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# Assessing post-game emotions in soccer teams: The role of distinct emotional dynamics

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## ABSTRACT

This study examined the relationships between team ( $n = 10$ ) and player post-game emotions following two consecutive games. In addition, the relationship between emotional contagion susceptibility and player post-game emotions was assessed. Applying an experience sampling methodology, male amateur and semi-professional soccer players ( $N = 114$ ,  $M_{\text{age}} = 25.46$  years,  $SD = 9.24$ ) completed a sport emotion questionnaire shortly after the conclusion of two competitive games. Participants also completed a dispositional emotional contagion questionnaire prior to post-game data collection. Multilevel regressions revealed that teams' collective post-game emotions were strongly associated with players' post-game emotions, after accounting for within- (e.g. time, game outcome) and between-person (e.g. formal leaders, emotional contagion susceptibility) differences. In addition, partial support was found to indicate that emotional contagion susceptibility was associated with players' post-game emotions. In this context of soccer, the findings suggest that collective emotions following a game are more indicative of individual players' emotions than an individual's general tendency to mimic the emotions of others. From an applied perspective, the findings demonstrate the importance of coaches and players being mindful of the team's emotional climate after a game and the impact it may have on players, especially when that climate is negative.

## Highlights

- We assessed the relationship between soccer team ( $n = 10$ ) and player ( $N = 114$ ) post-game emotions.
- We also assessed how emotional contagion susceptibility was linked to post-game emotions.
- Multilevel regressions revealed that team's collective post-game emotions are more indicative of players' post-game emotions than a player's emotional contagion susceptibility.

## KEYWORDS





Collective emotions; ecological momentary assessment; group-based emotions; multilevel; personality; psychology of soccer

## Introduction

Collective emotional experiences hold important social, relational and performance functions for sport teams (Tamminen et al., 2016). The degree to which teammates converge or differ in their emotional experience within their teams is important to examine since shared emotions can build group understanding about emotional situations, and responses that occur from regular social exchanges. In turn, this can improve team integration, and help to adjust group goals (Rimé, 2009). For these reasons, emotions in sport can not only occur in response to an event (Lazarus, 1991), but they can also occur in response to interaction with others (Tamminen & Bennett, 2017). Emotions that are developed through any process of

interaction between individuals belonging to a team have broadly been referred to as emotional dynamics (Smith & Mackie, 2016). These dynamics outline distinct psychological mechanisms by which emotions can be (a) individually experienced in respect to the groups people identify with (i.e. group-based emotions), (b) shared between group members (i.e. collective emotions), or (c) individually imitated (i.e. emotional contagion).

To date, sport researchers have explored various mechanisms that illustrate how emotional dynamics may occur in teams (e.g. Cotterill, Clarkson, & Fransen, 2020; Moll, Jordet, & Pepping, 2010; Rumbold, Fletcher, & Daniels, 2018; Totterdell, 2000; van Kleef, Cheshin, Koning, & Wolf, 2019; Wergin, Mallett, Mesagno,

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Zimanyi, & Beckmann, 2019; Wolf, Harenberg, Tamminen, & Schmitz, 2018). However, these studies have typically examined distinct psychological mechanisms (e.g. group-based emotions, collective emotions, emotional contagion) in isolation from one another. This approach neglects to consider how different psychological mechanisms may coincide with one another, and how some emotional dynamic mechanisms may be more influential than others in affecting emotions in teams (i.e. group-based emotions). In the current study, we aim to contribute to a more holistic understanding of emotional dynamics in team sports. Using an experience sampling method (ESM; Hektner, Schmidt, & Csikszentmihalyi, 2007), we investigate how two distinct mechanisms of emotional dynamics (i.e. collective emotions, emotional contagion susceptibility) may independently influence players' group-based emotions following competitive soccer matches.

### ***Group-based emotions and collective emotions***

Group-based emotions can be described as individual emotions that occur in response to events, that have perceived relevance for a group in which the person identifies as being a member (Goldenberg, Sagay, & Halperin, 2014). What distinguishes group-based emotions from other individual emotions is that they are experienced merely because of their group membership (Goldenberg, Garcia, Halperin, & Gross, 2020). For example, a soccer player may experience group-based anger when their team loses a competitive game. Intergroup emotions theory suggests that individuals are able to experience emotions as a result of exposure to events that have relevance to their group (Mackie, Devos, & Smith, 2000). In this way, group-based emotions are influenced by the degree of social identity with a group (e.g. a sports team) and appraisals of the event encountered (e.g. a game outcome). In this study, we consider how team-based emotions in soccer may be shaped by collective emotions.

Collective emotions refer to group-based emotions which are shared and felt simultaneously by various individuals within a group. These collective emotions are dependent on a group responding to the same situation in the same way (e.g. collective cheering of a team after a goal is scored). As such, collective emotions differ from group-based emotions since group-based emotions refer to an individual's emotional experience in response to group-related events (e.g. a player cheering after their team has scored a goal), compared to collective emotions that refer to the collective as the entity that experiences the same emotion following the same event (Goldenberg et al., 2014). Social psychology research that has previously examined the relationships

between collective emotions and group-based emotions has followed the belief that these emotional dynamic mechanisms tend to converge, based on social identity theory (Tajfel & Turner, 1986) and appraisal theories of emotion (Lazarus, 1991). When a specific collective emotion is strong, or when the emotional climate is leading a group to share a certain emotion, individuals who identify as part of that group would be more likely to personally experience the same emotion in a group-based form (Goldenberg et al., 2020). This includes recognizing others' emotional expressions, understanding the meaning behind these expressions and then appraising the meaning for oneself (Campos & Sternberg, 1981). In the context of the current study, and in line with previous research that has examined collective and group-based emotions (Goldenberg et al., 2014, 2020), we argue that sport teams' collective emotions and perceptions about their teammates following competitive matches will be strongly linked to individual's group-based emotions in the same predicament.

### ***Emotional contagion***

The tendency of emotional dynamics to influence the similarity of individual emotions within teams has also traditionally been explored under the concept of emotional contagion susceptibility, which is influenced by processes including mimicry and social appraisals (Parkinson, 2020). Emotional contagion has been defined as the "process by which a person or group influences the emotions or behaviour of another person or group through the conscious and unconscious induction of emotion states and behavioural attitudes" (Schoenewolf, 1990, p. 50). Implicit within this definition are the processes by which people recognize the emotional expressions of group members and primitively imitate them through mimicry and afferent feedback (Hatfield, Cacioppo, & Rapson, 1994). According to Hatfield et al. (1994), the expressive cues of others invoke behavioural mimicry that leads to an emotional experience. This process is influenced by individuals' development of automatic mimicry to facial expressions, vocal tones and body language over time as well as feedback from their own expressive cues (Barsade, 2002). In this way, contagion through imitated cues should always be highly linked to group-related emotions. This is because there should be little chance to deviate from what is presumed to be default in view of mimicry serving to promote team unity and social bonds. In light of evidence that suggests that social closeness is linked to ingroup membership (van der Schalk et al., 2011), and produces greater mimicry (Gump & Kulik, 1997), we argue that soccer players' tendency to mimic

the emotions of others will be linked to their own group-related emotions following competitive matches. Soccer provides the ideal context to explore these links, as the identity conforming culture of this sport may mean that players are likely to mimic emotions in a similar way to which they have been found to with behaviour (Newman, Warburton, & Russell, *in press*).

The present study makes a contribution to research on emotional dynamics in sport teams in several ways. Firstly, we examine the relationships between collective emotions, group-based emotions, and emotional contagion susceptibility, where previous studies in sport have examined these interlinked mechanisms in isolation. Secondly, we used an experience sampling method (ESM) to collect post-game emotions immediately following two competitive soccer matches, to provide greater accuracy than can be gained through retrospective recall (Fisher & To, 2012). Thirdly, we controlled for a range of within- (e.g. time, game outcome) and between-person differences (e.g. formal leaders) to provide greater confidence in the convergence between emotion constructs. According to theories of emotion (Lazarus, 1991), individual variability in emotional responses may be due to changes over time and can typically be due to interpreting and responding to an event (e.g. the game outcome) or social interaction (e.g. changing room team dynamics). In addition, recent ESM studies of emotions in team sports have shown that leadership roles are linked to consistent affective responses over time (Rumbold, Fletcher, & Daniels, 2020). Moreover, leaders could demonstrate stronger degrees of group-based emotions than non-leaders in the same team. In testing the abovementioned relationships, we hypothesize the following:

Hypothesis 1. Collective team emotions will be linked to individuals' group-based emotions following competitive games.

Hypothesis 2. Emotional contagion susceptibility will be associated with individuals' group-based emotions following competitive games.

## Materials and methods

### Participants

The participants were 114 male soccer players ( $M_{\text{age}} = 25.46$  years;  $SD = 9.24$ ) who played competitively for amateur ( $n = 61$ , 53.5%) and semi-professional ( $n = 53$ , 46.5%) teams ( $n = 10$ ). On average, players had competed for their soccer clubs for 2.38 years ( $SD = 1.86$ ) and each club was involved in structured league competitions at a regional and national level in the United Kingdom. Of the participant sample, 21 players (18.4%) identified

themselves as being a formal leader (e.g. captain, vice-captain) within their team. Following institutional ethics approval, soccer clubs were contacted with a letter inviting their players to participate in the study. Players were then recruited via managers' request for volunteers from the teams. Each participant was provided with an information sheet which explained the purpose of the study, clarified the anonymity and confidentiality of the data to be collected, and reminded players of their right to withdraw from the study at any time.

### Measures

#### Group-based and collective emotions

Participants' emotions were assessed using the 22-item Sport Emotion Questionnaire (SEQ, Jones, Lane, Bray, Uphill, & Catlin, 2005). To measure group-based emotions after competitive games, participants were asked to indicate how they feel right now after the game in relation to their team. The five subscales were anxiety ( $\alpha = .89$ , 5 items), dejection ( $\alpha = .96$ , 5 items), anger ( $\alpha = .96$ , 4 items), excitement ( $\alpha = .89$ , 4 items) and happiness ( $\alpha = .96$ , 4 items). Each participant's score for each distinct group-based emotion was calculated using the subscale means. To compare each player's group-based score to their team's collective score for each emotion, a team mean score (excluding the teammate whose group-based mean score this was being compared to) was calculated for each of the 10 participating teams. This enabled an assessment of emotion convergence between a player's group-based emotions and the collective emotions of their teammates (Goldenberg et al., 2020).

#### Emotional contagion

Participants' susceptibility to others' emotions was assessed using the 15-item unidimensional Emotional Contagion (EC) scale (Doherty, 1997). Participants were asked to rate the degree to which they would usually respond to the emotional experience of others, using a range of hypothetical scenarios. All items were rated on a 4-point scale (1 = "Never", 4 = "Always"). The EC as a unidimensional construct was found to demonstrate good reliability ( $\alpha = .82$ ).

#### Control variables

A selection of situational control variables were included. Firstly, time (e.g. 0 = "game 1", 1 = "game 2"), and game outcome (e.g. 0 = "no win", 1 = "win") were dummy coded as within-person controls. Secondly, being a formal leader in each team was dummy coded as a between-person control variable (e.g. 0 = "not a leader", 1 = "leader").

## Procedure

Data were collected using hardcopy questionnaires. Participants firstly completed a background questionnaire prior to a competitive game. This questionnaire required participants to provide some demographic (e.g. age, sex) and sporting background information (e.g. competitive standard, length of time playing for their club, identification as a formal leader). During this time, participants also completed the EC questionnaire (Doherty, 1997). Following this, at the end of a competitive game for two consecutive weeks, players completed the SEQ (Jones et al., 2005) in their changing rooms. In line with ESM recommendations where event-contingent designs are employed, the decision to have participants complete the SEQ in their changing rooms following a game was twofold. Firstly, measurement accuracy of a person's emotional response is enhanced and recall bias reduced when measuring emotions as close as possible to the events in which individual and group emotions occur (Hektner et al., 2007). In this context, the stimulus for triggering post-game emotions is the game outcome. Secondly, as we were interested in assessing how post-game collective emotions may affect a player's group-based emotions, it was important for players to view and interpret the verbalized feelings and overt behaviours of their teammates in their natural environment; in this case the team's changing room facility following a competitive soccer match (cf. Csikszentmihalyi & Larson, 1987).

## Data screening and analysis

Data was initially screened for univariate and multivariate outliers in addition to missing data (Tabachnick & Fidell, 2014). Six cases (2.63%) were identified as having univariate outliers and extreme scores were replaced with raw scores that were one unit larger (or

smaller) than the next most extreme score in the distribution. Less than 5% of the data for all variables were missing.<sup>1</sup> All variables were z-score standardized to reduce any potential collinearity between predictor variables, and to create equal scale ranges for the dichotomous and continuous variables.<sup>2</sup> Multilevel regressions were conducted using SPSS with maximum likelihood, and residual scatterplots were examined for normality, linearity, and homoscedasticity. A mixed model was used to estimate the associations between collective and group-based emotions, whilst accounting for within- and between-person controls. An incremental stepwise approach was adopted as follows. Firstly, for each dependent variable, a null model was run to assess the within- and between-group variance and the variance of the intercept. Secondly, within-person dummy control variables (time, game outcome) were entered prior to the inclusion of the independent variable and left in their raw metric form. Collective emotions were then entered as a predictor and centered within cluster (CWC; Enders & Tofighi, 2007). This centering approach was taken to assess how variations from teams' ( $n = 10$ ) collective post-game emotions may link to teammates' group-based emotions. Regression slopes were set to vary as random slopes, however, these were fixed when the slope for the independent variable had non-significant variance components (Raudenbush et al., 2011). Following this, between-person control variables (leader, emotional contagion) were entered. Emotional contagion was grand mean centered at the overall mean of the participant sample to provide meaning to the intercept (Hofmann & Gavin, 1998).

## Results

Table 1 shows the descriptive statistics, reliabilities and correlations for all variables. Table 2 shows the results

**Table 1.** Means, standard deviations, internal consistencies, and correlations.

	<i>M</i>	<i>SD</i>	<i>α</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Anxiety <sup>a</sup>	0.50	0.71	.89	–													
2. Dejection <sup>a</sup>	0.74	1.16	.96	.65	–												
3. Anger <sup>a</sup>	0.85	1.25	.96	.67	.90	–											
4. Excitement <sup>a</sup>	2.25	1.18	.89	–.37	–.59	–.55	–										
5. Happiness <sup>a</sup>	2.54	1.33	.96	–.46	–.65	–.61	.85	–									
6. Collective anxiety	0.51	0.51	–	.52	.64	.62	–.65	–.65	–								
7. Collective dejection	0.74	1.02	–	.53	.59	.57	–.62	–.63	.92	–							
8. Collective anger	0.85	1.03	–	.52	.59	.55	–.57	–.61	.91	.93	–						
9. Collective excitement	2.25	0.95	–	–.52	–.63	–.60	.70	.72	–.80	–.84	–.75	–					
10. Collective happiness	2.54	1.15	–	–.53	–.61	–.59	.70	.73	–.81	–.81	–.77	.94	–				
11. Emotional contagion	2.56	0.41	.82	–.05	–.16	–.14	.28	.28	–.41	–.34	–.34	.21	.21	–			
12. Time	0.50	0.50	–	–.04	–.03	–.08	.07	.05	–.09	.01	.06	.02	.03	.00	–		
13. Win	0.72	0.45	–	–.37	–.52	–.44	.41	.49	–.43	–.48	–.45	.48	.53	.04	.19	–	
14. Leader	0.18	0.38	–	–.05	.00	–.03	.08	.05	–.03	–.03	–.04	.00	.02	.10	–.01	.00	–

Note:  $N = 114$ ;  $N$  of observations = 228,  $r > |.12|$ ,  $p < 0.05$ ,  $r > |.17|$ ,  $p \leq 0.01$ .

<sup>a</sup>Group-based emotions.

**Table 2.** Multilevel regressions of collective emotions and contagion susceptibility on teammate group-based emotions.

	Anxiety			Dejection			Anger			Excitement			Happy		
	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t
Intercept	-0.02	.08	-0.24	-0.02	.05	-0.35	-0.01	.07	-0.11	0.05	.06	0.73	0.06	.06	0.97
<i>Within-person</i>															
‡Time	-0.04	.04	-1.01	-0.02	.02	-1.12	-0.06	.02	-2.52**	0.09	.04	2.20*	0.08	.04	2.10*
§Win	-0.09	.06	-1.42	-0.02	.03	-0.66	-0.01	.04	-0.42	0.05	.06	0.83	0.09	.07	1.23
Collective anxiety	0.54	.13	4.25***												
Collective dejection				0.82	.07	11.32***									
Collective anger							0.75	.09	8.24***						
Collective excitement										0.63	.10	6.64***	0.65	.12	5.57***
Collective happiness															
<i>Between-person</i>															
‡Leader	-0.08	.07	-1.11	-0.01	.05	-0.28	-0.02	.06	-0.37	0.07	.06	1.20	0.06	.05	1.13
§Emotional contagion	0.14	.07	1.87†	0.04	.05	0.83	0.04	.06	0.64	0.15	.06	2.53**	0.13	.05	2.49**
<i>Variance components</i>															
Residual	0.19***	.04		0.03***	.00		0.05***	.01		0.21***	.03		.19***	.03	
Intercept	0.25***	.06		0.15***	.03		0.21***	.05		0.15***	.04		0.11**	.04	
Team emotion	0.14*	.07		0.06**	.02		0.16**	.06		Fixed			Fixed		

Notes: N = 114, number of observations = 228. ‡ = control variables. Figures in the main section of the table are standardized beta regression coefficients. Collective post-game emotions are averaged values per game per team (n = 10).

† p ≤ 0.06, \*p ≤ 0.05, \*\*p ≤ 0.01, \*\*\*p ≤ 0.001.

of the multilevel regression analyses of post-game collective emotions on group-based emotions, whilst accounting for within- and between-person controls. When examining the multilevel regressions for collective anxiety on group-based anxiety, the findings showed that teams' collective anxiety was strongly associated with individual players' group-based anxiety following games ( $B = 0.54, p < 0.001$ ). Collective anxiety and within-person controls accounted for 70% of the within-person variance. These results support hypothesis 1 whilst controlling for time, game outcome, formal leaders within each team, and players' emotional contagion susceptibility to mimic the emotions of others. Regarding the latter, emotional contagion ( $B = 0.14, p < 0.06, \text{Level } 2 R^2 = 26\%$ ) was also marginally related to group-based anxiety following games.

When investigating the relationships between collective dejection and players' group-based dejection, the convergent linkage was very strong ( $B = 0.82, p < 0.001$ ). Collective dejection and within-person controls accounted for 90.50% of the within-person variance in group-based dejection. Counter to hypothesis 2, there was no significant association between emotional contagion susceptibility and a player's group-based dejection ( $\text{Level } 2 R^2 = 14.67\%$ ). When examining the relationship between collective anger and group-based anxiety post games, hypothesis 1 was supported again, such that collective anger was strongly associated with players' group-based anger ( $B = 0.75, p < 0.001$ ). In addition, time was also an inverse predictor of group-based anger ( $B = -0.06, p < 0.01$ ). Collective anger and all within-person controls accounted for 89.19% of the within-person variance in players' group-based anger. Counter to hypothesis 2, there was no significant association between emotional contagion and group-based anger ( $\text{Level } 2 R^2 = -19.41\%$ ).

When examining the relationship between collective excitement and teammate's group-based excitement after games, a strong association was found ( $B = 0.63, p < 0.001$ ). Moreover, time was related to group-based excitement ( $B = 0.09, p < 0.05$ ). Collective excitement and all within-person controls explained 67.47% of the within-person variance. In support of hypothesis 2, emotional contagion susceptibility was strongly associated with players' group-based excitement ( $B = 0.15, p < 0.01, \text{Level } 2 R^2 = 21.38\%$ ). When examining the multilevel regressions for collective happiness on teammate group-based happiness, a similar finding was observed to that for post-game excitement convergence in support of both hypotheses. Collective happiness after games was strongly associated with teammate group-based happiness ( $B = 0.65, p < 0.001$ ). In addition, time was positively related to players' group-based happiness

( $B = 0.08, p < 0.05$ ). Collective happiness and within-person controls explained 76.16% of the within-person variance. In support of hypothesis 2, emotional contagion was strongly associated with players' group-based happiness following games ( $B = 0.13, p < 0.01, \text{Level } 2 R^2 = 90\%$ ).

## Discussion

This study examined the relationships between collective emotions, group-based emotions, and emotional contagion susceptibility. Using ESM to capture collective and individual group-based emotions following two competitive soccer matches, we found strong support for hypothesis 1, whilst controlling for a series of within- and between-person differences. Collective emotions were strongly linked to an individual's group-based emotions (hypothesis 1), which supports the tenets of intergroup emotions theory (Mackie et al., 2000). Team members regularly share the same environments, interdependent tasks and social influences. Because of this, soccer players may tend to converge with their teammates in their interpretations of a situation that they are collectively exposed to (van der Schalk et al., 2011), such as the game outcome. This also supports the notion that people's emotions may depend on the emotions of their teammates with whom they interact and identify with (Totterdell, Wall, Holman, Diamond, & Epitropaki, 2004).

By quantitatively demonstrating support for a high convergence between collective and group-based emotions in soccer teams and their teammates, our findings provide support for a series of limited studies that have examined team emotion linkage in sport in a similar manner. Totterdell (2000) investigated mood linkage among professional cricketers and found that happy moods of individual players were positively related to the team's average level of happiness during a championship match. Our research extends on this study by examining the influence of teams' temporal collective emotions on individuals' temporal group-based emotions, rather than the other way around. In contrast to the Totterdell (2000) study, our findings also demonstrated that the convergence of emotions was in some cases much stronger for negative emotions than positive emotions. One possible explanation is that experiencing specific negative emotions (e.g. dejection, anger) in a changing room following a competitive game may result in a greater likelihood of verbalizing feelings, and presenting behaviours which can then be easily interpreted and subsequently shared by teammates. This is in comparison to experiencing specific positive emotions (e.g. excitement, happiness) that may be less noticeable to detect in a soccer team



environment unless the emotions experienced are intense and explicitly communicated with teammates.

Partial support was found for hypothesis 2, such that emotional contagion susceptibility was significantly related to positive group-based emotions, but not negative emotions for the most part. There are a number of theoretical and practical explanations for this finding. Firstly, mimicry of others' emotions can result in increased prosocial behaviour and liking in teams (Doherty, 1997). In the context of soccer team cultures, players could have learned over time that the display of negative emotions (even with high general tendencies to mimic emotions of others) may have negative consequences for communication, social bonds and team goals. Consistent with findings in professional football (Newman et al., *in press*) this may be the representation of players working within a "community of practice" through adhering to the behavioural norms of emotional expression. While it is acknowledged that the present findings occurred outside of the elite level, they suggest that the subservient culture of professional football "trickles down" to the lower tiers in the sport's hierarchy, such that emotional expression norms around suppressing negatively valenced emotions are maintained (Campo, Mackie, & Sanchez, 2019). Moreover, afferent feedback that individuals may receive from their team over time may highlight a default to mimic others' emotions, only when emotions are positively valenced.

Another potential explanation for the partial support of hypothesis 2 is the current lack of a domain-specific measure of emotional contagion susceptibility. Although soccer players rated how they would usually respond to the emotional experience of others, this was in relation to a series of non-sport hypothetical scenarios. Therefore, it is conceivable that the way a person mimics the emotions of others in other life domains is not necessarily a good predictor of an individual's group-based emotions in sport team contexts. Despite this, this is the first study to our knowledge in sport science that has examined the contribution of two distinct emotional dynamics mechanisms in explaining soccer players' post-game emotions. Our findings for both hypotheses also support the approaches taken by Parkinson (2020) in mainstream psychology literature; controlling for mimicry susceptibility enabled us to demonstrate that post-game emotion linkage between collective and group-based emotions occurred above and beyond an imitated cues mechanism.

### **Strengths and limitations**

In assessing the nature of emotional dynamics in soccer teams, our study makes an original contribution

by assessing interrelated manifestations of emotional dynamics whilst controlling for temporal (e.g. time, game outcome) and contextual (e.g. leadership) sport factors. In this regard, our findings highlight how collective and group-based emotion convergence demonstrate a stronger relationship than that seen between a player's susceptibility to mimic others' emotions and their individual group-based emotions after games. Our findings, therefore, make a progressive contribution in offering recommendations on how emotional dynamics could best be examined in sport in the future; namely, through examination of multiple inter-relating mechanisms. The ESM design adopted is also considered as a strength of the study. Collecting post-game emotions in the team changing room following a competitive game offers high ecological validity that is often difficult to achieve operationally, but enables researchers to accurately capture emotions as close as possible to when they are occurring (Fisher & To, 2012).

A potential limitation was the small number of repeated weekly observations ( $n = 2$ ) for each of the 10 participating teams ( $N = 114$ ). We recommend that future researchers conduct event-contingent ESM designs with a higher number of hourly, daily, or weekly observations of feelings and behaviours, to increase confidence in within-person and within-team variations over time. The generalizability of findings from male amateur and semi-professional soccer clubs to females and other standards of soccer could be challenged. Future research could advance on these findings adopting a similar approach with a greater range of teams and competitive standards.

### **Future research recommendations**

A key consequence of sharing emotions in teams is the development of social affiliation, mutually agreed knowledge, and identity (Martin, Balderson, Hawkins, Wilson, & Bruner, 2017). In this regard, a person's general and developing team identity over time seem to be appropriate variables to examine in potentially explaining the emotion linkage relationship in sport teams, and vice-versa. Secondly, since emotions are considered to arise from how individuals appraise their ongoing transactions with the environment (Lazarus, 1991), future researchers should examine the degree to which post-game collective and group-based emotions in sport teams are mediated by an individual's cognitive appraisal and team appraisal linkage using ESM diary designs. Finally, an important future research consideration is the quantitative examination of emotion convergence between coaches and their

teams. Although some evidence for coach-to-athlete emotion transfer does exist (e.g. Tamminen et al., 2016; van Kleef et al., 2019), research that examines the reverse transfer of emotions is relatively weak (Didymus, Rumbold, & Staff, 2019), and could be predictive of coach burnout symptoms over time. We would suggest that temporal measurements of collective emotions during training or competitions, and coaches' emotions following these events may help to address this research endeavour.

From an applied perspective, the findings suggest that coaches and team members need to be mindful of the team's emotional climate after a game and the impact it may have on players' feelings towards their team, particularly when that climate is negative. Conducting mixed method longitudinal audits of teams throughout the season could help to identify how emotional dynamics processes modify or maintain existing team cultures with respect to how teams regulate their emotions for the benefit of social identity, team unity and collective goals (Rumbold et al., 2018).

## Conclusion

In summary, the present study used experience sampling methodology (ESM) to provide ecologically valid information about distinct but interrelated emotional dynamics mechanisms which explain soccer players' group-based emotions following competitive games. Our findings suggest that collective emotions are a stronger predictor of an individual's group-based emotions following games than an individual's susceptibility to mimic the emotions of their teammates.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Notes

1. This excludes the emotional contagion variable where 30.7% of data was not missing at random. To counter this, we used the maximum likelihood estimator as this method handles missing data adequately even when data are not missing at random (Graham, 2009).
2. When independent and dependent variables comprising dichotomous (e.g. time, win, leader) and continuous variables (e.g. collective and group-based emotions) are converted to standard z-scores, they all become measured on the same scale (−1.00 to 1.00). Moreover, once variances have been standardized, the regression slope is then measured in equal units and subsequently represents the strength of relationship between a predictor and dependent variable. The closer  $\beta$  is to 1.00 or −1.00, the stronger the prediction of the dependent

variable from the independent variable (cf. Tabachnick & Fidell, 2014, p. 1038).

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