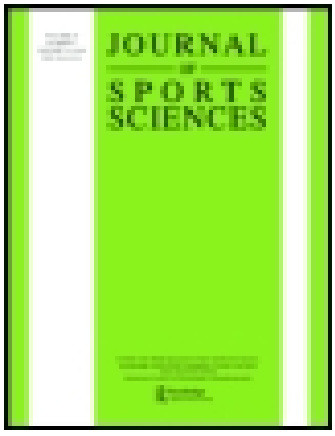


Journal of Sports Sciences
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rjsp20

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

Katrien Fransen[a], Steven Decroos[a], Norbert Vanbeselaere[b], Gert Vande Broek[a], Bert De Cuyper[a], Jari Vanroy[a] & Filip Boen[a]

[a] Department of Kinesiology, KU Leuven, Leuven, Belgium

[b] Center for Social and Cultural Psychology, KU Leuven, Leuven, Belgium

Published online: 05 Aug 2014.

To cite this article: Katrien Fransen, Steven Decroos, Norbert Vanbeselaere, Gert Vande Broek, Bert De Cuyper, Jari Vanroy & Filip Boen (2014): Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games, Journal of Sports Sciences, DOI: 10.1080/02640414.2014.942689

To link to this article: http://dx.doi.org/10.1080/02640414.2014.942689

*Journal of Sports Sciences*, 2014
http://dx.doi.org/10.1080/02640414.2014.942689



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

KATRIEN FRANSEN[1], STEVEN DECROOS[1], NORBERT VANBESELAERE[2], GERT VANDE BROEK[1], BERT DE CUYPER[1], JARI VANROY[1] & FILIP BOEN[1]

[1]*Department of Kinesiology, KU Leuven, Leuven, Belgium and* [2]*Center for Social and Cultural Psychology, KU Leuven, Leuven, Belgium*

(*Accepted 30 June 2014*)



**Abstract**
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 optimise team performance.

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

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

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

In contrast, the second type of team confidence focuses on outperforming the opponent and comprises athletes' confidence in their team's abilities to obtain a certain outcome (e.g. "I believe that my team will win this game"). Collins and Parker (2010) termed this construct "team outcome efficacy". In sports, this outcome-oriented confidence in winning or performing better than the opponent has been termed "competitive efficacy" or "comparative efficacy" (Myers & Feltz, 2007). However, this outcome-oriented measure does not capture the

Correspondence: Katrien Fransen, Department of Kinesiology, KU Leuven, Leuven, Belgium. E-mail: Katrien.Fransen@faber.kuleuven.be

process-oriented nature of collective efficacy as described by Bandura (1997). As such, an "efficacy" label seems inappropriate. Moreover, several authors emphasised the difference between the confidence in outperforming the opponent (i.e. performance judgments) and outcome expectations (Myers & Feltz, 2007; Myers, Paiement, & Feltz, 2007). Bandura (1997, pp. 22–23) noted that "an outcome is the consequence of a performance, not the performance itself". Performance accomplishments can take the form of letter grades in academia or a final game score in sports. A trophy, praise from the coach or self-satisfaction are examples of outcomes that might ensue from a performance accomplishment (Myers & Feltz, 2007). Given the conceptual differences between efficacy beliefs and outcome expectations, the outcome-oriented measure of team confidence has recently been labelled "team outcome confidence" (Fransen, Kleinert, et al., 2014). We adopt this recent conceptualisation in the current research and distinguish between "process-oriented collective efficacy" on the one hand and "outcome-oriented team outcome confidence" on the other hand.

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

In order to ground our hypotheses on the existing literature, previous studies had to be interpreted with regard to the measurements they used to assess the team confidence—performance relation. Based on the distinction described earlier, we classified previous studies as targeting either collective efficacy or team outcome confidence. First, with regard to collective efficacy, the literature review revealed inconsistent results regarding its relation with team performance. Bandura (1997, p. 470) stated: "the higher the sense of collective efficacy, the better the team's performance". A meta-analytic review including 96 studies confirmed this statement and revealed that collective efficacy is significantly related to group performance (Stajkovic et al., 2009). In line with these findings, Keshtan, Ramzaninezhad, Kordshooli, and Panahi (2010) demonstrated that professional volleyball teams with high levels of collective efficacy were positioned higher in the ranking than professional teams with low levels of collective efficacy. In contrast, a study with university basketball teams revealed no significant relation between a team's collective efficacy and the team's performance, measured by shooting percentage and difference in rebounds taken (MacLean & Sullivan, 2003). Likewise, Chen et al. (2002) revealed that in more recreational basketball teams, players' collective efficacy did not predict the team's performance, assessed by the season winning percentage and the point difference.

Second, with regard to team outcome confidence, the literature consistently revealed a positive relation with performance. In the experiment of Stanimirovic and Hanrahan (2004), teams of secondary school students were assigned to either a repeated success or repeated failure condition. Success and failure were manipulated by having participants compete against a respectively lower or higher score of an imaginary opponent. The results demonstrated the positive impact of performance on team outcome confidence; teams in the repeated success condition reported higher confidence in winning the game than teams competing in the repeated failure condition. On the other hand, two laboratory studies revealed that the reversed causal direction also holds since they observed that teams with a higher team outcome confidence performed better than teams who lost confidence in their winning chances (Chen et al., 2002; Hodges & Carron, 1992). Additionally, field studies in intercollegiate ice hockey teams delivered further support for the reciprocal relation between team outcome confidence and team performance, measured by official game statistics (Feltz & Lirgg, 1998; Myers, Paiement, & Feltz, 2004).

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

Myers et al. (2007) tested the importance of this temporal proximity by examining the relation between team confidence, measured before the game, and three cumulative performance intervals within ice hockey games. Their results revealed that team confidence before the game was a significant predictor of team performance at each of the three performance intervals. However, the magnitude of this relationship did not change significantly as the

temporal proximity between team confidence and performance decreased. It should be noted though that team confidence was only measured once within the 24 h before the game. In the time span between the measurement of team confidence and the team's performance, intervening experiences may have impacted on the players' confidence (e.g. a coach's motivational speech or the playing level of the team). As a consequence, it has been suggested that the best way to minimise this problem is to measure players' team confidence during performance (Myers & Feltz, 2007).

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

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

Although previous work on the relation between team confidence and team performance revealed inconsistent results, most studies demonstrated a positive reciprocal relation between both constructs; the more confident players were, the better they performed and vice versa (e.g. Myers, Paiement et al., 2004; Stajkovic et al., 2009). Bandura (1997, p. 67) added that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity. Therefore, we expected our results to demonstrate positive reciprocal relations between both types of team confidence (i.e. (a) collective efficacy and (b) team outcome confidence) and team performance. More specifically, we hypothesised that players' team confidence before the game would be positively correlated with the perceived team performance in the first half (H1a,b). Likewise, we hypothesised players' team confidence during half-time to be positively correlated with the perceived team performance in the second half (H2a,b). On the other hand, we also expected the perceived team performance during the first half to be a significant predictor of players' team confidence during half-time (H3a,b). Finally, we hypothesised the perceived team performance during the second half to be positively correlated with players' team confidence after the game (H4).

## Methods

### *Recruitment*

In Study 1, the coaches of 13 Flemish soccer teams were invited via e-mail to participate in our field study. Ten teams agreed to participate, leading to a response rate of 77%. In Study 2, a similar approach was maintained, resulting in a response rate of 67% and again 10 participating teams. The most frequently cited reason for non-participation was the refusal by the coach to allow measurements before the game or during half-time in order to maintain the concentration of the players. There was no overlap in the samples of Study 1 and Study 2.

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

### *Participants*

*Study 1.* Ten soccer teams participated in the present study, including 134 male players. Seven teams

played at U17 regional level (i.e. youth teams playing at regional level and only including players younger than 17 years old at the start of the season), two teams at U17 provincial level and one team at U19 national level. The players were on average 15.9 years old ($s$ = 0.8) and had an average soccer experience of 9.5 years ($s$ = 2.4) of which 6.2 years in their current team ($s$ = 3.7). All participants filled out the questionnaires, once before the game (i.e. before the warming-up) and both at the start and at the end of the half-time break.

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

### Measures

*Team confidence.* In line with previous research (Collins & Parker, 2010; Feltz & Chase, 1998), Fransen, Kleinert, and colleagues (2014) conceptually distinguished between outcome-oriented team confidence and process-oriented collective efficacy. We adopted this conceptualisation in our research, and assembled both concepts under the general term "team confidence". Each study assessed both forms of team confidence at three different time points. Study 1 assessed team confidence (i.e. both collective efficacy and team outcome confidence) before the warming-up, at the beginning of half-time and at the end of half-time. Study 2 assessed players' team confidence before the warming-up, at the beginning of half-time and after the game. Because there was no break between the warming-up and the start of the game, the nearest moment at which players' team confidence could be measured was right before the warming-up. As such, previous recommendations to measure team confidence at least within 24 h prior to the performance were taken into account (Feltz & Lirgg, 2001).

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

*Collective efficacy.* The Collective Efficacy Questionnaire for Sports (CEQS; Short, Sullivan, & Feltz, 2005) included five subscales: Ability (e.g. "play more skilfully than the opponent"), Effort (e.g. "demonstrate a strong work ethic"), Persistence (e.g. "persist when obstacles are present"), Preparation (e.g. "devise a successful strategy") and Unity (e.g. "keep a positive attitude"). Each of the items began with the stem "To what extent do you believe that, during the upcoming game period, your team has the abilities to …" Fransen, Kleinert, and colleagues (2014) conducted an exploratory factor analysis which revealed that the CEQS consisted of two factors: (1) the Ability subscale of the CEQS and (2) the other four subscales of the CEQS (i.e. Effort, Persistence, Preparation and Unity). This factor analysis demonstrated that the Ability subscale focused on the confidence in outplaying the opponent, and as such is outcome-oriented, in contrast to the process-oriented nature of collective efficacy, as originally defined by Bandura (1997). Therefore, in the present research, we will focus on the subscales of Effort, Persistence, Preparation and Unity that have been shown to represent a valid measure of process-oriented collective efficacy (Fransen, Kleinert, et al., 2014).

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

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

*Performance.* Previous studies that examined the relation between team confidence and performance mostly used objective measures such as scoring percentage, number of turnovers or game outcome to measure the team's performance (Feltz & Lirgg, 1998; Myers, Paiement et al., 2004; Watson, Chemers, & Preiser, 2001). However, Raglin and Morgan (1988) pointed to the advantages of subjective measures of performance. These subjective measures might be more accurate because they can account for performance indicators that objective measures such as the game outcome cannot. To measure the team's performance, we assessed players' subjective perceptions of the team's performance during half-time and after the game. More specifically, players assessed the item "How well did your team play during the previous half?" on a 7-point scale anchored by −3 (*very bad*) and 3 (*very well*). By evaluating players' perceptions of the quality of their team's play, the present measure focuses on the process, rather than on the outcome.

### *Data analysis*

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

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

In addition, the hypothesised structural equation models were analysed in a multilevel analysis to test the variance in intercepts and slopes that might be attributed to the nesting of players within teams. This was done by comparing the likelihood ratios of the fixed model with a $\chi^2$ estimation when allowing for random intercepts, and a $\chi^2$ estimation when allowing for random slopes.

## Results

Descriptive statistics and correlations among the variables are provided in Table I for both studies. The measurements of players' team confidence before the game, during the game and after the game were only moderately correlated, illustrating the dynamic nature of team confidence and its variation within a single game. This was found for collective efficacy ($r$ = .42 in Study 1; $r$ = .27−.67 in Study 2) as well as for team outcome confidence ($r$ = .48 in Study 1; $r$ = .36−.48 in Study 2). Furthermore, the correlations between process-oriented collective efficacy and outcome-oriented team outcome confidence before the game (.46 in

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

| | Variable | *M* | *s* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Study 1** | | | | | | | | | | | |
| 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 |
| **Study 2** | | | | | | | | | | | |
| 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 |

*Note*: *$P$ < .05; **$P$ < .01

Table II. Variance partition coefficients of team outcome confidence (TOC), collective 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 (%) |
| **Study 1** | | | | |
| 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 1st half | 38* | – | – | – |
| Performance 2nd half (a) | 39* | 23* | 28 | 49 |
| Performance 2nd 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 1st half | 62* | – | – | – |
| Performance 2nd half (a) | 59* | 61* | 7 | 32 |
| Performance 2nd half (b) | 59* | 62* | 4 | 34 |

*Note*: *Team-level variance component adds significantly to the model's likelihood ratio ($P < .05$).

Study 1; .49 in Study 2) are clearly lower than the correlations between both constructs during and after the game (respectively .75 and .82 in Study 1; .67 and .69 in Study 2). In addition, it is noteworthy that these correlations were only moderately correlated at all three measurement time points (i.e. before, during, and after the game), indicating that collective efficacy and team outcome confidence, although related, are two distinct constructs.

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

### *Study 1*

For Study 1, the hypothesised relations between both types of team confidence (i.e. collective efficacy and team outcome confidence) and the team's perceived performance in the first and second half were modelled in a structural equation model, which is shown in Figure 1 for collective efficacy and Figure 2 for team outcome confidence. The dotted pathways were hypothesised, but failed to show significant regression weights at the $P < .05$ level. Additionally, modification indices suggested that

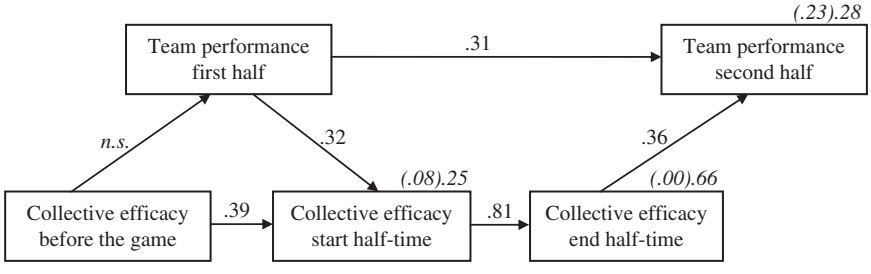


Figure 1. The structural model of Study 1 for the reciprocal relation between players' process-oriented collective efficacy and their perceived team performance. All regression coefficients are standardised, significant ($P < .001$) and presented along the pathways. The proportion of predicted variance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

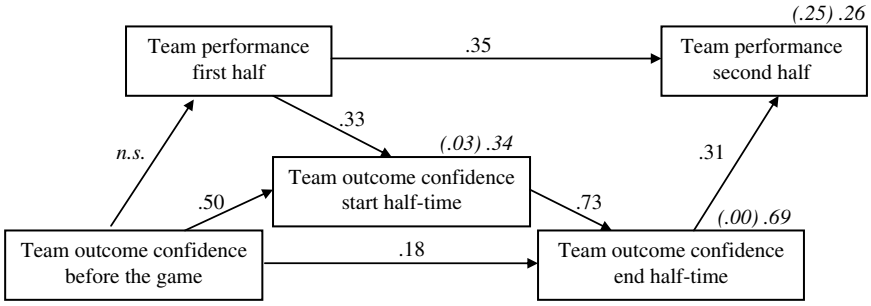


Figure 2. The structural model of Study 1 for the reciprocal relation between the players' outcome-oriented team outcome confidence and their perceived team performance. All regression coefficients are standardised, significant ($P < .01$) and presented along the pathways. The proportion of predicted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

subsequent assessments of collective efficacy, team outcome confidence and team performance were also directly predicted by their prior measures. These additional suggested pathways were added and both models provided evidence of a good fit to our data.

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

## *Study 2*

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

In contrast to H1, but in line with the findings of Study 1, no significant regression was found between

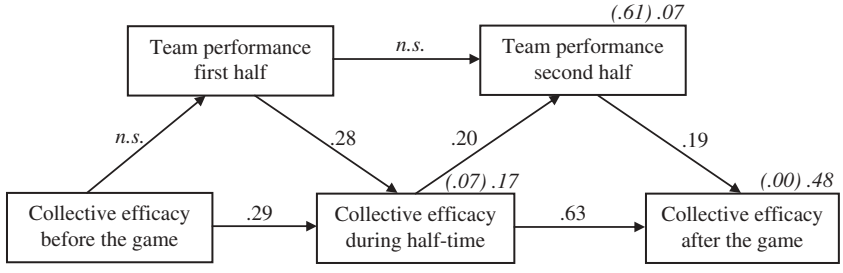


Figure 3. The structural model of Study 2 for the reciprocal relation between the players' process-oriented collective efficacy and their perceived team performance. All regression coefficients are standardised, significant ($P < .01$) and presented along the pathways. The proportion of predicted variance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

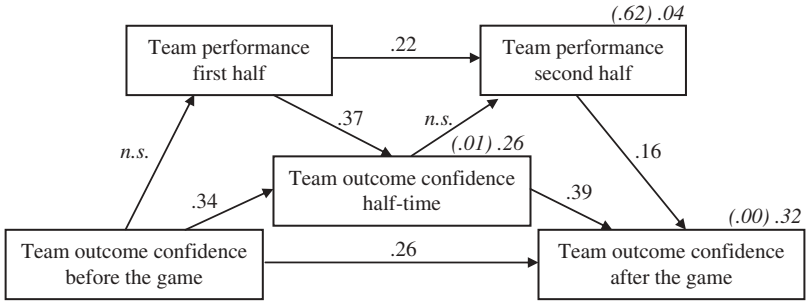


Figure 4. The structural model of Study 2 for the reciprocal relation between the players' outcome-oriented team outcome confidence and their perceived team performance. All regression coefficients are standardised, significant ($P < .05$) and presented along the pathways. The proportion of predicted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



both forms of players' team confidence before the game and the team's perceived performance during the first half (for collective efficacy $P = .22$; for team outcome confidence $P = .84$). Our expectation that the team's confidence during half-time would be a predictor of the team's perceived performance during the second half (H2) was confirmed for collective efficacy (H2a; $\beta = .20$, $P < .01$), but not for team outcome confidence (H2b; $P = .40$). In other words, players' confidence in the game's outcome did not affect the team's performance in the next half. However, players who were confident during half-time in the team's abilities to demonstrate a strong work ethic, to persist when encountering difficulties, to devise a successful strategy and to keep a positive attitude, perceived their team as performing better in the second half.

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

### *Multilevel analysis*

Testing the same models in a generalised structural model with random intercepts across teams revealed a significant proportion of variance at team level (for collective efficacy in Study 1: $\Delta\chi^2$ ($\Delta df = 2$) = 22.99, $P < .001$; for collective efficacy in Study 2: $\Delta\chi^2$ ($\Delta df = 2$) = 89.79, $P < .001$; for team outcome confidence in Study 1: $\Delta\chi^2$ ($\Delta df = 2$) = 22.13, $P < .001$; and for team outcome confidence in Study 2: $\Delta\chi^2$ ($\Delta df = 2$) = 77.66, $P < .001$). However, an intercept by intercept analysis revealed that the initial values of collective efficacy and team outcome confidence predicted more variance of respective subsequent measures than the portion of variance at team level. For these measures, the variance at team level decreased as prior measures were taken into account. Only for the team's performance in the second half, in both models in both studies, a substantial random team effect remained. The predicted variances at team and individual level are provided in Table II.

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

## Discussion

The present research extended previous research in two ways. First, within a field context, players' team confidence was assessed in a quantitative way, not only before and after the game, but for the first time also during the game. Our findings highlight the dynamic nature of team confidence, demonstrated by the variation of players' team confidence within a single game. This observation contrasts with previous assumptions that team confidence prior to the competition is relatively stable throughout the competition (Myers et al., 2007). Second, we conceptually distinguished between process-oriented collective efficacy and outcome-oriented team outcome confidence and examined their relation with

perceived team performance. Our findings provide partial support for the reciprocal relation between players' team confidence (including both team outcome confidence and collective efficacy) and players' perceptions of the team's performance.

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

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

In our study, the performance was measured by players' subjective perceptions of the overall team performance. By evaluating players' perceptions of the quality of their team's play, the present measure focuses on the process, rather than on the outcome. Therefore, it can be derived that the measure of collective efficacy (representing the confidence in the processes underlying the performance) is more concordant with the performance measure that we used than is the confidence in winning the game. For example, if a team plays against a weakly performing opponent, it is likely that players will not base their performance ratings predominantly on the game outcome, but instead use a process-based evaluation to rate whether their team has played well.

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

However, it should be considered that players' team confidence before the game is based on general impressions (such as the team's playing level in previous games, the ranking of the opponent, etc.), whereas players' team confidence during half-time is the result of much more concrete experiences during the game (e.g. present-day playing level of the own team and of the opponent). This difference might explain why the team confidence—performance relation was not found for the first half, but did emerge in the second half.

Another plausible reason for this discrepancy in the relation between team confidence and performance relates to the time between the measurements. Previous research (Bandura, 1997; Myers & Feltz, 2007) stated that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity. The time lapse between the measurement of team confidence before the game (i.e. before the warming-up) and the team's perceived performance in the first half allowed for intervening experiences that may have impacted on the team's confidence, such as the pre-game speech of the coach, the team appearance of the opponent during the warming-up or the cheering of the

audience (Ronglan, 2007; Vargas-Tonsing & Bartholomew, 2006). The much smaller time lapse between half-time and the team's performance during second half may have accounted for a more accurate measure of players' team confidence during half-time, resulting in a significant team confidence–performance relation within the game.

The second aim of our research was to examine whether previous perceptions of the team's performance were a significant predictor of players' team confidence. The present findings provided empirical support for that hypothesis. More specifically, Study 1 and Study 2 demonstrated a significant relation between the perceived team performance during the first half and both types of players' team confidence during half-time (H3). Furthermore, Study 2 added evidence for a significant relation between the perceived team performance during second half and both forms of players' team confidence after the game (H4). These results are consistent with Bandura's theory (1997) that points to prior performance as one of the most important sources of team confidence. Several studies confirmed this statement and revealed that as teams performed better, the more confident they became concerning the abilities of their team (Feltz & Lirgg, 1998; Heuzé, Raimbault, & Fontayne, 2006; Myers, Paiement et al., 2004; Stajkovic et al., 2009; Stanimirovic & Hanrahan, 2004).

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

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

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

Because collective efficacy was originally considered as a group level construct, many studies have used an approach that assesses each player's belief in the team's capabilities as a whole and then aggregates these individual measures to the team level (Myers, Feltz, & Short, 2004; Myers, Paiement et al., 2004). Although Bandura (2000) assumed that this aggregated collective efficacy estimate is a better predictor of team performance within highly interactive tasks, the present research suggests that, during the game, the focus should be on the individual perceptions of team confidence, rather than on the aggregated team perception.

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

A second strength of the present study is that we conceptually distinguished between two forms of team confidence in our two studies: process-oriented collective efficacy and outcome-oriented team outcome confidence. Although most relations were consistent across both forms, an important difference was demonstrated in Study 2; in contrast to team outcome confidence, collective efficacy during half-time was shown to be a significant predictor for the team's performance in the second half. The team's belief in the process (i.e. collective efficacy) is much more controllable than the team's belief to win (i.e. team outcome confidence), which is more susceptible to external factors such as the opponent, dubious referee decisions or a lucky goal. Given its stronger link with the subsequent team performance, coaches and athlete leaders should primarily focus on enhancing players' collective efficacy, which in turn may foster the team's outcome confidence (Fransen, Coffee, Vanbeselaere, Slater, De Cuyper, & Boen, 2014).

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

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

Although our subjective measures of performance varied between .45 and 1.22 on a scale from −3 to 3, and as such did not reflect a ceiling effect, examining the in-game relation between team confidence and both subjective and objective measures of performance might be a fruitful line for further research. In this regard, objective performance measures should not only focus on the outcome, but also include process indicators. Future research could use the recently developed technological devices and mathematical methods to analyse the performance of soccer players (Clemente, Couceiro, Martins, Mendes, & Figueiredo, 2013; Couceiro, Clemente, Martins, & Tenreiro Machado, 2014). Such performance measures can capture both technical and tactical performance, indicated by factors such as ball possession, the covered distance, etc.

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

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

Fifth, with regard to the participants in our study, we mainly assessed older youth players. Future research should examine whether our findings can be generalised to other age groups and other competition levels. With regard to age, it is likely that the team confidence of mature players is more stable over time. Furthermore, in high-level teams, the team confidence of the different players within a team could be more homogeneous. A plausible underlying reason for this homogeneity is that in high-level teams the coach is expected to have a higher impact on the players, thereby influencing the team confidence on the team level. Furthermore, high-level players spend more training time together in which the underlying processes for performance are practiced. As such, it is likely that high-level teams share a common confidence in their abilities to perform these processes successfully. As a consequence, we expect that more variance of collective efficacy and team outcome confidence is explained at team level in high-level teams than in low-level teams.

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

Another fruitful line for future research pertains to the stability of players' team confidence. Although many studies have assessed players' team confidence, the strength of this confidence, or in other

words, the stability of this confidence over time, has only rarely been measured. However, considerable individual differences might exist regarding the stability of one's team confidence; some players' team confidence is strong, in the sense that this confidence is able to resist even the strongest pressures to change (such as being behind in the game, a teammate's injury, etc.). On the other hand, if a player's team confidence is unstable and vulnerable to situational pressures, overconfidence at the start of the game might lead to a collapse (both in confidence and performance) if the team is performing worse than expected. Therefore, in line with the literature on attitudes (Krosnick & Abelson, 1992), further research could include a measure for the strength or stability of team confidence over time, and investigate the link with performance.

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

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

Not only coaches, but also athlete leaders within the team play a key role in enhancing the team's confidence and preventing downward efficacy—performance spirals (Lindsley, Brass, & Thomas, 1995). Several studies pointed out that leaders who display confidence are more likely to enhance collective efficacy among their teammates (Fransen et al., 2012; Moritz & Watson, 1998; Vargas-Tonsing et al., 2004; Zaccaro, Rittman, & Marks, 2001). Furthermore, verbal persuasion can be used as an effective form to increase players' team confidence (Vargas-Tonsing et al., 2004). Ronglan (2007) added that team confidence building might be facilitated if key players use their leader status to affect their teammates' confidence positively. As such, an important task for coaches is to make their athlete leaders aware of their potential and responsibility as role models in the team.

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

## Acknowledgement

We are grateful to Lode Wuyts for his assistance during the data collection.

## Funding

This research was supported by a PhD Fellowship (Aspirant) of the Research Foundation Flanders (FWO), awarded to Katrien Fransen.

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