in close temporal  
459 proximity, but when they are also concordant (Bandura, 1997).

460           In our study, the performance was measured by players' subjective perceptions of the  
461 overall team performance. By evaluating players' perceptions of the quality of their team's  
462 play, the present measure focuses on the process, rather than on the outcome. Therefore, it can  
463 be derived that the measure of collective efficacy (representing the confidence in the

464 processes underlying the performance) is more concordant with the performance measure that  
465 we used than is the confidence in winning the game. For example, if a team plays against a  
466 weakly performing opponent, it is likely that players will not base their performance ratings  
467 predominantly on the game outcome, but instead use a process-based evaluation to rate  
468 whether their team has played well.

469         The different findings for the first and second half reflect the inconsistency found in  
470 previous literature. Although some studies demonstrated that team confidence judgments  
471 taken prior to the competition are predictive of team performance throughout the competition  
472 (Chou, Yu, & Chi, 2010; Edmonds et al., 2009; Feltz & Lirgg, 1998; Myers, Paiement, et al.,  
473 2004; Myers et al., 2007), other studies did not find such a link (MacLean & Sullivan, 2003;  
474 Watson et al., 2001). Chen et al. (2002) conducted both a laboratory study and a field study to  
475 test this relation. Although the laboratory study revealed that collective efficacy positively  
476 predicted team performance, this relation was not replicated in the field sample. These  
477 findings are consistent with previous meta-analytic studies on self-efficacy (Stajkovic &  
478 Luthans, 1998), which suggest that efficacy beliefs predict performance more strongly in  
479 laboratory settings than in field settings. A plausible rationale for this finding might reside in  
480 the situational unpredictability of the surrounding circumstances in field studies, compared to  
481 the highly controlled circumstances in laboratory experiments. As Bandura (1997, p. 64)  
482 stated “if one does not know what demands must be fulfilled in a given endeavor, one cannot  
483 accurately judge whether one has the requisite abilities to perform the task.” The fact that the  
484 present research includes two field studies may explain why no significant effect was found  
485 between players’ team confidence before the game and the perceived performance during the  
486 first half.

487         However, it should be considered that players’ team confidence before the game is  
488 based on general impressions (such as the team’s playing level in previous games, the ranking

489 of the opponent, etc.), whereas players' team confidence during half-time is the result of much  
490 more concrete experiences during the game (e.g., present-day playing level of the own team  
491 and of the opponent). This difference might explain why the team confidence–performance  
492 relation was not found for the first half, but did emerge in the second half.

493         Another plausible reason for this discrepancy in the relation between team confidence  
494 and performance relates to the time between the measurements. Previous research (Bandura,  
495 1997; Myers & Feltz, 2007) stated that the relation between team confidence and performance  
496 is revealed most accurately when both constructs are measured in close temporal proximity.  
497 The time lapse between the measurement of team confidence before the game (i.e., before the  
498 warming-up) and the team's perceived performance in the first half allowed for intervening  
499 experiences that may have impacted on the team's confidence, such as the pre-game speech of  
500 the coach, the team appearance of the opponent during the warming-up, or the cheering of the  
501 audience (Ronglan, 2007; Vargas-Tonsing & Bartholomew, 2006). The much smaller time  
502 lapse between half-time and the team's performance during second half may have accounted  
503 for a more accurate measure of players' team confidence during half-time, resulting in a  
504 significant team confidence–performance relation within the game.

505         The second aim of our research was to examine whether previous perceptions of the  
506 team's performance were a significant predictor of players' team confidence. The present  
507 findings provided empirical support for that hypothesis. More specifically, Study 1 and Study  
508 2 demonstrated a significant relation between the perceived team performance during the first  
509 half and both types of players' team confidence during half-time (H3). Furthermore, Study 2  
510 added evidence for a significant relation between the perceived team performance during  
511 second half and both forms of players' team confidence after the game (H4). These results are  
512 consistent with Bandura's theory (1997) that points to prior performance as one of the most  
513 important sources of team confidence. Several studies confirmed this statement and revealed

514 that as teams performed better, the more confident they became concerning the abilities of  
515 their team (Feltz & Lirgg, 1998; Heuze, Raimbault, & Fontayne, 2006; Myers, Paiement, et  
516 al., 2004; Stajkovic et al., 2009; Stanimirovic & Hanrahan, 2004).

517 Although Myers and Feltz (2007) recommended multilevel modeling as the optimal  
518 framework for analyzing collective efficacy data, their meta-analysis demonstrated that  
519 previous studies rarely used a multilevel approach. Submitting meaningfully nested observed  
520 data to multilevel modeling is seen as the most efficient, most unbiased, and most appropriate  
521 way to analyze this type of data (Raudenbush & Bryk, 2002). In contrast to these  
522 recommendations, most researchers have focused on either the individuals within groups or  
523 the group as a whole, but seldom on both (Moritz & Watson, 1998).

524 In the present manuscript, the data of both studies were analyzed by a multilevel  
525 approach. Our findings revealed that the variance of the measured constructs was explained  
526 both at the individual level (i.e., within-team level) and at the team level (i.e., between-team  
527 level). The regression weights between the different constructs did *not* vary at team level,  
528 indicating that the impact of team confidence on perceived performance and vice versa is  
529 similar for every individual player regardless of the team.

530 The variance of players' perceptions of their team's performance was mainly  
531 explained at team level, both for first and second half. With regard to collective efficacy and  
532 team outcome confidence, the variance explained at team level decreased with time; although  
533 a significant part of the variance of both constructs before the game was explained at team  
534 level, during the game the individual perception was the factor that explained most variance.  
535 This finding implies that no team effects emerged during the game (e.g., no impact of a  
536 motivational speech of the coach directed at the whole team).

537 Because collective efficacy was originally considered as a group level construct, many  
538 studies have used an approach that assesses each player's belief in the team's capabilities as a



539 whole and then aggregates these individual measures to the team level (Myers, Feltz, & Short,  
540 2004; Myers, Paiement, et al., 2004). Although Bandura (2000) assumed that this aggregated  
541 collective efficacy estimate is a better predictor of team performance within highly interactive  
542 tasks, the present research suggests that, during the game, the focus should be on the  
543 individual perceptions of team confidence, rather than on the aggregated team perception.

544         When interpreting the present findings, it is worth considering the strengths and  
545 weaknesses of our study approach. A major strength of this research is that for the first time  
546 players' team confidence was assessed not only before and after the game, but also during the  
547 game. This in-game measurement allowed us to capture the dynamic nature of players' team  
548 confidence within the game. Although Myers et al. (2007) assumed that players' team  
549 confidence prior to the competition may be relatively stable during the performance, the  
550 moderate correlations between team confidence before, during, and after the game obtained in  
551 the present studies reveal that team confidence did fluctuate during the game. This finding  
552 emphasizes the need to examine team confidence as a dynamic construct instead of as a trait-  
553 like characteristic with a strong cross-temporal stability.

554         A second strength of the present study is that we conceptually distinguished between  
555 two forms of team confidence in our two studies; process-oriented collective efficacy and  
556 outcome-oriented team outcome confidence. Although most relations were consistent across  
557 both forms, an important difference was demonstrated in Study 2; in contrast to team outcome  
558 confidence, collective efficacy during half-time was shown to be a significant predictor for  
559 the team's performance in the second half. The team's belief in the process (i.e., collective  
560 efficacy) is much more controllable than the team's belief to win (i.e., team outcome  
561 confidence), which is more susceptible to external factors such as the opponent, dubious  
562 referee decisions, or a lucky goal. Given its stronger link with the subsequent team  
563 performance, coaches and athlete leaders should primarily focus on enhancing players'

564 collective efficacy, which in turn may foster the team's outcome confidence (Fransen, Coffee,  
565 Vanbeselaere, Slater, De Cuyper, & Boen, 2014).

566 In addressing the limitations of the present research, several opportunities for future  
567 research emerge. First, although the team's performance was demonstrated to be a significant  
568 predictor of players' team confidence, it should be noted that the production of team  
569 confidence is an interpersonal process, brought about not only by perceptions of previous  
570 performances, but also by persuasive actions of the coach or athlete leaders, by motivational  
571 and tactical communication within the team, and by the enthusiasm expressed by the team  
572 members (Fransen, Coffee, et al., 2014; Fransen et al., 2012; Ronglan, 2007). Future research  
573 may investigate how these behaviors affect players' team confidence within a game and as  
574 such the subsequent team performance.

575 Second, we chose to assess players' subjective perception of the team's performance.  
576 Although Raglin and Moran (1988) pointed to the advantages of these subjective measures of  
577 performance (e.g., more accurate because they can account for performance indicators that  
578 objective measures, such as game outcome, cannot), some limitations should be denoted. Self-  
579 serving bias for example can distort these performance perceptions by the need to maintain  
580 and enhance self-esteem. In this regard, players are more likely to attribute a winning game to  
581 their own abilities (i.e., internal attribution), while blaming a defeat to the circumstances (i.e.,  
582 external attribution). This self-serving bias would involve that the subjective perceptions of  
583 performance represent an overestimation of the actual performance.

584 Although our subjective measures of performance varied between .45 and 1.22 on a  
585 scale from -3 to 3, and as such did not reflect a ceiling effect, examining the in-game relation  
586 between team confidence and both subjective and objective measures of performance might  
587 be a fruitful line for further research. In this regard, objective performance measures should  
588 not only focus on the outcome, but should also include process indicators. Future research

589 could use the recently developed technological devices and mathematical methods to analyze  
590 the performance of soccer players (Clemente, Couceiro, Martins, Mendes, & Figueiredo,  
591 2013; Couceiro, Clemente, Martins, & Tenreiro Machado, 2014). Such performance measures  
592 can capture both technical and tactical performance, indicated by factors such as ball  
593 possession, the covered distance, etc.

594 Third, constrained by practical feasibility, we included only one measurement point  
595 within the game, namely during half-time. Future research may explore the dynamic relation  
596 between team confidence and performance even further by including more measurement  
597 points within the game. Other team sports that are characterized by multiple breaks within a  
598 game, such as volleyball or basketball, might be more appropriate to reach this aim. When  
599 aiming for even more dynamic in-game measurements, using continuous observations instead  
600 of questionnaires to measure team confidence would be an important step forward to capture  
601 the dynamic in-game relation between team confidence and performance (Fransen, Kleinert,  
602 et al., 2014).

603 Fourth, given the time constraints during half-time, it was not possible to administer  
604 the full CEQS scale. Instead, we used the short version of the CEQS, which has lower  
605 psychometric qualities. However, it should be noted that this questionnaire assesses five  
606 specific behaviors that might not capture the key processes underlying the team performance.  
607 Therefore, future research should establish whether the same results are observed when using  
608 a collective measure that includes the most important game competencies specific for a given  
609 sport (e.g., the measures used in Myers, Feltz, et al., 2004; Myers, Paiement, et al., 2004).

610 Fifth, with regard to the participants in our study, we mainly assessed older youth  
611 players. Future research should examine whether our findings can be generalized to other age  
612 groups and other competition levels. With regard to age, it is likely that the team confidence  
613 of mature players is more stable over time. Furthermore, in high-level teams, the team

614 confidence of the different players within a team could be more homogeneous. A plausible  
615 underlying reason for this homogeneity is that in high-level teams the coach is expected to  
616 have a higher impact on the players, thereby influencing the team confidence on the team  
617 level. Furthermore, high-level players spend more training time together in which the  
618 underlying processes for performance are practiced. As such, it is likely that high-level teams  
619 share a common confidence in their abilities to perform these processes successfully. As a  
620 consequence, we expect that more variance of collective efficacy and team outcome  
621 confidence is explained at team level in high-level teams than in low-level teams.

622 In addition, only soccer players participated in our study. Considering that the  
623 outcome in soccer is more unpredictable and susceptible to external factors, such as a lucky  
624 goal or a dubious referee decision, it remains to be determined whether our findings apply to  
625 other sports as well. For instance, in games such as volleyball and basketball, in which the  
626 scoring range is much higher, and as such, the game outcome is more controllable and  
627 represents the playing level of both teams better, future research should examine whether  
628 team confidence relates similarly to performance in these sports as was the case in soccer.

629 Another fruitful line for future research pertains to the stability of players' team  
630 confidence. Although many studies have assessed players' team confidence, the strength of  
631 this confidence, or in other words, the stability of this confidence over time, has only rarely  
632 been measured. However, considerable individual differences might exist regarding the  
633 stability of one's team confidence; some players' team confidence is strong, in the sense that  
634 this confidence is able to resist even the strongest pressures to change (such as being behind  
635 in the game, a teammate's injury, etc.). On the other hand, if a player's team confidence is  
636 unstable and vulnerable to situational pressures, overconfidence at the start of the game might  
637 lead to a collapse (both in confidence and performance) if the team is performing worse than  
638 expected. Therefore, in line with literature on attitudes (Krosnick & Abelson, 1992), further

639 research could include a measure for the strength or stability of team confidence over time,  
640 and investigate the link with performance.

641         There are a number of practical implications that could be considered by coaches,  
642 sport psychologists, and sports teams. First, the only moderate correlations of collective  
643 efficacy before, during, and after the game demonstrate that collective efficacy is amenable to  
644 change. In this regard, it is important to note that the multilevel analyses of the present study  
645 showed that the variance of team confidence during the game is mainly explained at the  
646 individual level. Therefore, coaches should strive to enhance each player's team confidence in  
647 an individualized way. Based on the present findings, such an individual approach is likely to  
648 be more effective than a motivational speech for the whole group.

649         Second, our findings did not demonstrate a significant relation between players' team  
650 confidence before the game and their playing level during first half. In line with the  
651 abovementioned comments on team confidence stability, it might be better for coaches to  
652 strive for a realistic, but stable team confidence before the game, for instance by strengthening  
653 players' confidence in their team's tactical game plan. As such, unrealistic overconfidence at  
654 the start of the game can be avoided, thereby reducing the chances on confidence collapses  
655 during the game if the team's performance falls short. Because our findings suggest that a  
656 players' team confidence during half-time is a positive predictor of the team's performance in  
657 the second half, it seems important for coaches to create a team confidence that is not only  
658 high, but also stable throughout the game.

659         Not only coaches, but also athlete leaders within the team play a key role in enhancing  
660 the team's confidence and preventing downward efficacy-performance spirals (Lindsley,  
661 Brass, & Thomas, 1995). Several studies pointed out that leaders who display confidence are  
662 more likely to enhance collective efficacy among their teammates (Fransen et al., 2012;  
663 Moritz & Watson, 1998; Vargas-Tonsing et al., 2004; Zaccaro, Rittman, & Marks, 2001).

664 Furthermore, verbal persuasion can be used as an effective form to increase players' team  
665 confidence (Vargas-Tonsing et al., 2004). Ronglan (2007) added that team confidence  
666 building might be facilitated if key players use their leader status to affect their teammates'  
667 confidence positively. As such, an important task for coaches is to make their athlete leaders  
668 aware of their potential and responsibility as role models in the team.

669 In conclusion, the current manuscript provided a deeper insight into the dynamics of  
670 the reciprocal relation between team confidence and perceived performance within soccer  
671 games. Given the fact that both process-oriented collective efficacy and team outcome  
672 confidence are dynamic processes that can be controlled by coach and players, the present  
673 findings open new avenues to optimize the team's performance.

674

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