The Relationship between Affect and Imagery Use in a Non-Competitive Setting

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Abstract

This study investigated the relationship between positive affect (PA), negative affect (NA), and subsequent imagery use outside of a sports competitive setting. Participants from a United Kingdom university included 117 individuals (71 male, 46 female), with a mean age of 19.11 (SD = 1.74), from a number of sports (e.g., rugby, football, netball, athletics, cricket), completed the Sport Imagery Questionnaire (SIQ; Hall et al., 1998) and Positive Affect Negative Affect Schedule (PANAS; Watson et al., 1988). Repeated measures ANOVA demonstrated significant differences in participants’ imagery use, Wilks’ $\Lambda F (4, 113) = 21.715, p = < 0.01, \eta^2 = .44$, with pairwise comparisons using a Bonferroni adjustment of $p = 0.01$ recording significant differences in SIQ subscale ratings. To analyse the extent PA and NA predict functions of imagery use five hierarchical regressions were performed. The results demonstrate PA more so than NA influences the SIQ’s motivational imagery functions. Neither PA nor NA acted as predictors for the SIQ’s cognitive subscales. To account for the specificity of this relationship the authors propose a model to guide future research.

KEYWORDS: positive affect, negative affect, imagery, motivation
Introduction

A number of models in the sport psychology literature have been designed to assist practitioners in the effective delivery of imagery interventions (e.g., Holmes & Collins, 2001; Martin, Moritz, & Hall, 1999; Munroe, Giacobbi, Hall, & Weinberg, 2000; Watt, Morris, & Andersen, 2004). Unfortunately a lack of homogeneity regarding number and type of variables (e.g., competitive level [Hall et al. 2009], deliberate practice [Cumming & Hall, 2002], age [Gregg & Hall, 2006], skill type [Arvinen-Barrow, Weigand, Thomas, Hemmings, & Walley, 2007], outcome [Taylor & Shaw, 2002]) likely to influence the models efficacy exists. Further, the variety and number of variables included in an intervention varies relative to the theoretical orientation advanced in support of the adopted models composite structure (see Holmes & Collins, 2001; Martin et al., 1999). This has culminated in creating a situation where some variables (e.g., competitive level, imagery ability) have received a disproportionate level of investigatory attention. One variable that has been integrated into a number of contemporary sports imagery models (e.g., Guillot & Collet, 2008; Holmes & Collins, 2001; Watt, Morris, & Andersen, 2004) though not extensively researched is emotion. Furthermore, research has focused primarily upon negative emotions such as anxiety (e.g., Strachan & Munroe-Chandler, 2006; Vadocz, Hall, & Moritz, 1997) with few investigations considering more basic affective states which are purported to act as building blocks in constructing more complex emotional states (Russell, 2003). Moreover, little attention has been paid to positive affect (PA) let alone positive emotions. This omission is in urgent need of address, especially within sport cohorts who have been found to use imagery frequently (e.g., Parker & Lovell, 2009) in environments where emotions and mood is seen to be influential in determining sports performance (see Raglin, 2001).

It is well documented in sport that imagery is used by athletes for a variety of reasons (see Weinberg, 2008). Paivio’s (1985) general analytic framework proposes that imagery can mediate motor behaviour through cognitive and motivational response systems. The cognitive element encompasses skill and strategy based rehearsal with regulation of arousal and development of self-confidence acting at a motivational level. To establish the function and frequency of imagery use amongst athletes, Hall, Mack, Paivio, and Hausenblas (1998) developed the Sport Imagery Questionnaire (SIQ). Initially by recording individual differences in imagery habits Hall et al. determined that motivational imagery could represent specific goals, and goal-orientated behaviours. Additional to this, athletes also generated images that could evoke emotion-arousing situations, with engagement in cognitive imagery focused towards the rehearsal of game strategies and motor skills. The use of factor analytic
procedures culminated in the retention of five functions of imagery use. Cognitive specific (CS) imagery involves the mental rehearsal and execution of specific skills, cognitive general (CG) encompasses imagery of strategies, game plans, and routines used during practice and competition. Motivational specific (MS) imagery is goal orientated with a focus towards achievement and outcome (e.g., winning). Motivational general-arousal (MG-A) imagery involves feelings of relaxation, arousal, and anxiety associated with performance whereas motivational general-mastery (MG-M) imagery can be utilized to simulate behaviours that display confidence in difficult situations, being in control, and remaining mentally tough. The use of the SIQ has proven to be very successful in ascertaining which functions of imagery are most regularly used by athletes and the variables impinging upon its utility. In general, researchers have found that athletes employ MG-M most often with MS imagery being used least (e.g., Arvinen-Barrow et al., 2007). Although, there is evidence that does deviate from this trend (see Parker & Lovell, 2009).

Recent investigations exploring relationships between emotion and imagery use in youth cohorts have considered largely the influence of competitive anxiety; adherent to a burgeoning consensus that consider anxiety the most likely factor to influence sport performance (see Raglin & Hanin, 2000). Imagery and its frequency of use is believed to be a cognitive strategy that can be utilized to control and contribute to the deleterious thoughts, feelings, and behaviours associated with this negative emotion (Strachan & Munroe-Chandler, 2006). Examples that support this position include Vadocz et al. (1997) who reported MG-A imagery use predicted higher levels of cognitive anxiety amongst a sample of elite roller skaters between 12 and 18 years of age. The same authors found that increases in self-confidence were attributable to increased MG-M imagery use, illustrating that imagery functions are not equal in their contribution to the reduction or elevation of anxiety levels during competition.

Based upon Piaget’s (1971) research that a child’s cognitive processing changes at different times in their development Strachan and Munroe-Chandler (2006) investigated the relationship between imagery use, self-confidence, and anxiety across two age cohorts of young athletes. The authors hypothesized that athletes in both age cohorts would utilize cognitive and motivational functions of imagery differently with an increase in imagery use expected from the older age cohort. Additional to this, reduced levels of cognitive and somatic anxiety accompanied with higher levels of self-confidence were predicted for the older cohort. Their results documented that no significant differences between age cohorts in frequency of imagery use existed. Subsequent regression analyses reported that for the 12-15 year olds MG-M imagery was the only predictor of self-confidence with MS imagery a predictor of cognitive anxiety. In the 7-11 age group the relationship between MS imagery as a predictor of cognitive anxiety
was negative. The authors suggested that the increased use of MS imagery reduced levels of cognitive anxiety for the younger children with the opposite effect the case for the older cohort. To account for these findings Strachan and Munroe-Chandler cited changes in goal orientations that alter due to increased levels of anxiety. Initially, thoughts that pertain towards outcome related goals such as winning prove to be facilitative in combating anxiety for the younger athletes as they may have experienced more success and witnessed little failure. However, the likelihood of the older cohort remaining inoculated from witnessing failure decreases as a function of time resulting in the same images increasing anxiety. Although this explanation is speculative there is theoretical evidence that supports such a claim. For example, Self-Efficacy Theory highlights the importance of previous mastery and vicarious experiences in mediating reactions to anxiety provoking stimuli and thought processes thereafter (Bandura, 1997). This position is echoed by Vadocz et al. (1997) who reported athletes who experienced prior successes in competition were less worried about an upcoming competition. Taken together, the studies illustrate imagery functions have differential effects upon the experience of competitive anxiety and self-confidence levels in child, youth, and adult sport performers. However, valuable to practitioners as the aforementioned evidence is, it pays little consideration to more basic affective states that act as the core to more complex and multifaceted emotions (Russell, 2003), and importantly, it fails to address whether affect is influential in determining the frequency of certain cognitions.

At the subjective level, affect can be perceived as pleasant-unpleasant and activating-deactivating, thus providing an affective quality to the experienced stimuli (Russell, 2003). Watson and Tellegen (1985) have reduced this primitive level of affective structure to a basic two dimensional model of positive affect (PA) and negative affect (NA), arguing that these are distinctive dimensions as opposed to opposite ends of a continuum. The authors purport that PA is manifest in feelings of enthusiasm and alertness. Individuals high in PA are likely to experience a state of high energy, be fully concentrated, feeling pleasurable engagement, with low PA indicative of states characterized by lethargy and sadness. Alternatively, NA represents subjective distress and unpleasant engagement that subsumes a number of aversive moods such as anger, fear, and nervousness. Importantly, many of our cognitive processes occur not in isolation but during the presence of either a positive or negative affective state (Ashby, Turken, & Isen, 1999). Of these, PA appears to be influential in altering cognitive processing (see Isen, 1993, 1999). For example, everyday experience of PA has been demonstrated to improve creative problem solving (e.g., Estrada, Young, & Isen, 1994; Stafford, Ng, Moore, & Bard, 2010), increases unusual associations to neutral words (Isen, Johnson, Mertz, & Robinson 1985), and reduces inhibited mental processing (Bar, 2009). Furthermore, affect has been shown to be a
determining factor in the selection, approach, and avoidance of future goals, thus providing a motivational impetus towards the achievement of certain behavioural outcomes (Bjørnebekk, 2008; Gjesme, 1981). With this position reflected in Damasio’s (1994) postulation that our affective disposition has an energizing effect upon our perceived evaluation of whether a future course of action will be successful or not. This is of interest to sport imagery researchers as quasi-perceptual experiences generated via visual imagery are often used in representing information about goals. Thus offering an individual the capacity to project themselves into the future and simulate the success of goal orientated behaviours or reflect on those achieved previously (Conway, Meares, & Standart, 2004). As many, if not all imagery functions pertain to goals, with some specific and general to motivation (MS, MG-M, MG-A), an understanding of affect and its influence on the functions of imagery use would seem justified. Moreover, the paucity of studies focusing on affective states other than competitive anxiety and imagery use is surprising especially when it is considered that imagery is a flexible form of cognition strongly associated with imagination (e.g., Thomas, 1999), serves cognitive and motivational purposes (e.g., Paivio, 1985), and is adopted frequently by sport performers (e.g., Cox, 2002).

A further consideration, currently overlooked, relates to the time frame in which the psychometric measures used to record imagery use and subjective affective states are presented. Previous studies have required participants complete the imagery measure (e.g., SIQ; Hall et al., 1998) between two to three days prior to a competitive event with the affective state test (e.g., Competitive State Anxiety Inventory-2; Stadulis, MacCracken, Eidson, & Severance, 2002) distributed amongst participants approximately two hours before they are due to enter a competitive situation (see Strachan & Munroe-Chandler, 2006). The rationale for this presentation timeline is based upon the premise that the utilization of certain imagery functions before competition are influential in predicting levels of competitive anxiety before performance. Although important, these studies only inform us of imagery use and emotional states within a narrow epoch of time. Moreover, for some athletes this situation is one more likely to generate increased levels of stress and temporal differences in pre-competition anxiety (Eubank, Collins, Lovell, Dorling, & Talbot, 1997). Consequently the impact PA and NA have upon cognitions such as imagery within a sport context has been ignored. Further, few investigations have considered time instructions that progress beyond two hours before a competitive athletic performance commences. This has also culminated in a limited understanding of affects likely impact upon imagery use in non-competitive situations.

To this end, the purpose of our study was to investigate the association between PA, NA, and imagery functions used by sport performers outside of a competitive event. As previous research has demonstrated that athletes generally
experience more positive mood states (e.g., vigour) than non-athletic populations (see Raglin, 2001) it was anticipated participants would record higher levels of PA than NA. Based on research that has identified PA increases the frequency of certain cognitions (e.g., Isen et al., 1985) we hypothesized PA would be strongly associated with imagery use. Finally, in accordance with Conway et al.’s assertion that imagery is predominately goal orientated with affect influential in contributing to approach and avoidance behaviours (Bjørnebekk, 2008) it was predicted that the motivational functions of imagery use (e.g., MS, MG-M, MG-A) would be most strongly influenced by participants’ PA level.

**Method**

**Participants**

One hundred and seventeen participants (71 male, 46 female) were recruited from a United Kingdom University with an average age of 19.11 years ($SD = 1.74$). Participants represented 19 different sports (e.g., rugby, football, hockey, netball, volleyball, golf, rowing, cycling) and participated at either recreational ($n = 17$), club ($n = 61$), county ($n = 27$), or national ($n = 12$) level. Participants had been involved in their respective sport for 9.47 years ($SD = 4.35$) and practiced 4.51 hours ($SD = 3.10$) per week. None of the participants in this sample had received any formal imagery training.

**Measures**

*The Sport Imagery Questionnaire* – (*SIQ; Hall et al., 1998*). To assess the frequency of imagery use the Sport Imagery Questionnaire was used. The SIQ is a 30 question multi-scale inventory that consists of five subscales that represent functions of imagery use. CS measures imaging of skills, CG assesses imaging strategies and game plans, MS imagery includes images that are goal orientated, MG-A represents imagery that evokes arousal and relaxation levels, with MG-M imagery focused upon remaining mentally tough and coping with adversity. The questionnaire requires that items are rated on a 7-point Likert scale ($1 = never/rarely$ and $7 = often$). Adopting confirmatory factor analysis Hall et al. confirmed the SIQ’s five-factor structure with all subscales recording acceptable internal consistency values with alpha coefficients greater than (0.70).

*Positive and Negative Affect Schedule* – (*PANAS; Watson, Clark, & Tellegen, 1988*). State positive and negative affect were measured using the Positive and Negative Affect Schedule. The PANAS consists of two independent 10 item mood scales rated on a 5-point scale ($1 = very slightly$ or $5 = not at all$ to
Watson et al. have referred to this rating scale as an extent format as participants are asked to rate the extent a mood state is experienced. The scales possess high internal consistency values for all time instructions with associated stable test-retest reliabilities. A number of time instructions can be adopted when using the PANAS (e.g., moment, today, past week, past few weeks, year, general). It was determined due to the non-competitive environment when data collection took place that a longer duration of time could be considered for participants to record retrospectively different feelings and emotions. Research has shown that the test-retest reliabilities for both scales over an eight week retest interval demonstrate that scale stability rises as the temporal aggregation increases (see Watson et al., 1988) Consequently participants’ responses to the PANAS are likely to reflect trait and dispositional components of affect when asked to rate affective experience over longer time periods (Watson & Clark, 1984). Therefore, in an attempt to provide a more generalizable indicator of the influence affect has upon imagery use the time instruction selected for this study asked participants to ‘Indicate to what extent you feel this way during the past week’.

**Procedure**

Prior to data collection ethical clearance was approved by the participating institution. Participants were informed that inclusion in the study was purely on a voluntary basis and that they could withdraw from the study at anytime. Consent forms were signed by all participants before inclusion in the study was permitted. Prior to the questionnaires being distributed the lead researcher briefed participants on imagery providing a working definition based on that given by Morris, Spittle, and Watt, (2005, pp. 19). On doing this the SIQ and PANAS were distributed to participants in groups of no more than 20. At all times the lead researcher was available to deal with queries. Questionnaires were counterbalanced across participants to account for order effects with no stipulated time limit to completion specified. Overall, participants completed both questionnaires in approximately 10 minutes. Completed questionnaires were returned immediately to the lead researcher. Data collection took place during the competitive season in a week when athletes had no university competitive match.

**Data Analyses**

A reliability analysis was conducted on the subscales of both the SIQ and PANAS. Differences in participants’ imagery use scores were examined using a one-way repeated measures analysis of variance (ANOVA). A paired samples t-test was performed to determine differences in PA and NA as measured by the
subscales of the PANAS. Hierarchical regression analyses were conducted to examine PA and NA as predictors of imagery function.

**Results**

**Reliability Analysis**

The current study demonstrated internal consistency values in accordance with recommendations made by Nunnally (1978) where an alpha coefficient of 0.70 is considered an acceptable criterion level for a scale. These guidelines were not violated for any subscales of the SIQ and PANAS (see Table 1).

**Descriptives**

Repeated measures ANOVA demonstrated significant differences in participants’ use of imagery, Wilks’ $\Lambda$ $F$ (4, 113) = 21.715, $p = < 0.01$, $\eta^2 = .44$. Simple pairwise comparisons with a Bonferroni adjustment of $p = 0.01$ to maintain alpha of 5% revealed significant differences for all SIQ subscale ratings except for comparisons between CS imagery and MG-M imagery, CG imagery and MS imagery, CG imagery and MG-A imagery, and MG-A imagery and MS imagery. Participants used MG-M imagery ($M = 5.58$, $SD = 1.39$) the most, with MS imagery ($M = 4.75$, $SD = 1.46$) used the least (see Table 1). Participants recorded higher levels of PA than NA, this difference was significant $t$ (116) = 15.54, $p < .001$.

Table 1. Descriptive statistics for SIQ and PANAS subscales

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>5.31</td>
<td>1.24</td>
<td>0.78</td>
</tr>
<tr>
<td>CG</td>
<td>4.85</td>
<td>1.23</td>
<td>0.70</td>
</tr>
<tr>
<td>MS</td>
<td>4.75</td>
<td>1.46</td>
<td>0.74</td>
</tr>
<tr>
<td>MG-A</td>
<td>4.87</td>
<td>1.34</td>
<td>0.75</td>
</tr>
<tr>
<td>MG-M</td>
<td>5.58</td>
<td>1.39</td>
<td>0.82</td>
</tr>
<tr>
<td>PA</td>
<td>3.42</td>
<td>0.65</td>
<td>0.85</td>
</tr>
<tr>
<td>NA</td>
<td>2.02</td>
<td>0.63</td>
<td>0.80</td>
</tr>
</tbody>
</table>

**Abbreviations:** CS = Cognitive Specific, CG = Cognitive General, MS = Motivational Specific, MG-A = Motivational General-Arousal, MG-M = Motivational General-Mastery, PA = Positive Affect, NA = Negative Affect.
Regression Analyses

Five hierarchical regressions were performed to examine the extent PA and NA predicted functions of imagery use (see Table 2). PA was entered into the regression equations first followed by NA. This decision was based upon athletes in this sample recording higher levels of PA than NA. Probability levels were set at 0.01 to protect against Type 1 error rates and were adopted for each regression analysis. PA proved to be a significant predictor of MS imagery accounting for 9% of the variance with NA contributing a further 1% to this result. Beta values demonstrated positive relationships between PA, NA, and MG-A imagery with PA and NA accounting for 7% of the variance. The strongest predictor for MG-M imagery was PA which accounted for 7% of the variance, an additional 1% of the variance was attributable to NA. Beta values indicated that the relationship between PA and MG-M imagery was positive as was the relationship with NA. Neither PA nor NA acted as significant predictors for the cognitive subscales of the SIQ (e.g., CS, CG).

Table 2. Regression analyses for PA and NA predicting imagery use

<table>
<thead>
<tr>
<th>Variable</th>
<th>R</th>
<th>R²</th>
<th>F</th>
<th>B</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>Step 1: PA</td>
<td>.11</td>
<td>.01</td>
<td>1.32</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td>Step 2: NA</td>
<td>.13</td>
<td>.02</td>
<td>.75</td>
<td>.08</td>
</tr>
<tr>
<td>CG</td>
<td>Step 1: PA</td>
<td>.06</td>
<td>.00</td>
<td>.54</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Step 2: NA</td>
<td>.14</td>
<td>.02</td>
<td>.17</td>
<td>.13</td>
</tr>
<tr>
<td>MS</td>
<td>Step 1: PA</td>
<td>.30</td>
<td>.09</td>
<td>11.58</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Step 2: NA</td>
<td>.32</td>
<td>.10</td>
<td>6.57</td>
<td>.11</td>
</tr>
<tr>
<td>MG-A</td>
<td>Step 1: PA</td>
<td>.21</td>
<td>.04</td>
<td>5.07</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>Step 2: NA</td>
<td>.27</td>
<td>.07</td>
<td>4.46</td>
<td>.17</td>
</tr>
<tr>
<td>MG-M</td>
<td>Step 1: PA</td>
<td>.26</td>
<td>.07</td>
<td>8.39</td>
<td>.28</td>
</tr>
<tr>
<td></td>
<td>Step 2: NA</td>
<td>.29</td>
<td>.08</td>
<td>1.71</td>
<td>.12</td>
</tr>
</tbody>
</table>

Abbreviations: CS = Cognitive Specific, CG = Cognitive General, MS = Motivational Specific, MG-A = Motivational General-Arousal, MG-M = Motivational General=Mastery, PA = Positive Affect, NA = Negative Affect

Discussion

The primary objective of this study was to investigate the relationship between PA, NA, and subsequent imagery use amongst sport performers. It was hypothesized that PA would be most influential in determining the strength of this relationship. The results demonstrated that this sample use imagery frequently, utilizing all the SIQ’s imagery functions. Consistent with previous studies MG-M imagery (M = 5.58, SD = 1.39) was used most frequently (e.g., Gregg, Hall, & Nederhof, 2005; Parker & Lovell, 2009), with MS imagery (M = 4.75, SD = 1.46)
used least (e.g., Watt, Spittle, Jaakkola, & Morris, 2008). This result indicates that across the sample these athletes are predominately adopting imagery for mastery purposes that involve imaging scenarios that require fortitude and mental toughness. However, it is worthy of note that the MS imagery scores were above a moderate level indicating the function is being frequently used. Consequently this result could be construed to have departed from studies that have recorded lower levels of MS imagery across similar samples (e.g., Gregg et al., 2005). A possible reason for this variant may include athletes’ goal orientations at the time of data collection. In a study by Cumming, Hall, Harwood, and Gammage (2002) it was demonstrated that athletes high in ego orientation recorded more frequent use of imagery functions that demonstrated performing superior skills in comparison to others. Additionally, due to the studies non-competitive nature and athletes’ propensity to experience higher levels of PA may have influenced a focus towards outcome related functions of imagery use. Had a competitive event been imminent then perhaps more time considering how to perform (e.g., mastery images) may have taken precedence and contributed to lowering the amount of outcome orientated imagery used (e.g., my position in the competition). Future research is needed to determine whether these tentative assumptions hold. Also athletes reported significantly higher levels of PA ($M = 3.42$, $SD = 0.65$) than NA ($M = 2.02$, $SD = 0.65$). This is commensurate with previous research that has identified sport participation develops enjoyment, a construct described as ‘a positive affective response to sport experience that reflects generalized feelings such as pleasure, liking, and fun’ (Scanlan & Simons, 1992, pp. 202-203).

Intercorrelations between the subscales of the SIQ and PANAS demonstrated the motivational imagery subscales (i.e., MS, MG-A, MG-M) and PA subscale reached significance. It appears that higher levels of PA are related to increased motivational imagery use. This result was partially to be expected as previous research has established that PA plays a prominent role in increasing the frequency of certain cognitions (Isen et al., 1985). Subsequently, images that relate to positive outcomes such as remaining confident during difficult circumstances, experiencing relaxation, calmness in game situations, and success as an end product of participation, are likely imagery content for this group. Psychological constructs that have established a similar relationship with these functions (e.g., MG-M) include self-confidence (Vadocz et al., 1997), and collective efficacy (Munroe-Chandler & Hall, 2004). Based on this evidence it would imply that affective states, especially PA, are more involved in images of a motivational orientation with cognitive imagery influenced by other factors. Examples of research identifying similar functional exclusivity include the relationship between the SIQ’s cognitive subscales (e.g., CS, CG) and self-report movement imagery ability measures (see Gregg et al., 2005; Parker & Lovell, 2009).
Results from the present study indicate PA was a significant predictor for MS and MG-M imagery functions, with NA contributing minimally to their respective total variances. Both PA and NA were significant predictors of MG-A imagery and suggests, as stipulated in certain imagery models (e.g., Martin et al., 1999), that athletes use this imagery function to regulate their arousal and stress outside of competition to levels normally associated with the demands of the environment. Neither affective state predicted the SIQ’s cognitive subscales.

From the onset it must be stated that contributions to total variance levels were small with the highest accounting for 10% of the models overall variance. This issue, however, is possibly a result of the study design that endeavored to measure affect outside of a stress provoking encounter. Previous research has considered timelines that are very close to a competitive event which naturally induce greater emotional responses (e.g., Strachan & Munroe-Chandler, 2006). Furthermore, it was not this studies intention to determine how imagery functions influence specific stable mood states (e.g., depression, anger, tension) or emotions known to impact negatively upon performance (e.g., competitive anxiety), but rather how affect is associated with imagery functions. Of interest here is that affect, especially PA, has been shown to influence only certain imagery functions and specifically those attributed to simulating approach orientated behaviours.

The likely reasons for this imagery function specificity (e.g., MS, MG-M, MG-A) could be linked to the following. Research has demonstrated that PA and NA have antagonistic effects on approach and avoidance behaviours (see Bjørnebekk, 2008). Additional to this, Conway et al. (2004) have stipulated that mental images are specialized for the purpose of maintaining information about goals. Conway and colleagues define mental images as cognitive representations that activate goal information with images then influencing current processing. They stipulate the reason why goals are experienced as images is related to goals being perceived as processes that render them unavailable for direct conscious inspection. Furthermore the authors have elaborated on this position stating that the likely reason images are frequently associated with goals is that both are linked to actions. Taken together, the evidence presented by Conway et al. and Bjørnebekk suggest that affect appears to have a potentially motivating influence upon approach and avoidance behaviors that require either activation or deactivation of goal states to achieve a designated outcome. Consequently, images could act as the portal from which goal processes are cognitively represented and consciously experienced, hence Conway et al.’s assertion that mental imagery acts as ‘a sort of “language” of goals’ (p.525).

In the context of this study sport performers may well be utilizing MS imagery to represent specific goals that are hierarchically orientated (e.g., winning a county championship versus winning a national championship). The function of MG-M imagery is more general relative to MS goals with likely image content...
including the demonstration of mastery experiences during challenging circumstances. These images no doubt would be deemed important in achieving goal states represented through MS imagery. Embedded within these associations PA and NA could potentially initiate feelings that alert performers of how successful or unsuccessful the outcome of these goals are likely to be, this function of affect has previously been reported by Watson and Tellegen (1985). Although further investigation is needed, the possibility arises where affect and goal processes act reciprocally, utilizing motivational imagery functions (dependent on goal state, affect dimension, and strength of activation) to consciously represent actual goal states. Such a process tentatively offers an explanation as to why only the motivational imagery functions were influenced by affect in this study. To illustrate how these relationships emerge the following model has been constructed (see figure 1).

Figure 1. The model demonstrates the potential interplay between affective states, goal processes, and motivational imagery functions. Affect and goal processes interact and contribute to the likelihood of activating motivational imagery functions. The selected imagery function then acts as the medium to consciously represent determined goal state/s. A feedback loop exists where information (e.g., success or failure) from actions used to pursue designated goals influences subsequent affective levels and goal processes. In line with previous research it is possible imagery functions can influence current affect and goal processes without additional information acquired from the overt actions themselves. Abbreviations: PA: Positive Affect; NA: Negative Affect; MS: Motivational Specific; MG-M: Motivational General-Mastery; MG-A: Motivational General-Arousal.

In previous studies MS imagery use has been viewed as a function likely to induce cognitive anxiety (Strachan & Munroe-Chandler, 2006). However, relative to the present study it appears that PA is associated with its utilization, a
consequence possibly of the non-competitive environment participants found themselves in during data collection. There are, however, ramifications to this result as MS imagery is closely aligned to achievement orientations based on athletes demonstrating higher levels of ability compared to a normative reference group (Cumming et al., 2002). This could be problematic as considerable evidence exists as to the limits of using result orientated goals (Duda & Nicholls, 1992), in that they lack relevant information needed to mobilize behaviours necessary to achieve success (Cumming et al., 2002). Although some studies have illustrated the merits of using this function (Callow & Hardy, 2001), it would appear that a balance needs to be struck between imaging behaviours that not only demonstrate superior abilities but how these capabilities are to be developed (Cumming et al., 2002). The present study illustrates that PA is positively associated with this imagery function and athletes experiencing feelings of alertness and energy are more likely to adopt it. Fortunately, this sample adopted a broad range of imagery functions with MG-M imagery well represented.

However, practitioners need to be vigilant that PA does not contribute to galvanizing athletes towards a profile of imagery use deficient in content needed to convey behaviours appropriate to achieve the goal states MS imagery represents. Additionally, sport performers in this cohort had not received formal imagery training thus increasing the speculated probability of their imagery use being ad hoc. This has been shown to be problematic as specified in Martin et al.’s (1999) Applied Model of Imagery in Sport where the sport situation, function of imagery use, anticipated outcome imagery use serves, and athletes’ imagery ability need to be considered to increase the optimal match between imagery function and eventual sporting outcome. Based upon the results of this study affect appears to be a variable in need of monitoring to ensure its influence is desirable upon the determination of imagery function and outcome relations. Moreover, as has been the case in two recent studies, where few youth sport performers have been shown to receive any formal imagery training (Parker & Lovell, 2009, Parker & Lovell, 2011), the continued detection and consideration of exogenous (e.g., practice volume) and endogenous (e.g., positive and negative affect) variables and their direct influence upon frequency and utilization of imagery use need continued investigation. Failure to address this could render suboptimal imagery development amongst sport performers.

The current study is not without limitations. We employed time instructions that were not all encompassing and future research will certainly need to record how affect is influenced across wider and narrower time frames. Furthermore, competitive environments will need to be explored as the prominence of PA is probably the result of this study’s non-competitive nature. Accomplishing these tasks could offer an insight as to the true magnitude affect plays in the utilization of imagery use. Additional support will be required to...
determine whether PA and NA are associated with only the motivational imagery functions of the SIQ. Naturally, careful consideration of research designs that can induce different affective states would be required to establish which combination are most effective in influencing imagery functions (e.g., Holmes, Mathews, Dalgleish, & Mackintosh, 2006). Finally, previous studies have reported similar relationship specificity findings (e.g., Gregg et al., 2005; Parker & Lovell, 2009) and adopted different yet complementary psychometric tools to test the robustness of these results. Investigations of this nature are sadly in decline within the sport sciences and a revival would be applauded.

In summary, positive and negative affect were shown to influence motivational imagery use amongst a cohort of sport performers. Predominantly, for MS and MG-M imagery, PA was recorded as most influential in determining the strength of this relationship with PA and NA predictors of MG-A. Although the percentage of the regression models variance attributable to affect was small, the positive relationship suggests that mainly increased levels of PA initiate subsequent increases in motivational imagery use. Practitioners and research scholars should attempt to continue exploring this association and further account for affect as an endogenous variable with the capability to influence change upon motivational imagery functions. Finally, a model of the variables and processes directly involved in this relationship is offered.

References


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