

**Relationships between Team-Referent Attributions and Sport Outcomes:  
Moderating Effects of Team Contextual Factors**

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## Thesis Abstract

People's explanations for why team events occur (i.e., team-referent attributions) are instrumental in subsequent cognitive, affective, and behavioural responses. The nature of these relationships is likely dependent on the contexts in which they occur. The purpose of this PhD was to examine the extent to which contextual factors structure the relationships between attributions and sport outcomes. Chapters 1 and 2 provide an introduction and detail three team contextual factors that could structure the relationships between team-referent attributions and sport outcomes. The subsequent three chapters detail empirical investigations examining if these contextual factors moderate team-referent attribution-sport outcome relationships. In Chapter 3 the moderating roles of dispositional team-referent attributions on the relationships between situational team-referent attributions and collective efficacy were examined. Results indicated that adaptive dispositional attributions might buffer against the negative effects of maladaptive situational attributions. In Chapter 4, two studies were used to examine the moderating role of social identity on the relationships between team-referent attributions and sport outcomes. Results indicated that relationships between attributions and collective efficacy vary at different levels of social identity. In Chapter 5, the effect of team-referent attributions and attributional consensus on interpersonal outcomes and performance were examined. Two experiments in which participants were led to believe their teammate agreed or disagreed with their personal team-referent attribution revealed that high attributional consensus led to more positive interpersonal and performance outcomes. Chapter 6 provides a summary and theoretical explanation for the findings, as well as strengths, limitations, and future directions relevant to the research conducted. At a specific

attribution level, the results of this thesis indicate that athletes' teams might help structure the way they think about their attributions. At a broad level, the results of this thesis highlight the importance of considering contextual factors when exploring group level constructs within sport.

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## **Chapter 1. Literature Review**

Attributions are individuals' explanations for why certain events occurred, (Weiner, 1985) and these attributions are strongly associated with cognitive perceptions, affective responses, and behavioural outcomes (Rees, Ingledew, & Hardy, 2005; Weiner, 1985). These relationships have been well established in the domains of general social psychology (Miller & Norman, 1981), and sport psychology (Allen, Jones, & Sheffield, 2009a; Coffee & Rees, 2008a; Le Foll, Rasclé, & Higgins, 2006). Within sport, attributions invariably take place within a social context (Hardy & Jones, 1994; Rees et al., 2005). This is particularly the case for athletes who engage in team sports. That is, when explaining the cause of a collective performance (i.e., team-referent attribution), athletes have no choice but to consider the role of their teammates in the performance. As such, the social context likely has an important role within the process of explaining team performances. This PhD was designed to (1) investigate if the social context can structure the way individuals perceive their team-referent attributions and (2) examine whether consensus over team-referent attributions can influence relational outcomes pertinent to sport.

Within this literature review, principal theories of attributions are discussed. This is followed by a discussion of how group constructs, particularly attributions, can be measured. After defining team-referent attributions, an overview of the evidence for the effects of team-referent attributions on cognitive, affective, and behavioural outcomes is detailed. The literature supporting the potential moderating effects of contextual factors on these relationships is also discussed. Finally, the chapter concludes with a review of the evidence that demonstrates whether consensus over team-referent attributions might affect relational outcomes pertinent to sport.

## **Attribution theories**

Fritz Heider (1944) was one of the first individuals to study attributions when he examined how people have a propensity to ascribe a causal inference to the movement of objects and the behaviour of others. Individuals develop explanations for one's own and others' behaviour as a means of understanding and gaining control over one's environment (Heider, 1958). These attributions can lead individuals to feel more confident in their environment (White, 1959). Heider's work facilitated the development and refinement of attribution theories over the following decades. These theories, which are briefly outlined below, include: Jones and Davis's (1965) Correspondent Inference Theory, Kelley's (1967) Covariation Model, Maier and Seligman's (1976) Learned Helplessness Hypothesis, and Weiner's (1985) Attribution Model of Achievement Motivation. These developments contributed to the formation of Rees, Ingledew, and Hardy's (2005) sport specific attribution theory.

Jones and Davis's (1965) Correspondent Inference Theory extended attribution research by focusing on the correspondence between an individual's action and his/her disposition. High correspondence results when an individual's behaviour is in line with their personal disposition. For example, if an American football player is labelled as an aggressive person, high correspondence will occur when he exhibits aggressive behaviour both on and off the field of play.

Kelley (1967) built off Jones and Davis's work with the Covariation Model. A central component of Kelley's theory is that individual attributions are based on the decision between internal and external causes and the cognitive process in which these decisions are made. Kelley undertook a multidimensional approach theorising that individuals will make judgements on distinctiveness,

consistency, and consensus information when attributing a cause to an outcome. In sport, this means an individual's perception of a poor performance will be determined by the extent to which he/she believes the cause has happened before (distinctiveness), is common across time (consistency), and is common to other athletes (consensus). This process can, in turn, facilitate positive perceptions (Försterling, 1988). For example, to elicit positive perceptions after a team loss, an individual could recall previous good performances (distinctiveness), times his team won (consistency), and acknowledge that other teams lose matches as well (consensus). This more adaptive attribution strategy, compared to a maladaptive attribution strategy, would likely lead to more positive sport outcomes.

While the Covariation Model introduced the dimensional approach to attribution research, this was further developed through the Learned Helplessness Model (Maier & Seligman, 1976). Maier and Seligman theorised that organisms' responses to a stimulus are dependent on perceptions of uncontrollability (Maier & Seligman, 1976). That is, perceptions of uncontrollability regarding a negative event lead to deleterious motivational, cognitive, and emotional effects.

Abramson, Seligman, and Teasdale (1978) expanded upon this by hypothesising the importance of perceptions of stability (is the cause going to continue in the future?), globality (will the cause continue across situations?), and internality (is the cause perceived as internal or external to the perceiver?). That is, when exposed to an uncontrollable event, future outcomes are generally dependent on an individual's attribution to stability, globality, and internality. Thus, individuals who attribute an uncontrollable event to a cause that is stable, global, and internal will experience more negative outcomes than individuals who perceive an event

as unstable, unlikely to continue across future situations, and external to an individual.

Perhaps the most influential contribution to the contemporary study of attributions is Weiner's (1985) Attribution Model of Achievement Motivation. Within this model, Weiner predicted that individuals' responses to events are dependent on their attributions to internal or external factors (locus of causality), factors that are within their control or out with their control (controllability), and whether factors will or will not change over time (stability). Specifically, perceptions of causality are related to affective reactions of pride and self-esteem, perceptions of controllability are related to affective reactions of anger and guilt, and perceptions of stability are related to expectations of future events. Although attributions are not believed to directly impact behaviour, the effects of attributions on emotions and expectancy are believed to result in subsequent behavioural consequences (Weiner, 1985). The indirect effect of attributions on behaviour has been demonstrated within sport psychology studies. That is, changing athletes' attributions after an unsuccessful performance significantly affected subsequent persistence (Le Foll et al., 2006; Le Foll, Rascle, & Higgins, 2008; Rascle et al., 2015) and performance outcomes (Orbach, Singer, & Murphey, 1997). Weiner's (1985) model has facilitated the development of several attribution inventories (Crocker, Eklund, & Graham, 2002; Greenlees, Lane, Thelwell, Holder, & Hobson, 2005; McAuley, Duncan, & Russell, 1992; Russell, 1982) and helped inform Rees, Ingledew, and Hardy's (2005) attribution theory in sport.

Rees and colleagues (2005) built on previous attribution theories by proposing an attribution theory pertinent to sport. Similar to the influence of

uncontrollability within the Learned Helplessness Model, Rees and colleagues proposed that perceptions of controllability should be the main dimension of focus in attribution research. However, the theory diverges from Weiner's model and the Learned Helplessness Model as locus of causality is not directly assessed. Rees and colleagues suggested that locus of causality and controllability share many similar properties (e.g., Crocker et al., 2002). Further, Rees and colleagues noted that while attributing negative events to controllable causes is generally positive, attributing negative events to internal causes can sometimes be maladaptive. Therefore, in line with Anderson and Riger (1991), Rees et al. (2005) emphasised the importance of analysing whether athletes believe the cause of performance is something they can control. Thus, controllability is considered to be the most important attribution dimension.

Moving beyond perceptions of controllability, Rees and colleagues (2005) proposed that perceptions of generalisability have an influential role in the impact of attributions on sport outcomes. Building from Kelley's Covariation Model, that focused on perceptions of consistency, distinctiveness, and consensus, Rees et al. theorised that perceptions of stability (does the cause generalise across time?), globality (does the cause generalise across situations?), and universality (does the cause generalise across people/teams?) are integral in understanding attributions in sport. Therefore, Rees et al.'s theory focusses on athletes' perceptions of controllability after a performance, along with their perception of stability, globality, and universality.

### **Shared group perceptions / team referent variables**

Although attribution research is often focused on self-referent attributions, team-referent attributions may be an important predictor of psychological

outcomes (Allen, Coffee, & Greenlees, 2012; Martin & Carron, 2012). For example, focussing on team-referent attributions offers athletes an opportunity to think more adaptively after a poor individual performance. When an athlete performs poorly, but her team performs well, it is possible that adopting a team-referent attribution may be a source of positive self-esteem. Evidence for this was observed by Greenaway and colleagues (2015) who found that individuals often gain self-esteem through group membership. Thus, after a poor individual performance, shifting focus to group membership, and in turn adopting team-referent attributions, might be a strategy to protect or enhance an athlete's self-esteem. This outlines the importance of examining attributions at the team-level. However, examining team-level constructs is conceptually different from studying individual-level constructs as one individual can make up, at most, only one half of a team. Therefore, there are several strategies that may be employed to measure team-level constructs.

Myers and Feltz (2007) outline four common strategies used to measure team-level construct such as attributions. First, individual group members can be asked to provide a self-referent attribution for their own performance. The responses of all team members can then be subsequently aggregated to produce a collective team attribution. While aggregating self-referent measures can be used to operationalise team attributions, this method actually assesses an individual's perception of him/herself (Arthur Jr, Bell, & Edwards, 2007; Bandura, 2000; Chan, 1998). Thus, an individual can perform well while his/her team perform poorly. Therefore, this strategy would be difficult to employ in the study of attributions at the team level.

A second strategy to measure team constructs is to use each team member as an informant for the team. This would involve asking team members to report what the team believes is the main reason for the team's performance. While this strategy has been used to measure collective efficacy (Paskevich, Brawley, Dorsch, & Widmeyer, 1999), the inherent problem is that a team is a social system and not a living entity that can form its own attributions. Therefore, it is questionable whether team members can act as a reliable informant for the team.

A third strategy for measuring attributions at the team level is to have team members collaboratively discuss and agree upon an attribution for the team's performance. While this method may be effective, it creates the potential for the attribution to be informed by a few persuasive team members and may not actually reflect the true feelings of other teammates (Myers & Feltz, 2007).

Finally, the fourth strategy, and the strategy used within this PhD, is the team-referent approach. This approach involves asking individual team members to provide an attribution for their team's collective performance. The team-referent approach mimics the approach often used within self-referent attribution literature, however the reference is shifted from an individual to the team. This is known as a referent-shift and has been used in the development of attribution measures including the Causal Dimension Scale for Teams (CDS-T; Greenlees et al., 2005) and the Team-Referent Attribution Measure in Sport (TRAMS; Coffee, Greenlees, & Allen, 2015). By employing the team-referent approach, it is an individual's own perception being measured; however, the team is the reference point. For example, within a team, each team member would report their own attribution for the team's collective performance. This approach has been applied

in contemporary sport psychology studies (Allen et al., 2009a; Dithurbide, Sullivan, & Chow, 2009).

The distinction between the third and fourth strategy is synonymous with the distinction between team attributions and team-referent attributions (Allen et al., 2012). That is, team attributions refer to an attribution derived from the collective, while team-referent attributions refer to each athlete's subjective attribution in reference to the team performance. Arthur and colleagues (2007) concluded that the referent shift approach is more appropriate when analysing interdependent groups. Further, using the referent shift approach in the measurement of efficacy was found to be a better predictor of performance among interdependent sport teams (Feltz & Lirgg, 1998; Myers, Feltz, & Short, 2004).

This team-referent approach is used to measure all team level variables within this PhD. Thus, when measuring team level variables, participants are asked their perception in reference to their team. That is, dispositional and situational attributions are measured in reference to team events/performances, while social identity is measured as individuals' subjective perception of their identity with their team. Similarly, collective efficacy is assessed as individuals' perception of their own confidence in their teams' capabilities. Finally, conflict and cohesion is measured as individuals' subjective perceptions of conflict and cohesion within the team.

### **Team-referent attributions**

In line with Rees and colleagues' theory of attributions in sport psychology, team-referent attributions can be categorised into four dimensions (Rees et al., 2005). These dimensions measure the extent to which an individual believes the underlying cause of a team performance is *controllable* (to what

extent is the cause under the team's control or out with the team's control?), *stable* (to what extent is the cause perceived as stable or variable?), *global* (to what extent is the cause perceived to affect a wide or narrow range of situations?), and *universal* (to what extent is the cause perceived as being common to other teams or unique to a team?) (Coffee et al., 2015). Along these dimensions, the way that athletes' explain their team's performance is theorised to influence affective, cognitive, and behavioural outcomes (Allen et al., 2012).

The effects of attributions are often dependent on whether an event or performance was considered successful or unsuccessful. While high levels of controllability are associated with positive outcomes after both successful (Rees, 2007) and unsuccessful (Coffee & Rees, 2009) performances, the effects that high levels of stability, globality, and universality have on efficacy is expected to change after successful and unsuccessful performances. For example, after a successful performance, higher levels of stability were often associated with positive outcomes such as higher levels of efficacy (i.e., confidence) (Coffee et al., 2015; Dithurbide et al., 2009), yet after an unsuccessful performance, a negative relationship, in which higher levels of stability were associated with negative outcomes, was observed (Dithurbide et al., 2009). This same relationships have been observed within the globality dimension: after success, higher levels of globality were correlated with positive outcomes (Coffee & Rees, 2008a), whereas, after failure, higher levels of globality were associated with negative outcomes (Coffee & Rees, 2008b, 2009). Finally, this relationship was reversed for the universality dimension as, after success, higher levels of universality were associated with negative outcomes (Coffee & Rees, 2008a), while after failure, higher levels of universality were associated with positive

outcomes (Coffee & Rees, 2008b). Therefore, after success, higher levels of controllability, stability, globality and lower levels of universality were associated with more positive outcomes and after failure higher levels of controllability and universality, and lower levels of stability and globality were associated with more positive outcomes.

The terminology used to describe attributions that lead to positive outcomes and attributions that lead to negative outcomes has varied over time and discipline. For example, within a performance setting, attributions that generally lead to more positive outcomes have been described on scales from functional to dysfunctional (e.g., Rascle et al., 2015; Rees et al., 2005), optimistic to pessimistic (Carron, Shapcott, & Martin, 2014), and adaptive to maladaptive (e.g., Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010; Rees et al., 2005). For the purpose of simplicity and consistency within this PhD, attributions that are typically associated with positive outcomes are referred to as adaptive, while attributions that are typically associated with negative outcomes are referred to as maladaptive.

### **Outcomes of team-referent attributions**

**Collective efficacy.** Collective efficacy is defined as “a group’s shared belief in its conjoint capabilities to organise and execute the courses of action required to produce given levels of attainments” (Bandura, 1997, p. 477).

Researchers who have adopted Bandura’s definition of efficacy often adopted the team-referent approach in which individuals’ beliefs in their teams’ capabilities were examined (e.g., Myers et al., 2004). This team-referent approach was adopted within this PhD.

Weiner (1985) theorised that individuals' attributions have a direct impact on their expectations of future success. Success expectations and efficacy are similar concepts; however, a key difference is that success expectations are beliefs that a certain behaviour will produce a successful outcome, while efficacy expectations are an individual's belief in his/her ability to execute a behaviour that will produce a successful outcome (Bandura, 1977). Nevertheless, in achievement settings, expectations of success and efficacy are believed to be operationally identical (Kirsch, 1985). Therefore, relationships between attributions and expectations of success are expected to parallel relationships between attributions and efficacy.

Attributions are believed to be applicable within Bandura's (1997) sources of efficacy beliefs. Bandura proposed that efficacy is derived from previous performance accomplishments, vicarious experience, verbal persuasion, and physiological/affective states. While attributions likely share a reciprocal relationship with each of those sources of efficacy, Bandura (1997) highlights the influential power of attributions from previous performance accomplishments. That is, while previous successful performance typically leads to stronger cognitive appraisals of efficacy, individuals' attributions for success or failure can influence these appraisals. For example, the gains in efficacy from success may be limited if an individual attributes the successful performance to a cause that is uncontrollable and unstable. Conversely, gains in efficacy may be enhanced if attributions are made to controllable and stable causes. Thus, theoretically, attributions are believed to share a strong relationship with perceptions of efficacy.

Attribution researchers in sport psychology have demonstrated strong relationships between attributions and expectations of success (Le Foll et al., 2008; Orbach, Singer, & Price, 1999; Rascle, Le Foll, & Higgins, 2008) as well as between attributions and efficacy (Coffee & Rees, 2008a, 2008b; Rees, 2007). Researchers conducting experimental studies have demonstrated a causal link between more adaptive attributions and higher levels of self-efficacy (Coffee, Rees, & Haslam, 2009). This relationship has also been evidenced in applied practice (Parkes & Mallett, 2011). These studies were conducted at the individual level measuring self-efficacy; however, conceptually, collective efficacy is believed to be similar to self-efficacy (Bandura, 1997) and the effects of self-referent attributions on self-efficacy is believed to be similar to the effects of team-referent attributions on collective efficacy (Allen et al., 2012). Further, through cross-sectional studies, researchers have observed an association between team-referent attributions and collective efficacy (Allen et al., 2009a; Coffee et al., 2015; Dithurbide et al., 2009). Thus, while the evidence for the relationship between attributions and efficacy is not as extensive at the team level, team-referent attributions likely have an effect on levels of collective efficacy.

**Emotions.** Through his Attribution Model of Achievement Motivation, Weiner (1985) predicted that emotions are, in part, dependent on attributions. While the outcome of an event often produces general positive or negative emotions, individuals' attributions for the event influence specific emotions that are experienced (Weiner, 1985). For example, after a successful performance, an attribution to luck (i.e., uncontrollable) would elicit feelings of surprise, while an attribution to effort (i.e., controllable) would elicit feelings of serenity. From a dimensional approach, Weiner suggested that feelings of pride and esteem are

elicited from the causality dimension; feelings of anger, gratitude, guilt, and shame arise from the controllability dimension; finally, feelings of hopelessness are developed from perceptions of stability.

Within sport, Rees et al., (2005) suggested that attributions for performance can impact athletes' emotions. The effects of attributions on emotions have been demonstrated through studies on sport performance. For example, modifying athletes' attributions after an unsuccessful sport performance revealed that athletes' who adopted adaptive attributions experienced positive emotions (Orbach et al., 1999). Further, golfers identified anger as lasting for a longer period of time when they attributed a poor performance to a stable cause (Allen, Jones, & Sheffield, 2009b). Thus, in sport, the way in which individuals explain their performances can have an impact on their subsequent positive and negative emotions.

Emotions are also believed to be influenced within a team setting (Allen et al., 2012). Although the relationships between team-referent attributions and emotions are relatively unexplored, one study has demonstrated a modest positive relationship between perceptions of team control and happiness (Allen et al., 2009a). While the effects of team-referent attributions and emotions likely resemble that of self-referent attributions and emotions (Allen et al., 2012), further evidence supporting these relationships is needed.

**Performance.** There is no apparent direct relationship between attributions and behavioural change, however, attributions are believed to influence behaviour indirectly through changes in cognitions and affect (Weiner, 1985). For example, as previously discussed, attributions have been demonstrated to impact perceptions of efficacy; while efficacy has been observed to impact

subsequent performance (Stajkovic, Lee, & Nyberg, 2009; Woodman & Hardy, 2003). Therefore, although attributions are not believed to have any direct effect on performance, through changes in efficacy, athletes may perform better because of their adaptive attributions.

Researchers investigating links between attributions and behavioural outcomes such as performance have generally utilised experimental designs (Le Foll et al., 2008; Rascle et al., 2008). These studies provided evidence that attributional feedback can be an effective method to change both behavioural and non-behavioural outcomes. Specifically, attributions ascribed to uncontrollable and stable factors after failure produced debilitating behavioural outcomes such as less persistence in practice as well as poorer performance (Coffee & Rees, 2011; Rascle et al., 2015). Similarly, manipulating attributions to be more controllable and unstable facilitated better performance (Coffee & Rees, 2011; Orbach et al., 1997). These effects have also been observed in subjects who have an adaptive attributional style compared to those with a maladaptive attributional style (Le Foll et al., 2006). To date, no experimental studies have explored if changing dispositional team-referent attributions will produce behaviour change, however, there is evidence that dispositional team-referent attributions are associated with more successful team performance (Carron et al., 2014).

### **Potential Moderating Variables**

While the consequences of team-referent attributions in sport have been established over the preceding decades, the antecedents of team-referent attributions are less clear. Rees et al., (2005) point to the contextual factors that are likely involved in the attribution process. Allen et al. (2012) expand on this, suggesting that, within teams, individual and group differences, social

relationships, and social exchanges are responsible for predicting team-referent attributions. Yet they also acknowledge that event information is an important influential factor in the development of team-referent attributions. Therefore, while there may be various antecedents to team-referent attributions, they are ultimately a product of an individual's perception of an event. However, this is not to say that contextual factors such as group differences, social relationships, and social exchanges are not important to the team-referent attribution process. Perhaps, instead of predicting team-referent attributions, these contextual factors moderate the effects of team-referent attributions. That is, individuals' perceptions (i.e., team-referent attributions) are structured by team contextual factors. Within this PhD, contextual factors that are believed to moderate this relationship include: dispositional team-referent attributions, social identity, and attributional consensus.

### **Attributional style**

There are two distinct perspectives that have been used to study attributions: the situational response perspective and the dispositional tendency perspective. The situational response perspective refers to an individual's explanation for a specific, time-referenced performance. The dispositional tendency perspective refers to individuals' propensities to explain events in a particular way (Peterson & Seligman, 1984). In other words, individuals have personal characteristics that structure the way they tend to attribute events. The dispositional tendency perspective is often referred to as attributional style.

Attributional style was developed from the Learned Helplessness Hypothesis (Maier & Seligman, 1976) which was developed around the study of depression. Within the Learned Helplessness Hypothesis, individuals with

depression were believed to have dispositions that structure their attributions for negative uncontrollable events to be stable, global, and internal (Abramson et al., 1978). At the other extreme, optimistic individuals would attribute negative uncontrollable events to causes that are stable, global, and external (Seligman, Abramson, Semmel, & von Baeyer, 1979). A key component of this theory was that individuals display tendencies to explain events in certain ways, and these tendencies differed between individuals.

As was the case with situational attributions, the team-referent approach can also be applied to the measurement of attributional style. That is, individuals can have team specific dispositions that structure their attributions for team events (Carron et al., 2014). Within this PhD, these are referred to as dispositional team-referent attributions. While these have previously been referred to as team attributional style (e.g., Shapcott & Carron, 2010), typically, team attributional style is a more general term that encompasses athletes' aggregated perceptions of all attribution dimensions. For example, an individual who has an adaptive attributional style would generally explain positive events with attributions that are controllable, stable, global, and specific to an individual/team. However, it is conceivable that individuals would have an adaptive controllability disposition, and a maladaptive stability disposition. Therefore, within this PhD, individuals' perceptions of each attribution dimension are measured separately, and will be referred to as dispositional attributions.

In sport, dispositional attributions have been studied and measured using Rees and colleague's (2005) attribution theory (e.g., Carron et al., 2014; Shapcott & Carron, 2010). This research has provided evidence that teams with athletes who reported more adaptive dispositional controllability and universality

displayed a better win percentage than teams with athletes who reported more maladaptive dispositions to controllability and universality (Carron et al., 2014). Further, teams with athletes who reported more adaptive dispositional controllability, stability, globality, and universality, also reported greater team cohesion (Shapcott & Carron, 2010). These studies highlight the benefits associated with having adaptive dispositional team-referent attributions.

While the situational response perspective and the dispositional tendency perspective have been studied simultaneously within sport (Le Foll et al., 2006), there has been sparse research on how situational and dispositional attributions work in conjunction with one another. Research on the interaction between situational anxiety responses and dispositional anxiety may provide insight into the attributional processes. That is, Egloff and Hock (2001) demonstrated that the effects of situational anxiety on cognitive processes change dependent on levels of dispositional anxiety. Specifically, individuals who typically reported low dispositional anxiety did not experience the deleterious cognitive effects of high situational anxiety. This apparent buffering effect may exist between situational and dispositional team-referent attributions. For example, a controllable (adaptive) disposition might protect individuals from negative effects of uncontrollable situational attributions. In other words, dispositional team-referent attributions might moderate the effects of situational team referent attributions upon outcomes such as collective efficacy. Researchers in sport have called for further investigation of the interplay between dispositional and situational team-referent attributions (Martinko, Harvey, & Dasborough, 2011; Rascle et al., 2015).

### **Social identity**

Social identity refers to an individual's feelings of belongingness and

emotional attachment to a group (Tajfel, Billig, Bundy, & Flament, 1971). Social identity can be broken down into three separate but related components (Tajfel, 1982). First, individuals need to have a cognitive awareness that they are a part of a group. Second, this knowledge of group membership must also have some value or significance (self-esteem). Finally, individuals who have a social identity with a group will often be emotionally invested with the group (affective commitment). The extent to which individuals perceive this cognitive awareness, gain self-esteem from the group, and are emotionally invested with the group will determine the extent to which they identify with the group. As is the case with situational and dispositional attributions and collective efficacy, a team-referent approach to the measurement of social identity was adopted within this PhD. That is, subjective perceptions of individuals' identity with the team were assessed.

A key component of the social identity approach is the idea that individuals self-categorise themselves as part of a group (self-categorisation). This process sees individuals perceiving themselves less as individuals and more as part of a category (Turner, 1982). In sport, this means individuals will go through a process of de-individualisation, define themselves as a team member, and ultimately influence and be influenced by other teammates (Rees, Haslam, Coffee, & Lavallee, 2015). This process then lays the foundation for group behaviour to exist (Turner, 1982).

The extent to which individuals identify with a group can structure their cognitions and perceptions (Cruwys, South, Greenaway, & Haslam, 2015). For example, social identity can moderate the effects of group membership on individuals' perceptions of others. That is, while group membership generally leads individuals to perceive others as similar to themselves, sharing a high levels

of social identity was seen to strengthen this effect (Hackel, Looser, & Van Bavel, 2014). In other words, individuals' perceptions of others were structured through their social identity. Further, social identity can also structure individuals' perceptions of events. Cruwys et al., (2015) observed that individuals with stronger social identities tended to interpret negative events more favourably than individuals with weaker social identities. These moderating effects of social identity can be explained through self-categorisation theory, as when individuals begin to see themselves through their group memberships, they begin to perceive others and events through a more collective perspective (Turner & Oakes, 1997). This in turn has a positive effect on individuals (Cruwys et al., 2015).

This shift from an individual to a more collective perspective can shape the way people perceive negative personal events. For example, after recalling events in which participants experience high or low levels of control, high levels of social identity prevented individuals from reporting a loss of perceived personal control (Greenaway et al., 2015). Yet this buffering effect was not observed in individuals who had lower levels of social identity. This provides insight into potential interactions between team-referent attributions and social identity. While social identity can impact how individuals perceive personal events, this effect may be stronger when perceiving team events. That is, social identity encourages athletes to view outcomes through a more collective lens; as such, team-referent attributions likely have a stronger impact on those athletes who share a strong social identity with their team.

Interactions between attributions and social identity have not been explicitly tested in a team environment; however, social identity has been demonstrated to shape the way athletes think about attributions (Rees et al., 2013).

Rees and colleagues observed that attributions adopted by athletes were more impactful when communicated by in-group members. That is, individuals who were provided with adaptive attributional feedback from an in-group member performed better compared to those who were provided with the same feedback from an out-group member. This study provided experimental evidence that social identity can impact individuals' responses to certain self-referent attributions. However, the extent to which social identity will moderate perceptions of team-referent attributions is unknown.

### **Attributional consensus**

Attributional consensus refers to the extent that individuals agree (i.e., high attributional consensus) or disagree (i.e., low attributional consensus) over team-referent attributions. As outlined previously, within his Covariation model Kelley (1967) suggests that individuals seek consensus information when attributing events. The process of seeking consensus information likely leads athletes to confer with teammates over their attributions. This, in turn, means athletes may experience agreement or disagreement towards team-referent attributions.

Across a team, when athletes provide team-referent attributions for their team's performance, they are likely to provide explanations that have similar or different underpinning dimensional properties. As an example, one might draw from research on the actor-observer bias/asymmetry, that refers to the tendency for an actor (an individual) to attribute his/her behaviour to unstable causes, while observers (others) may tend to explain the same behaviour to more stable causes (Jones & Nisbett, 1971; Saulnier & Perlman, 1981). The concept underpinning the actor-observer asymmetry is that attributions are, to some extent, a product of

personal perspectives. Therefore, individuals (i.e., teammates) may experience high or low consensus over their attribution.

From previous sections, it is evident that team-referent attributions can affect collective efficacy, and in extension performance. That is, adaptive team-referent attributions can have a positive effect on collective efficacy (Coffee et al., 2015) and higher levels of collective efficacy often predicts better performance (Stajkovic et al., 2009). Thus, team-referent attributions likely have an indirect effect on performance, however, in a team environment, teammates may structure these effects. For example, individuals might perceive their attribution differently when they learn a teammate agrees or disagrees with their attribution.

Consequently, attributional consensus may structure the effects that team-referent attributions have on performance.

### **Main effects of attributional consensus**

While attribution consensus may moderate the effects of team-referent attributions, it also likely has implications on important relational outcomes in sport. In the study of team-referent attributions, the potential facilitative or debilitating effects of attributional consensus have not been explored. There is, however, indirect evidence outside of the attribution literature to suggest low consensus among team members likely has negative interpersonal consequences. Researchers have observed that disagreement within teams was a source of intra-group conflict (Barki & Hartwick, 2004) and facilitated negative interpersonal outcomes (van Woerkom & Sanders, 2010). Within sport teams, disagreement between team members was associated with interpersonal issues (Paradis, Carron, & Martin, 2014a). As such, low consensus among teammates over team-referent

attributions may lead to increased levels of conflict, lower levels of cohesion, and lower levels of social identity.

**Conflict.** Conflict occurs between two or more individuals, yet it can be measured through individuals' subjective perceptions (i.e., team-referent conflict). Disagreement and conflict can often be perceived as synonymous (Jehn, 1995), however, Barki and Hartwick (2004) believe that disagreement is a precursor to conflict, and in order to experience conflict individuals must also experience negative emotions, and interference with goal attainment (Paradis, Carron, & Martin, 2014b). Therefore, those who experience low attributional consensus, and thus, disagreement, may also experience higher levels of intra-team conflict. Researchers examining intra-team conflict in sport have demonstrated a negative relationship between perceptions of conflict and cohesion (Paradis et al., 2014b), thus, intra-group conflict may also coincide with reductions in cohesion.

**Cohesion.** Cohesion has been studied extensively within sport psychology and is defined as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (Carron, Brawley, & Widmeyer, 1998, p. 213). Typically, cohesion is measured as individuals' subjective perception of team cohesion (e.g., Carron, Widmeyer, & Brawley, 1985; Eys, Loughhead, Bray, & Carron, 2009). As such, this team-referent approach to the measurement of cohesion was adopted within this PhD. Within sport, researchers have demonstrated a positive relationship between intra-team agreement and team cohesion (Carron et al., 2003). Therefore, those who experience high attributional consensus, and thus, agreement, may also report higher levels of cohesion. In terms of team-referent attributions, the relationships

between attributional consensus and cohesion are likely reciprocal in nature and may mimic the relationships between attributional consensus and social identity.

**Social identity.** Postmes, Haslam, and Swaab (2005), explain that social identity can inform group processes (top down) and be informed by group processes (bottom up). That is, within small groups such as sport teams, athletes' social identity can inform how they think, feel, and behave. However, these group processes can also influence perceptions of social identity. One of the antecedents and consequences of social identity in small groups is the process of consensualisation (Postmes et al., 2005). Within teams, consensualisation occurs when individuals share similar perceptions to other team members, which can in turn strengthen social identity. As such, within sport teams, high consensus over team-referent attributions will likely strengthen perceptions of social identity.

### **Summary**

The strategies athletes use to explain their teams' performances can influence their cognitive (Coffee et al., 2015), affective (Allen et al., 2009a), and behavioural responses (Carron et al., 2014). Further, it is understood that contextual factors can structure how individuals' interpret events (Cruwys et al., 2015; Rees et al., 2013); therefore, it is likely that contextual factors structure how athletes interpret their cognitive perceptions. However, researchers are yet to investigate the extent to which contextual factors can shape the way individuals interpret cognitive variables such as team-referent attributions. This limitation in the research is expanded upon in Chapter 2.

## **Chapter 2. Limitations in the Literature and Research Questions**

Chapter 1 outlined evidence that the way people interpret their team-referent attributions is likely structured by contextual factors. Allen and colleagues (2012) theorised that contextual factors including group differences, social relationships, and social exchanges are antecedents to athletes' team-referent attributions. However, attributions are almost always dependent on the nature of the event which occurs. As such, it may be that these contextual factors structure athletes' perceptions of their team-referent attributions. Thus, this PhD was designed to examine if contextual factors including group differences, social relationships, and social exchanges structure the effects of team-referent attributions on sport outcomes.

### **Group differences**

Group differences were assessed through individuals' dispositional team-referent attributions. At the individual level, dispositional characteristics often distinguish individuals from one another and the way in which individuals tend to explain events is an important dispositional characteristic. For example, individuals who generally explain negative events using attributions that are uncontrollable are said to have a pessimistic disposition and to be at risk of depression (Peterson & Seligman, 1984). At the team level, these dispositions are unique to a team. That is, individuals within teams adopt their own dispositions for attributing events pertinent to their team (Shapcott & Carron, 2010). Therefore, dispositional team-referent attributions are an effective way to examine the effects of group differences on the team-referent attribution-collective efficacy relationships.

### **Social relationships**

Social identity was used to examine the moderating effects of social

relationships. The extent to which athletes identify with their team is believed to be the basis for sport group behaviour and contributes to the way athletes perceive themselves (Rees et al., 2015). Further, outside of sport, high levels of social identity have been demonstrated to structure the way individuals perceive personal events (Cruwys 2015). Therefore, the extent to which athletes identify with their team is likely central to the social relationships one builds with his/her team.

### **Social exchanges**

Social exchanges were measured through attributional consensus. A central component of Kelley's attribution theory (1967) was that individuals seek out consensus information when explaining events. Essentially, people want to know whether others agree with their explanations. This process facilitates social exchanges pertinent to attributions. In other words, to understand whether others agree with an attribution, athletes are likely to discuss their attributions with fellow teammates. Thus, the extent to which individuals perceive consensus over their team-referent attribution is a key component of these social exchanges.

### **Current PhD**

Accordingly, dispositional team-referent attributions (Chapter 3), social identity (Chapter 4), and attributional consensus (Chapter 5) are examined as moderators of the relationships between team-referent attributions and outcomes of collective efficacy (Chapters 3 and 4), emotions (Chapter 4), and performance (Chapter 5). Further, the effects of attributional consensus on relational outcomes of conflict, cohesion, and social identity are explored (Chapter 5). Therefore, within this PhD, Chapters 3, 4, and 5 each address a specific limitation in the literature.

**Chapter 3.** As outlined in Chapter 1, attributions can be studied from a situational perspective (e.g., how does an individual explain a specific event or performance?) or a dispositional approach (e.g., how does an individual typically explain events or performances?). These approaches have traditionally been studied separately. This may, in part, be due to the fact that situational attribution research in an achievement setting has generally been underpinned by Weiner's (1985) theory, while research on dispositional attributions has generally been underpinned by the Reformulated Learned Helplessness Model (Abramson et al., 1978). This limitation was addressed in Chapter 3 as the interactive effects of situational and dispositional attributions were explored; both approaches were underpinned by Rees and colleagues (2005) attribution theory in sport. Therefore, understanding if situational and dispositional attributions interact, and the nature of this interaction, may address this key pitfall in researchers approach to attribution studies.

**Chapter 4.** A second limitation within the literature is that researchers have yet to investigate the importance of social identity in structuring cognitive perceptions within athletes. Recently, social psychology researchers have established that social identity can change how individuals perceive personal failure (Cruwys et al., 2015). Thus, it is logical that social identity might structure athletes' perceptions of team failure (and team success) (i.e., team-referent attributions). There is sufficient evidence that team-referent attributions have a meaningful effect on outcomes important to sport (Allen et al., 2009a; Coffee et al., 2015), however, researchers are yet to examine if social identity might structure athletes' perceptions of team events. This limitation was addressed in Chapter 4 through two studies on the moderating effect of social identity on the

relationships between attributions and sport outcomes including collective efficacy and emotions. This research has the potential to advance the way researchers and practitioners understand group level constructs. That is, the information obtained in Chapter 4 can inform researchers of the variables pertinent to group level research and inform practitioners of potential avenues towards adapting attributions at the team level.

**Chapter 5.** A final limitation addressed within this PhD concerns the lack of attention provided to the impact of consensus within teams. Researchers have demonstrated that athletes within teams often, to some extent, share perceptions of sport outcomes (Carron et al., 2003; Shapcott, Carron, Greenlees, & El-Hakim, 2008). This understanding that teammates share perceptions is beneficial to the analysis of team level variables as it allows researchers to understand the necessity of multilevel analysis. That is, individuals are nested within teams, and this effect is controlled through multilevel analysis. Yet it is improbable that athletes share uniform agreement (high consensus) across an entire team; some teams likely include athletes who do not share a similar perspective (low consensus) as other team members. However, the effects of consensus on team-referent perceptions have not been tested. This limitation is addressed in Chapter 5 through an experimental study that was designed to examine if team-referent attributional consensus structured perceptions of athletes' team-referent attributions. This was done by exploring the main and interaction effects of attributional consensus on relationship outcomes and performance.

### **Summary and Research Questions**

Within this thesis, cross-sectional, longitudinal, and experimental research designs are employed to investigate two research questions:

1. Do contextual factors moderate the effect of team-referent attributions?
2. Does consensus over team-referent attributions influence relationship outcomes?

The common theme throughout this thesis was examining if team-contextual factors moderated the relationships between team-referent attributions and sport outcomes. The following team-contextual factors were explored in the thesis: (1) dispositional team-referent attributions, (2) social identity, and (3) attributional consensus. In Chapter 3, results indicated that dispositional team-referent attributions might moderate the relationships between situational team-referent attributions and collective efficacy. To build on this, in Chapter 4, two studies (Study 2 and Study 3) were then conducted to examine if athletes' social identity with their team moderated the relationships between situational team-referent attributions and sport outcomes including collective efficacy and emotions. Upon observing evidence for a moderating effect of social identity using a cross-sectional design (Study 2), a longitudinal study (Study 3) was conducted which provided further evidence supporting the moderating effect of social identity on the relationships between team-referent attributions and collective efficacy. Finally, upon understanding that individuals' perceptions of their team can moderate the team-referent attribution-collective efficacy relationships, two studies (Study 4 and Study 5) in Chapter 5 were conducted to examine whether social exchanges pertinent to attributions would influence interpersonal relationships and moderate the effect of team-referent attributions on performance. These studies revealed that high levels of attributional consensus with teammates, compared to low levels of attributional consensus, might be an antecedent of positive outcomes, but no moderating effect was observed. The

findings and implications of these studies are discussed in a concluding chapter that details the contribution of this thesis to the current attribution and team dynamic literature in sport psychology.

### **Chapter 3. Study 1**

**Adaptive Thinking: Can Adaptive Dispositional Attributions Protect Against  
the Harmful Effects of Maladaptive Situational Attributions?**

Athletes' perceptions of causes for team performance are termed *team-referent attributions* (Allen et al., 2012). There are two main approaches to the study of team-referent attributions; a situational perspective (Coffee et al., 2015) and a dispositional perspective (Shapcott & Carron, 2010). The situational perspective focuses upon athletes' explanations for their team's performance, while the dispositional perspective focuses upon how athletes typically explain the cause of team events. As mentioned in the previous chapters, dispositional team-referent attributions reflect individual dispositions pertinent to an athlete's team. Situational and dispositional attributions are related but identifiably different, in that, individuals' team-referent attributions for performance are often dependent on an event itself, yet unique team characteristics such as personalities, relationships, and shared experiences may structure the effect of those perceptions (Allen et al., 2012; Rees et al., 2005). The current study was designed to examine the main and interactive effects of situational and dispositional team-referent attributions on collective efficacy in sport. While situational and dispositional attributions can be either self-referent or team-referent, for simplicity within this chapter, unless specifically stated, situational and dispositional attributions refer to team-referent attributions.

Historically, both situational and dispositional self and team-referent attributions have been studied using a dimensional structure (Hanrahan, Grove, & Hattie, 1989; McAuley, Duncan, & Russell, 1992; Peterson et al., 1982; Russell, 1982). Through the development of theory and empirical evidence, perceptions of controllability has emerged as a primary focus within the study of attributions (Coffee & Rees, 2008b; Rees et al., 2005). Controllability refers to the extent to which athletes believe their explanations for a team performance or event is

controllable by the team. In addition to controllability, Rees and colleagues also theorised that the generalisability dimensions of attributions including stability (the extent to which a cause is perceived as stable or variable over time), globality (the extent to which a cause is perceived to affect a wide or narrow range of situations), and universality (the extent to which a cause is perceived as common to all teams or unique to a team) are important to the study of attributions in sport (e.g., Rees et al., 2005). This dimensional structure to the study of attributions is consistent across both situational and dispositional team-referent attributions (Coffee et al., 2015; Shapcott & Carron, 2010).

Typically, attributions that are believed to be controllable are associated with positive sport outcomes; while attributions that are believed to be uncontrollable are typically associated with negative sport outcomes (Allen et al., 2009a; Carron et al., 2014). For example, if an athlete believes the cause of her team's poor performance is something that can be controlled (e.g., the team had a poor strategy), she is likely to believe the team will amend their strategy for future performances, thus leading to more positive outcomes such as greater confidence in her team. However, if she believes the cause of her team's poor performance is something that generally cannot be controlled (e.g., her team lacks ability), she is likely to believe her team will not be able to make changes that will overcome this poor performance, thus leading to more negative outcomes such as reduced confidence in her team. Therefore, controllable attributions are typically considered to be adaptive and uncontrollable attributions are typically considered to be maladaptive. However, whether generalisability dimensions are considered adaptive or maladaptive is dependent on the nature of the event which has occurred. That is, athletes who believe the cause of their team victory is

something that is consistent across time (i.e., high stability), consistent across situations (i.e., high globality), and/or is unique to the team (i.e., low universality) would be considered to have adaptive attributions. While athletes who believe the cause of their team defeat is something that is consistent across time (i.e., high stability), consistent across situations (i.e., high globality), and/or is unique to the team (i.e., low universality) would be considered to have maladaptive attributions. The extent to which particular attributions are considered adaptive or maladaptive, therefore, is dependent on whether the attribution is for a positive or negative event. This is true across both situational and dispositional attributions (Rees et al., 2005).

Situational attributions, explanations for a single event or performance, are typically associated with sport outcomes pertinent to subsequent performance (Rees et al., 2005; Weiner, 1985). For example, situational attributions are associated with athletes' perceptions of collective efficacy such that, after a team performance, more adaptive attributions are associated with higher levels of collective efficacy going into a subsequent performance (Allen et al., 2009a; Coffee et al., 2015). The importance of situational attributions have been empirically demonstrated (Allen et al., 2009a; Coffee et al., 2015; Dithurbide et al., 2009; Greenlees et al., 2005), yet team characteristics such as dispositional attributions (team attributional style) are believed to play a key role within these relationships (Martinko et al., 2011; Rascle et al., 2015).

In contrast to situational attributions, dispositional attributions (also known as attributional or explanatory styles), are individual's tendencies to explain events in a certain way (Hanrahan et al., 1989; Shapcott & Carron, 2010); however, like situational attributions they are also associated with important sport

outcomes (Carron et al., 2014; Shapcott & Carron, 2010). Contemporary research on dispositional attributions has been underpinned by Rees et al.'s theory of attributions in sport. Carron and colleagues observed associations between dispositional attributions and team processes such as team cohesion (Shapcott & Carron, 2010) and team success (Carron et al., 2014). That is, team athletes who had adaptive dispositional attributions generally reported higher levels of cohesion; while individuals on successful teams generally reported more adaptive dispositional attributions. Moreover, relationships between dispositional self-referent attributions and important sport outcomes observed at the individual level (Martin-Krumm, Sarrazin, Peterson, & Famose, 2003) are also believed to exist at the team level (Allen et al., 2012). Therefore, further investigation into the correlates of dispositional attributions in sport is warranted.

Situational and dispositional attributions are related but distinct concepts (Solomon, 1978), and while researchers have examined these concepts within the same study (Le Foll et al., 2006), interactive effects of situational and dispositional attributions have yet to be explored. It is possible that dispositional attributions may moderate relationships between situational attributions and collective efficacy. Researchers have observed interactions between the same situational and dispositional constructs. For example, within anxiety research, situational responses and dispositional tendencies have been observed through state and trait anxiety (Egloff & Hock, 2001). That is, the effect of situational anxiety on cognitive outcomes appeared dependent on how anxious an individual typically was. Those who reported low trait anxiety were partially protected against the negative effects of high situational anxiety. Within attributions, researchers have observed that team specific traits are associated with team-

referent attributions (Shapcott, Carron, Greenlees, & El-Hakim, 2010) and it is believed that dispositional attributions are one of those team traits (Allen et al., 2012). Therefore, the team context (including athletes' dispositional attributions) might structure the relationship between situational attributions and sport outcomes (Allen et al., 2012; Rees et al., 2005; Shapcott et al., 2010).

Collective efficacy, the belief in a group's capabilities to perform to a high standard (Bandura, 1997), has been observed as an important outcome of situational attributions (Allen et al., 2009a; Coffee et al., 2015). The association between dispositional team-referent attributions and collective efficacy has not been explored in sport. At the individual level, however, it has been observed that athletes who adopt adaptive dispositional self-referent attributions tend to report higher levels of self-efficacy (Parkes & Mallett, 2011). Attribution researchers have predicted that the relationships between self-referent attributions and sport outcomes also exist at the team level (Allen et al., 2012), therefore, although it has not been empirically tested, it is likely that dispositional team-referent attributions are associated with collective efficacy. This means that both situational and dispositional attributions are likely, to some extent, associated with collective efficacy.

The current study was designed to focus on the interaction between situational and dispositional perceptions of controllability, stability, globality, and universality. These steps were carried out separately for each attribution dimension. That is, four separate hierarchical analyses were conducted—one for each attribution dimension. The first hypothesis was that adaptive situational attributions would be associated with higher levels of collective efficacy (Hypothesis 1). The second hypothesis was that adaptive dispositional attributions

would be associated with higher levels of collective efficacy (Hypothesis 2). The final hypothesis was that an interaction effect between situational and dispositional attributions would be observed. It was predicted that the expected positive relationship between situational attributions and collective efficacy would only be observed when individuals had maladaptive dispositional attributions (Hypothesis 3).

## **Method**

### **Participants**

Athletes ( $n_{male} = 62$ ,  $n_{female} = 101$ ) from 17 competitive university sport teams in the United Kingdom participated in the study ( $M_{age} = 20.51$  years,  $SD = 2.16$ ). Of the 17 teams, four were exclusively male and 13 were exclusively female. Athletes were recruited from interactive sport teams including: American football (37 individuals; 1 team), field hockey (23 individuals, 2 teams), ultimate Frisbee (11 individuals, 2 teams), polo (8 individuals, 2 teams), netball (25 individuals, 4 teams), lacrosse (20 individuals, 2 teams), basketball (20 individuals, 2 teams), and soccer (19 individuals, 2 teams).

Of the 163 participants, four participants dropped out before completing the questionnaire battery. This left a total of 92 participants across eight winning teams and 67 participants across nine losing teams; however, six participants perceived their team defeat as a success. Consistent with Allen et al. (2009) and Coffee et al. (2015), these six participants were removed from the analysis. This left a final sample 92 individuals (8 teams) who perceived their team victory as a success and 61 individuals (9 teams) who perceived their team defeat as a failure.

### **Measures**

Before completing questionnaires, participants reported demographic information, the result of their most recent team competition, and whether they perceived their most recent team performance as a success or failure. Participants reported their perceptions of success or failure on a binary response option (success, failure).

**Dispositional team-referent attributions.** The Team Attributional Style Questionnaire (TASQ) was used to measure dispositional attributions (Shapcott & Carron, 2010). The TASQ is a self-report questionnaire that asks individuals to provide reasons for six negative hypothetical situations their team could experience. Upon providing reasons, the questionnaire measures the extent to which participants believe the reason they provided is controllable (Is the cause something that is controllable by your team or is it not in your team's control?), stable (In the future, when your team performs below expectations, will this cause be an influencing factor again?), global (Is the cause something that just influences this situation or does it also influence other situations experienced by your team?), and universal (Is the cause of your team's poor performance unique to your team or do you believe the cause is a problem for all teams?). As all situations were negative, higher scores of controllability and universality were adaptive and lower scores of controllability and universality were maladaptive. Likewise, lower scores of stability and globality were adaptive and higher scores of stability and globality were maladaptive. All items were assessed on a 7-point Likert scale with scale anchors adjusted to fit each dimension (e.g., Not in our team's control – In our team's control). Cronbach's alpha for the controllability subscale was very low ( $\alpha = .46$ ). Consequently, results for analyses including this subscale were not interpreted. Stability, globality, and universality subscales ( $\alpha =$

.67,  $\alpha = .69$ ,  $\alpha = .74$  respectively) were close to the often cited .70 benchmark (Nunnally & Bernstein, 1979) (Table 1). These were similar to values observed in previous attribution research (Coffee et al., 2015; Shapcott & Carron, 2010). Nevertheless, caution should be exercised when interpreting results pertinent to these dimensions.

**Situational team-referent attributions.** The Team-Referent Attribution Measure in Sport (TRAMS) was used to measure situational attributions. When completing the TRAMS, athletes report what they believe to be the main reason for their most recent team performance (Coffee et al., 2015). Participants then read 15 items asking the extent to which they believed this reason was: controllable (e.g., your team could control in the future), stable (e.g., remains stable across time), global (e.g., relates to a number of different situations your team encounters), and universal (e.g., is a common cause of performance for other teams). All items were assessed on a 5-point Likert scale ranging from 1 (*Not at all*) to 5 (*Completely*). Cronbach's alpha for controllability ( $\alpha = .76$ ), stability ( $\alpha = .82$ ), globality, ( $\alpha = .67$ ) and universality ( $\alpha = .81$ ) were close to or above the .70 benchmark.

**Collective efficacy.** The Collective Efficacy Questionnaire in Sport (CEQS) is a 20-item, self-report measure and assesses athletes' confidence in five areas pertinent to collective efficacy before an upcoming performance: 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) (Short, Sullivan, & Feltz, 2005). Each dimension is measured using four items on a 10-point Likert scale from 1 (*Not at all confident*) to 10 (*Completely confident*).

Table 1. Means, standard deviations, alpha reliability coefficients, intra-class correlation coefficients

	Alpha	Team Victory			Team Defeat		
		<i>M</i>	<i>SD</i>	ICC	<i>M</i>	<i>SD</i>	ICC
S. Control	.72	4.13	0.57	.16	3.94	0.93	.02
S. Stable	.81	3.39	0.87	.07	2.98	1.00	.05
S. Global	.66	4.04	0.63	.00	3.71	0.66	.07
S. Universal	.80	4.03	0.77	.05	3.66	0.75	.02
D. Control	.46	5.63	0.86	.01	5.64	0.87	.03
D. Stable	.67	4.88	0.87	.00	4.98	0.74	.07
D. Global	.69	5.03	0.93	.00	5.02	0.86	.10
D. Universal	.74	5.61	0.92	.01	5.38	0.88	.05
Collective Efficacy	.94	8.09	1.06	.10	7.32	1.17	.23

*Note.* S. = Situational, D. = Dispositional. *M* = Mean, *SD* = Standard Deviation, Alpha = Cronbach's alpha, ICC = Intra-class correlation coefficient

Following Hampson and Jowett (2014), all five subscales were collapsed to provide one global index of collective efficacy. The Cronbach's alpha for collective efficacy was .94.

### **Design**

The relationships between attributions and outcomes are often dependent on whether the event being explained was positive or negative (Weiner, 1985). In other words, whether situational attributions were considered adaptive or maladaptive was dependent on whether they experienced team victory or team defeat. As such, after data collection analyses were separated into teams that won (i.e., team victory) and teams that lost (i.e., team defeat). This was consistent with previous studies that were designed to examine situational attributions in sport (Allen et al., 2009a; Coffee et al., 2015). Dispositional attributions on the other hand, were measured using strictly negatively worded hypothetical scenarios; therefore, previous match outcome was not relevant to whether attributions were considered adaptive or maladaptive.

### **Procedure**

Ethical approval for this study was granted by a university ethics committee prior to data collection. Head coaches of sport teams were first contacted via email to inquire about their willingness to have their athletes participate in the study. The primary researcher then attended a team training session to inform athletes of the purpose of the study and invited them to participate in the research. Athletes who agreed to participate were then handed the paper and pencil questionnaire and asked not to talk to their teammates while completing it. Questionnaires were completed within the presence of the primary

researcher to ensure any queries could be answered.

### **Data Analysis**

Although individual perceptions of team-referent attributions and collective efficacy were measured, these variables had an inherent team structure. Therefore, multi-level analyses were used to control for the nested nature of the data. This was consistent with previous sport studies examining group dynamics (Coffee et al., 2015; Heuzé, Raimbault, & Fontayne, 2006). Within team variance and between team variance was estimated before examining the effect of the predictor variables (situational attributions, dispositional attributions, and the interaction terms) on the dependent variable (collective efficacy). Statistical analyses were performed in R version 3.5.1 (R Core Team, 2018). Specifically, the lme4 package was used to fit multilevel linear models with a normal distribution (Bates, Machler, Bolker, & Walker, 2015). While previous attribution studies have examined if attribution dimensions interact (Allen et al., 2009; Coffee et al., 2015; Coffee & Rees, 2008), separate models were used to explore if each situational attribution dimension interacted with the corresponding dispositional attribution dimension. For each model, the main effect of the situational attribution dimension was entered at Step 1. Then, the main effect of the corresponding dispositional attribution dimension was entered at Step 2. Finally, the interaction term between the situational and dispositional attribution dimension was entered at Step 3.

Changes in the log likelihood at each step and the regression coefficients (and standard errors) were used to ascertain significance. Changes in the  $R^2$  statistic was also used as a model diagnostic tool (Edwards, Muller, Wolfinger, Qaqish, & Schabenberger, 2008). To examine the relationship between situational

attributions and collective efficacy at specific levels of dispositional attributions, a simple slopes analysis was conducted for each dimension (Robinson, Tomek, & Schumacker, 2013). That is, in addition to changes in log likelihood and  $R^2$  statistic, simple slopes were examined at 1 standard deviation below the mean and 1 standard deviation above the mean for all interaction terms. Simple slopes analysis is believed to be a more sensitive and direct test of moderation that does not increase the risk of Type 1 error (Robinson et al., 2013). While the interaction term tests whether the product of two independent variables account for a significant amount of variation in the dependent variable, simple slopes analysis specifically tests whether there is a different relationship between an independent variable and a dependent variable at specific levels of another independent variable. In the context of the current study, simple slopes analysis provides a test to see whether relationships between situational attributions and collective efficacy are different when dispositional attributions are adaptive or maladaptive. Therefore, by examining the interaction term and simple slopes, a more comprehensive understanding of moderation is achieved. This analytical procedure has been adopted in recent sport psychology research (Hannan, Moffitt, Neumann, & Thomas, 2015).

## **Results**

### **Preliminary Analyses**

All individual level means and standard deviations are provided in Table 1. The proportion of missing values was 2% or less for all variables. Values were determined to be missing completely at random,  $\chi^2(734) = 744.42, p = .387$  (Little, 1988). When individuals missed an item within a questionnaire, imputation from the scale mean pertinent to the individual was used to replace the missing value

(Osborne, 2012). As expected, situational and dispositional attributions were related but distinct concepts as bivariate correlations between corresponding situational and dispositional dimensions ranged from  $-.04$  to  $.45$  (Table 2).

MANOVA revealed a significant difference in attribution scores after team victory and team defeat,  $F_{4,149} = 4.20$ ,  $p = .003$ . Follow up discriminant function analysis revealed stability (standardised structure coefficient (SC) =  $.56$ ), globality (SC =  $.30$ ), and universality (SC =  $.53$ ) were the salient variables. Controllability did not contribute to the multivariate effect (SC <  $.30$ ). After team victory, athletes' perceived their attributions to be more stable, global, and universal compared to after team defeat. Further, an independent samples  $t$ -test revealed that collective efficacy was significantly higher after team victory,  $M = 8.09$ ,  $SD = 1.05$ , compared to after team defeat,  $M = 7.32$ ,  $SD = 1.16$ ,  $t_{152} = 4.24$ ,  $p < .001$ , meaning successful performance possibly boosted teams' perceptions of collective efficacy (Bandura, 1977; Stajkovic et al., 2009). In sum, these results provide support for the need to analyse data separately for team victory and team defeat conditions.<sup>1</sup>

### **Multilevel Analysis**

**Team victory.** Results of the multilevel analyses for situational and dispositional attribution dimensions on collective efficacy are presented in Table 3. After team victory, the variance in collective efficacy between teams was  $.09$  ( $se = .10$ ) and within teams was  $.98$  ( $se = .15$ ). Therefore, the intra-class correlation (ICC) was  $.09$  indicating that 9% of the variance in collective efficacy

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<sup>1</sup> A second MANOVA revealed that dispositional attributions did not significantly differ after team victory or defeat ( $F_{3,149} = 1.36$ ,  $p = .26$ ). This was expected as dispositional attributions are distinct from specific performance outcomes.

Table 2. Bivariate correlations between situational attributions, dispositional attributions, and collective efficacy

	1	2	3	4	5	6	7	8
1. S.Control		.03	.34**	.46**	.07	.05	.22	.08
2. S. Stable	-.03		.43**	.25	.22	.12	.07	.13
3. S. Global	.30**	.13		.35**	.15	.26*	.23	.11
4. S. Universal	.32**	-.19	.65**		.16	-.05	.45**	.22
5. D. Stable	-.08	-.04	.22	.17		.50**	.28*	.01
6. D. Global	.01	-.02	.24*	.25*	.45**		.21	.09
7 D. Universal	.02	-.02	.35**	.40**	.33**	.57**		.34**
8. Collective efficacy	.18	.22	.15	.04	.02	.11	.21	

*Note.* Bottom half = Team victory, Top half = Team defeat. S. = Situational, D. = Dispositional. Cont = Controllability, Stab = Stability, Glob = Globality, Univ = Universality, CE = Collective Efficacy. \*\* $p < .01$ , \* $p < .05$ . Dispositional controllability was not assessed due to low levels of reliability

Table 3. Multilevel regression models reporting the contribution of situational and dispositional attribution dimensions and the interaction terms on collective efficacy

	Team Victory				Team Defeat				
Model	-2( $\chi^2$ )	$\Delta\chi^2$	b(SE)	$\Delta R^2$	Model	-2( $\chi^2$ )	$\Delta\chi^2$	b(SE)	$\Delta R^2$
<b>Controllability</b>					<b>Controllability</b>				
Constant	266.08		7.98 (.17)		Constant	185.64		7.29 (.23)	
S. Controllability	264.24	1.84	.28 (.20)	.02	S. Controllability	183.84	1.80	.20 (.15)	.03
<b>Stability</b>					<b>Stability</b>				
Constant	266.08		7.98 (.16)		Constant	185.64		7.29 (.23)	
S. Stability	263.60	2.48	.20 (.13)	.03	S. Stability	183.49	2.15	.21 (.14)	.04
D. Stability	263.60	<.01	.01 (.12)	<.01	D. Stability	183.28	0.21	-.09 (.20)	<.01
Interaction	258.18	5.42*	.39 (.17)*	.06	Interaction	182.93	0.35	.14 (.25)	.01
<b>Globality</b>					<b>Globality</b>				
Constant	266.08		7.98 (.16)		Constant	185.64		7.29 (.23)	
S. Globality	263.70	2.38	.27 (.17)	.03	S. Globality	180.97	4.67*	.46 (.21)*	.09
D. Globality	263.02	0.68	.10 (.12)	.01	D. Globality	180.59	0.38	-.10 (.17)	<.01
Interaction	260.30	2.72†	.26 (.16)†	.03	Interaction	180.25	0.33	-.17 (.31)	<.01
<b>Universality</b>					<b>Universality</b>				
Constant	266.08		7.98 (.16)		Constant	185.64		7.29 (.23)	
S. Universality	265.88	0.20	.07 (.15)	<.01	S. Universality	184.25	1.38	.22 (.19)	.03
D. Universality	264.00	1.88	.18 (.13)	.02	D. Universality	181.51	2.75†	.29 (.18)	.05
Interaction	262.86	1.14	.13 (.12)	.02	Interaction	181.14	0.36	-.16 (.27)	<.01

Note. D. = Dispositional, S. = Situational, Interaction = Interaction term. \* $p < .05$ , † $p < .10$ .

Analyses involving dispositional controllability were excluded as reliability coefficients were too low.

was between teams. Julian (2001) recommends using multilevel models to account for nested data when the ICC is greater than .05.

Collective efficacy was not significantly associated with any situational attribution dimensions or dispositional attribution dimensions. Perhaps most central to this study was the analysis of interaction terms between situational and dispositional attribution dimensions. Inclusion of the interaction terms did not significantly improve the globality  $\Delta\chi^2(1) = 2.72, p = .108, \Delta R^2 = .03$ , or universality  $\Delta\chi^2(1) = 1.12, p = .29, \Delta R^2 = .01$  models. The interaction term did, however, improve the stability model  $\Delta\chi^2(1) = 5.42, p = .020, \Delta R^2 = .06$ .

Simple slopes analyses were also conducted for all models. Robinson et al., (2013) suggested that researchers examining moderating effects should examine simple slopes instead of relying on the interaction term. This analysis tests whether the slope of a regression is significantly different from zero. In other words, the simple slopes analysis was used to examine whether the relationship between situational attributions and collective efficacy was significantly different from zero when dispositional attributions were either adaptive or maladaptive (i.e., at 1 standard deviation above the mean and 1 standard deviation below the mean). The simple slopes analysis revealed no significant regression slopes within the universality model. Within the stability model, there was a significant positive association between situational stability and collective efficacy when individuals reported maladaptive dispositional stability,  $b = .55, p = .004$ . When individuals reported adaptive dispositional stability, there was no significant relationship between situational stability and collective efficacy,  $b = -.12, p = .532$  (Figure 1a). For globality, the simple slopes analysis revealed a significant positive relationship between situational globality and collective efficacy when athletes

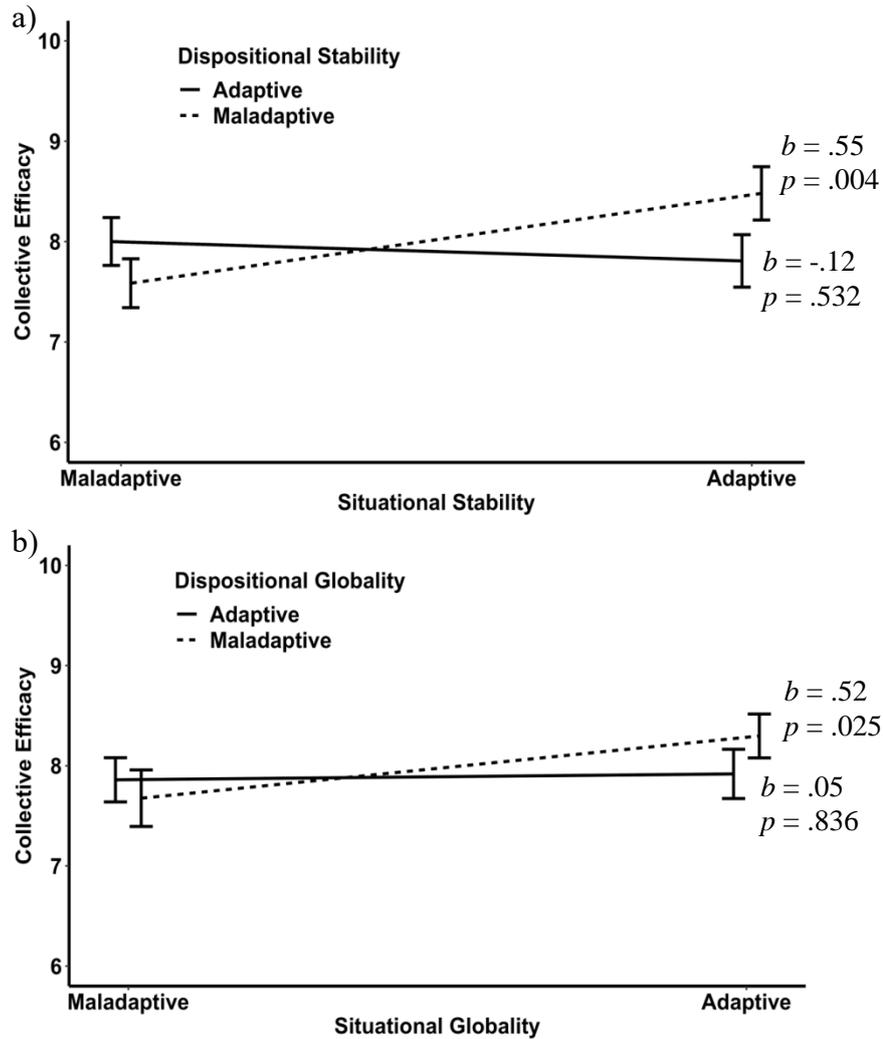


Figure 1. Interaction between a) situational stability and dispositional stability on collective efficacy after team victory and b) situational globality and dispositional globality on collective efficacy after team victory.

Situational stability was plotted at 1 SD = .81 (Adaptive) and -1 SD = -.81 (Maladaptive). Dispositional stability was plotted at 1 SD = .86 (Maladaptive) and -1 SD = -.86 (Adaptive).

Situational globality was plotted at 1 SD = .60 (Adaptive) and -1 SD = -.60 (Maladaptive). Dispositional globality was plotted at 1 SD = .91 (Maladaptive) and -1 SD = -.91 (Adaptive).

reported maladaptive dispositional globality,  $b = .52, p = .025$ . There was no relationship between situational globality and collective efficacy when athletes reported adaptive dispositional globality,  $b = .05, p = .836$  (Figure 1b).

**Team defeat.** After team defeat, the variance in collective efficacy between teams was  $.27$  ( $se = .21$ ) and the variance within teams was  $1.06$  ( $se = .21$ ). The ICC was  $.25$ , providing support for continued use of multilevel models to account for the nested nature of the data (Julian, 2001). Across all dimensions, situational globality was positively associated with collective efficacy  $\Delta\chi^2(1) = 4.67, p = .031, \Delta R^2 = .09$ . There were no significant associations between situational attribution dimensions and no significant interaction terms. Simple slopes analysis did not reveal any significant relationships at high or low levels of dispositional attributions.

### Discussion

The present study was designed to examine the main and interactive effects of situational attributions and dispositional attributions on collective efficacy. It was hypothesised that situational (Hypothesis 1) and dispositional (Hypothesis 2) attributions would be associated with collective efficacy. Further, the expected relationships between situational attribution dimensions and collective efficacy was only expected to be observed when individuals had maladaptive dispositional attributions in the corresponding dimension (Hypothesis 3). There was minimal support for Hypothesis 1 and 2. There was, however, some evidence to support Hypothesis 3 as, within the stability and globality dimensions, a moderating effect of dispositional attributions on the situational attribution-collective efficacy relationship was observed. The nature of the interactions in both dimensions was the same. That is, the strength of the relationships between

situational attributions and collective efficacy were different when individuals had adaptive or maladaptive dispositional attributions. Specifically, after a team victory, when athletes reported adaptive dispositional stability their perceptions of situational stability had no association with levels of collective efficacy. It was only when athletes reported maladaptive dispositional stability that their perceptions of situational stability were associated with collective efficacy. The same relationships were observed within the globality dimension.

Interpretation of these interaction effects indicate that situational attributions are of importance when dispositional attributions are maladaptive, with relationships occurring as would be expected. In short, situational attributions appear important when dispositional attributions are maladaptive. When dispositional attributions are adaptive, the nature of situational attributions appears unimportant, perhaps because adaptive dispositional attributions offer a protective effect. Within the anxiety literature, trait (dispositional) anxiety appeared to structure individuals' reactions to state (situational) anxiety (Egloff & Hock, 2001). The results of the current study offer preliminary evidence that dispositions pertaining to an athlete's team can structure the relationships between situational attributions and collective efficacy. While this evidence is correlational, it may be that adaptive dispositional attributions prevent athletes from experiencing the negative effects typically associated with maladaptive situational attributions. Simply put, those who have adaptive dispositional attributions might be unaffected by their situational attributions.

Sport psychology researchers have established that both situational and dispositional self-referent attributions are associated with sport outcomes pertinent to performance (Le Foll et al., 2006; Rasclé et al., 2015). The current study

extends this research, and attribution theory, by providing evidence that these variables can interact, in that adaptive dispositional attributions might have a stabilising effect and protect against the negative cognitive effects typically associated with maladaptive situational attributions. Therefore, while sport psychology researchers have observed experimental support for the effects of adaptive and maladaptive situational self-referent attributions on outcomes relevant to performance (Le Foll et al., 2008), it is important to consider how individuals' dispositional attributions may contribute to the effects of situational attributions on performance outcomes.

Within the context of attribution retraining, manipulating situational and dispositional attributions are not discrete processes. For example, within an academic achievement domain, attribution retraining strategies that reinforce the use of adaptive attributions throughout the year were effective in improving achievement related outcomes (Parker, Perry, Chipperfield, Hamm, & Pekrun, 2017). Although these strategies target situational attributions, continuous exposure to attribution retraining can generalise across time and situations (Rascle et al., 2015). Thus, over time, it may be that attribution retraining strategies are effective in manipulating athletes' dispositional attributions. This would be particularly useful when athletes adopt a maladaptive situational attribution as their adaptive disposition could potentially protect them against the harmful effects of the maladaptive situational attribution.

These results also highlight how attribution retraining strategies could be effective at the team level. That is, the results of the current study, and previous research (Carron et al., 2014), indicate that maladaptive dispositional attributions are associated with negative achievement related outcomes. To avoid these

potential deleterious relationships, team-level interventions focused on utilising the protective effects of adaptive dispositional attributions could be adopted by sport psychology practitioners. Researchers have established the efficacy of attribution retraining with the purpose of adapting individuals self-referent attributional style (Parkes & Mallett, 2011; Struthers & Perry, 1996). Given the results of the current study, interventions may be applicable at the team level as well. That is, applying attribution retraining at the team level may allow practitioners to use less resources while effectively enhancing individual and team functioning.

### **Limitations**

Of course, there are many variables beyond situational and dispositional attributions that inform athletes' collective efficacy. For example, an important predictor of collective efficacy is previous team performance (Stajkovic et al., 2009). Previous performance was not measured within the current study; however, separating the sample into team victory and team defeat conditions, in part, accounted for the influence of team performance on collective efficacy. That is, in general, the teams that performed well were more likely to be victorious, and these teams were analysed separately from the teams that were defeated. Nevertheless, there were variables that may have contributed to variation in collective efficacy that were unaccounted for in the current study.

Another limitation was that the dynamic nature of the attribution process was not accounted for. Researchers have observed that attributions can vary over time (Coffee & Rees, 2009), perhaps after consultation with teammates (Allen et al., 2012). The cross-sectional nature of the current study means the study did not capture how these processes evolve over time and throughout the season and as

such, the relationships observed can only be inferred to exist at the time of measurement. For example, adaptive dispositional attributions protected against the harmful effects of maladaptive attributions on collective efficacy, however, it is unclear whether this effect would be evident consistently throughout a season. In other words, if an athlete consecutively adopts maladaptive situational team-referent attributions, this protective effect of adaptive dispositional team-referent attributions may be mitigated. Further, consecutive maladaptive situational attributions may in turn lead to a maladaptive attributional style. Therefore, the current study provided a snapshot into the interactive effects of situational and dispositional attributions, but further research is needed to gain a more comprehensive understanding as to the scope of the observed relationships.

### **Future studies**

The current research is believed to be the first study to examine interactions between dispositional and situational attributions in a team setting and at a dimensional level. Extending these results beyond the dimensional level, although maladaptive attributions are associated with lower levels of collective efficacy (Allen et al., 2009; Coffee et al., 2015; Dithurbide, Sullivan, & Chow, 2009) it is possible that attributional style may protect athletes against these negative effects. These results open new ground for exploration as they offer evidence that perceptions of a team might change the way in which athletes interpret their attributions. In other words, in addition to team attributional style, there may be other contextual factors pertinent to a sport team that moderate the relationship between team-referent attributions and collective efficacy. For example, whether athletes develop a positive or negative attachment to the team they are on might play an important role in the effect of team-referent attributions.

Researchers may seek to extend the results of the current study by examining whether high levels of identity with a group strengthen the effect that team-referent attributions have on sport outcomes.

An important caveat to these findings is that interactions were observed within only two of the models. This could, in part, be due to the low reliability observed within the TASQ subscales. Thus, before team attributional style in sport is investigated further, a revised measure might be necessary. The controllability subscale was observed to be unreliable, and the stability, globality, and universality subscales showed low levels of reliability. Researchers using the TASQ have also observed low reliability within the controllability subscale (Carron et al., 2014; Shapcott & Carron, 2010). While these previous studies observed evidence that there may be an association between levels of dispositional controllability and sport outcomes, without a more reliable measure no conclusions about the nature of these relationships can be firmly drawn. Therefore, researchers should look to further develop and improve the reliability of the TASQ to accurately examine if dispositional controllability is associated with these important sport outcomes.

## **Conclusion**

Through this study, initial evidence that dispositional team-referent attributions can moderate the relationship between situational team-referent attributions and collective efficacy was observed. It appears that having adaptive dispositional attributions might protect against the lows associated with maladaptive situational attributions. As such, these results offer a starting point into understanding the mechanisms involved in the attribution-efficacy relationship.

## **Chapter 4. Studies 2 and 3**

### **The Effects of Team-Referent Attributions on Collective Efficacy and Emotions: Examining the Moderating Role of Social Identity**

Athletes' explanations for their team's performance (i.e., team-referent attributions) are strongly associated with subsequent cognitive and affective outcomes (Allen et al., 2012, 2009a). The results observed in Chapter 3 provided initial evidence that perceptions of the team might be important to the way athletes think about their attributions. To build on this, the studies in Chapter 4 were designed to explore if athletes' social identity with their team moderates the relationships between team-referent attributions and sport outcomes. For example, researchers have demonstrated that individuals will react differently to performance feedback provided by someone they shared a social identity with, compared to performance feedback provided by someone they did not share a social identity with (Rees et al., 2013). In other words, the social context, in this instance, social identity, appeared to structure the way individuals thought about the information presented to them. Thus, within a team environment, social identity may structure the way individuals think about their team-referent attributions. To date, sparse research has been conducted on whether the social context can structure the way individuals think about their own attributions. Therefore, the studies within this chapter were conducted to examine if social identity moderates the effects that team-referent attributions have on collective efficacy and emotions.

Team-referent attributions are often categorised as either adaptive or maladaptive (e.g., Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010). Whether an attribution is adaptive or maladaptive is dependent on whether the performance was a success or failure and the extent to which athletes believe the cause of their team performance is controllable by the team (controllability), consistent across time (stability), consistent across situations (globality), and

unique to the team (universality) (e.g., Rees et al., 2005). To date, extensive research has been conducted that has established relationships between team-referent attributions and sport outcomes such as collective efficacy (Allen et al., 2009a; Coffee et al., 2015; Dithurbide et al., 2009). Crucially, however, the attribution process occurs within a highly social context (Hardy & Jones, 1994); a context that likely structures the relationships between attributions and sport outcomes. For example, a study examining the effect of self-referent attributions on individual performance demonstrated that, although individuals were provided with the same attribution for their performance, their response to the attribution changed dependent on whether or not they identified with the individual providing them with the attribution (Rees et al., 2013). This highlights the role of the social context, specifically social identity, in structuring individuals' responses to attributions.

Social identity refers to an individual's feelings of belongingness and emotional attachment to a group (Tajfel et al., 1971). According to the social identity approach, individuals perceive themselves and others in terms of social categories. Within a sport environment, this means athletes see teammates not as other athletes but as part of a team and this team shapes how athletes perceive themselves (Rees et al., 2015). The extent to which athletes identify with their team can vary, but social identity has been demonstrated to facilitate both positive (Fransen et al., 2015) and negative (Graupensperger, Benson, & Evans, 2018) sport outcomes.

In research exploring the effect that group membership can have on individuals outside of sport, Cruwys, South, Greenaway, and Haslam (2015) established that social identity can structure individuals cognitive processes. That

is, through social identity, individuals perceive group outcomes from the perspective of the collective (Turner & Oakes, 1997). This means that the way in which individuals think about events is dependent on their social identity at least in some degree (Greenaway et al., 2015). Therefore, as social identity can structure the way individuals think about personal events, it is likely that social identity structures the way individuals think about their attributions for team events. Although not substantively explored to date, further understanding of the moderating effects of social identity on team-level constructs such as team-referent attributions would advance theoretical understanding of how people's engagement in social groups can shape cognitive processes believed to be important in sport.

Collective efficacy, the belief in a group/team's capabilities to perform to a high standard (Bandura, 1997), is one important outcome of team-referent attributions (Allen et al., 2009a; Coffee et al., 2015). Although the effects of team-referent attributions on collective efficacy have been established (Allen et al., 2009a; Coffee et al., 2015), these effects may be conditioned by social identity. Specifically, social identity can structure individuals' thoughts to a more group oriented perspective (Cruwys et al., 2015; Turner & Oakes, 1997), meaning team-referent attributions likely hold more meaning for those who are highly identified with a team compared to those who do not share that social identity. This, in turn, means that a team member who is highly identified may use a team-referent attribution as a source of collective efficacy, whereas a team member who is not highly identified may not be influenced by a team-referent attribution.

The moderating effect of social identity may also be evident on relationships between team-referent attributions and emotions. Researchers have

previously observed that attributions (Biddle & Hill, 1988; Graham, Kowalski, & Crocker, 2002) and group environments (Tamminen & Bennett, 2016; Tamminen et al., 2016) can shape athletes' emotional experiences after certain events.

Researchers exploring team-referent attributions and emotions have found team-referent attributions are associated with feelings of happiness but not excitement, anxiety, anger, or dejection (Allen et al., 2009a). Allen and colleagues suggested that this may be because the provision of a team-referent attribution diffuses responsibility among teammates thus weakening the effects of attributions on emotions (Naquin & Tynan, 2003). However, social identity may inhibit this diffusion of responsibility as those who exhibit more collectivist tendencies in teams often experience stronger emotions (Ilies, Wagner, & Morgeson, 2007). Further, high levels of social identity means that the group is internalised into an individual's self-concept (Tajfel & Turner, 1979), which likely leads group outcomes to be internalised by high identifiers more so than low identifiers. Therefore, those with a high social identity, who perceive, and thus attribute team outcomes through a more collective lens, may experience stronger consequences of team-referent attributions compared to those who do not share a strong social identity with their team.

Through two separate studies, the moderating effect of social identity on relationships between team-referent attributions and (a) collective efficacy and (b) emotions is explored. It was predicted that: (1) team-referent attributions would be associated with subsequent collective efficacy and emotions; (2) social identity would be associated with collective efficacy and emotions; and (3) social identity would moderate the effects of team-referent attribution dimensions on collective efficacy and emotions. Specifically, it was predicted that, at lower levels of social

identity, team-referent attributions would not be associated with collective efficacy or emotions, while at high levels of social identity team-referent attributions would be associated with collective efficacy and emotions.

These hypotheses were explored across both studies. To address the limitation that a cross-sectional design was used within Study 2, a longitudinal design was used within Study 3 to examine if the relationships observed in Study 2 are consistent across a season. Due to the strengths of the relationships observed in Study 2, collective efficacy was the only dependent variable measured in Study 3.

## Study 2

### Method

**Participants.** Athletes ( $n_{male} = 110$ ,  $n_{female} = 117$ ) from 30 university or club level teams in the United Kingdom and Canada participated in the study. Participants had a mean age of 21.47 years ( $SD = 4.34$ ) with a mean length of 2.29 years ( $SD = 2.12$ ) of experience with their team. Interactive sport team athletes were recruited for participation including: American football (40 individuals, 1 team), field hockey (47 individuals, 7 teams), ultimate Frisbee (8 individuals, 2 teams), ice hockey (40 individuals, 5 teams), cheerleading (22 individuals, 1 team), polo (7 individuals, 3 teams), netball (21 individuals, 4 teams), rugby (7 individuals, 2 teams), lacrosse (15 individuals, 2 teams), basketball (11 individuals, 2 teams), and soccer (9 individuals, 1 team).

**Measures.** Before completing measures of team-referent attributions, social identity, collective efficacy, and emotions, participants reported demographic information, the result of their most recent competition, and subjective perceptions of success or failure. In line with earlier attribution studies

(e.g., Allen et al., 2009a; Coffee et al., 2015), subjective perceptions of team success or failure were measured using a binary response option (success, failure).

***Team-referent attributions.*** Team-referent attributions were measured using the 15 item Team-Referent Attributions Measure in Sport (TRAMS) (Coffee et al., 2015). The TRAMS measures athletes' perceptions of the main reason for their team's performance. In line with Rees and colleague's (2005) theory of attributions in sport, perceptions of controllability (4 items; e.g., your team could control in the future), stability (3 items; e.g., remains stable across time), globality (4 items; e.g., relates to a number of different situations your team encounters), and universality (4 items; e.g., is a common cause of performance for other teams) were examined. Scale anchors ranged from 1 (*Not at all*) to 5 (*Completely*). Cronbach's alphas for attribution dimensions were all between .74 and .84 (Nunnally & Bernstein, 1979). See supplementary material for all Cronbach's alphas (Table S1).

***Social identity.*** Social identification was measured with the 14 item scale developed by Leach et al. (2008). This inventory measures levels of identification athletes feel toward their team through five components: solidarity (3 items; e.g., I feel a bond with my team), satisfaction (4 items; e.g., I am glad to be on my team), centrality (3 items; e.g., Being on my team is an important part of how I see myself), individual self-stereotyping (2 items; e.g., I am similar to the average team member), and in-group homogeneity (2 items; e.g., My teammates are very similar to each other). While each of the five subscales corresponds with a different component of identification, all subscales were significantly correlated with one another (Table S2). Further, no a priori predictions regarding differential effects of these components were made. Therefore, in line with Postmes, Haslam,

and Jans (2013a) recommendations, a global approach to identification was adopted. As such, following Leach, Mosquera, and Hirt (2010), all five subscales were collapsed to form a single index of group identification. All items were assessed on a scale from 1 (*Not at all*) to 5 (*Extremely*). Cronbach's alpha for the social identity index was .90.

**Collective efficacy.** Collective efficacy for an upcoming performance was measured using the 20 item Collective Efficacy Questionnaire in Sport (CEQS) (Short et al., 2005). Consistent with Bandura's (1997) recommendations, collective efficacy was measured as individuals' beliefs in the ability of their team. Thus, participants first read the stem: "In terms of the upcoming game or competition, rate your confidence that your team has the ability to..." They then rated their confidence in five different areas pertinent to collective efficacy: ability (4 items; e.g., play more skillfully than the opponent), effort (4 items; e.g., demonstrate a strong work ethic), persistence (4 items; e.g., persist when obstacles are present), preparation (4 items; e.g., devise a successful strategy), and unity (4 items; e.g., keep a positive attitude). Each subscale was rated on a Likert-type scale from 1 (*Not at all confident*) to 10 (*Extremely confident*). All subscales were significantly correlated with each other and the total score (Table S3); therefore, like Hampson and Jowett (2014), subscales were combined for a global index of collective efficacy. Cronbach's alpha for the collective efficacy index was .96.

**Emotions.** The Sport Emotion Questionnaire (SEQ) measured pre-performance emotions (Jones, Lane, Bray, Uphill, & Catlin, 2005). The SEQ is a 20 item sport specific self-report measure that asks participants to rate the extent to which they feel positive and negative emotions in relation to an upcoming performance. These emotions can be categorised into two positive affective states:

excitement (4 items; e.g., exhilarated), and happiness (4 items; e.g., pleased), as well as three negative affective states: anxiety (5 items; e.g., nervous), dejection (5 items; e.g., upset), and anger (4 items; e.g., irritated). Items were measured on a five-point scale from 1 (*Not at all*) to 5 (*Extremely*). Cronbach's alphas ranged between .80 and .87.

**Design and data reduction.** According to attribution theory, the relationships between attributions and outcomes often differ dependent on task outcome (i.e., victory or defeat) (Weiner, 1985). Therefore, after data collection, the sample was separated into teams that won (team victory) and teams that lost (team defeat) their most recent performance. Of the 227 athletes who participated, 116 were on teams that won and 111 were on teams that lost. Of those on teams that won, eight participants perceived their team performance as a failure. Of those on teams that lost, 28 participants perceived their team performance as a success. In line with attribution researchers who adopted a similar design, these participants were removed from analyses (Allen et al., 2009a; Coffee et al., 2015). One participant did not complete the team-referent attribution measure and was therefore removed from the analysis. This left a sample of 108 athletes (11 teams) in the team victory condition and 82 athletes (14 teams) in the team defeat condition. In the team defeat condition, three participants did not complete the emotions questionnaire and one participant did not complete the collective efficacy questionnaire. Data from these participants were removed from the respective analyses. These sample sizes are similar to those obtained in Allen et al., (2009a) Coffee et al., (2015).

**Procedure.** Approval for this study was granted by a university ethics committee. Team coaches were first contacted via email to inquire about their

interest in having their athletes participate in the study. Those coaches who agreed to have their team participate then arranged a time for the researcher and athletes to meet before a training session. At data collection, the first author informed the athletes of the purpose of the study and invited them to participate in the research. Following informed consent, athletes were asked to complete the questionnaires independently without discussion with teammates. Upon completion, questionnaires were returned to the researcher and participants were thanked for their participation.

**Data Analysis.** Missing values were missing completely at random (MCAR) as Little's (1988) MCAR statistic was not significant  $\chi^2(585) = 498.79, p = .99$ . The proportion of missing data was < 1% for variables in the team victory condition and up to 1.2% in the team defeat condition. In these cases, participants' subscale mean was used to replace missing values as items within subscales were significantly correlated (Osborne, 2012).

All statistical analyses were conducted in R version 3.5.1 (R Core Team, 2018). Multilevel linear models were fitted with the lme4 R package (Bates et al., 2015). Before predictor variables were entered into the model, a null model with no parameters was first analysed to examine the proportion of between team variance and within team variance.<sup>2</sup> Across both team victory and team defeat

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<sup>2</sup> Analyses were conducted at the individual level. This does not, however, discount the hierarchical nature of the data as participants were nested within teams. To account for this, team membership was controlled for by separating between and within team variance using a two-level regression model. Therefore, models were fitted with random intercepts and fixed coefficients. While random coefficients models were explored, these did not significantly improve the models. This multilevel approach is consistent with the strategy employed by Coffee et al. (2015) and Heuzé, Raimbault, and Fontayne (2006).

conditions, all intra-class correlation coefficients (ICCs) for dependent variables ranged between .02 and .36, providing support for the multilevel approach (Julian, 2001) (Table S1). Consistent with previous team-referent attribution studies (Allen et al., 2009a; Coffee et al., 2015), predictor variables were entered sequentially with attribution dimensions at Step 1, followed by social identity at Step 2, and the interaction product terms between attribution dimensions and social identity at Step 3. The changes in the log likelihood at each step as well as the coefficients (and standard errors) were used to ascertain significance. The  $R^2$  statistic was used as an adjunct to changes in log likelihood as a model diagnostic tool (Edwards et al., 2008). Further, in accordance with Robinson et al., (2013) simple slopes were explored to observe whether the relationships at high (1 *SD*) and low (-1 *SD*) levels of the moderator (i.e., social identity) were significantly different from zero (e.g., Hannan, Moffitt, Neumann, & Thomas, 2015). Weiner (1985) suggested that affective responses are outcome dependent and that positive emotions are relevant after success and negative emotions after failure. Therefore, consistent with Allen et al. (2009), positive emotions were analysed after team victory and negative emotions were analysed after team defeat. The current research was designed to focus on individual differences in relation to the team, therefore, all predictor variables were group mean centred (see Enders & Tofghi, 2007). A visual inspection for linearity, homoscedasticity, and normality of residuals revealed no obvious violations of assumptions.

## **Results**

**Collective efficacy.** See Supplementary materials for descriptive statistics (Table S1) and bivariate correlations (Table S4). Multilevel linear models were used to examine the effects of attribution dimensions, social identity, and

interaction (product) terms on collective efficacy (see Table 1). In the team victory condition, at Step 1, attributions were significantly associated with collective efficacy,  $\Delta\chi^2(4) = 18.12, p = .001, \Delta R^2 = .17$ , primarily attributable to the significant effect of the controllability dimension,  $b = .36, p = .034, R^2 = .05$ . At Step 2, social identity was significantly associated with collective efficacy,  $\Delta\chi^2(1) = 13.38, p < .001, \Delta R^2 = .11$ , with higher levels of social identity associated with higher levels collective efficacy,  $b = .68, p < .001, R^2 = .13$ . At Step 3, no significant interactions between attribution dimensions and social identity were observed,  $\Delta\chi^2(4) = 2.94, p = .569, \Delta R^2 = .02$ .

In the team defeat condition, at Step 1, attributions were significantly associated with collective efficacy,  $\Delta\chi^2(4) = 10.94, p = .027, \Delta R^2 = .15$ , again primarily attributable to the significant effect of controllability,  $b = .53, p = .040, R^2 = .07$ . At Step 2, after accounting for the variance of attributions, social identity was significantly associated with collective efficacy,  $\Delta\chi^2(1) = 19.56, p < .001, \Delta R^2 = .21$ , as higher levels of social identity were associated with higher levels of collective efficacy,  $b = 1.21, p < .001, R^2 = .25$ . Finally, at Step 3, a significant interaction between attribution dimensions and social identity was observed,  $\Delta\chi^2(4) = 19.74, p < .001, \Delta R^2 = .16$ . Regression coefficients indicated that interaction terms of controllability and social identity,  $b = -.95, p = .041, R^2 = .06$ , and stability and social identity,  $b = -1.32, p = .012, R^2 = .09$ , were salient predictors. At low levels of social identity, a positive relationship between controllability and collective efficacy was observed. Simple slopes were significant when social identity was below  $-.33$  and above  $3.78$ . Further, at high levels of social identity, a negative relationship between stability and collective efficacy was observed. However, at low levels of social identity, a positive

Table 1. Study 2 multilevel regression model reporting the contribution of attribution dimensions, social identity, and interaction terms on collective efficacy after team victory and team defeat

Model	Team Victory				Model	Team Defeat			
	$-2(\chi^2)$	$\Delta\chi^2$	$b$ (SE)	$\Delta R^2$		$-2(\chi^2)$	$\Delta\chi^2$	$b$ (SE)	$\Delta R^2$
Constant	313.74		7.59 (.24)**		Constant	293.34		7.33 (.25)**	
Step 1	295.62	18.12*		.17	Step 1	282.34	10.94*		.15
Controllability			0.36 (0.17)*		Controllability			0.53 (0.25)*	
Stability			0.07 (0.12)		Stability			0.08 (0.21)	
Globality			0.27 (0.22)		Globality			0.14 (0.40)	
Universality			-0.03 (0.14)		Universality			0.21 (0.28)	
Step 2	282.24	13.38**		.11	Step 2	262.84	19.56**		.21
Social identity			0.68 (0.18)**		Social identity			1.21 (0.26)**	
Step 3	279.3	2.94		.02	Step 3	243.1	19.74**		.16
Cont*SI			0.23 (0.40)		Cont*SI			-0.95 (0.46)*	
Stab*SI			-0.10 (0.28)		Stab*SI			-1.32 (0.51)*	
Glob*SI			-0.10 (0.58)		Glob*SI			0.56 (0.83)	
Univ*SI			-0.41 (0.36)		Univ*SI			0.82 (0.43)	
Total $R^2$				.30	Total $R^2$				.52

Note. SI = Social identity, Cont = Controllability, Stab = Stability, Glob = Globality, Univ = Universality. \* $p < .05$ , \*\* $p < .01$ .

relationship between stability and collective efficacy was observed. Simple slopes were significant when social identity was below  $-.71$  and above  $.16$ . These interactions are illustrated in Figures 1a and 1b.

**Emotions.** Results pertinent to the analyses of attributions and social identity on emotions are presented in Table 2. In the team victory condition, at Step 1, attributions were significantly associated with levels of happiness,  $\Delta\chi^2(4) = 9.78, p = .044, \Delta R^2 = .10$ . Regression coefficients indicated stability to be the significant predictor, with higher levels of stability associated with higher levels of happiness,  $b = .25, p = .020, R^2 = .06$ . At Step 2, after accounting for attributions, social identity was significantly associated with happiness,  $\Delta\chi^2(1) = 10.48, p = .001, \Delta R^2 = .19$ , with higher levels of social identity associated with higher levels of happiness,  $b = .52, p = .002, R^2 = .10$ . At Step 3, there was no effect of interaction terms on happiness,  $\Delta\chi^2(4) = 2.28, p = .682, \Delta R^2 = .01$ .

For excitement, at Step 1 there was no significant effect of attributions,  $\Delta\chi^2(4) = 9.36, p = .053, \Delta R^2 = .09$ . At Step 2, there was a main effect of social identity  $\Delta\chi^2(4) = 14.52, p < .001, \Delta R^2 = .13$ , indicating a positive relationship between social identity and excitement,  $b = .53, p < .001, \Delta R^2 = .14$ . At Step 3 no interaction between attributions and social identity was observed,  $\Delta\chi^2(4) = 6.42, p = .171, \Delta R^2 = .04$ . However, a significant regression coefficient for the interaction between controllability and social identity was evident,  $b = .65, p = .027, R^2 = .05$ . Simple slopes indicated that at high levels of social identity, no relationship between controllability and excitement was evident,  $b = .09, p = .628$ , however, at low levels of social identity, a negative relationship between controllability and excitement was observed,  $b = -.52, p = .003$ . Simple slopes were significant when social identity was below  $-.02$  and above  $2.77$  (Figure 2).

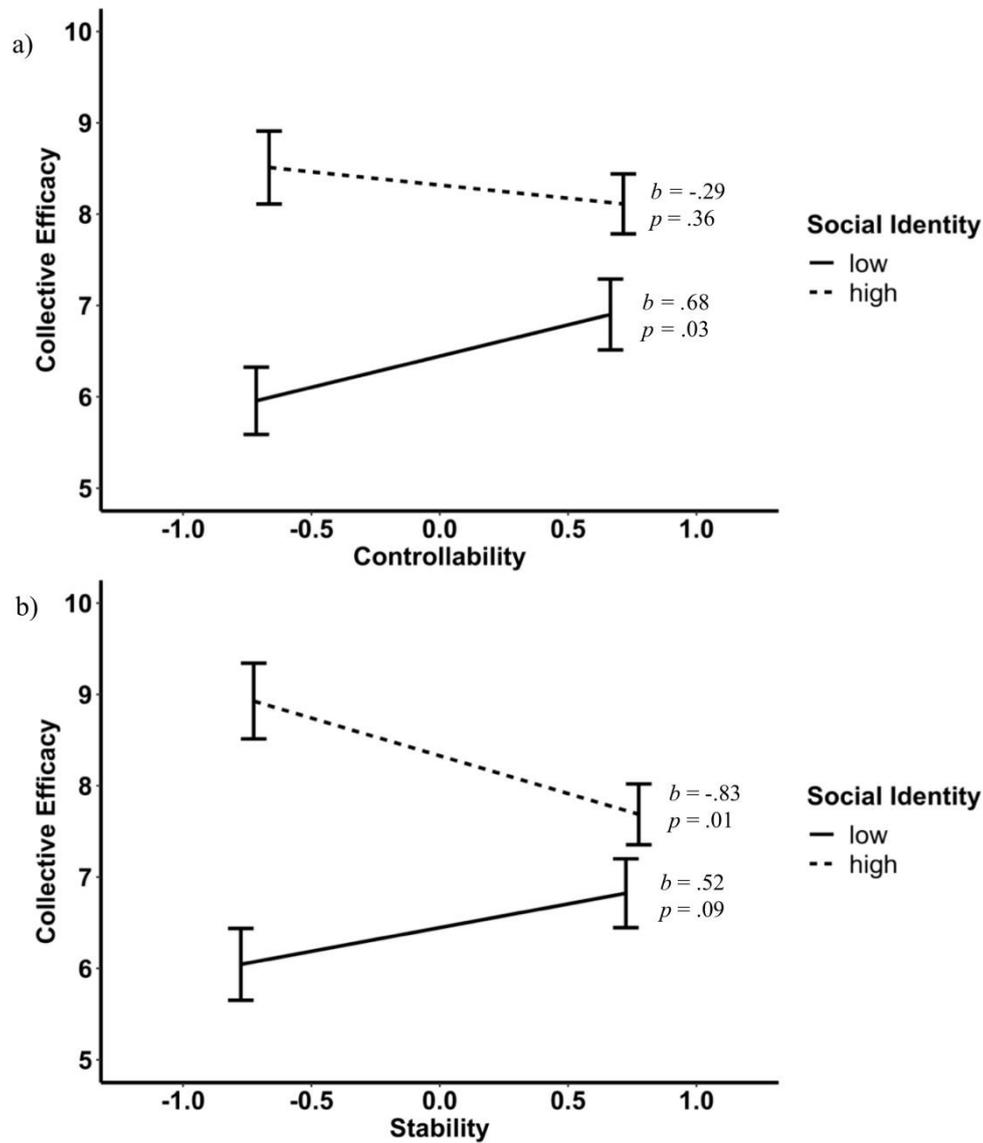


Figure 1. Study 2 interactions between a) controllability and social identity, and b) stability and social identity on collective efficacy after team defeat. Social identity was plotted at 1 SD (.51) above the mean centred on zero and 1 SD (-.51) below the mean centred on zero.

Table 2. Study 2 multilevel regression model reporting the contribution of attribution dimensions, social identity, and interaction terms on emotions

	Positive Emotions						Negative Emotions					
	Happiness		Excitement		Anxiety		Dejection		Anger			
	$\Delta\chi^2$	<i>b</i> (SE)	$\Delta R^2$	$\Delta\chi^2$	<i>b</i> (SE)	$\Delta R^2$	$\Delta\chi^2$	<i>b</i> (SE)	$\Delta R^2$	$\Delta\chi^2$	<i>b</i> (SE)	$\Delta R^2$
-2* log lik	267.14		237.1		216.6		199		197.7			
Constant	3.41 (0.15)**		3.66 (0.14)**		2.27 (0.16)**		1.56 (0.15)**		1.71 (0.15)**			
Step 1	9.78*		.10		9.36		.09		3.76		.06	
Cont	-0.09 (0.14)		-0.18 (0.12)		0.00 (0.17)		0.02 (0.16)		0.10 (0.16)			
Stab	0.25 (0.10)*		0.15 (0.09)		0.07 (0.14)		0.16 (0.13)		0.11 (0.13)			
Glob	0.12 (0.19)		0.23 (0.16)		0.22 (0.27)		0.03 (0.24)		-0.10 (0.24)			
Univ	0.08 (0.12)		0.11 (0.11)		0.11 (0.19)		-0.01 (0.17)		0.13 (0.17)			
Step 2	10.48**		.09		14.52**		.13		0.42		.00	
SI	0.52 (0.16)**		0.53 (0.14)**		-0.13 (0.21)		-0.44 (0.18)*		6.23*		.09	
Step 3	2.28		.01		6.42		.04		5.42		.06	
Cont*SI	0.22 (0.35)		0.65 (0.29)*		-0.45 (0.41)		-0.22 (0.35)		5.43		.10	
Stab*SI	0.29 (0.24)		-0.21(0.20)		-0.38 (0.43)		-0.47 (0.37)		4.63		.05	
Glob*SI	-0.42 (0.50)		-0.17 (0.42)		-0.05 (0.70)		-0.01 (0.60)					
Univ*SI	-0.09 (0.31)		-0.08 (0.26)		0.42 (0.38)		0.25 (0.33)					
Total $R^2$			.20				.26				.12	

Note. SI = Social identity, C = Controllability, S = Stability, G = Globality, U = Universality. \* $p < .05$ , \*\* $p < .01$

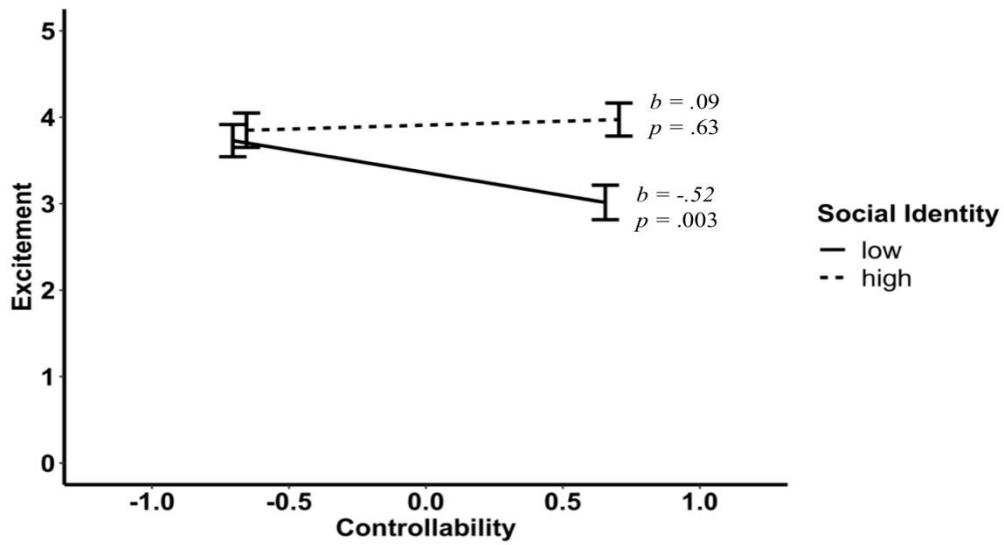


Figure 2. Study 2 interaction between controllability and social identity on excitement after team victory.

Social identity was plotted at 1 SD (.47) above the mean centred on zero and 1 SD (-.47) below the mean centred on zero.

In the team defeat condition, for anxiety and anger, the best fitting model was the variance components model. For levels of dejection, there were no main effects of attributions or interaction effects between attributions and social identity, however social identity was significantly associated with dejection,  $\Delta\chi^2(1) = 6.23, p = .013, \Delta R^2 = .09$ , with higher levels of social identity being associated with lower levels of dejection,  $b = -0.44, p = .017, R^2 = .09$ .

### Study 3

#### Method

**Participants.** Data were collected over the course of one season from a university American football team in the United Kingdom. At the beginning of the season, the team included 47 athletes; however, four participants left the team after the first game and were subsequently removed from the study. The 43 remaining athletes had a mean age of 21.54 years ( $SD = 4.01$ ). All players were male and reported an average of 3.97 ( $SD = 4.02$ ) years of experience playing American football. Average experience with the team on which they completed the study was 1.03 years ( $SD = 1.18$ ) and ranged from 0 to 4 years. Data collection took place one year after data collection for Study 2. Twenty-two individuals who took part in Study 2 also participated in Study 3.

**Measures.** Consistent with Study 2 and previous attribution research, after each game, participants reported whether they perceived the team's performance as a success or a failure using a binary response (success, failure) (Allen et al., 2009a; Coffee et al., 2015). The same measures of team-referent attributions (i.e., TRAMS; Coffee et al., 2015) and collective efficacy (i.e., CEQS; Short, Sullivan, & Feltz, 2005) were employed again in Study 3 with Cronbach's alphas ranging between .81 and .98. See supplementary material for Cronbach's alphas, intra-

class correlation coefficients and bivariate correlations for all Study 3 variables (Table S5).

***Social identity.*** Due to multiple measurement waves, the shorter four-item social identification scale (FISI) was used to measure social identity (Postmes et al., 2013). The FISI is, in part, derived from Leach et al.'s (2008) measure of in-group identification. As such, individual items in the FISI correlate highly with that of Leach et al.'s in-group identification measure (Postmes et al., 2013). Participants were asked to rate the extent to which they agree with four statements pertaining to their level of identification with their team (e.g., I identify with [name of team]). Items were rated on a 7-point Likert-type scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Cronbach's alpha for the social identity index was .88.

***Procedure.*** Ethical approval was granted by a university ethics committee. The head coach of the team was contacted first about the study. After approval from the team coach, the study purpose and procedure were explained in detail to all team members before the beginning of the season, and team members provided informed consent to participate in the research. All team games took place on Sunday, and data collection waves took place on two occasions between games. Occasion one was on the Wednesday following games (TRAMS and FISI) and occasion two was on the Friday before games (CEQS). This is consistent with Bandura's (1997) recommendations that collective efficacy should be measured in as close temporal proximity to the match as possible, while minimising the impact of data collection on team performance.

***Data reduction.*** There was a total of 11 team games and 20 data collection occasions across 10 waves. Therefore, there were 43 team members to

complete the questionnaires over 10 measurement waves, totalling 430 possible observations for analysis. On 12 occasions participants reported a team defeat as a success and on one occasion a participant reported a team victory as a failure. Like in Study 2 and other attribution studies (e.g., Allen et al., 2009a; Coffee et al., 2015), these individuals were excluded from the entire measurement wave. Due to injury or absence at measurement occasion, not all participants were measured at each occasion. Therefore, of the 417 remaining observations, there were 238 observations in which participants completed questionnaires at both occasions within a measurement wave. Of these 238 observations, 167 observations (across 38 participants) were completed after team victory and 71 observations (across 38 participants) were completed after defeat.

Preliminary data screening involved examining data for missing values, outliers and violations of assumptions.<sup>3</sup> The maximum missing data for a single variable was less than 2%. To maximise the number of possible observations for analysis, observations in which participants completed the questionnaire battery but missed items were completed via imputation of the scale mean pertinent to that individual at that specific occasion (Osborne, 2012). Akin to Study 2, data were analysed using R Studio version 3.5.1 (R Core Team, 2018).

**Data analysis.** As in Study 2, multilevel linear modelling was employed to analyse these data. However, instead of individuals being nested within teams,

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<sup>3</sup> Measures of skewness and kurtosis for the raw scores of the response variable (collective efficacy) were within a normal range; however, a histogram revealed inflation at the maximum end of the scale. While generalised linear mixed effect models were run to examine the effect of this inflation (see supplementary material: Note S1), results closely resembled the results observed when using the linear mixed effects models. Therefore, to ensure parsimony, linear mixed effects models were used.

due to the longitudinal nature of the dataset, multilevel models were used to account for the interdependency of participants completing the questionnaires in reference to the same match, and being assessed multiple times. Part 1 of the analysis was aimed at exploring the relationships after a team victory and team defeat, and Part 2 was aimed at exploring the relationships across an entire season.

**Part 1.** Fixed coefficient models were used to test for the interactions evident in Study 2. Therefore, the same analytical approach used for Study 2 was adopted for Study 3. The data were separated into waves after team victory (7) and waves after team defeat (3). Individual and wave were included as random effects, with a fixed coefficient structure to examine the effect of predictor variables on collective efficacy. Although a random coefficient structure is often recommended, (Barr, 2013; Nezlek, 2008) the fixed coefficient models were used to examine for the presence of the relationships observed in Study 2, with no specific hypotheses regarding the nature of these relationships between individuals and across the season (i.e., different waves). Therefore, in accordance with Nezlek's (2001) recommendations, such a reason justifies the implementation of a fixed coefficient structure. Main effects of attribution dimensions were first included in the model (Step 1), followed by the main effect of social identity (Step 2). Finally, the interaction product terms between attribution dimensions and social identity were examined (Step 3). Again, changes in log likelihood and the  $R^2$  statistic were used as model diagnostic tools and simple slopes were explored to observe whether the relationships at high (1 *SD*) and low (-1 *SD*) levels of the moderator (i.e., social identity) were significantly different from zero.

**Part 2.** The purpose of the second part of the analysis was to examine if the moderating effect of social identity was consistent between individuals and

across the entire season. Unlike other attribution dimensions, the effects of controllability are not dependent on performance outcome (Rees et al., 2005), and as such, the interaction effect between controllability and social identity was explored across all individuals and all measurement waves, regardless of team victory or team defeat. However, because performance is strongly associated with efficacy (Bandura, 1997; Bray, 2004), the result of the previous match was included as a covariate. To account for the possibility that the observed relationships vary between individuals and across time a full random intercepts and slopes model was adopted. This analysis was similar to the analysis adopted by Beattie and colleagues who used multilevel models to analyse a longitudinal dataset (Beattie, Dempsey, Roberts, Woodman, & Cooke, 2017).

As in Study 2 the purpose of Study 3 was to examine athletes' attributions and social identity in relation to the team, thus, predictor variables were mean centred at each measurement wave (Enders & Tofighi, 2007). A visual inspection for linearity, homoscedasticity, and normality of residuals revealed no obvious violations of assumptions. Descriptive statistics for all variables across each time point are presented in Table S6.

## Results

### **Multilevel analysis.**

*Part 1.* Table 3 presents the results of the fixed coefficient models used to analyse the relationships between team-referent attributions and social identity on collective efficacy. After team victory, at Step 1, attributions were not significantly associated with collective efficacy scores,  $\Delta\chi^2(4) = 2.64, p = .620, \Delta R^2 = .02$ . At Step 2, no significant relationships between social identity and collective efficacy was observed,  $\Delta\chi^2(1) = 2.04, p = .153, \Delta R^2 = .01$ . At Step 3, the

Table 3. Study 3 multilevel regression model reporting the contribution of attribution dimensions, social identity, and interaction terms on collective efficacy after team victory and team defeat

Team Victory					Team Defeat				
Model	$-2(\chi^2)$	$\Delta\chi^2$	$b$ (SE)	$\Delta R^2$	Model	$-2(\chi^2)$	$\Delta\chi^2$	$b$ (SE)	$\Delta R^2$
Constant	421.66		8.41 (0.20)**		Constant	211.16		8.37 (0.21)**	
Step 1	419.02	2.64		.02	Step 1	208.12	3.04		.06
Cont			-0.05 (0.12)		Cont			0.15 (0.15)	
Stab			0.08 (0.10)		Stab			0.12 (0.16)	
Glob			0.04 (0.15)		Glob			-0.23 (0.23)	
Univ			0.09 (0.10)		Univ			0.18 (0.17)	
Step 2	416.98	2.04		.01	Step 2	195.34	12.78**		.18
SI			0.13 (0.09)		SI			0.47 (0.13)**	
Step 3	380.90	36.08**		.20	Step 3	190.59	4.76		.08
Cont*SI			0.51 (0.09)**		Cont*SI			-0.18 (0.16)	
Stab*SI			-0.01 (0.09)		Stab*SI			0.02 (0.16)	
Glob*SI			-0.21 (0.11)		Glob*SI			-0.10 (0.23)	
Univ*SI			-0.26 (0.10)*		Univ*SI			0.28 (0.15)	
Total $R^2$				.23	Total $R^2$				.32

Note. SI = Social identity, Cont = Controllability, Stab = Stability, Glob = Globality, Univ = Universality. \* $p < .05$ , \*\* $p < .01$ .

interaction between attribution dimensions and social identity was significantly associated with collective efficacy,  $\Delta\chi^2(4) = 36.08, p < .001, \Delta R^2 = .21$ .

Regression coefficients indicated that interaction terms of controllability and social identity,  $b = .51, p < .001, R^2 = .18$ , as well as universality and social identity were the salient predictors,  $b = -.25, p = .012, R^2 = .04$ . At higher levels of social identity, a positive relationship between controllability and collective efficacy was observed; however, at lower levels of social identity, this relationship was negative. Simple slopes were significant below  $-.29$  and above  $.64$  levels of social identity. For the interaction between universality and social identity, at higher levels of social identity there was a non-significant negative relationship between universality and social identity, however, at lower levels of social identity, this relationship was significant and positive (Figure 3). Simple slopes were significant below  $-.74$  and above  $1.68$  levels of social identity.

After team defeat, at Step 1, attributions were not significantly associated with collective efficacy scores,  $\Delta\chi^2(4) = 3.04, p = .552, \Delta R^2 = .06$ . At Step 2, social identity was significantly associated with collective efficacy,  $\Delta\chi^2(1) = 12.78, p < .001, \Delta R^2 = .18$ , with higher levels of social identity associated with higher levels of collective efficacy,  $b = .47, p < .001, R^2 = .18$ . At Step 3, the interaction term was not significant,  $\Delta\chi^2(4) = 4.76, p = .312, \Delta R^2 = .08$ .

**Part 2.** A significant interaction between controllability and social identity on collective efficacy across individuals and across the entire season was observed,  $b = .19, p = .047, R^2 = .16$ . Simple slopes analysis revealed a significant positive relationship between controllability and collective efficacy only at high levels of social identity (Figure 4). Simple slopes were significant when social identity was below  $-4.22$  and above  $.78$ .

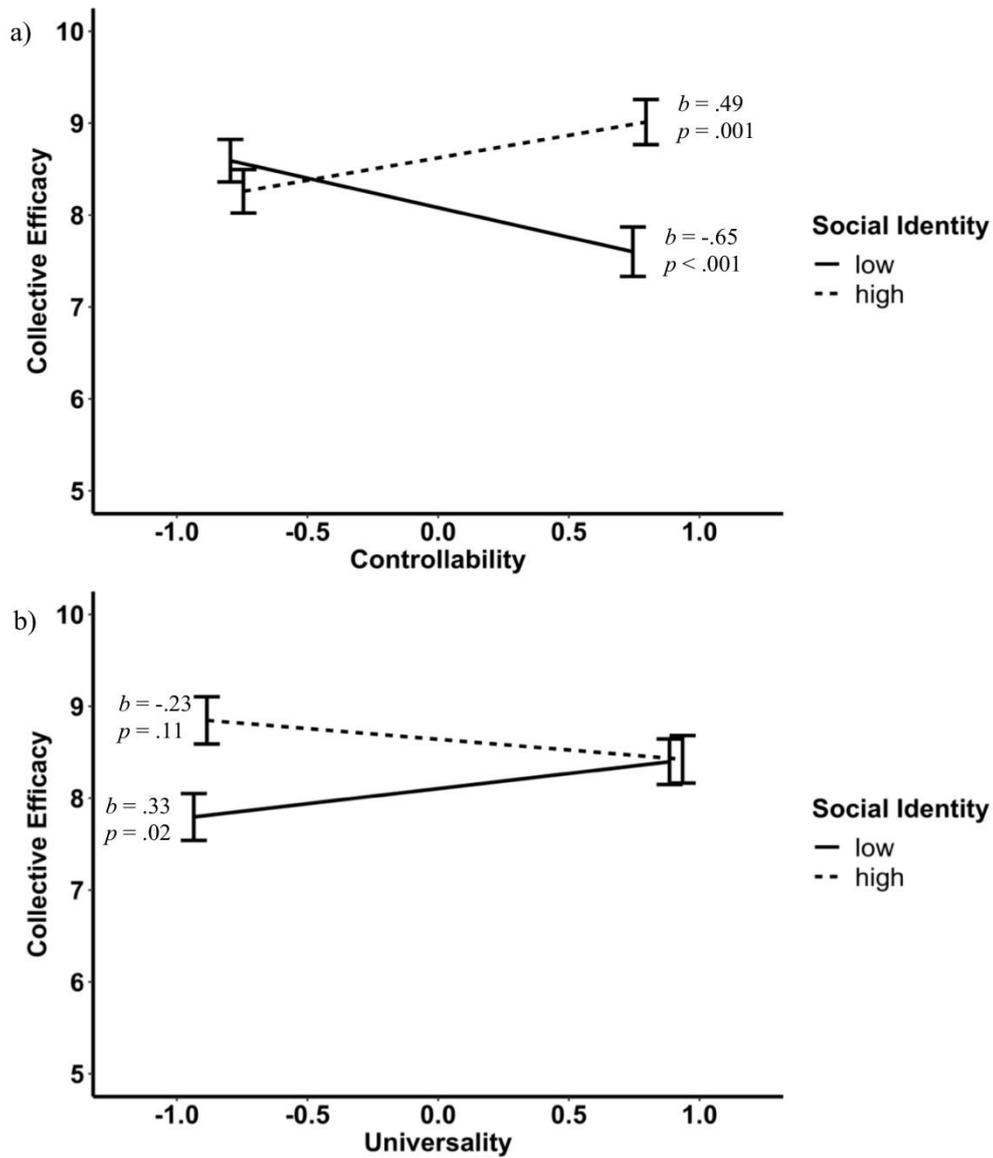


Figure 3. Study 3 interaction between a) controllability and social identity, and b) universality and social identity on collective efficacy after team victory.

Social identity was plotted at 1 SD (1.11) above the mean centred on zero and 1 SD (-1.11) below the mean centred on zero.

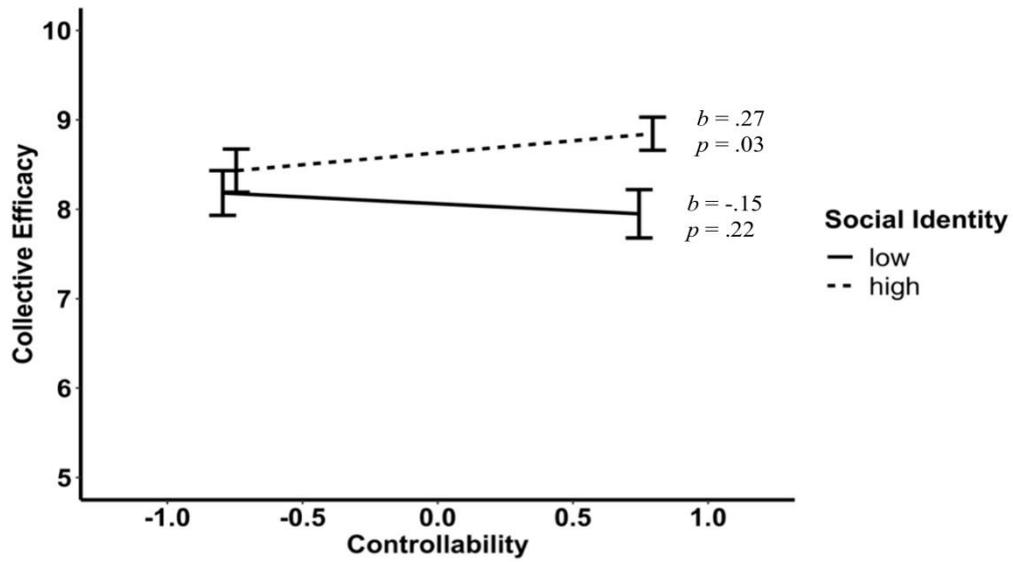


Figure 4. Study 3 interaction between controllability and social identity on collective efficacy after all matches across the season. Social identity was plotted at 1 SD (1.10) above the mean centred on zero and 1 SD (-1.10) below the mean centred on zero.

## General Discussion

Contextual factors such as social identity likely moderate the attribution-  
efficacy relationships and attribution-emotions relationships (Allen et al., 2012;  
Coffee et al., 2009; Martinko et al., 2011); however, these moderating effects had  
not yet been explored. As such, the current studies were designed to explore the  
main effects of attributions (Hypothesis 1), social identity (Hypothesis 2, and their  
interactive effects (Hypothesis 3) on sport outcomes including collective efficacy  
and emotions. Hypothesis 1 was supported as there was evidence of a small to  
moderate main effect of the controllability dimension on collective efficacy in  
Study 2, but no such main effects in Study 3. There was weak support for  
relationships between attribution dimensions and emotions observed in Study 2.  
Support for Hypothesis 2 was observed across both studies as higher levels of  
social identity were associated with higher levels of collective efficacy and  
positive emotions. Hypothesis 3 was also supported across both studies as the  
relationships between attribution dimensions and collective efficacy differed at  
different levels of social identity.

As previously mentioned, attributions typically range on a scale from  
maladaptive to adaptive with adaptive attributions being associated with positive  
sport outcomes (Coffee & Rees, 2008b). Through behavioural experiments,  
researchers have demonstrated a causal link between perceptions of controllability  
(i.e., adaptive attributions) and positive sport outcomes (Rasclé et al., 2015).  
Correlational support for these relationships was observed within the current  
studies as higher levels of controllability (i.e., adaptive attributions) were  
consistently associated with higher levels of collective efficacy, and thus, lower  
levels of controllability (i.e., maladaptive attributions) were associated with lower

levels of collective efficacy. Rees and colleagues also theorised that high levels of stability, globality, and low levels of universality are generally adaptive after victory and maladaptive after defeat; while low levels of stability, globality, and high levels of universality are generally maladaptive after victory and adaptive after defeat. There was some support for this assertion; however, the presence of the interaction effects indicated that the strength (and in the case of universality, the direction) of these relationships varied at different levels of social identity.

The nature of the observed interactions between controllability and collective efficacy took two different forms. First, in Study 2, after team defeat, at high levels of social identity there was no relationship between controllability and collective efficacy. However, at low levels of social identity, the relationship between controllability and collective efficacy indicated those who reported lower levels of controllability also reported lower levels of collective efficacy. These relationships appear indicative of a buffering effect of social identity. That is, at high levels of social identity, individuals may be protected from deleterious effects typically associated with low levels of controllability. These relationships are consistent with results of previous studies that have demonstrated social identity might buffer against negative outcomes (Häusser, Kattenstroth, van Dick, & Mojzisch, 2012).

Second, in Study 3, after team victory, at high levels of social identity the expected positive relationship between controllability and collective efficacy was evident; at low levels of social identity, a negative relationship was observed. This relationship was also evident in Study 2 after team defeat in the stability dimension as unstable attributions, which are often considered to be adaptive following defeat, were only associated with higher perceptions of collective

efficacy under conditions of high social identity. These relationships might be explained by the way social identity can structure individuals' to think more collectively (Turner & Oakes, 1997). That is, individuals who have high levels of social identity may think about their attributions differently (i.e., more collectively) than those who have low levels of social identity. For example, a soccer player who is highly identified with his team might internalise his team-referent attribution and thus believe it is reflective of himself as an individual. This means, the athlete's team-referent attribution would be more meaningful and impactful on the athlete's cognitions. In contrast, an athlete who has a low social identity with a team may perceive his team-referent attribution as relevant to the team he is on, but is not reflective of himself as an individual. Thus, the athlete's cognition might only be minimally influenced by the team-referent attribution. A potential avenue for further research is to examine the potential mechanism behind the relationships observed in these studies by exploring whether individuals perceive team-referent attributions as more personally meaningful when they highly identify with their team.

There was a particularly unique effect within the universality-social identity interaction as, after team victory, a positive relationship between universality and collective efficacy was observed at low levels of social identity. While attributing team victory to causes that are common to all teams (i.e., high universality) is typically associated with more negative outcomes (Coffee & Rees, 2008a), high universality was actually associated with higher collective efficacy. This may be because, at low levels of social identity athletes did not see their team as unique or distinct from other teams (Rees et al., 2015), therefore, attributions for team victory that are common to all teams (i.e., high universality) might have

become positive as individuals viewed their own team as similar to other teams. However, this interpretation needs to be confirmed through further research on the potential moderating effect of social identity.

In addition to the effects of attributions, positive relationships between social identity and collective efficacy were observed across both studies. Those who identified more with their team reported higher levels of collective efficacy before the next match. This is believed to be the first study to demonstrate the relationship between social identity and collective efficacy in a field setting. This finding adds to the growing body of literature that points towards the importance of social identity in a performance setting (Bruner, Eys, Evans, & Wilson, 2015; Rees et al., 2015).

Within Study 2 only levels of happiness, out of all five emotions assessed, were significantly associated with attribution dimensions. Specifically, after a successful performance, attributions of stability were associated with higher levels of happiness. Further, after a successful team performance individuals were more excited and happier before their next performance when they reported higher levels of social identity with their team. This is consistent with previous research that demonstrated that fans who were strongly identified with their team experienced an increase in positive emotions after team victory (Jones, Coffee, Sheffield, Yangüez, & Barker, 2012; Tamminen et al., 2016). The minimal interaction effects between attributions and social identity on emotions may be due to reduced feelings of responsibility, as within a team environment there is a diffusion of responsibility that minimises the prevalence emotions (Naquin & Tynan, 2003). While it was anticipated that social identity would minimise this diffusion of responsibility, this did not appear to be the case. It may be, instead,

social identity supersedes the relationships between team-referent attributions and emotions. In other words, a strong social identity might be associated with positive emotions and less negative emotions regardless of team-referent attributions.

### **Strengths and Limitations**

Researchers have demonstrated that attributions can influence sport outcomes beyond a single time point (Allen et al., 2009b; Rascle et al., 2015). That is, attributions reported at a certain time are associated with outcomes days later. The relationships observed within Study 3 support this effect as measurement of collective efficacy occurred at least two days after measurement of attributions. Therefore, Study 3 demonstrated that the relationships between attributions and collective efficacy exist beyond a simple association at the time of measurement. Further, the relationships observed appeared consistent across the entire season of an American football team. That is, the apparent moderating effect of social identity observed at one time point in Study 2, was also evident throughout a team's entire season in Study 3. Thus, it is likely that the relationships observed within these studies are consistent across time.

A potential limitation of these studies pertains to the samples used. Specifically, a cross-sectional design with a small level two sample size was employed within Study 2, while Study 3 was conducted on a single team across a season. Conceptually, generalisability could be enhanced by looking at multiple teams across a season. Further, the relationships observed were entirely correlational. While interpretations of the relationships were based on attribution theory, social identity theory as well as existing empirical evidence, this does not discount the possibility of alternative explanations for these findings. As such a

potential avenue for future research is to examine the role of social identity on these relationships using an experimental design.

### **Future Research**

A limitation of these studies, and most attribution studies, is the potential for athletes to perceive illusory control. That is, some athletes may perceive an uncontrollable cause as controllable. In these instances, a controllable attribution may be maladaptive. This fallacy is acknowledged within sport attribution theory (Rees et al., 2005) and the effects have been debated within the literature (Colvin & Block, 1994), yet the prevalence of it within sport is unknown. As such, a potential avenue for future research is to examine the how illusory control could impact the attribution process.

It is noteworthy that although social identity appeared to moderate the effect of attributions on collective efficacy, the impact of intra-team agreement/disagreement over team-referent attributions was not explored within the current studies. While social identity is an important contextual factor, the extent to which teammates agree with one another may have a meaningful effect on the relationships between team-referent attributions and performance. For example, at the team level, intra-group agreement is associated with both positive (Carron et al., 2003) and negative (Hart, 1991) group outcomes. Yet, few researchers have investigated if agreement over team-referent attributions can influence these outcomes, as well as the role social identity may have on these relationships. As such, attribution and social identity literature may be advanced through examining how social identity can influence the effects of agreement or disagreement between teammates.

The results of these studies extend attribution theory by demonstrating that the relationships between attributions and collective efficacy might be structured through social identity. Future studies may look to implement interventions aimed at maximising collective efficacy through attribution retraining strategies (Parker et al., 2017) while also encouraging the development of social identity (e.g., Slater & Barker, 2018). Overall these studies offer evidence for the importance of contextual factors, such as social identity, in structuring individuals' perceptions of team-referent attributions.

**Chapter 5. Studies 4 and 5****Attributional Consensus: The Importance of Agreement over Causes for  
Team Performance to Interpersonal Outcomes and Performance**

Team-referent attributions are individual team members' explanations for why team/group outcomes occurred (Allen et al., 2012). Researchers studying attributions have observed associations between team-referent attributions and sport outcomes (Allen et al., 2009a; Coffee et al., 2015; Dithurbide et al., 2009). The preceding chapters provided evidence that athletes' perceptions of their team can moderate the team-referent attribution-outcome relationships; the studies detailed in this chapter were designed to go beyond exploring athletes' perceptions of their team and explore whether social exchanges with teammates might moderate these relationships. Specifically, within a team setting, the presence of teammates' attributions might impact the team-referent attribution-sport outcome relationships. In accordance with attribution theory (Kelley, 1967), this might be because individuals seek consensus information during the attribution process. That is, by seeking consensus information, people aim to comprehend others' attributions to understand if they explained the same outcome in the same way. Therefore, while attribution studies have provided a good understanding of the effects of attributions, researchers have not accounted for the influence that teammates can have on the attribution process. The current study was designed to examine the effect of teammates agreeing or disagreeing over team-referent attributions (i.e., attributional consensus) on the attribution process. Attributional consensus between teammates likely lies on a continuum between complete agreement to complete disagreement; this study was designed to examine the interpersonal and behavioural consequences of teammates diverging along this continuum and finding themselves at opposite ends of this attributional consensus spectrum.

### **Attributional Consensus**

Individuals working collectively to achieve a common goal, as is the case in sport teams, are likely to agree and disagree on issues pertinent to collective performances (Jehn & Mannix, 2001). According to the actor-observer bias/asymmetry, actors (individuals) have a propensity to attribute their own behaviour to situational characteristics, while observers (others) tend to explain the same behaviour through an actor's personal disposition (Jones & Nisbett, 1971). The concept underpinning this is that attributions are a product of personal perspectives, and these perspectives can vary between individuals. For example, an athlete might believe his team lost due to a poor effort, while a teammate could believe the same loss was due to a lack of ability. These diverging perspectives exemplify how individuals within a team may derive different causes to explain a collective performance (i.e., low attributional consensus). Consequently, disagreement is an inevitable part of group involvement.

Low attributional consensus between group members can lead to negative outcomes such as intra-group conflict (Mitchell, 2018). Although disagreement and conflict may often be perceived as synonymous with one other, researchers in social and sport psychology suggest that disagreement between team members is a precursor to intra-team conflict (Barki & Hartwick, 2004; Paradis, Carron, & Martin, 2014). Among sport teams, disagreement that leads to conflict is generally perceived to be negative, as conflict is often associated with negative group outcomes such as experiences of negative emotions and disruption of collective goals (Barki & Hartwick, 2004). Disagreement between team members, however, can also be perceived as a healthy and a potentially important aspect of team dynamics (Goncalo & Duguid, 2008). Thus, the extent to which disagreement in

the form of low attributional consensus causes conflict among teammates warrants examination.

On the other hand, agreement between team members during the attribution process (i.e., high attributional consensus) may facilitate positive intra-group effects. For example, in coach-athlete dyads, those who tend to agree more often report greater feelings of trust and friendship with one another (Jackson, Dimmock, Gucciardi, & Grove, 2011), and these relationships are indicative of cohesive teams (Mach, Dolan, & Tzafrir, 2010). Researchers have demonstrated a positive association between agreement within teams and perceived cohesion (Carron et al., 2003). Thus, team members who believe their team is cohesive, may perceive this cohesion to be a product of agreement over important team processes such as team-referent attributions. This relationship is akin to the process of consensualisation regarding social identity. The process of consensualisation can occur when individuals who agree with one another are more likely to feel a stronger sense of shared identity (Postmes et al., 2005). That is, the process of agreement facilitates a stronger sense of attachment to the group among individuals, and in turn they define themselves from their connection with their group (Tajfel, 1982). In short, individuals tend to feel more cohesive and share a social identity with others who agree with them.

This is likely a reciprocal relationship as social identity often influences the decision-making process within teams (Postmes et al., 2005). Therefore, the effect of agreement or disagreement over attributions on social identity and cohesion is difficult to empirically examine as agreement is likely influenced by existing levels of social identity and cohesion. As a starting point, the current research is designed to examine these relationships in newly formed groups,

thereby, restricting the possibility of existing levels of social identity and cohesion impacting the effect of attributional consensus on outcomes.

### **Attribution Dimensions**

Traditionally, attributions are examined at the dimensional level (Rees et al., 2005; Weiner, 1985). This means, when measuring attributions, the way in which individuals appraise their attributions is of importance. For example, an individual who attributes an unsuccessful performance to a lack of ability may believe this cause is something that is uncontrollable and unlikely to change in the future (stable). However, this same attribution could also be believed to be something that can be controlled through practice, and therefore can change in the future (unstable). Through this dimensional structure, Rees and colleagues theorise that attributions can be assessed on perceptions of controllability (the extent to which a cause is perceived as controllable or uncontrollable), stability (the extent to which a cause is perceived as stable or variable over time), globality (the extent to which a cause is perceived to affect a wide or narrow range of situations), and universality (the extent to which a cause is perceived as common or unique to all people/teams).

Generally, athletes who attribute an unsuccessful performance to causes that are controllable and likely to change in the future are said to have adaptive attributions (controllable and unstable), while those who attribute an unsuccessful performance to causes that are uncontrollable and unlikely to change in the future are said to have maladaptive attributions (uncontrollable and stable: e.g., Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010; Rees et al., 2005). The type of attribution (i.e., adaptive or maladaptive) an individual adopts is believed to impact important sport outcomes (Rees et al., 2005). Those who adopt, when

possible, adaptive attributions are more likely to persist in a challenging task (Le Foll et al., 2008; Rascle et al., 2015), be more confident (Coffee et al., 2015; Coffee & Rees, 2008a, 2009), and ultimately perform better in a subsequent sport performance task (Rees et al., 2013). However, minimal research exists that has examined the influence teammates have on these attribution-outcome relationships.

### **Attributional Consensus and Performance**

Teammates may have a strong influence on the attributional process. For example, in work groups, disagreement between teammates impaired group performance (van Woerkom & Sanders, 2010), which in turn had deleterious effects on individual performance. In terms of attributions in sport, the effects of disagreement with teammates may be dependent on the content of the athlete's attribution. For example, confirmation bias suggests that individuals will seek out information that supports their existing belief (Jonas, Schulz-Hardt, Frey, & Thelen, 2001). Therefore, a teammate agreeing with an adaptive or maladaptive attribution should reaffirm an individual's belief, increasing or decreasing performance respectively.

### **Current Studies**

Within this chapter, two studies are detailed that were designed to examine the effect of attributional consensus between teammates. To do this, an approach similar to that of previous attribution studies (Le Foll et al., 2008; Rascle et al., 2015) was adopted, in that attributions after failure were analysed on a spectrum from adaptive (i.e., controllable and unstable) to maladaptive (i.e., uncontrollable and stable). High attributional consensus was operationalised as convergence on one end of the spectrum (i.e., adaptive-adaptive, maladaptive-maladaptive) while

low attributional consensus was operationalised a divergence towards opposite ends of the spectrum (i.e., adaptive-maladaptive, maladaptive-adaptive). This approach was adopted to explore if high or low attributional consensus influenced perceptions of interpersonal outcomes and objective performance.

Although an attribution dimensional approach was adopted, unlike previous attribution experiments (Le Foll et al., 2008; Rascle et al., 2015), the main purpose of these studies was to explore the effects of attributional consensus on interpersonal outcomes. As such, whether participants adopted an adaptive or maladaptive attribution was not expected to impact the interpersonal relationship with their teammate. In other words, adaptive and maladaptive attributions were used as a mechanism to provide the participant and confederate attributions to agree or disagree on. Therefore, no specific hypotheses regarding the effect of adaptive and maladaptive attributions on interpersonal outcomes were tested. However, because researchers have demonstrated the effect of adaptive/maladaptive attributions on subsequent performance (Rees et al., 2013), the effect of these conditions on performance were tested.

In Study 4, it was predicted that those in the low attributional consensus condition would report more conflict and less cohesion than those in the high attributional consensus condition (Hypothesis 1a). To build on Hypothesis 1a, the effects of attributional consensus on social identity and performance was tested within Study 5. As such it was predicted that those in the low attributional consensus condition would report weaker social identity and perform worse compared to those in the high attributional consensus condition (Hypothesis 1b). Further, it was predicted that participants who adopted an adaptive attribution would perform better compared to those who adopted a maladaptive attribution

(Hypothesis 2). Finally, an interaction effect between adaptive/maladaptive attributions and attributional consensus was predicted (Hypothesis 3). Specifically, it was predicted that participants would perform better when their teammate agreed with their adaptive attribution compared to when their teammate agreed with their maladaptive attribution or disagreed with their adaptive or maladaptive attribution. A vignette design was used within Study 4 to test Hypothesis 1a, while a behavioural experiment was used within Study 5 to test Hypotheses 1a, 1b, 2, and 3.

## Study 4

### Method

**Participants and design.** After three individuals were removed for failing the screening questions, a final online sample of 56 male and 44 female tennis players was used ( $N = 100$ ,  $M_{\text{age}} = 21.56$ ,  $SD = 5.12$ ). Tennis players were sampled as tennis is often played in a doubles format. The study adopted a 2 (attributional consensus: low, high) x 2 (attribution type: adaptive, maladaptive) factor design. Participants were recruited through tennis clubs' web pages. To ensure participants played tennis and they could fully and vividly imagine the situation after exposure to the vignette, they were asked two screening questions: 1) "At what level do you play tennis?" and 2) "How well were you able to imagine the scenario?" As previously mentioned, three individuals failed the screening questions by answering not at all for either one or both questions and were subsequently removed from the analysis. The remaining 100 individuals (25 per condition) competed at various levels (recreational:  $n = 21$ , club:  $n = 56$ , national:  $n = 19$ , international:  $n = 4$ ) and could moderately ( $n = 70$ ) or vividly ( $n = 30$ ) imagine the scenario.

**Procedure.** Approval for the study was granted through a university's research ethics board. Those agreeing to participate in the study clicked a link taking them to an informed consent page. Once participants provided consent, they were asked to complete brief demographic items assessing participants' gender and age. They then read the following vignette:

You are competing in a tennis doubles competition with a partner of similar ability who you have never met. In this competition, you and your partner (the team) perform very poorly and fail.

Half of participants then read a situation in which they and their partner disagreed on an adaptive [or maladaptive] attribution.

You think the main reason the team failed is due to a poor strategy [the difficulty of the task]. This is something that the team can[not] control and something that does [not] change over time. However, your partner disagrees with you and thinks the main reason the team failed is due to the difficulty of the task [a poor strategy]. This is something that the team cannot [can] control and something that does not [does] change over time.

The other half of participants read a situation in which they and their partner agreed on an adaptive [or maladaptive] attribution.

You and your partner agree that the main reason the team failed is due to a poor strategy [the difficulty of the task]. This is something that the team can[not] control and something that does [not] change over time.

Participants then completed items measuring perceptions of conflict and cohesion.

**Measures.** Single item measures were used to assess perceptions of conflict and cohesion. Due to the exploratory nature of this vignette study, and the

use of single item measures in previous social psychology studies (Postmes et al., 2013), these items were deemed to be appropriate. Participants were asked to rate the extent they believed they and their partner would likely experience conflict and cohesion. These were rated on a scale from 1 (*not at all*) to 5 (*completely*).

## Results

Independent samples *t*-tests were used to analyse how agreeing (i.e., high consensus) or disagreeing (i.e., low consensus) on attributions affected perceptions of conflict and cohesion.

**Conflict.** Those in the low attributional consensus condition reported significantly greater levels of conflict,  $M = 2.92$ ,  $SD = 1.01$ , compared to those in the high attributional consensus condition,  $M = 2.38$ ,  $SD = .83$ ,  $t_{98} = -2.93$ ,  $p = .004$ ,  $d = .59$ .

**Cohesion.** Those in the low attributional consensus condition reported significantly lower levels of cohesion,  $M = 2.70$ ,  $SD = .95$ , compared to those in the high attributional consensus condition,  $M = 3.12$ ,  $SD = .94$ ,  $t_{98} = 2.22$ ,  $p = .029$ ,  $d = .45$ .

## Study 5

Study 4 provided initial support for the effects of attributional consensus on interpersonal outcomes, yet the generalisability of the results are limited. First, the study only targeted tennis players. This may raise questions regarding the effects of attributional consensus in other settings. Also, the study examined participants' responses to a fictitious situation. Such a design is not ideal to examine behavioural outcomes like performance or outcomes that emerge through behavioural interactions. Therefore, the purpose of Study 5 was two-fold. First, the study was designed to replicate the effects observed in Study 4 in a

behavioural experiment (Hypothesis 1a). Second, Study 5 was designed to examine the main effects of attributional consensus on social identity and performance (Hypothesis 1b) and the main (Hypothesis 2) and interactive (Hypothesis 3) effects of attributional consensus and attribution type on objective performance.

## **Method**

**Participants.** Two participants did not complete the study as they failed a manipulation check. This left a final sample of 24 male and 32 female university students from a university in the UK ( $N = 56$ ,  $M_{\text{age}} = 23.86$ ,  $SD = 6.42$ ). This sample size is similar to the sample size used in Rascle et al.'s (2015) attribution experiment. On a scale from 1 (*no experience*) to 10 (*a lot of experience*) participants reported little dart throwing experience ( $M = 2.62$ ,  $SD = 1.91$ ).

**Materials.** A regulation size dart board was mounted 1.73 meters from the bull's-eye to the ground (the regulation dart throwing height) and participants threw from 2.37 meters (the regulation dart throwing distance). This distance was marked out by a line on the floor. These materials and distances are consistent with the materials and distances used in Rascle et al. (2015). During each performance, a visual shield was in place to ensure the non-performer was not able to see their teammate's score.

## **Measures.**

***Conflict and cohesion.*** The measures of conflict and cohesion used in Study 4 were also used in Study 5.

***Social identity.*** To examine the effect of attributional consensus on social identity, participants completed the Single Item Social Identity Scale (SISI) (Postmes et al., 2013). The SISI asks participants to report the extent to which

they agree with the statement “I identify with [target group]” on a 7-point scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). In this study, “target group” was replaced with “my team”.

***Performance.*** To measure performance, participants completed two rounds of a dart throwing task (pre-manipulation and post-manipulation). The dart board was divided into 10 sections in concentric circles ranging from 1 (around the outside) to 10 (bull’s-eye), with higher scores corresponding to a better performance. In each round participants threw six darts. Higher scores corresponded with those who threw their darts closer to the middle of the dartboard. Participants who missed the dartboard completely were given a score of zero for that throw.

***Manipulation checks.*** To ensure participants perceived their performance as a failure and understood the manipulation, they were asked to circle a) whether their performance was “rather like a success” or “rather like a failure” and b) which paragraph they selected and which paragraph their teammate (the confederate) selected.

***Procedure.*** Ethical approval for the study was granted by a university’s research ethics board. A participant and the confederate entered the laboratory and were provided details regarding the nature of the study. They then completed an informed consent form and were notified that they would be completing a dart throwing task together as part of a team. They were given a collective target score

of 90 with 12 darts and were informed that they would each throw six darts<sup>4</sup>. Once the participant and confederate indicated they understood the task, the researcher informed them that the participant would perform first. The researcher then instructed the confederate to stand behind a visual shield so the teammate's performance was visible but the score (dartboard) was not visible. After the participant threw six darts and the scores were recorded and the darts removed, the participant and confederate switched positions and the confederate threw six darts. Subsequently, the researcher informed them that, as a team, they did not reach the target score of 90 and thus had failed the task.

Participants were then asked to read two paragraphs describing (1) an adaptive attribution and (2) a maladaptive attribution (e.g., Rascle et al., 2015) and asked to circle the paragraph they believed best described the causes of their team performance. The researcher then prompted participants to verbally state which attribution they selected. This self-selection procedure was reinforced as the researcher reminded them that they chose an attribution that was [un]controllable and [un]likely to change. To manipulate attributional consensus, when asked, the confederate verbally agreed and stated the selection of the same attribution (high attributional consensus,  $n = 26$ ), or disagreed and stated the selection of the other attribution (low attributional consensus,  $n = 26$ ). Before the experiment, participants were randomly assigned to the low attributional consensus condition or high attributional consensus condition.

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<sup>4</sup> Pilot testing indicated that, given the option of an adaptive or maladaptive attribution, around half of participants would circle an adaptive attribution after failing to reach a target score of 90.

Following the attributional consensus manipulation, participants were asked to complete the manipulation check and measures of conflict, cohesion, and social identity. They then completed the task for a second and final time. After the second and final performance, participants were informed that the study was complete and were fully debriefed.

**Analyses.** Akin to Study 4, the effects of attributional consensus on conflict, cohesion, and social identity were analysed using *t*-tests. To analyse the main and interactive effects of attribution type and attribution consensus on performance, a 2 (attribution type: adaptive, maladaptive) x 2 (attribution consensus: high, low) x 2 (time: pre, post) ANOVA with repeated measures on the last factor was used.

## **Results**

Descriptive statistics for Study 5 variables and bivariate correlations for Study 5 variables are detailed in Table 1. Means and standard deviations for pre- and post-manipulation performance are detailed in Table 2.

**Manipulation checks.** Two participants circled “rather like a success” and were subsequently removed from the study. All 56 participants who completed the study correctly identified the attribution they selected and the attribution the confederate selected.

### **Demographic variables.**

**Age and experience.** A 2 (attribution type: adaptive, maladaptive) x 2 (attribution consensus: high, low) ANOVA revealed no significant differences in age or experience between attribution type conditions and attributional consensus conditions ( $ps > .37$ ).

Table 1. Study 5 means, standard deviations and bivariate correlations

Dependent Variable	Consensus	<i>M</i>	<i>SD</i>	Bivariate Correlations			
				1	2	3	4
1. Conflict	High	1.29	.53				
	Low	1.89	.99				
2. Cohesion	High	3.07	1.18	-.26			
	Low	2.54	.58				
3. Social Identity	High	4.36	1.34	-.27*	.61**		
	Low	3.43	1.10				
4. Performance 1	High	29.50	9.01	-0.10	.22	.19	
	Low	30.35	9.70				
5. Performance 2	High	32.68	8.84	-.15	0.20	.24	.71**
	Low	29.57	9.79				

*Note.* *M* = Mean, *SD* = Standard Deviation, \**p* < .05, \*\**p* < .01.

Table 2. Study 5 mean pre-manipulation and post-manipulation performance scores

Condition	Pre-Manipulation		Post-Manipulation	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Adaptive/High consensus	29.21	2.52	32.21	2.53
Adaptive/Low consensus	32.43	2.52	30.79	2.53
Maladaptive/High consensus	29.78	2.52	33.14	2.53
Maladaptive/Low consensus	28.28	2.52	28.35	2.53

*Note.* AH = adaptive and high consensus, AL = adaptive and low consensus, MH = maladaptive and high consensus, ML = maladaptive and low consensus.

**Gender.** *T*-tests indicated that males,  $M = 3.12$ ,  $SD = .80$ , reported higher levels of cohesion than females,  $M = 2.56$ ,  $SD = 1.01$ ,  $t_{54} = 2.32$ ,  $p = .024$ . There were no gender differences for conflict and social identity. Further, a 2 (gender: male, female) x 2 (time: pre, post) ANOVA with repeated measures on the last factor revealed no main or interaction effects for gender ( $ps > .14$ ).

### **Dependent Variables.**

**Conflict.** Akin to Study 4, there was a significant effect of attributional consensus on perceptions of conflict. Generally, participants reported higher levels of conflict when their teammate (the confederate) disagreed and selected the other attribution,  $M = 1.89$ ,  $SD = .99$ , compared to conditions in which the confederate agreed with the F participant,  $M = 1.28$ ,  $SD = .53$ ,  $t_{54} = -2.85$ ,  $p = .007$ ,  $d = .88$ .

**Cohesion.** There was also a significant effect of attributional consensus on perceptions of cohesion. Participants in conditions of high attributional consensus, in general, reported more cohesion,  $M = 3.07$ ,  $SD = .57$ , than participants in conditions of low attributional consensus,  $M = 2.54$ ,  $SD = .54$ ,  $t_{54} = 2.15$ ,  $p = .038$ ,  $d = .69$ .

**Social identity.** A significant effect of attributional consensus on social identity was also observed. Participants in high attributional consensus conditions generally reported higher levels of social identity,  $M = 4.37$ ,  $SD = .1.34$ , compared to those in low attributional consensus conditions,  $M = 3.43$ ,  $SD = 1.10$ ,  $t_{54} = 2.83$ ,  $p = .006$ ,  $d = .77$ .

**Performance.** A 2 (attribution type: adaptive, maladaptive) x 2 (attribution consensus: high, low) ANOVA revealed no significant differences in pre-manipulation scores between conditions ( $ps > .35$ ). A 2 (attribution type: adaptive,

maladaptive) x 2 (attribution consensus: high, low) x 2 (time: pre, post) ANOVA with repeated measures on the last factor revealed an interaction between attribution consensus and time,  $F_{1, 52} = 4.49$ ,  $p = .039$ ,  $\eta_p^2 = .08$ . Compared to pre-manipulation baselines, participants in high attributional consensus conditions performed significantly better post-manipulation ( $p = .018$ ). There was no evidence of an effect between attribution type and time on performance,  $F_{1, 52} = .30$ ,  $p = .58$ ,  $\eta_p^2 = .01$  and there was no interaction effect between attribution type and attributional consensus across time,  $F_{1, 52} = .13$ ,  $p = .72$ ,  $\eta_p^2 = .003$ .

### General Discussion

These studies were designed to test if attributional consensus (i.e., high or low consensus) affects interpersonal outcomes and performance (Hypotheses 1a and b), if attribution type (i.e., adaptive or maladaptive) affects performance (Hypothesis 2), and if attribution type and attributional consensus interact to affect performance (Hypothesis 3). Across the two studies and in line with Hypotheses 1a and 1b, high attributional consensus between teammates generally led to perceptions of less conflict, more cohesion, stronger social identity, and better performance than low attributional consensus between teammates. Hypotheses 2 and 3 were not supported as, contrary to previous attribution studies, attribution type did not affect performance, and there was no interaction between attributional consensus and attribution type. Instead, it was attributional consensus between teammates that significantly influenced performance. In other words, agreement over the cause of an unsuccessful performance appeared more influential to subsequent performance than the content of the attribution. Overall, the results provide evidence for the effects of attributional consensus on interpersonal outcomes and performance.

Interpersonal outcomes, including conflict, cohesion, and social identity were influenced by attributional consensus. Those in the low attributional consensus condition reported greater conflict with their partner. While some individuals and teams may handle conflict well, in general, experiences of conflict are often accompanied with experiences of negative emotions and perceived disruption of future goals (Barki & Hartwick, 2004). Therefore, it is apparent that low attributional consensus can negatively impact important intra-group processes. This was also evident in the effect of low attributional consensus on cohesion as those who experienced low attributional consensus reported lower levels of cohesion. Cohesion among team members is known to have many beneficial effects at the team and individual level (Carron, Colman, Wheeler, & Stevens, 2002). The results from these studies indicate that attributional consensus is an antecedent to important group dynamics that can influence team functioning. A caveat here is that, in Study 5, there was a gender effect as males reported higher levels of cohesion compared to females. It is unlikely this effect of gender nullifies the results as the attributional consensus-cohesion relationship was observed with no gender effects in Study 4. Further, there was a significant correlation between cohesion and social identity, and there was no confound on the attributional consensus-social identity relationship. Nevertheless, caution should be taken when interpreting these results.

High attributional consensus also led to stronger perceptions of social identity compared to low attributional consensus. Because participants had no prior relationship with the confederate, the process of agreeing on attributions may have contributed to the development of social identity (Swaab, Postmes, Neijens, Kiers, & Dumay, 2002). In other words, through the interaction between

the group members (the attributional consensus manipulation), participants' agreement or disagreement with the confederate influenced levels of shared social identity. This can be explained through the process of consensualisation (Postmes et al., 2005). According to Postmes and colleagues, consensualisation occurs when agreement with group members builds social identity. This might explain why participants reported higher levels of social identity when the confederate agreed with them, compared to when the confederate disagreed with them.

A particularly novel finding is that, when it comes to performance, it appears that agreeing with team-members may be of more importance than the type of attribution. Although attribution researchers have previously demonstrated that performance improves when adaptive, compared to maladaptive, attributions are adopted (Rees et al., 2013), the results of this study show that attribution type had no effect on performance. The process of attributional consensus may provide insight into this finding. Specifically, agreeing or disagreeing on attributions may have reduced or negated the effects of adopting an adaptive or maladaptive attribution. In other words, in a team setting, the process of agreeing or disagreeing on explanations for performance might be important.

Insight to explain this finding may be gained through Heider's (1956) Balance Theory. Central to Balance Theory is the idea that one seeks harmony between themselves and the situation or surrounding environment. Therefore, when a dyad experiences low attributional consensus, there is a perceived imbalance. For example, when an individual learns that her partner has a different attribution for a poor collective outcome, she perceives an imbalance. This imbalance can then cause stress within the team members leading to a poorer performance. Indeed, Balance Theory has been used to explain negative

performance effects on team motor tasks (Boss & Kleinert, 2015). This may explain why participants whose team agreed on an adaptive cause did not perform better than participants whose team agreed on a maladaptive cause. In both conditions, participants may have perceived a balance between themselves, their partner, and their collective performance. However, under conditions of disagreement, they may have perceived an imbalance, perhaps causing stress, which resulted in poorer subsequent performance.

No interaction effect between attributional consensus and attribution type was observed. As expected, when the confederate disagreed with participants' adaptive attributions, they generally reacted negatively. However, when the confederate disagreed, and communicated a more adaptive attribution that contrasted participants' maladaptive attributions, participants typically did not perform better. While researchers have demonstrated that adaptive attributions from an in-group member can be a source of motivation (Rees et al., 2013), this did not appear to be the case in Study 5. This might be because the effect of disagreement between teammates superseded the effect of attribution type. For example, participants may have been less motivated by an adaptive attribution upon learning their teammate disagreed with them. Of course, in more naturalistic conditions, teammates would be able to communicate further and perhaps come to an understanding. Indeed, in field studies adaptive team-referent attributions have been linked to successful performance (Carron et al., 2014). Thus, moving beyond the scope of this research, these effects might change dependent on whether teammates have the opportunity to resolve the disagreement.

### **Strengths and limitations**

Traditionally, in attribution studies, participants are told they have an adaptive or maladaptive attribution (Le Foll et al., 2008; Rascle et al., 2015; Rees et al., 2013). This approach has demonstrated the differential effects of adaptive and maladaptive attributions on behavioural outcomes; however, the process in which attributions are communicated from researcher to participant is inconsistent with the actual attribution process an athlete experiences. In more natural settings, it is likely athletes develop their own attributions for performance, and these may then be influenced by those around them. Therefore, a key strength of Study 5 was that it permitted individuals to choose their attribution, thus more closely resembling the actual attribution process. A caveat to this, however, is that participants were not subsequently able to change their attribution after input from their teammate. Regardless, participants' attributions did not appear to influence their performance and, as such, these results diverge from previous attribution studies (Orbach et al., 1997; Rees et al., 2013). Building on the results of the current studies, researchers should explore whether athletes change their attributions after input from their teammates and the extent to which this process can be generalised to more natural settings.

While the results of Study 5 highlight how social identity may be built through the process of agreeing with group members, under non-experimental conditions existing levels of social identity likely influence the propensity for agreement and the effects of agreement (Postmes, Spears, & Lea, 1998). In other words, there is likely a reciprocal relationship between attributional consensus and social identity. While the current studies were limited to testing only one direction of this relationship, it is likely that levels of social identity may also impact the extent to which individuals experience attributional consensus.

Another limitation resulting from the experimental conditions concerns the extent to which participants' perceived meaningful conflict. While athletes appear to experience higher levels of conflict when they disagree on attributions compared to when they agree, under non-experimental conditions it is unknown whether this level of conflict is enough to disrupt psychological processes. Likewise, it is unknown whether teams would benefit from the higher levels of cohesion and social identity reported in the high attributional consensus condition.

### **Future research**

These studies demonstrated the beneficial effects of high attributional consensus; however, disagreement does not always lead to higher levels of conflict (Jehn, 1995). Indeed, under certain conditions, agreement may have negative effects while disagreement may be advantageous. For example, agreement between team members (i.e., high consensus) can foster atmospheres in which groupthink is prevalent (Hart, 1991), while sharing different information among teammates (i.e., low consensus) can be beneficial to performance (Goncalo & Duguid, 2008). As such, there may be times when teams will benefit from low attributional consensus. If coaches and teammates observed different reasons for their team's unsuccessful performance, it may be in the team's best interest to hear all potential explanations to maximise their chances of amending mistakes. As such, an avenue for future research might be to investigate the conditions under which low attributional consensus can facilitate performance without leading to negative consequences.

Both conflict and cohesion are often measured as multidimensional constructs (Carron et al., 1985; De Dreu & Weingart, 2003). Generally, they are categorised into task and social conflict and task and social cohesion. Given the

results of the current research, researchers may want to examine how attributional consensus impacts perceptions of task and social aspects separately. For example, because attributional consensus relates directly to individuals' perceptions of a task, it is possible the detrimental effects experienced pertain more to perceptions of task conflict and cohesion compared to social conflict and cohesion.

### **Conclusion**

The results of these studies provide valuable insight into the processes teams experience after failure. Specifically, these results indicate that teams may benefit from agreement over the cause of an unsuccessful performance. Further research is needed to confirm these results and to understand how low levels of attributional consensus within a team might lead to conflict, reductions in cohesion and social identity, and possibly poor performance. It is important how athletes individually attribute failure (Rees et al., 2013); however, in a team setting, whether teammates perceive the same cause for failure may be of greater significance.

## **Chapter 6. General Discussion**

### **Summary of Thesis**

The purpose of this thesis was to explore the moderating effects of team contextual factors on the relationships between team-referent attributions and sport outcomes. The literature review in Chapter 1 provided theoretical background and a comprehensive review of team-referent attributions along with an overview of potential consequences of team-referent attributions upon outcomes including collective efficacy, emotions, and performance. This was followed by an outline of the contextual factors that may moderate these relationships, and the potential main effects of attributional consensus on conflict and cohesion. Commentary within Chapter 2 detailed an outline and overview of some of the limitations of the literature pertinent to team-referent attributions within sport, and the two research questions addressed in the thesis were detailed. These were: 1. Do contextual factors moderate the effects of team-referent attributions? and 2. Does team-referent attributional consensus predict relational outcomes and performance? The findings across the five studies in this thesis (chapters 3-5) provided evidence for importance of considering team contextual factors in the analysis of team-referent attributions. Within the current chapter, a brief summary of these findings will be presented, and this will be followed by discussion of the overall theoretical implications of the PhD thesis, the applied implications, the strengths and limitations, and suggestions for future research.

### **Summary of Results**

In Study 1 (Chapter 3), the effects of team contextual factors on relationships between situational team-referent attributions and collective efficacy were explored by analysing the moderating role of dispositional team-referent attributions. Seventeen teams completed measures of dispositional and situational

team-referent attributions and a measure of collective efficacy. Results demonstrated that, after a team victory, perceptions of dispositional stability moderated the effects of situational stability on collective efficacy. The same effect was also observed in the globality dimension. The nature of these interactions were indicative of a buffering effect as adaptive dispositional attributions protected athletes from the deleterious effects of maladaptive situational attributions. Interpretation of the results beyond the dimensional level suggests that employing an intervention to facilitate a more adaptive attributional style may be a beneficial alternative to adapting athletes' situational attributions.

In Studies 2 and 3 (Chapter 4), the moderating role of social identity on the relationships between team-referent attributions and collective efficacy, as well as the relationships between team-referent attributions and emotions, was assessed. Specifically, in Study 2, 30 teams completed measures of team-referent attributions, social identity, collective efficacy, and emotions. In Study 3, an American football team, across a season, completed measures of social identity and collective efficacy between matches (10 data collection points). Multilevel analyses revealed that social identity moderated the effects of team-referent attributions on collective efficacy. Key findings were that a high level of social identity facilitated the positive effects of adaptive attributions and that these effects were consistent across a season. Overall, without higher levels of social identity, interventions aimed at adapting team-referent attributions may be ineffective.

In Studies 4 and 5 (Chapter 5), the interactive effects of team-referent attributions and attributional consensus were explored. Additionally, the main effects of attributional consensus on intergroup dynamics including conflict,

cohesion, social identity, and performance were assessed. First, a vignette study (Study 4) was used to establish preliminary evidence of the potential main effects of attributional consensus on intergroup dynamics. Subsequently, an experiment was conducted (Study 5) in which participants ( $N = 56$ ) were told that themselves and their partner had failed at a task and were subsequently asked to select an adaptive or maladaptive team-referent attribution. Attributional consensus was then manipulated when the partner (confederate) agreed or disagreed with the participant's team-referent attribution. The participants then completed measures of conflict, cohesion, social identity, and then performed the task again. The expected interaction effect between team-referent attributions and attributional consensus was not observed, but a main effect was demonstrated and indicated that participants who had their partner agree with them reported less conflict, more cohesion, higher social identity, and performed better in their subsequent performance, regardless of whether the content of attributions was adaptive or maladaptive. Generally, results provided evidence that consensus over team-referent attributions may be more important than the content of attributions.

### **Theoretical Implications**

Rees and colleagues (2005) theorised that attributions have an important role in an athlete's psychological makeup and there is extensive empirical evidence to support this claim (Allen et al., 2009b; Coffee et al., 2009; Rascle et al., 2015). The results of the current thesis support this evidence as main effects of team-referent attributions on sport outcomes were observed in Study 2. However, researchers have also theorised that contextual factors may be important to how athletes perceive their attributions (Martinko et al., 2011; Rees et al., 2005; Shapcott et al., 2010). As such, this thesis was designed to explore how contextual

factors including (a) dispositional team-referent attributions, (b) social identity, and (c) team-referent attributional consensus moderated the effects that situational team-referent attributions had on sport outcomes. The findings of this thesis demonstrated that the effects of team-referent attributions on team-referent outcomes can change as (a) a function of how athletes typically explain team events (dispositional team-referent attributions) and (b) whether athletes identify with their team. No evidence was found for the moderating effects of (c) attributional consensus on team-referent attributions, but main effects of attributional consensus were observed and suggested that attributional consensus may be more important than attributional content for team-referent attributions.

### **Dispositional team-referent attributions**

Results of Study 1 indicated that athletes' dispositional team-referent attributions can moderate the relationships between situational team-referent attributions and collective efficacy. It appears that adaptive dispositional attributions can have a buffering effect such that individuals who report adaptive dispositional attributions do not always experience the negative effects of maladaptive situational attributions. In other words, athletes who report adaptive dispositional attributions might not experience decreases in collective efficacy when they explain a specific situational team performance with a maladaptive attribution. However, athletes with maladaptive dispositional attributions are still prone to the negative effects of situational attributions on collective efficacy. This builds on previous research by demonstrating the importance of considering both situational attributions and dispositional attributions. That is, instead of situational and dispositional concepts being mutually exclusive (Le Foll et al., 2006), the results of this thesis provide evidence that they interact in their association with

collective efficacy.

These results offer an alternative to changing situational attributions. Allen and Colleagues (2012) commented that attributions that arise from incidents during a match “are less easy to identify and control for, and are perhaps where sport psychology consultants will need to be more intuitive in delivering interventions on a group-by-group basis” (p. 9). Aspects that are more easily identified and can be targeted in a controlled manner are dispositional attributions. Indeed, focusing on athletes’ dispositional team-referent attributions to prevent maladaptive situational attributions from negatively impacting sport outcomes may be an effective strategy. In other words, adapting dispositional team-referent attributions can circumvent the issue of consistently modifying perceptions of a performance (i.e., situational attributions).

### **Social identity**

The findings from Studies 2 and 3 revealed the importance of social identity when explaining team outcomes, such that social identity moderated the effects of team-referent attributions on collective efficacy. Specifically, team-referent attributions were more strongly associated with collective efficacy when athletes reported higher levels of social identity. This result may be because team-referent attributions take on more importance among individuals who are highly identified with their team. Researchers have demonstrated that those who share a strong social identity with a group or team are more likely to understand personal events from a more collective perspective (Turner & Oakes, 1997) and this effect is likely a reflection of the way in which social identity structures individuals’ perceptions of events (Cruwys et al., 2015). The results of Studies 2 and 3, however, indicated that social identity can also structure the relationships between

attributions and their outcomes. This is because individuals who are highly identified with their team perceive their attribution more at a group level compared to those who are not highly identified with their team. For example, athletes' team-referent attributions were significantly associated with collective efficacy when they had high levels of social identity. This might mean that these team-referent attributions were more meaningful to athletes who were thinking at a team level, compared to those who had low levels of social identity and thus thinking at an individual level.

These results have theoretical implications beyond that of attribution research as social identity likely plays a vital role within other team level relationships. Social identity is often shaped through intra-group processes (Postmes et al., 2005), and simple group inclusion is often not sufficient to develop a strong sense of social identity. This is reflected in the intra-team variability often observed within social identity. That is, some team members identify with their team more than others and, according to self-categorisation theory, those who report high levels of social identity find team outcomes more personally meaningful to themselves as individuals (Turner & Oakes, 1997). Therefore, drawing upon self-categorisation theory, the results of Studies 2 and 3 highlight that those who report high levels of social identity are likely to perceive team outcomes as more 'personal' compared to those who do not share high levels of social identity. This likely has implications on other established team-level relationships as social identity may be a pre-requisite to make team-level constructs possible. For example, researchers have established a strong relationship between perceptions of collective efficacy and collective performance (Stajkovic et al., 2009); however, at low levels of social identity, these

relationships may not exist as perceptions of collective efficacy may be less meaningful to a team member who does not identify with the team. Therefore, expanding the results of these studies beyond that of attributions, theoretically, sharing a high social identity with a team might be necessary to experience the effects of team level constructs.

### **Attributional consensus**

Researchers have demonstrated that athletes' attributions for athletic performance are influenced by others around them (Rees et al., 2013). Therefore, Studies 4 and 5 were designed to examine team-referent attributional consensus within teams. While interaction effects of team-referent attributions and attributional consensus on performance were not observed within these studies, main effects of attributional consensus was evident. These effects demonstrated that perceptions of team dynamics can be influenced by team-referent attributional consensus. It appeared that the process of agreeing over team-referent attributions contributed to perceptions of less conflict, stronger perceptions of cohesion, and higher levels of social identity. These findings support the work of Postmes and colleagues (2005) who reported that consensualisation in small groups contributes to stronger perceptions of social identity. That is, when teammates believe they share similar opinions, specifically over attributions, they report more positive perceptions of team dynamics.

As well as influencing team dynamics, attributional consensus influenced performance. It appeared that attributional consensus was more important than the content of participants' team-referent attributions as there was no effect of adaptive or maladaptive attributions on performance, but those who experienced high attributional consensus performed better than those who experienced low

attributional consensus. Although this effect is partially consistent with previous literature that demonstrates the positive effects of agreement on performance (Janssen, Van De Vliert, & Veenstra, 1999), it was somewhat unexpected as participants performed better when their partner agreed with them, regardless of whether the content of attribution was adaptive or maladaptive. This appears to be an area overlooked in the study of attributions in sport as researchers have generally focussed on the content of attributions and neglected the influence of agreement or disagreement from those around them (e.g., Rascle et al., 2015; Rees et al., 2013). Thus, instead of focussing solely on the content of an athlete's attributions, perhaps consensus between team members might be of more importance.

### **Summary of theoretical implications**

The studies within this PhD offer empirical evidence in support of Rees and colleagues (2005) assertion that contextual factors are important to the attributional process. Further, team-referent attributions have been theorised to be affected by group differences, social relationships, and social exchanges (Allen et al., 2012). The information derived from this thesis indicates that these factors can moderate the effects that team-referent attributions have on sport outcomes. Overall, these results support sport-specific attribution theory and provide avenues for researchers to advance understanding of the importance of the contexts in which team-referent attributions are developed.

### **Applied implications**

To date, researchers have demonstrated the efficacy of adapting athletes' situational team-referent attributions (Orbach et al., 1997, 1999; Rascle et al., 2015). This is typically done through attributional retraining strategies.

Attribution retraining generally involves replacing individuals' maladaptive attributions that often have negative consequences with adaptive attributions that often facilitate positive consequences (Haynes, Perry, Stupnisky, & Daniels, 2009). This is done through either changing the attribution itself (e.g., the team lost because of a poor strategy, not due to a lack of ability) or changing the dimensional properties associated with the attributions (e.g., the team lost due to a lack of ability, but instead of being uncontrollable, this is something that can be controlled) (Perry & Hamm, 2013). Regardless of which approach is adopted, the key element is to change perceptions of attribution dimensions. In doing so, individuals experience more positive cognitive and emotional outcomes, which in turn improve behavioural outcomes like performance (Perry, Chipperfield, Hladkyj, Pekrun, & Hamm, 2014). Within sport, attribution retraining techniques such as positive reflection have demonstrated efficacy (Allen, Jones, & Sheffield, 2010). The results of the five studies detailed in this thesis indicate that considering contextual factors in conjunction with these attribution retraining techniques might lead to more successful results. This will be discussed in detail below.

### **Adapting attributional style**

The results of Study 1 have implications within the context of attributional retraining procedures. Perry and Hamm, (2013) outline the pathway in which attributional retraining is believed to be effective in behavioural change. That is, attributional retraining manipulates individuals' appraisals of causal attributions, which in turn influences cognitions, and these changes in cognition can then lead to behaviour change. Support for this pathway has been observed as situational attributional retraining effectively altered individuals' attributions, which in turn

had a positive effect on cognitive and behavioural outcomes (Rascle et al., 2008). However, interpretation of the results of Study 1 suggests that causal attribution dimensions might not influence cognitions when athletes report more adaptive dispositional attributions. Therefore, it is important to target attributional retraining strategies at individuals' who are predisposed to adopting maladaptive dispositional attributions. Support for this finding has been observed within the work of Perry and colleagues (2014) who suggest attribution retraining strategies should target at risk individuals. Indeed, athletes who adopt maladaptive dispositional attributions are likely at risk of adopting maladaptive situational attributions. Therefore, given the results of Study 1, practitioners should continue to target populations who are at risk of developing maladaptive attributions when implementing attribution retraining strategies.

While attribution retraining demonstrated success in educational settings (Parker et al., 2017), within sport there are occasions when encouraging situational attributions to controllable causes may be encouraging individuals to believe they can control events which are uncontrollable (i.e., illusionary control) (Taylor & Brown, 1988). For example, if a coach wanted to communicate to his athletes that his team lost because of the strength of their opponent, the coach could do this without damaging their collective efficacy if the team members had an adaptive attributional style. That is, their adaptive attributional style would protect the athletes from the negative effects often associated with an uncontrollable situational attribution. Therefore, the results of Study 1 offer support for the use of attribution retraining programs like that of Parkes and Mallet (2011), who aimed to restructure athletes' dispositional attributions.

This may involve consistently working on changing situational attributions until the changes are adopted as a disposition. That is, by continuously focussing on changing how individuals perceive events, these changes can be internalised within the individual and become part of their disposition. Rascle and colleagues (2015) demonstrated that changes in individuals' attributions had a lasting effect across time and situations. Generally, within an academic setting, attribution retraining strategies include several 'booster sessions' that occur throughout the year (Parker et al., 2017). As such, including booster sessions throughout a team's season might facilitate attribution retraining strategies to change not only situational attributions, but also dispositional attributions. Thus, on occasions when athletes attribute a success or failure to a maladaptive cause, their adaptive dispositional attributions can protect them from experiencing the deleterious effects of the maladaptive situational attribution.

### **Adapting social identity**

Similar to the effects of dispositional attributions, the extent to which individuals share a social identity with their team can moderate the effects of team-referent attributions. Generally, it appears that social identity protects athletes from experiencing the negative effects of maladaptive team-referent attributions, and facilitates the positive effects of adaptive team-referent attributions. Interpretation of these results suggests that athletes might not experience the beneficial effects of attribution interventions if they do not share a social identity with their team. As such, practitioners should aim to develop a strong social identity within teams alongside attribution retraining strategies that encourage athletes to develop more adaptive team-referent attributions. Specifically, social identity development can be integrated within attribution

retraining strategies in a team environment. This might involve incorporating attribution retraining within social identity leadership programs.

Developing social identity within groups and teams can be done through social identity leadership programs (Haslam et al., 2017). These programs are guided by five stages including: (1) outlining the importance of social identity to group leaders, (2) identifying pertinent social identities of the group and subgroups with group leaders, (3) identifying goals pertinent to the subgroup's shared social identities and potential barriers as well as strategies that will overcome these barriers, (4) bringing subgroups together to identify strategies to implement the goals identified in the previous stage, and (5) monitoring progress of the goals developed. This program has demonstrated efficacy in improving leaders' perceptions of team goal clarity and team identification. Within sport, researchers have demonstrated the efficacy of a social identity leadership interventions on sport teams (Slater & Barker, 2018). Given the results of Studies 2 and 3, attribution retraining strategies might be incorporated into social identity leadership interventions. Specifically, attribution retraining strategies could be included within the fourth stage of the social identity leadership development. Researchers have demonstrated a relationship between goal importance and perceptions of controllability (Graham et al., 2002). Therefore, it makes sense to implement attribution retraining strategies when discussing goal setting within social identity leadership development. For example, this might involve setting goals that focus on positively reflecting on team outcomes, as positive reflection has been demonstrated to be an effective technique in changing attributions (Allen et al., 2010). Thus, sport psychology practitioners should seek to improve

attributions and social identity through combining established intervention strategies.

### **Adapting attributional consensus**

A final applied implication of this thesis is related to the effects of attributional consensus within teams. In Studies 4 and 5, compared to high attributional consensus, low attributional consensus led to increased levels of conflict and decreased levels of cohesion, social identity, and performance. As such, practitioners should be cognisant of the potential deleterious effects of low attributional consensus. Traditionally, sport psychology researchers and practitioners have taken the approach that perceptions of team-level constructs represent a shared belief. While this is sometimes the case (Carron et al., 2003; Shapcott et al., 2008), low consensus within teams can be destructive to not only relationships within the team, but also to team performance.

Study 5 demonstrated that attributional consensus might be more important than the content of the attribution. As such, coaches should work to ensure their team experiences consensus over their attributions. This might involve post-match discussions in which team members discuss the events of their previous match and identify the causes of their success or failure. Further, because attributions are believed to develop and change across time (Allen, 2010), this should be a dynamic process as team members continuously work towards consensus over their perceptions of controllability and other pertinent attribution dimensions. Therefore, coaches should consistently monitor and discuss with their team what the perceived causes for their performances are, and reach high consensus regarding the controllability and stability of these causes.

These effects of attributional consensus may be particularly important within newly formed teams. For example, the process of social identity formation is believed to be influenced by perceptions of agreement or disagreement within newly formed teams (Postmes et al., 2005). This assertion was supported by the results within Study 5 as agreement within a team facilitated feelings of social identity while disagreement had deleterious effects on social identity. However, a caveat here is that previous research has demonstrated conditions in which disagreement can have positive effects on performance (Goncalo & Duguid, 2008; Jehn, 1995). As such, practitioners should be aware that disagreement within a team can have deleterious effects on team functioning, especially within newly formed teams, but further research is needed to establish the situations in which these deleterious effects can be minimised or become positive.

### **Strengths and limitations**

#### **Strengths**

Chapters 3, 4, and 5 each detailed studies which demonstrated a unique strength that contributes to the impact of the findings. First, attributions have historically been analysed at the dimensional level (Rees et al., 2005; Weiner, 1985), and Study 1 is believed to be the first attribution study in sport to examine the interactions between situational and dispositional attributions at the dimensional level. In doing so, the design of the study provided insight into how perceptions of controllability after a performance interact with individuals' tendencies to perceive events as controllable. This effect was also explored across stability, globality, and universality dimensions. Establishing that dispositional attributions can buffer against negative effects of situational attributions provides

grounds to explore the interactive effects of situational attributions and attributional style beyond the dimensional level.

Second, in Study 3, a longitudinal dataset was used to measure attributions and social identity. This answered calls from attribution researchers who have aimed to go beyond single time point measures by exploring the lasting effects of attributions (Allen et al., 2009b; Rasclé et al., 2015). This sampling technique was similar to a momentary ecological assessment as variables were measured at various time points across an entire season. Specifically, the multilevel approach used to analyse these data allowed for examination of the moderating effect of the time-varying variable that is social identity. This measurement strategy is employed by measuring attributions and social identity three days after a competition and collective efficacy two days before the next competition, thus leaving an extended period between measurement occasions. As such, the interaction effects of team-referent attributions and social identity on collective efficacy can be generalised across time throughout a season.

While the designs of Studies 1-3 demonstrated high external reliability and ecological validity, the experimental designs of Studies 4 and 5 demonstrated high internal validity. Behavioural experiments have played an important role in the development of our understanding of attributions within sport (Coffee et al., 2009; Le Foll et al., 2008; Orbach et al., 1997, 1999; Rasclé et al., 2015; Rees et al., 2013); however, before these studies, this approach had not been used in a team performance task. The high experimental control demonstrated in the attributional consensus manipulation highlights the impact that attributional consensus between teammates can have on perceptions of conflict, cohesion, social identity, and performance. In other words, while there may have been extraneous variables at

play in Studies 1-3, the attributional consensus manipulation employed in Studies 4 and 5 controlled for this possibility and isolated the impact of agreement and disagreement. This advanced our understanding of the effects of agreement and disagreement within teams and facilitates the possibility of further research exploring the impact that attributional consensus between teammates can have and the situations that may influence these effects.

### **Limitations**

There are several important limitations to these studies that deserve attention. First, across all studies participants were asked to report the most important reason for their team's performance, yet athletes may develop more than one reason for a performance. An alternative measurement strategy would be to ask individuals to report their perception of each reason. However, this can lead individuals to report an average response to the attribution dimensions (see Biddle & Hanrahan, 1998). As such, the approach that participants report the most important reason was used in this study. Many researchers have also adopted this approach in their attribution research (Allen et al., 2009a; Coffee et al., 2015; Coffee & Rees, 2008a).

A second limitation concerns the dimensional approach used to measure attributions. Specifically, by measuring athletes' perceptions of stability, globality, and universality attributions, participants had to be split into success and failure conditions. This is because the implications of stability, globality, and universality attributions change dependent on perceptions of success or failure. While sport often provides a natural distinction between success and failure (i.e., team victory and team defeat), sometimes there is disagreement between teammates as to whether a team victory constitutes a successful performance and

whether a team defeat constitutes an unsuccessful performance. To resolve this issue, athletes who reported a team victory as a failure or a team defeat as a success were removed before analyses. This approach is consistent with previous research analysing team-referent attributions (Coffee et al., 2015). However, there may be valuable information lost in the removal of such participants. For example, does adopting a different perspective of success or failure from teammates change the nature of the relationships observed? Studies 4 and 5 took steps to address this limitation by exploring the effects of consensus over team-referent attributions; however, further research is needed to understand the impact this has on the interaction effects observed in Studies 1-3.

Finally, a key limitation within Studies 4 and 5 pertains to the high experimental control necessary to control for existing social identity. That is, the participants and the confederate had no existing relationship before the experiment and as such, they were not aware of a shared existing social identity. This design meant that the differences in reported social identity could be attributed to the effect of the manipulation (i.e., attributional consensus) and not confounded by teammates existing social identity. However, in more realistic settings, existing levels of social identity may impact attributional consensus. Therefore, the findings within Study 5 should be replicated in more realistic settings.

### **Future research**

Study 1 demonstrated that dispositional team-referent attributions can moderate the effects of situational team-referent attributions on collective efficacy; however, dispositional team-referent attributions may also predict athletes situational team-referent attributions (Allen et al., 2012; Shapcott et al.,

2010). For example, if an athlete usually believes team events are controllable they may be more likely to adopt a controllable attribution for a specific team performance. This assertion is supported by correlations observed in Study 1. That is, there was a moderate positive correlation between dispositional and situational controllability, dispositional and situational globality, and dispositional and situational universality. Therefore, researchers may examine the extent to which athletes' situational team-referent attributions are predicted by their dispositional team-referent attributions.

Another potential avenue of research is to explore the extent to which the results of Study 1 are generalisable over time. Because a cross-sectional design was employed, the robustness of the buffering effect observed in Study 1 is difficult to ascertain. For example, if an athlete consistently develops uncontrollable situational attributions (maladaptive), she might not experience the buffering effect that was observed in Study 1. In other words, this buffering effect may not be present when athletes consistently adopt maladaptive situational attributions. Therefore, researchers should adopt longitudinal designs to explore if these effects are consistent across a season.

While in Studies 2 and 3 the moderating effects of social identity on the team-referent attribution-collective efficacy relationship was observed, these effects may be generalised beyond the study of attributions. That is, social identity might moderate the relationship between team constructs. It is well known that collective efficacy is an important antecedent to performance (Stajkovic et al., 2009), however, it is possible that social identity can moderate this relationship. For example, the results of Studies 2 and 3 indicated that adaptive team-referent attributions were more effective in facilitating positive perceptions of collective

efficacy at high levels of social identity. Likewise, it is possible that the beneficial effects of collective efficacy on performance are stronger at high levels of social identity. Thus, researchers should examine whether adopting a more collective perspective through higher levels of social identity can facilitate the positive effects of collective efficacy on team performance.

While Study 5 was designed to measure the effects of attributional consensus on individual performance, researchers have observed that group performance can be improved with: reduced intra-group conflict, higher levels of group cohesion, and higher levels of social identity (Carron et al., 2002; Puck & Pregernig, 2014). Therefore, the performance effects observed within Study 5 may exist at the group level as well. As such, future studies should examine how attributional consensus impacts group performance. Indeed, perhaps more interdependent tasks that require greater interaction among teammates might strengthen the effects demonstrated in the Study 5.

While the disadvantages of low attributional consensus within teams were demonstrated within Study 5, disagreement and the exchange of ideas is often cited as a necessity for groups to function well. Goncalo and Duguid, (2008) observed that sharing unique information can help improve decision accuracy. That is, teams that agree on group level attributions were more likely to make an ill-informed decision compared to those teams whose members made unique individual contributions. Several factors may influence whether agreement has a negative or positive effect on teams. For example, groups that experience disagreement pertaining to the task tend to make better decisions compared to groups that experience disagreement pertaining to their relationship (Janssen et al., 1999). Also, groups performing more complex tasks often benefit from

disagreement compared to groups performing simple tasks (Jehn, 1995). This is because disagreement is often necessary for success in certain tasks as disagreement can facilitate an exchange of ideas and critical evaluation of tasks. These studies highlight that, under certain conditions, intra-group disagreement can be beneficial to teams. As such, future research should explore the circumstances in which low attributional consensus may have a positive influence within teams.

Social identity may influence the effects of attributional consensus on team outcomes. For example, in the study of emotions within teams, van der Schalk et al., (2011) observed that individuals will respond to stimuli differently, dependent on their social identity. Specifically, individuals reported similar (convergent) emotions with those whom they identify with and displayed different (divergent) emotions from those whom they did not identify with (were out-group members). Therefore, social identity may influence how individuals experience certain events and emotions. This process may also apply to the interpretation of attributions. Individuals who strongly identify with their team may respond differently to learning they do not share the same attributions as their teammates. In other words, in the same way social identity influences the effects of team-referent attributions (Studies 2 and 3), social identity may also influence how individuals interpret team-referent attributional consensus.

### **Conclusion**

Within this thesis, it was demonstrated that contextual factors are important to the associations between team-referent attributions and collective efficacy. Contextual factors included dispositional team-referent attributions, social identity, and attributional consensus with team members. Generally, it was

observed that dispositional team-referent attributions and social identity moderate the relationships between situational team-referent attributions and collective efficacy. Further, team-referent attributional consensus was observed to impact sport outcomes, regardless of the content of team-referent attributions. In general, team contextual factors were demonstrated to be an important moderator and antecedent within sport team dynamics.

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## **Appendix A. Study 1 Example Questionnaire packet**

### **INFORMATION SHEET**

#### **Effects of explanations for performance on sport outcomes**

##### **Background Information:**

The purpose of this study is to explore how teams explain their performances and the consequences of these explanations on factors that may affect future performances. Participants must be 18 years of age or older and participate on an interactive sports team.

##### **Procedures:**

If you agree to take part in this study you will be asked to complete a questionnaire that should take no longer than 10 minutes.

##### **Risk and Benefits:**

By participating, you will be asked to provide explanations for your own and your team's most recent performance. You will also be asked to rate your confidence level and emotions in regard to your teams most recent and upcoming performances.

There are no direct benefits to participation.

##### **Compensation:**

There is no compensation for participation.

##### **Confidentiality:**

The records of this study will be kept private and confidential to the extent permitted by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

### CONSENT BY VOLUNTEER TO PARTICIPATE

Name of participant: .....

Name of Study: Effects of explanations for performance on sport outcomes

Principal Investigator: Ross Murray

I have read the patient/volunteer information sheet on the above study and have had the opportunity to discuss the details with Ross Murray and ask questions. The principal investigator has explained to me the nature and purpose of the tests to be undertaken. I understand fully what is proposed to be done.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study or any part of the study at any time I wish.

I understand that these questionnaires are part of a research project designed to promote scientific knowledge, which has been approved by the Sports Studies Ethics Committee, and may be of no benefit to me personally. The Sports Studies Ethics Committee may wish to inspect the data collected at any time as part of its monitoring activities.

I hereby fully and freely consent to participate in the study which has been fully explained to me.

Signature of participants: .....

Date: .....

I confirm that I have explained to the patient/volunteer named above, the nature and purpose of the tests to be undertaken.

Signature of Investigator: .....

Date : .....

**Please complete this entire questionnaire in reference to the team you are currently with**

Initials: \_\_\_\_

Born: Day\_\_\_\_ Month\_\_\_\_

What is your age? \_\_\_\_\_

How many years of experience do you have in your sport? \_\_\_\_\_

How long have you been a member of your team? (In years) \_\_\_\_\_

How important are team competitions to you?

Not important at all 1 2 3 4 5 6 7 8 9 10 Extremely important

Were you at your team's last competition? Yes No

What was the result of your most recent team competition? Win Loss Tie

Do you consider your most recent team competition more of a success or more of a failure?

Success Failure

**DIRECTIONS:**

- Read each situation and vividly imagine it happening to your team.
- Decide what you believe to be the one major cause of the situation if it happened to your team.
- Write the cause in the blank provided.
- Answer the 4 questions about the cause by circling one answer per question.
- Go on to the next situation.

**SITUATION 1:** In a competition your team performs **SUBSTANTIALLY BELOW** expectations.

1. There are likely many reasons for why your team performed substantially below expectations. Please identify the **most important** cause: \_\_\_\_\_

2. Is the **cause** something that is controllable by your team or is it not in your team's control?  
 Not in our team's control      1      2      3      4      5      6      7      In our team's control

3. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?  
 Unique to our team      1      2      3      4      5      6      7      Common to all teams

4. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?  
 Will never again be an influencing factor      1      2      3      4      5      6      7      Will always be an influencing factor

5. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?  
 Only influences this particular team situation      1      2      3      4      5      6      7      Influences all team situations

**SITUATION 2:** Your team has **GREAT DIFFICULTY** successfully getting through a very difficult practice.

1. There are likely many reasons for why your team had difficulty successfully getting through a very difficult practice. Please identify the **most important** cause: \_\_\_\_\_

2. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?  
 Will never again be an influencing factor      1      2      3      4      5      6      7      Will always be an influencing factor

3. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?  
 Only influences this particular team situation      1      2      3      4      5      6      7      Influences all team situations

4. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?  
 Unique to our team      1      2      3      4      5      6      7      Common to all teams

5. Is the **cause** something that is controllable by your team or is it not in your team's control?  
 Not in our team's control      1      2      3      4      5      6      7      In our team's control

**SITUATION 3:** In a competition your opponent does something unexpected and your team has **GREAT DIFFICULTY** adjusting.

1. There are likely many reasons for why your team had difficulty adjusting to your opponent's behaviour. Please identify the **most important** cause: \_\_\_\_\_

2. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?

Only influences this particular team situation      1      2      3      4      5      6      7      Influences all team situations

3. Is the **cause** something that is controllable by your team or is it not in your team's control?

Not in our team's control      1      2      3      4      5      6      7      In our team's control

4. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?

Unique to our team      1      2      3      4      5      6      7      Common to all teams

5. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?

Will never again be an influencing factor      1      2      3      4      5      6      7      Will always be an influencing factor

**SITUATION 4:** Your team has a practice that goes **VERY POORLY**.

1. There are likely many reasons for why your team's practice went very poorly. Please identify the **most important** cause: \_\_\_\_\_

2. Is the **cause** something that is controllable by your team or is it not in your team's control?

Not in our team's control      1      2      3      4      5      6      7      In our team's control

3. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?

Unique to our team      1      2      3      4      5      6      7      Common to all teams

4. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?

Will never again be an influencing factor      1      2      3      4      5      6      7      Will always be an influencing factor

5. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?

Only influences this particular team situation      1      2      3      4      5      6      7      Influences all team situations

**SITUATION 5:** In a competition your team is leading by a lot and begins to play poorly and **LOSES** the competition.

1. There are likely many reasons for why your team lost. Please identify the **most important** cause: \_\_\_\_\_

2. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?

Unique to our team	1	2	3	4	5	6	7	Common to all teams
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3. Is the **cause** something that is controllable by your team or is it not in your team's control?

Not in our team's control	1	2	3	4	5	6	7	In our team's control
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4. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?

Will never again be an influencing factor	1	2	3	4	5	6	7	Will always be an influencing factor
---	---	---	---	---	---	---	---	--------------------------------------

5. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?

Only influences this particular team situation	1	2	3	4	5	6	7	Influences all team situations
--	---	---	---	---	---	---	---	--------------------------------

**SITUATION 6:** Your team has **GREAT DIFFICULTY** successfully getting through a challenging competition.

1. There are likely many reasons for why your team had difficulty successfully getting through a challenging competition. Please identify the **most important** cause: \_\_\_\_\_

2. Is the **cause** of your team's difficulty unique to your team or do you believe the cause is a problem for all teams?

Unique to our team	1	2	3	4	5	6	7	Common to all teams
--------------------	---	---	---	---	---	---	---	---------------------

3. In the future, when your team performs poorly in challenging competitions, will this **cause** be an influencing factor again?

Will never again be an influencing factor	1	2	3	4	5	6	7	Will always be an influencing factor
---	---	---	---	---	---	---	---	--------------------------------------

4. Is the **cause** something that just influences this situation or does it also influence other situations experienced by your team?

Only influences this particular team situation	1	2	3	4	5	6	7	Influences all team situations
--	---	---	---	---	---	---	---	--------------------------------

5. Is the **cause** something that is controllable by your team or is it not in your team's control?

Not in our team's control	1	2	3	4	5	6	7	In our team's control
---------------------------	---	---	---	---	---	---	---	-----------------------

**Please complete the following section in reference to your team's most recent competition**

In reference to your team's most recent performance, write the single most important reason for how YOUR TEAM performed: \_\_\_\_\_

Think about the reason you have written above. Please indicate to what extent the statements below relate to your reason by circling the most appropriate number from 1 (meaning not at all) to 5 (meaning completely).

1 = not at all  
2 = a little  
3 = somewhat  
4 = a lot  
5 = completely

In general, to what extent is your reason something that . . .

	Not at all	A little	Somewhat	A lot	Completely
your team could control in the future	1	2	3	4	5
remains stable across time	1	2	3	4	5
relates to a number of different situations your team encounters	1	2	3	4	5
in the future, your team could exert control over	1	2	3	4	5
is a common cause of performance for other teams	1	2	3	4	5
you feel remains constant over time	1	2	3	4	5
affects a wide variety of outcomes for your team	1	2	3	4	5
is a cause of performance that other teams relate to	1	2	3	4	5
stays consistent across time	1	2	3	4	5
in the future your team could change at will	1	2	3	4	5
influences the outcomes of new situations your team face	1	2	3	4	5
can be used to explain the performances of other teams	1	2	3	4	5
your team could regulate in the future	1	2	3	4	5
influences all situations your team encounters	1	2	3	4	5
is a cause of performance for other teams as well	1	2	3	4	5

**Think about your team's NEXT upcoming game or competition. Please complete this section in reference to this competition**

In terms of the upcoming game or competition, rate your confidence that your team has the ability to...

	Not at all confident					Extremely confident				
	1	2	3	4	5	6	7	8	9	10
Outplay the opposing team	1	2	3	4	5	6	7	8	9	10
Resolve conflicts	1	2	3	4	5	6	7	8	9	10
perform under pressure	1	2	3	4	5	6	7	8	9	10
Be ready	1	2	3	4	5	6	7	8	9	10
Show more ability than the other team	1	2	3	4	5	6	7	8	9	10
Be united	1	2	3	4	5	6	7	8	9	10
Persist when obstacles are present	1	2	3	4	5	6	7	8	9	10
Demonstrate a strong work ethic	1	2	3	4	5	6	7	8	9	10
Stay in the game when it seems like your team isn't getting any breaks	1	2	3	4	5	6	7	8	9	10
Play to its capabilities	1	2	3	4	5	6	7	8	9	10
Play well without your best player	1	2	3	4	5	6	7	8	9	10
Mentally prepare for this competition	1	2	3	4	5	6	7	8	9	10
Keep a positive attitude	1	2	3	4	5	6	7	8	9	10
Play more skillfully than the opponent	1	2	3	4	5	6	7	8	9	10
Perform better than the opposing team	1	2	3	4	5	6	7	8	9	10
Show enthusiasm	1	2	3	4	5	6	7	8	9	10
Overcome distractions	1	2	3	4	5	6	7	8	9	10
Physically prepare for this competition	1	2	3	4	5	6	7	8	9	10
Devise a successful strategy	1	2	3	4	5	6	7	8	9	10
Maintain effective communication	1	2	3	4	5	6	7	8	9	10

## **Appendix B. Study 2 Example Questionnaire packet**

### **Effects of explanations for performance on sport outcomes INFORMATION SHEET**

#### **Background Information:**

The purpose of this study is to explore how teams explain their performances and the consequences of these explanations on factors that may affect future performances. Participants must be 18 years of age or older and participate on an interactive sports team.

#### **Procedures:**

If you agree to take part in this study you will be asked to complete a questionnaire that should take no longer than 10 minutes.

#### **Risk and Benefits:**

By participating, you will be asked to provide explanations for your own and your team's most recent performance. You will also be asked to rate your confidence level and emotions in regard to your teams most recent and upcoming performances.

There are no direct benefits to participation.

#### **Compensation:**

There is no compensation for participation.

#### **Confidentiality:**

The records of this study will be kept private and confidential to the extent permitted by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

### CONSENT BY VOLUNTEER TO PARTICIPATE

Name of Volunteer: .....

Name of Study: Effects of explanations for performance on sport outcomes

Principal Investigator: Ross Murray

I have read the patient/volunteer information sheet on the above study and have had the opportunity to discuss the details with Ross Murray and ask questions. The principal investigator has explained to me the nature and purpose of the tests to be undertaken. I understand fully what is proposed to be done.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study or any part of the study at any time I wish.

I understand that these questionnaires are part of a research project designed to promote scientific knowledge, which has been approved by the Sports Studies Ethics Committee, and may be of no benefit to me personally. The Sports Studies Ethics Committee may wish to inspect the data collected at any time as part of its monitoring activities.

I hereby fully and freely consent to participate in the study which has been fully explained to me.

Signature of Volunteer: .....

Date: .....

I confirm that I have explained to the patient/volunteer named above, the nature and purpose of the tests to be undertaken.

Signature of Investigator: .....

Date : .....

**Please complete this entire questionnaire in reference to the team you are currently with**

Initials: \_\_\_\_

Born: Day \_\_\_\_ Month \_\_\_\_

What is your age? \_\_\_\_\_

How many years of experience do you have in your sport? \_\_\_\_\_

How long have you been a member of your team? (In years) \_\_\_\_\_

How important are team competitions to you?

Not important at all 1 2 3 4 5 6 7 8 9 10 Extremely important

Were you at your team's last competition? Yes No

What was the result of your most recent team competition? Win Loss Tie

Do you consider your most recent team competition more of a success or more of a failure?

Success Failure

**Please think of your team in general.**

Please rate the extent to which you agree with each statement

	Not at all	A little	Some what	A lot	Extremely
I feel a bond with my team	1	2	3	4	5
I feel solidarity with my team	1	2	3	4	5
I feel committed to my team	1	2	3	4	5
I am glad to be on my team	1	2	3	4	5
I think that my team have a lot to be proud of	1	2	3	4	5
It is pleasant to be on my team	1	2	3	4	5
Being on my team gives me a good feeling	1	2	3	4	5
I often think about the fact that I am on my team	1	2	3	4	5
The fact that I am on my team is an important part of my identity	1	2	3	4	5
Being on my team is an important part of how I see myself	1	2	3	4	5
I have a lot in common with the average team member	1	2	3	4	5
I am similar to the average team member	1	2	3	4	5
My teammates have a lot in common with each other	1	2	3	4	5
My teammates are very similar to each other	1	2	3	4	5
The most important thing to me are the results of my team	1	2	3	4	5
The most important thing to me are the friendships within my team	1	2	3	4	5

**Please complete the following section in reference to your team's most recent competition**

In reference to your team's most recent performance, write the single most important reason for how YOUR TEAM performed: \_\_\_\_\_

Think about the reason you have written above. Please indicate to what extent the statements below relate to your reason by circling the most appropriate number from 1 (meaning not at all) to 5 (meaning completely).

1 = not at all  
2 = a little  
3 = somewhat  
4 = a lot  
5 = completely

In general, to what extent is your reason something that . . .

	Not at all	A little	Somewhat	A lot	Completely
your team could control in the future	1	2	3	4	5
remains stable across time	1	2	3	4	5
relates to a number of different situations your team encounters	1	2	3	4	5
in the future, your team could exert control over	1	2	3	4	5
is a common cause of performance for other teams	1	2	3	4	5
you feel remains constant over time	1	2	3	4	5
affects a wide variety of outcomes for your team	1	2	3	4	5
is a cause of performance that other teams relate to	1	2	3	4	5
stays consistent across time	1	2	3	4	5
in the future your team could change at will	1	2	3	4	5
influences the outcomes of new situations your team face	1	2	3	4	5
can be used to explain the performances of other teams	1	2	3	4	5
your team could regulate in the future	1	2	3	4	5
influences all situations your team encounters	1	2	3	4	5
is a cause of performance for other teams as well	1	2	3	4	5

**Now, think about your team's NEXT upcoming game or competition. Please complete this section in reference to this competition**

In terms of the upcoming game or competition, rate your confidence that your team has the ability to...

	Not at all confident					Extremely confident				
	1	2	3	4	5	6	7	8	9	10
Outplay the opposing team	1	2	3	4	5	6	7	8	9	10
Resolve conflicts	1	2	3	4	5	6	7	8	9	10
perform under pressure	1	2	3	4	5	6	7	8	9	10
Be ready	1	2	3	4	5	6	7	8	9	10
Show more ability than the other team	1	2	3	4	5	6	7	8	9	10
Be united	1	2	3	4	5	6	7	8	9	10
Persist when obstacles are present	1	2	3	4	5	6	7	8	9	10
Demonstrate a strong work ethic	1	2	3	4	5	6	7	8	9	10
Stay in the game when it seems like your team isn't getting any breaks	1	2	3	4	5	6	7	8	9	10
Play to its capabilities	1	2	3	4	5	6	7	8	9	10
Play well without your best player	1	2	3	4	5	6	7	8	9	10
Mentally prepare for this competition	1	2	3	4	5	6	7	8	9	10
Keep a positive attitude	1	2	3	4	5	6	7	8	9	10
Play more skillfully than the opponent	1	2	3	4	5	6	7	8	9	10
Perform better than the opposing team	1	2	3	4	5	6	7	8	9	10
Show enthusiasm	1	2	3	4	5	6	7	8	9	10
Overcome distractions	1	2	3	4	5	6	7	8	9	10
Physically prepare for this competition	1	2	3	4	5	6	7	8	9	10
Devise a successful strategy	1	2	3	4	5	6	7	8	9	10
Maintain effective communication	1	2	3	4	5	6	7	8	9	10

**Again, please complete this section in reference to your team's NEXT upcoming game or competition**

Below you will find a list of words that describe a range of feelings that sport performers may experience. Please read each one carefully and indicate on the scale next to each item how you feel right now, at this moment, in relation to your NEXT UPCOMING COMPETITION. Do not spend too much time on anyone item, but choose the answer which best describes your feelings right now in relation to the upcoming competition.

	Not at all	A little	Moderately	Quite a bit	Extremely
Uneasy	1	2	3	4	5
Upset	1	2	3	4	5
Exhilarated	1	2	3	4	5
Irritated	1	2	3	4	5
Pleased	1	2	3	4	5
Tense	1	2	3	4	5
Sad	1	2	3	4	5
Excited	1	2	3	4	5
Furious	1	2	3	4	5
Joyful	1	2	3	4	5
Nervous	1	2	3	4	5
Unhappy	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Annoyed	1	2	3	4	5
Cheerful	1	2	3	4	5
Apprehensive	1	2	3	4	5
Disappointed	1	2	3	4	5
Energetic	1	2	3	4	5
Angry	1	2	3	4	5
Happy	1	2	3	4	5
Anxious	1	2	3	4	5
Dejected	1	2	3	4	5

## Appendix C. Study 3 Example Questionnaire packet

### INFORMATION SHEET

**Background Information:**

The purpose of this study is to explore how teams explain their performances and the consequences of these explanations on factors that may affect future performances. Participants must be 18 years of age or older and participate on an interactive sports team.

**Procedures:**

If you agree to take part in this study you will be asked to complete questionnaires at various points throughout the season. All questionnaires will take between 4-8 minutes to complete.

**Risk and Benefits:**

By participating, you will be asked to provide explanations for your own and your team's most recent performance. You will also be asked to rate your confidence level and emotions in regard to your teams most recent and upcoming performances.

**Compensation:**

There is no compensation for participation.

**Confidentiality:**

The records of this study will be kept private and confidential to the extent permitted by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

## CONSENT BY VOLUNTEER TO PARTICIPATE

Name of participant: .....

Name of Study: Effects of explanations for performance on sport outcomes

Principal Investigator: Ross Murray

I have read the patient/volunteer information sheet on the above study and have had the opportunity to discuss the details with Ross Murray and ask questions. The principal investigator has explained to me the nature and purpose of the tests to be undertaken. I understand fully what is proposed to be done.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study or any part of the study at any time I wish.

I understand that these questionnaires are part of a research project designed to promote scientific knowledge, which has been approved by the Sports Studies Ethics Committee, and may be of no benefit to me personally. The Sports Studies Ethics Committee may wish to inspect the data collected at any time as part of its monitoring activities.

I hereby fully and freely consent to participate in the study which has been fully explained to me.

Signature of participants: .....

Date: .....

I confirm that I have explained to the patient/volunteer named above, the nature and purpose of the tests to be undertaken.

Signature of Investigator: .....

Date : .....

Name: \_\_\_\_\_

Jersey Number: \_\_\_\_\_

1. Were you at the Clansmen's most recent competition? (Circle one option)    Yes            No

2. Do you consider the Clansmen's most recent competition more of a success or more of a failure? (Circle one option)

More of a success

More of a failure

3. How successful do you believe the Clansmen's most recent competition was? (Circle one option)

Complete failure    1    2    3    4    5    6    7    8    9    10    Complete success

4. What was the result of your most recent team competition? (Circle one option)

Win

Loss

Tie

**Please answer the following questions in relation to the Clansmen's most recent match**

In reference to the Clansmen's most recent performance, write the single most important reason for how the Clansmen performed: \_\_\_\_\_

Think about the reason you have written above. Please indicate to what extent the statements below relate to your reason by circling the most appropriate number from 1 (meaning not at all) to 5 (meaning completely).

1 = not at all

2 = a little

3 = somewhat

4 = a lot

5 = completely

**In general, to what extent is your reason something that . . .**

	Not at all	A little	Somewhat	A lot	Completely
5. the Clansmen could control in the future	1	2	3	4	5
6. remains stable across time	1	2	3	4	5
7. relates to a number of different situations the Clansmen encounters	1	2	3	4	5
8. in the future, the Clansmen could exert control over	1	2	3	4	5
9. is a common cause of performance for other teams	1	2	3	4	5
10. you feel remains constant over time	1	2	3	4	5
11. affects a wide variety of outcomes for the Clansmen	1	2	3	4	5
12. is a cause of performance that other teams relate to	1	2	3	4	5
13. stays consistent across time	1	2	3	4	5
14. in the future the Clansmen could change at will	1	2	3	4	5
15. influences the outcomes of new situations the Clansmen face	1	2	3	4	5
16. can be used to explain the performances of other teams	1	2	3	4	5
17. the Clansmen could regulate in the future	1	2	3	4	5
18. influences all situations the Clansmen encounters	1	2	3	4	5
19. is a cause of performance for other teams as well	1	2	3	4	5

**Thank you for completing that section. I am now interested assessing your identification with the Clansmen. Please complete the following four items.**

**Please rate the extent to which you agree with each statement...**

	<b>Strongly Disagree</b>					<b>Strongly Agree</b>	
20. I identify with the clansmen	1	2	3	4	5	6	7
21. I feel committed to the clansmen	1	2	3	4	5	6	7
22. I am glad to be a clansmen	1	2	3	4	5	6	7
23. Being a clansmen is an important part of how I see myself	1	2	3	4	5	6	7

**Thank you for completing these items. Please hand the questionnaires back to the researcher.**

**This section is looking to assess your perception of your confidence in your team's ability.**

**Rate your confidence, in terms of the upcoming game or competition, that your team has the ability to...**

	<b>Not at all confident</b>					<b>Extremely confident</b>				
	1	2	3	4	5	6	7	8	9	10
1. Outplay the opposing team	1	2	3	4	5	6	7	8	9	10
2. Resolve conflicts	1	2	3	4	5	6	7	8	9	10
3. Perform under pressure	1	2	3	4	5	6	7	8	9	10
4. Be ready	1	2	3	4	5	6	7	8	9	10
5. Show more ability than the other team	1	2	3	4	5	6	7	8	9	10
6. Be united	1	2	3	4	5	6	7	8	9	10
7. Persist when obstacles are present	1	2	3	4	5	6	7	8	9	10
8. Demonstrate a strong work ethic	1	2	3	4	5	6	7	8	9	10
9. Stay in the game when it seems like your team isn't getting any breaks	1	2	3	4	5	6	7	8	9	10
10. Play to its capabilities	1	2	3	4	5	6	7	8	9	10
11. Play well without your best player	1	2	3	4	5	6	7	8	9	10
12. Mentally prepare for this competition	1	2	3	4	5	6	7	8	9	10
13. Keep a positive attitude	1	2	3	4	5	6	7	8	9	10
14. Play more skillfully than the opponent	1	2	3	4	5	6	7	8	9	10
15. Perform better than the opposing team	1	2	3	4	5	6	7	8	9	10
16. Show enthusiasm	1	2	3	4	5	6	7	8	9	10
17. Overcome distractions	1	2	3	4	5	6	7	8	9	10
18. Physically prepare for this competition	1	2	3	4	5	6	7	8	9	10
19. Devise a successful strategy	1	2	3	4	5	6	7	8	9	10
20. Maintain effective communication	1	2	3	4	5	6	7	8	9	10

**Thank you for completing these questions. Please now return this form to the researcher**

## Appendix D. Chapter 4 Supplementary material

### Supplementary material

Table S1: Study 2 reliability coefficients, means, standard deviations, and intra-class correlation coefficients

	Alpha	Team Victory			Team Defeat		
		<i>M</i>	<i>SD</i>	<i>ICC</i>	<i>M</i>	<i>SD</i>	<i>ICC</i>
Control	.78	3.98	0.72	<.01	3.82	0.74	<.01
Stable	.81	3.44	0.93	.12	3.23	0.88	.12
Global	.74	3.98	0.62	.12	3.78	0.63	.13
Universal	.84	3.88	0.78	.04	3.75	0.75	.04
Social identity	.90	3.97	0.49	<.01	3.98	0.66	.24
Excitement	.80	3.82	0.75	.21	3.52	0.84	.02
Happiness	.85	3.58	0.85	.19	3.45	0.91	.04
Anxiety	.86	2.23	0.9	.16	2.26	0.98	.15
Dejection	.87	1.17	0.32	.04	1.64	0.87	.15
Anger	.85	1.31	0.58	.06	1.79	0.87	.16
Collective efficacy	.96	8.19	1.19	.36	7.26	1.55	.17

*Note.* *M* = Mean, *SD* = Standard deviation, Alpha = reliability coefficient, *ICC* = Intra-class correlation coefficient

Table S2: Study 2 bivariate correlations between social identity subscales

	Satisfaction	Centrality	Individual self-stereotyping	In-group homogeneity	Total
Solidarity	.75	.54	.43	.33	.83
Satisfaction		.44	.47	.35	.82
Centrality			.34	.43	.78
Individual self-stereotyping				.59	.71
In-group homogeneity					.64

Table S3: Study 2 bivariate correlations between collective efficacy subscales

	Effort	Persistence	Preparation	Unity	Total
Ability	.78	.77	.75	.79	.82
Effort		.88	.91	.91	.90
Persistence			.82	.85	.93
Preparation				.89	.90
Unity					.88

Table S4: Study 2 bivariate correlations for attribution dimensions, social identity, emotions and collective efficacy

	1	2	3	4	5	6	7	8	9	10	11
1. Control		.50**	.58**	.42**	.26**	.05	.13	.04	-.29**	-.21*	.31**
2. Stable	-.07		.41**	.21*	.19*	.14	.23*	.13	-.13	-.01	.30**
3. Global	.53**	.28*		.57**	.27**	.17	.13	.05	-.14	-.01	.38**
4. Universal	.34**	.24*	.62**		.26**	.10	.06	.19*	-.21*	-.20*	.07
5. Social Identity	.14	.21	.11	.20		.39**	.38**	-.14	-.34**	-.20*	.45**
6. Excitement	.01	-.13	-.04	.14	.25*		.79**	-.05	.02	.20*	.41**
7. Happiness	-.08	.05	-.10	.07	.33**	.75**		-.02	-.12	.04	.33**
8. Anxiety	.14	.09	.22*	.18	-.19	.18	.03		.33**	.15	-.24*
9. Dejection	.02	.31**	.11	.10	-.17	-.30**	-.19	.52**		.74**	-.17
10. Anger	.09	.28*	.16	.21	-.02	-.22	-.16	.49**	.82**		.05
11. Collective efficacy	.26*	.17	.19	.18	.66**	.14	.20	-.19	-.01	.05	

*Note.* Top half = Team Victory, Bottom half = Team Defeat

Table S5: Study 3 Reliability coefficients, intra-class correlation coefficients and bivariate correlations

	Alpha	Team victory <i>ICC</i>	Team defeat <i>ICC</i>	1	2	3	4	5	6
1. Controllability	.81	.31	.04		.49**	.70**	.55**	.41**	.28**
2. Stability	.87	.52	.33	.24*		.43**	.26**	.35**	.29**
3. Globality	.83	.39	.16	.39**	.51**		.59**	.34**	.27**
4. Universality	.90	.56	.44	.31**	.20	.58**		.21**	.22**
5. Social Identity	.88	.73	.59	.13	-.06	-.18	.05		.40**
6. Collective efficacy	.98	.75	.78	.19	.05	.06	.17	.49**	

*Note.* ICC = Intra-class correlation coefficient, Top half = Team Victory, Bottom half = Team Defeat

Table S6: Study 3 means and standard deviations for attribution dimensions, social identity, and collective efficacy across all games

Result and score of game	Controllability		Stability		Globality		Universality		Social Identity		Pre-game Collective Efficacy	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
L 40-37	4.16	.89	2.53	.88	3.56	.75	3.48	.95	6.25	.77		
W 13-6	3.95	.63	3.53	.90	3.91	.56	3.67	.79	5.95	1.42	8.18	1.48
L 48-21	4.24	.58	2.89	.94	3.84	.64	3.66	1.06	5.84	1.32	8.18	1.51
W 34-20	3.83	.79	3.36	.97	3.92	.81	3.62	.97	6.17	.98	8.41	1.40
W 21-7	3.81	.87	3.14	.80	3.70	.87	3.57	.97	5.98	1.07	8.31	1.35
W 48-14	4.20	.62	3.31	1.13	4.18	.81	4.01	1.14	6.00	1.05	8.20	1.49
W 39-21	3.97	.67	3.41	.74	3.99	.75	3.92	.95	5.78	1.01	8.48	1.48
L 14-12	3.87	1.09	2.79	1.11	3.73	1.05	3.74	.92	5.70	1.15	8.09	1.01
W 33-0	3.75	.84	3.19	.93	3.83	.68	3.82	.85	5.88	1.14	8.34	1.32
W 21-7	3.98	.84	3.31	.92	3.97	.55	3.82	.76	5.86	1.14	7.97	1.21
W 10-7											8.61	1.08

*Note.* W = Win, L = Loss. Controllability, stability, globality, universality, and social identity were measured after the corresponding game. Pre-match collective efficacy was measured before the corresponding game.

## Note S1. Collective efficacy response scores distribution

The response variable of collective efficacy demonstrated appropriate values of skewness  $-.53$  and kurtosis  $-.39$ . However, a visual inspection using the histogram revealed a negative skew typical to the expected distribution for efficacy scores (Feltz & Chase, 1998). Therefore, to ensure this distribution did not influence the results, models using alternative distributions were explored.

To do this, scores on the response variable were reverse scored and generalised multilevel linear models were carried out with an inverse-gamma distribution. To avoid zero values in the dataset, all scores were added by 1 after they were reverse scored. Because the inverse-gamma distribution transforms the response variable, the analysis corresponds to the original positive valence (higher scores represent stronger perceptions of collective efficacy). In line with Bolker and colleagues' suggestions,  $p$  values were obtained using Wald  $z$  tests (Bolker et al., 2009).

Interpretation of the results using generalised linear mixed effects models were effectively the same as the interpretation of the results using linear mixed effects models. All relationships demonstrated trends in the same direction. The only differences in significance between the approaches are outlined below.

Although the relationships are the same, the significance in the interactions between universality and social identity varied between the two approaches. Specifically, after team victory, the interaction did not reach significance (estimate =  $-.02$ ,  $se = .01$ ,  $p = .11$ ), yet after team defeat, the interaction did reach significance (estimate =  $.04$ ,  $se = .02$ ,  $p = .01$ ). The nature of the interaction is in line with the interaction between controllability and social identity in the team victory condition, that is, the expected positive relationship between universality and social identity is only present under conditions of high social identity. Moreover, in the failure condition, the relationship between social identity and collective efficacy did not reach significance (estimate =  $.03$ ,  $se = .02$ ,  $p = .07$ ). Finally, when running a generalised linear mixed effect model with random slopes across all variables, the same relationship was evident, except the interaction effect did not reach significance (estimate =  $.07$ ,  $se = .04$ ,  $p = .10$ ). Because all relationships were the same, and only very slight variations in the strength of relationships were observed, the more parsimonious analysis (linear mixed effects models) was used.

## Appendix E. Study 4 Example Questionnaire packet

### INFORMATION SHEET

**Background Information:**

The purpose of this study is to investigate how people think about performing. Participants must be 18 years of age or older to participate in this study.

**Procedures:**

If you agree to be in this study you will be asked to read a short vignette. You will then be asked to complete a very short questionnaire.

**Risk and Benefits:**

There are no direct risks or benefits to participation

**Compensation:**

There is no compensation for participation.

**Confidentiality:**

The records of this study will be kept private and confidential to the extent permitted by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

**CONSENT BY VOLUNTEER TO PARTICIPATE**

Name of Study: Perceptions of performance

Principal Investigator: Ross Murray

I have read the patient/volunteer information sheet on the above study and have had the opportunity to discuss the details with Ross Murray and ask questions. The principal investigator has explained to me the nature and purpose of the tests to be undertaken. I understand fully what is proposed to be done.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study or any part of the study at any time I wish.

I understand that these questionnaires are part of a research project designed to promote scientific knowledge, which has been approved by the Sports Studies Ethics Committee, and may be of no benefit to me personally. The Sports Studies Ethics Committee may wish to inspect the data collected at any time as part of its monitoring activities.

By clicking the link below, I am confirming I am 18 years of age or older and hereby fully and freely consent to participate in the study which has been fully explained to me.

What is your gender? Male Female

What is your age? \_\_\_\_\_

**Please vividly imagine yourself in the following scenario:**

You are competing in a tennis doubles competition with a partner of a similar ability who you have never met. In this competition, you and your partner (the team) perform very poorly and fail. You think the main reason the team failed is due to the difficulty of the task. This is something that the team cannot control and something that does not change over time. However, your partner disagrees with you and thinks the main reason the team failed is due to a poor strategy. This is something that the team can control and something that does change over time.

**In general, to what extent do you believe you and your partner are likely to...**

	Not at all				Completely
<b>be cohesive</b>	1	2	3	4	5
<b>experience conflict</b>	1	2	3	4	5

---

<b>How well were you able to imagine the scenario?</b>	Not at all	Moderately	Extremely
	1	2	3
<b>At what level do you play tennis?</b>	Not at all	Recreational	Club National International

## Appendix F. Study 5 Example Questionnaire packet

### INFORMATION SHEET

**Background Information:**

The purpose of this study is to investigate how people think about performing a target task with another individual.

**Procedures:**

If you agree to participate in this study you will be asked to complete *one* of four possible tasks. You will also be asked to complete a short questionnaire on your perceptions regarding your performance as well as your partner's performance.

**Risk and Benefits:**

There are no direct risks or benefits to participation

**Compensation:**

There is no compensation for participation.

**Confidentiality:**

The records of this study will be kept private and confidential to the extent permitted by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records. All video used for data analyses will be kept confidential to the same standards as responses to the questionnaires.

## CONSENT BY VOLUNTEER TO PARTICIPATE

**Name of Volunteer:** .....

**Name of Study:** Target Task Performance

**Principal Investigator:** Ross Murray

I have read the volunteer information sheet on the above study and have had the opportunity to discuss the details with Ross Murray and ask questions. The principal investigator has explained to me the nature and purpose of the tests to be undertaken. I understand fully what is proposed to be done.

I have agreed to take part in the study as it has been outlined to me, but I understand that I am completely free to withdraw from the study or any part of the study at any time I wish. I understand that this trial will be video recorded for research purposes. I understand and agree that my participation in the study is entirely at my own risk.

I understand that these trials are part of a research project designed to promote scientific knowledge, which has been approved by the Sports Studies Ethics Committee, and may be of no benefit to me personally. The Sports Studies Ethics Committee may wish to inspect the data collected at any time as part of its monitoring activities.

I hereby fully and freely consent to participate in the study which has been fully explained to me.

**Signature of Volunteer:** .....

**Date:** .....

I confirm that I have explained to the volunteer named above, the nature and purpose of the tests to be undertaken.

**Signature of Investigator:** .....

**Date :** .....

Please fill out the information below

1. Name: \_\_\_\_\_

2. Age (in years): \_\_\_\_\_

3. Gender (please circle):      Male    or    Female

4. How experienced are you at throwing darts?

No experience 0   1   2   3   4   5   6   7   8   9   10 A lot of experience

Was your team performance:

rather like a success

OR

rather like a failure

Please select the passage that you believe best describes the causes of your team's performance:

- A) The causes of your team's performance in this dart throwing task seem to reflect mostly uncontrollable and stable factors such as the task difficulty for example. As you know, these kinds of factors are things your team are not able to control and they don't change over time.
  
- B) The causes of your team performance in this dart throwing task seem to reflect mostly controllable and unstable factors, such as your team's concentration, your team's effort, or the strategy your team used to try to succeed in the task. As you know, your team have control over the effort put into the task or the strategy used, and the intensity of your team's effort or concentration might change over time.

**Which cause did you select?**

A  
(your team cannot control  
and is not likely to change)

OR

B  
(your team can control and is  
likely to change)

**Which cause did your partner select?**

A  
(your team cannot control  
and is not likely to change)

OR

B  
(your team can control and is  
likely to change)

**In general, to what extent do you believe your team are . . .**

	Not at all					Completely
<b>1. cohesive</b>	1	2	3	4	5	
<b>2. experiencing conflict</b>	1	2	3	4	5	

**Please rate the extent to which you agree with the following statement:**

	Disagree completely							Agree Completely	
<b>I identify with my team</b>	1	2	3	4	5	6	7		