Article

Attributions: Contemporary research and future directions

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This article focuses on the doctoral research of the winner of the 2009 DSEP PhD Dissertation Prize, Peter Coffee. Based upon proposals by Rees et al. (2005), seven studies are discussed, collectively providing support for the following propositions: (a) controllability is an important attribution dimension; (b) sport attribution research should examine alternative perspectives to that of Weiner's (e.g. 1985) model; and (c) attribution research should move beyond examining main effects of attribution dimensions to exploring interactive effects. The programme of research demonstrates the potential theoretical and applied advantages for examining an expanded conceptualisation of generalisability dimensions, together with testing interactive effects of attribution dimensions. The article concludes with suggestions for future research.

Keywords: *Controllability; generalisability; self-efficacy; performance; sport psychology.*

ATTRIBUTIONS are explanations about why particular behaviours occurred, and explanations enhance people's abilities to predict and control events in the future (Anderson & Riger, 1991). In sport psychology, there has been a decline in the frequency of published studies featuring attributions as the primary topic of interest (Biddle, 1999). This is despite attribution theory being a popular topic in the 1970s and one of the 'hot topics' of the 1980s (Biddle et al., 2001; Hardy et al., 1996), and despite acknowledgment that attributions are an area of importance in the field of applied psychology (Graham & Folkes, 1990). This demise may be related to the generally narrow conceptual approach to attribution research in sport (see Biddle & Hanrahan, 1998; Rees et al., 2005). Based upon proposals by Rees et al. (2005), a programme of research was undertaken to examine a broader conceptual approach to attribution research in sport.

A central premise within attribution research is that there is a dimensional structure underlying the explanations people give for events, and by categorising explanations into dimensions, one can better understand those explanations. According to Weiner (1985, 1986), whose perspective has been the focus of the majority of sport-related attribution research (Biddle, 1993), there are three principal attribution dimensions: locus of causality refers to whether a cause is inside (internal) or outside (external) the person, stability refers to whether a cause will (unstable) or will not (stable) change over time, and controllability refers to whether a cause is controllable or uncontrollable.

In Rejeski and Brawley's (1983) review of the status of sport attribution research at that time, they criticised the unquestioning use of Weiner's model and urged a broader conceptual approach in future work. Rees et al. (2005) subsequently proposed that research in sport should focus upon the main effects of controllability, together with the interactive effects of controllability and generalisability dimensions (stability, globality and universality) upon outcomes such as self-efficacy and performance. This proposal is underpinned by at least three key points that are briefly outlined here. First, reviewers of attribution research in sport psychology have suggested that controllability is a key dimension upon which atten-

tion should be focused (e.g. Biddle, 1993; Biddle et al., 2001; Hardy et al., 1996). Indeed, the need to exert control over future events was foundational to early attribution theorising. Heider (1958) wrote, 'it is an important principle of common-sense psychology … that man grasps reality, and can predict and control it' (p.79). Similarly, Kelley (1972) commented, 'the purpose of causal analysis – the function it serves for the species and the individual – is effective control' (p.23). Controllability is also considered the most important attribution dimension in the general social psychology research of Anderson and colleagues (e.g. Anderson & Riger, 1991). Attributing an event to a controllable cause leads to expectations of control over events in the future. Moreover, the effect and importance of perceived *un*controllability is demonstrated in the learned helplessness literature (e.g. Abramson et al., 1978). Abramson et al.'s reformulation of the learned helplessness model regards the *expectancy of future uncontrollability* to be the most direct determinant of helplessness.

Second, whilst controllability relates to whether the cause is controllable or uncontrollable, the stability, globality and universality dimensions are somewhat different, in that they deal with the *generalisability* of the cause of the event. As I have noted, stability refers to whether the cause will (unstable) or will not (stable) change over time. The addition of globality refers to whether the cause affects a wide range of situations with which the person is faced (a global attribution) or a narrow range of situations (a specific attribution); universality refers to whether the cause is common to all people (a universal attribution) or unique to the individual (a personal attribution) (cf. Abramson et al., 1978; Rees et al., 2005). This leads to an expanded conceptualisation of generalisability: In addition to whether causes generalise across time (stability), attribution research should examine whether causes generalise across situations (globality) and/or all people (universality).

Third, the focus of much attribution research has been upon main effects of attribution dimensions (e.g. Bond et al., 2001; Gernigon & Delloye, 2003). To model generalisability implies the need to consider interactive effects (see Carver, 1989), but only a few studies have employed this strategy (e.g. Ingledew et al., 1996). Interactions of attribution dimensions are important because, for example, attributing failures to uncontrollable causes may only lead to lower levels of self-efficacy and poorer performance, when causes are also considered to be stable (will not change over time), or global (affect a wide range of situations), or personal (unique to the individual). For example, a swimmer attributing his/her poor performance to a poor leg-kick action might say, 'There is nothing I can do about it' (an uncontrollable attribution), together with 'and it is not going to change' (a stable attribution), or 'and this affects all aspects of my swimming' (a global attribution), or 'and it is just me who has this problem' (a personal attribution). In this instance, the swimmer might well be expected to experience lower levels of self-efficacy for subsequent performance and, ultimately, poorer subsequent performance. Conversely, higher levels of self-efficacy and a better subsequent performance might be expected if the swimmer were to combine his/her uncontrollable attribution with 'but this will change' (an unstable attribution), or 'however, this only affects my breast stroke' (a specific attribution), or 'but everyone struggles with aspects of their technique at some point' (a universal attribution).

Coffee and colleagues (Coffee & Rees, 2008a, 2008b, 2009a; Coffee et al., 2009) have explored the proposition of Rees et al. (2005), providing empirical evidence for the importance of controllability, an expanded conceptualisation of generalisability, and testing of interactive effects of controllability and generalisability dimensions. The programme of research initially addressed the requirement for a measure of controlla-

bility and the three generalisability dimensions. The most widely used state attribution measure is the revised Causal Dimension Scale (CDSII: McAuley et al., 1992). The CDSII assesses the dimensions of locus of causality, stability and controllability; the measure does not assess the generalisability dimensions of globality and universality. Concerns have been raised regarding the factor structure of the CDSII. For example, Ingledew et al. (1996) found a poor fit for the CDSII with hospital workers in a failure condition, reporting relatively high values for the Root Mean Square Error of Approximation (RMSEA; .10, $p<.004$) and the Standardised Root Mean Square Residual (SRMR; .13). Similarly, Crocker et al. (2002) found poor fits for the CDSII across team and individual sports subsamples, and male and female subsamples, reporting relatively low values for the Comparative Fit Index (CFI; values ranged from .87 to .92). It has also been noted that the assessment of personal and external control is not congruent with Weiner's (1979, 1985) model upon which the CDSII is based, and that respondents have considerable problems understanding some items and the interpretation of scale anchors (Biddle & Hanrahan, 1998; Biddle et al., 2001).

These concerns, in part, led to recent calls (e.g. Crocker et al., 2002) for further instrument development. The first study of the PhD (subsequently published as study one in a three-study paper, Coffee & Rees, 2008a) provided initial evidence of construct validity for a novel four-factor measure of attributions, the CSGU, assessing the dimensions of controllability, stability, globality and universality. Participants (N=218 competitive athletes; mean age 20.00, SD=1.53 years) completed the CSGU for their least and most successful performances within the past three months. The construct validity of the measure was tested using confirmatory factor analysis and the sequential model testing approach (Jöreskog, 1993). Factors were initially confirmed in the least successful condition (e.g. $\chi^2(98)=129.88$, $p<.05$; RMSEA=.04, $p>.05$; SRMR=.04; and, CFI=.98) and subsequently confirmed in the most successful condition (e.g. $\chi^2(98)=129.49$, $p<.05$; RMSEA=.04, $p>.05$; SRMR=.05; and, CFI=.98). Across conditions, support was found for configural, measurement and structural factorial invariance (for further explanation of factorial invariance, see Byrne, 2010). To provide further evidence of construct validity for the CSGU, two additional studies were undertaken alongside the PhD and subsequently published as studies two and three in a three-study paper by Coffee and Rees. In the second study reported by Coffee and Rees, participants (N=225 competitive athletes; mean age 22.83, SD=8.40 years) completed the CSGU and the CDSII up to one hour after competition. The results provided further evidence of construct validity for the CSGU. Support was provided for the factor structure of the CSGU with an independent sample (e.g. $\chi^2(98)=136.39$, $p<.05$; RMSEA=.04, $p>.05$; SRMR=.05; and, CFI=.98), together with initial evidence of concurrent validity for the controllability and stability subscales of the CSGU: The controllability subscale of the CSGU was significantly and positively associated with the personal control subscale of the CDSII (r=.62, $p<.01$), and the stability subscale of the CSGU was significantly and positively associated with the stability subscale of the CDSII (r=.67, $p<.01$).

The third study reported by Coffee and Rees (2008a) examined the main and interactive effects of controllability and generalisability dimensions upon subsequent self-efficacy. According to Bandura's (1997) self-efficacy theory, attributions are fundamental to the formation of self-efficacy. With particular reference to controllability attributions, Williams and Lillibridge (1992) noted, 'perceptions that the environment is controllable may lead people to exercise their personal efficacy strongly, while perceptions that the environment is uncontrollable may lead people to exercise their personal efficacy weakly' (p.158). Similarly, Bandura and

Wood (1989) reported that participants who managed a simulated organisation under a belief that organisations were not easily controllable had low self-efficacy even when standards were within easy reach; participants who believed that organisations were controllable had high self-efficacy even when success was hard to achieve.

Within sport, only a few studies have examined the attributions-self-efficacy relationship (Bond et al., 2001; Gernigon & Delloye, 2003). In a study with 81 golfers, Bond et al. found that under conditions of perceived success, stability attributions predicted self-efficacy; under conditions of perceived failure, attributions did not predict self-efficacy. With 62 national level sprinters, Gernigon and Delloye reported main effects for controllability and stability attributions upon self-efficacy. Aside from this work, there is a dearth of sport specific research in this area, and an obvious need to establish how attributions affect self-efficacy in sport. In the third study reported by Coffee and Rees (2008), participants (N=100 competitive road cyclists; mean age 21.64, SD=6.96 years) completed measures of pre-competition self-efficacy (one hour prior to race one), attributions (the CSGU; up to one hour after race one), and subsequent self-efficacy (at least one week following race one and one hour prior to race two). Pre-competition self-efficacy was entered as a control variable in moderated hierarchical regression analyses. Results demonstrated that following less successful performances, main effects (ΔR^2=.10, p<.01) were reported for controllability (b=.23, p<.01), globality (b=–.16, p<.01), and universality (b=.17, p<.01) upon self-efficacy. In other words, after less successful performances, individuals had higher self-efficacy when they perceived causes of performance as controllable and/or specific (perceived as likely to affect a narrow range of situations) and/or universal (perceived as likely to affect all people). There was an interactive effect for controllability and stability upon self-efficacy (ΔR^2=.06, b=.12, p<.01). The interaction demonstrated that, following less successful performances, if causes were perceived as relatively stable (≥–.87 SD in the level of stability), higher levels of controllability were associated with higher levels of self-efficacy. In other words, it is particularly important for athletes to perceive control over causes of less successful performances when athletes also perceive that the causes are likely to recur.

The second study of the PhD (subsequently published as Coffee & Rees, 2008b) further examined the factor structure of the CSGU with an independent sample, together with examining main and interactive effects of controllability and generalisability dimensions upon self-efficacy following less and more successful performances. Participants (N=360; mean age 21.64, SD=6.96 years) completed measures of pre-competition self-efficacy (one hour prior to competition one), attributions (the CSGU; up to one hour after competition one), and subsequent self-efficacy (at least one week following competition one and one hour prior to competition two). The factor structure of the attributions measure was tested across less successful and more successful performances. Although the chi-square statistics were significant, values for RMSEA (≤.05, non-significant) and SRMR (≤.07) were low, and values for CFI (≥.96) were high. These values are indicative of good fit (Hu & Bentler, 1999) and provide further evidence for the factor structure of the CSGU.

Demographic variables and pre-competition self-efficacy were entered as control variables in moderated hierarchical regression analyses. Results demonstrated that following less successful performances, participants had higher subsequent self-efficacy when they viewed causes of performances as controllable (ΔR^2=.10, b=.25, p<.01). Although the three generalisability dimensions of stability, globality and universality explained no significant additional variance in subsequent self-efficacy, an *interaction* (ΔR^2=.07, p<.01) for controllability and globality (b=.22, p<.01) demonstrated that if causes were perceived as likely to affect a wide range of situations, higher levels of

controllability were associated with higher levels of subsequent self-efficacy. That is, controllability had a significant effect upon subsequent self-efficacy at moderate to high levels of globality (≥–.86 SD in the level of globality). In other words, when a cause of a less successful performance is perceived as likely to affect many situations, it is important to perceive that the cause is controllable.

Following more successful performances, attributions to controllability were not associated with significant effects upon subsequent self-efficacy. It would appear that whether causes of more successful performances are controllable or uncontrollable has little impact upon subsequent self-efficacy beliefs. Rather, participants had higher subsequent self-efficacy when they generalised (ΔR^2=.38, p<.01) causes of performance across time (stability: b=.45, p<.01) and/or across situations (globality: b=.49, p<.01) and/or perceived causes to be unique to themselves (universality: b=–.46, p<.01). In other words, regardless of the controllability of the cause, participants had higher subsequent self-efficacy they viewed causes of performances as stable (likely to recur) and/or global (likely to affect a wide range of situations) and/or personal (unique to the individual).

The third study of the PhD (subsequently published as Coffee & Rees, 2009a) examined the main and interactive effects of *immediate* (up to half-an-hour after that day's performance) and *reflective* (three days following performance) attributions upon subsequent self-efficacy. In sport psychology, the majority of attribution research has assessed attributions immediately (e.g. within 10 minutes, Gernigon & Delloye, 2003) after performance. Assessed in this manner, attributions are distant from future outcomes. To my knowledge, no research has examined the effects of attributions assessed at multiple time points upon self-efficacy, even though attributions may well change/develop over time. Indeed, Krull (1993) noted that an attribution may first be made and then later invalidated as information is received, and Biddle (1999) stated, 'we have not tested the longevity or consistency of attributions over time … coaches, athletes, and sport psychologists tell us that attributions … change with time' (p.9).

In the third study of the thesis, participants (N=117 competitive athletes; mean age 25.77, SD=8.45 years) completed measures of immediate attributions (the CSGU; up to one hour after competition one), reflective attributions (the CSGU; three days after competition one), and subsequent self-efficacy (at least one week following competition one and one hour prior to competition two). Data were analysed using moderated hierarchical regression analyses. Results indicated differential effects for immediate and reflective attributions upon subsequent self-efficacy following more successful performances, but not following less successful performances. Following less successful performances, there was a significant effect for controllability (immediate: R^2=.27, b=.26, p<.01; reflective: R^2=.17, b=.21, p<.01) upon subsequent self-efficacy, together with interactive effects (immediate: R^2=.18, p<.01; reflective: R^2=.23, p<.01) for controllability and stability (immediate: b=.19, p<.01; reflective: b=.25, p<.01) upon subsequent self-efficacy; these effects were similar across time. In line with the results of Coffee and Rees (2008a), the interactions demonstrated that stability moderates the effect of controllability upon subsequent self-efficacy. It would appear that if causes of less successful performances are perceived as likely to recur (relatively higher levels of stability; ≥–.36 *SD* in the level of stability), higher levels of controllability are associated with higher levels of self-efficacy. In other words, when a cause of a less successful performance is perceived as likely to recur, it is important to perceive that the cause is controllable.

Following more successful performances, there was no significant effect for controllability upon subsequent self-efficacy, but there were significant effects for the generalisability dimensions (stability, globality and universality) upon subsequent self-efficacy; these effects differed across time. Immedi-

ately after more successful performances, participants had higher subsequent self-efficacy when they generalised (ΔR^2=.27, p<.01) causes of performance across situations (globality: b=.37, p<.01); upon reflection, participants had higher subsequent self-efficacy when they generalised (ΔR^2=.27, p<.01) causes of performance across time (stability: b=.16, p<.05) and/or across situations (globality: b=.27, p<.05) and/or perceived causes to be unique to themselves (universality: b=–.27, p<.05). In other words, regardless of the controllability of the cause, participants had higher subsequent self-efficacy when they viewed causes of performances as stable (likely to recur) and/or global (likely to affect a wide range of situations) and/or personal (unique to the individual).

To this point, I have discussed research focusing on the effects of attributions upon self-efficacy. Ultimately, however, one is likely to be interested in effects upon subsequent behaviour/performance. Furthering the aforementioned research, the fourth and fifth studies of the PhD (subsequently published as Coffee et al., 2009) reported the results of two experiments that examined the interactive effects of attributions for failure on self-efficacy and objective task performance. Although a large body of psychological theory suggests that causal attributions following failure can play a significant role in affecting people's subsequent performance (Abramson et al., 1978; Bandura, 1997; Weiner, 1985), empirical evidence that links such attributions to subsequent performance is sparse. Indeed, despite the strong emphasis that is routinely placed upon the management of performance in applied settings, relatively little research has examined the direct impact of psychosocial variables on actual performance. In sport, the examination of the effects of attributions upon subsequent performance has produced inconsistent findings. For example, Rudisill (1988), Orbach et al. (1999), and Le Foll et al. (2008) reported no effects for attribution manipulations upon subsequent performance. On the other hand, Rudisill (1989) and Orbach et al. (1997) found that performance was enhanced for participants who were orientated toward attributions that were controllable and unstable.

In two experiments, Coffee et al. (2009) examined interactions for controllability and stability dimensions following failure. The first experiment was a vignette study that explored participants' (N=368; mean age 19.48, SD=1.85 years) self-efficacy in response to imagined failure on a sporting task. The second experiment examined participants' (N=80; mean age 20.51, SD=2.31 years) self-efficacy and actual performance across two attempts on a dart-throwing task, for which failure was induced after the first attempt. Both experiments had a two-factor design, with two levels to each factor (controllability: high, low; stability: high, low). Data were analysed using factorial ANOVAs (experiment 1) and factorial ANCOVAs (experiment 2). In both studies, significant interactions between controllability and stability (F(1,364)=10.74, p<.01, η_p^2=.03 and F(1,75)=5.06, p<.05, η_p^2=.06, for experiments 1 and 2, respectively) revealed significant differences in self-efficacy between participants in the uncontrollable and stable condition, and participants in: (a) the controllable and stable condition; and (b) the uncontrollable and unstable condition. Self-efficacy in the latter conditions did not differ from that in the controllable and unstable condition. Moreover, in the second experiment, this effect was observed upon subsequent task performance (F(1,75)=5.16, p<.05, η_p^2=.06). Dependent t-tests also indicated that performance of participants in the uncontrollable and stable condition decreased significantly across the two trials (t(19)=4.23, p<.01, d=1.94) but that the scores of participants in the other three conditions did not change (ps>.10). On the second trial, this meant that the performance of individuals who made uncontrollable and stable attributions was less than half as good as that of participants in the other three conditions.

Collectively, the programme of research (Coffee & Rees, 2008a, 2008b, 2009a; Coffee et al., 2009) provides support for the following propositions: (a) controllability is an important attribution dimension (e.g. Anderson & Riger, 1991; Biddle, 1993; Biddle et al., 2001; Hardy et al., 1996); (b) sport attribution research should examine alternative perspectives to that of Weiner's (1979, 1985, 1986) model (e.g. Rees et al., 2005; Rejeski & Brawley, 1983); and (c) attribution research should move beyond examining main effects of attribution dimensions to exploring interactive effects (e.g. Rees et al., 2005). Indeed, the programme of research demonstrates the potential theoretical and applied advantages for examining an expanded conceptualisation of generalisability dimensions, together with testing interactive effects of attribution dimensions.

Coffee and colleagues (Coffee & Rees, 2008a, 2008b, 2009a; Coffee et al., 2009) provide evidence that, following less successful performances (or failure), attributions to controllability are associated with main effects upon self-efficacy and performance. This supports results of studies in a wide array of domains that have shown that perceived personal control is an important psychological predictor (e.g. Alicke, 2000; Amirkhan, 1998; Ong et al., 2005; Skinner, 1995). The findings also support the work of Anderson and colleagues (e.g. Anderson & Riger, 1991; Deuser & Anderson, 1995) who consider controllability to be the most important attribution dimension, and Abramson et al. (1978) who regard the expectancy of future uncontrollability to be the most direct determinant of helplessness. In relation to self-efficacy, the results support empirical research (e.g. Bandura & Wood, 1989; Gernigon & Delloye, 2003) that reports that individuals who believe the environment is controllable are motivated to exercise fully their self-efficacy.

Following more successful performances, Coffee and Rees (2008b, 2009a) demonstrate that although controllability was not associated with effects upon self-efficacy, the generalisability dimensions of stability, globality and universality were associated with main effects upon self-efficacy. It would appear, that after more successful performances, individuals have higher self-efficacy when they perceive causes of performance as likely to recur (stable) and/or as likely to affect a wide range of situations (global) and/or as unique to themselves (personal). Bond et al. (2001) similarly found that under conditions of perceived success, participants had higher self-efficacy when they generalised causes of success across time. The results of Coffee and Rees suggest that in addition to stability, further generalisability dimensions of globality and universality affect self-efficacy. This supports propositions (e.g. Rees et al., 2005) for an expanded conceptualisation of generalisability in attribution research. In addition to whether causes generalise across time (stability), attribution research should also examine whether causes generalise across situations (globality) and/or all people (universality).

Rees et al. (2005) noted that the interactive effects of controllability and stability, globality, and universality may ultimately influence outcomes such as self-efficacy and performance. Although main effects for attribution dimensions have been reported (e.g. Bond et al., 2001; Gernigon & Delloye, 2003; Grove & Pargman, 1986), only a few studies have examined their interactive relationships (Anderson & Riger, 1991; Brown & Siegel, 1988; Ingledew et al., 1996). The research of Coffee and colleagues (Coffee & Rees, 2008a, 2008b, 2009a; Coffee et al., 2009) demonstrates that following less successful performances, the main effects of controllability are conditioned by interactions with stability and globality. The interactive effects of controllability and stability (Coffee & Rees, 2008a, 2009a; Coffee et al., 2009) and controllability and globality (Coffee & Rees, 2008b) demonstrate that when causes of less successful performances are perceived as likely to recur or likely to affect a wide range of situations, controlla-

bility is positively associated with self-efficacy (and performance; Coffee et al., 2009). Although across studies, controllability interacts with a different generalisability dimension, the nature of the interactions is consistent: Controllability has a significant effect upon outcomes when causes are perceived to *generalise*, either across time or across situations.

Importantly, Coffee et al. (2009) demonstrated that the main effects for stability upon self-efficacy and performance were conditioned by interactions for controllability and stability. Based upon Weiner's (1985, 1986) model (a focus upon main effects of attributions), Coffee et al. might have concluded that stable attributions for failure result in lowered self-efficacy and performance; however, the interactive effects demonstrate that this is only the case if causes are also perceived to be uncontrollable. In line with Abramson et al. (1978), the results of Coffee et al. suggest that the negative effects of perceptions of uncontrollability upon future outcomes, such as self-efficacy and performance, are only problematic when causes of failure are also perceived to generalise across time. A further explanation of the results might be gained from the literature on self-enhancement. Self-enhancement theory suggests that, wherever possible, individuals believe in the best for themselves unless possibilities to self-enhance are explicitly precluded (Kurman, 2006; Sedikides et al., 2003; Sedikides et al., 2002). It appears that self-efficacy and performance are only thwarted when people perceive *no* opportunities for personal self-enhancement. Indeed, Coffee et al. demonstrated that, following failure, stable attributions only result in lowered self-efficacy and performance if causes are also considered uncontrollable; if causes are considered controllable, it would appear that individuals grasp the possibility to self-enhance, believe in their capabilities and perform well. In short, the interactive effects demonstrate that a greater understanding of the nature of relationships between attribution dimensions and outcomes, such as self-efficacy and performance, can be gained from examining interactive effects of controllability and generalisability dimensions.

In summary, the research of Coffee and colleagues (Coffee & Rees, 2008a, 2008b, 2009a; Coffee et al., 2009) demonstrates that following less successful performances (or failure), controllability is important and is positively associated with self-efficacy and performance. These effects, however, are conditioned by interactive effects with generalisability dimensions, namely, stability and globality. Conversely, following more successful performances, attributions to controllability are not associated with significant effects upon self-efficacy. Rather, attributions to stable (likely to recur) and/or global (likely to affect a wide range of situations) and/or personal (unique to the individual) causes are associated with higher levels of self-efficacy. In other words, regardless of the controllability of the cause, individuals have higher self-efficacy when they generalise causes of more successful performances across time and/or situations and/or when they perceive causes to be unique to themselves. Based upon these results, following less successful performances (or failure), practitioners might, in general, encourage athletes to focus upon aspects of their performance that they can control; this is particularly the case when athletes view causes of less successful performances as likely to recur or as likely to affect a wide range of situations. Following more successful performances, practitioners might encourage athletes to believe that the causes of performance are likely to recur and/or are likely to positively affect a wide range of situations and/or are unique to the athlete.

Future directions

Building upon the recent work, I will now outline a number of ideas for future research projects including, where relevant, references to articles in preparation. My early work (Coffee & Rees, 2008a, 2008b), examining the interactive effects of attribu-

tions upon self-efficacy and performance, might be extended to other outcomes such as emotions. Indeed, there is an extensive body of research examining relationships between attributions and emotions (see Weiner, 1985, 1986, 1995), although little of that research has considered the importance of interactive effects. For example, if failure is attributed to a controllable cause such as lack of effort, then guilt is experienced (Weiner et al., 1982). On the other hand, failure attributed to an uncontrollable cause, such as low ability, gives rise to shame (Brown & Weiner, 1984). The relationships between controllability and such emotions might, however, be dependent upon whether causes for failure are perceived as stable and/or global and/or personal. Future research is necessary to examine the interactive effects of attributions on outcomes such as emotions. Moreover, future research might extend the findings of two-way interactive effects for controllability and stability (Coffee & Rees, 2008a, 2009a; Coffee et al., 2009), and controllability and globality (Coffee & Rees 2008b). As previously noted, although across studies, controllability interacts with a different generalisability dimension, the nature of the interactions is consistent. This might lead one to examine a three-way interaction for controllability, stability and globality attributions upon outcomes such as self-efficacy, emotions and performance.

The results of Coffee and Rees (2009a), together with recent research by Allen et al. (2009), serve as a stimulus for future research to examine the effects of attributions measured at multiple time points upon outcomes such as self-efficacy and emotions. The results of Coffee and Rees suggest that following more successful performances, analysis of reflective assessments of attributions may help to further understanding of the relationships between attributions and outcomes such as self-efficacy. The differential relationships between immediate and reflective attributions and self-efficacy for the more successful group might reflect the relative timing of when satisfactory attributions are generated following more successful performances. This raises the implication for practitioners concerning when to intervene and when to try and retrain attributions. Empirical evidence to inform this process might be generated through further attribution research that examines relationships between attributions and outcomes across: (a) a season; and/or (b) an important competition. One might consider methods such as ecological momentary assessment (Stone & Shiffman, 1994) or experience sampling (Csikzentmihalyi & Larson, 1984). These methods would allow a detailed observation of naturally occurring attributions over time, the interaction with the environment and the reattribution process.

Extending the above proposal, one might consider examining the reciprocal relationships between attributions and outcomes. For example, Bandura (1986, 1997) has argued within a larger social cognitive framework that causal attributions and self-efficacy are reciprocally related. Perceived self-efficacy is considered to be both a determinant (Bandura, 1997) of causal attributions and a mediator (Chwalisz et al., 1992; Haney & Long, 1995; Relich et al., 1986; Schunk & Gunn, 1986) of their effects on performance. Kelley and Michela (1980) noted that many of the antecedents and consequences of attributions are bound together in cyclical relationships, and Hardy et al. (1996) stated that there was an urgent need for more longitudinal studies which explore these cyclical relationships. To date, this issue has been largely uninvestigated and remains an important directive for future research.

The results of two experiments (Coffee et al., 2009) converge in demonstrating that an induced belief that failure is both uncontrollable and unlikely to change leads to lower self-efficacy and poorer performance, relative to conditions in which outcomes are believed to be controllable and/or unstable. These findings suggest that where opportunities for self-enhancement are totally

precluded, self-efficacy and performance will suffer. Coffee and Rees (2009b) are extending this line of inquiry through exploring the interactive effects of attributions upon self-efficacy and performance following repeated failure and initial feedback that causes are uncontrollable and unlikely to change. In other words, the piece of research examines what combination of attributions leads to improved self-efficacy and performance, once in the situation of perceiving no hope – this failure is outside of my control and unlikely to change. Furthermore, the research will examine whether self-efficacy mediates the effects of attributions upon performance. It is surprising that little research has examined the effects of attributional feedback following repeated failures, given that nearly 20 years ago Hardy and Jones (1992, p.12) noted that investigating 'ways in which attribution retraining … can be used to modify attributions' was a priority for future research in sport.

Finally, it is important for future research to consider the conditions under which individuals form attributions. The role of the social context may be particularly pertinent; people do not engage in attributional thought in a vacuum. Invariably, attributions are made in a social context, and social factors influence attributions (Hardy & Jones, 1994). Biddle et al. (2001) and Hardy and Jones have suggested that it would be particularly beneficial to study athlete-coach interactions and refer to this as a divergent perspectives approach, because two people might make different attributions for the same event. The interaction of attributions given by the coach and the athlete may ultimately influence the athlete's subsequent behaviour. One might incorporate such suggestions into more complex multi-level models (Luke, 2004). For example, an athlete's attribution for performance may be a function of the following hierarchical determinants: (a) individual characteristics and behaviour (e.g. innate ability, age, gender, motivation); (b) social, family, and community networks (e.g. the coach, teammates); (c) living, working, and training conditions; and (d) broad social, economic, cultural, health, and environmental conditions and policies.

In conclusion, this article has summarised a recent programme of research that demonstrates the potential theoretical and applied advantages for examining an expanded conceptualisation of generalisability dimensions, together with testing interactive effects of attribution dimensions. In short, the results suggest that whether (and what) we learn from mistakes and failures depends upon whether we are encouraged to believe that there is something to learn. Following success, it would simply appear beneficial to draw upon and apply recent positive experiences to current situations. I hope that this discussion, together with ideas for future research will inspire further investigation into attribution research in sport.

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