

The Iceberg has Melted: Theoretical, Measurement and Applied Developments in the Area of Mood and Physical Activity

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Introduction

Investigations of relationships between mood and physical activity have provided a focus for researchers for decades; led by William P. Morgan's pioneering research efforts since the 1960s. Generally, the central tenets of Morgan's (1985) mental health model, which proposed an inverse relationship between psychopathology and sport performance, have stood the test of time (see Raglin, 2001). However, one proposal associated with Morgan, immortalised in a 1980 article *Test of Champions: The Iceberg Profile*, in which he espoused the importance of a mood profile characterised by low anger, confusion, depression, fatigue and tension, and high vigour, has been the subject of much critical debate in the sport psychology literature (e.g., Renger, 1993; Rowley, Landers, Kyllö, & Etnier, 1995; Terry, 1995, Beedie, Terry, & Lane, 2000), which continues to the present time.

The presentations in this symposium will address a wide range of theoretical, measurement and applied issues concerned with the inter-relationships between mood and physical activity, both in the sport and exercise domains. In doing so, it will perhaps become apparent that the research emphasis on the importance of the iceberg profile has proven something of a distraction from what many consider to be the more important research questions to address, such as "What exactly is mood?", "How is it best measured?", "How does mood influence athletic performance or exercise influence mood (because it appears self-evident that it does)?", and "How can individuals learn to exert control over the process?" After all, the iceberg profile simply reflects the notion that athletes tend to report less negative feelings and greater vigour than the norm for ... well, originally for a sample of psychiatric outpatients or students, norms that were acknowledged by their authors McNair, Lorr, and Drippelman (1971, p.19) to be "very tentative". Such a notion is hardly surprising.

The generation of sport-specific norms for the original Profile of Mood States (McNair et al., 1971, 1992) based on data from more than 2000 athletes (Terry & Lane, 2000) showed unequivocally that an iceberg profile is the typical profile reported by athletes across a range of sports and situations. Admittedly, following injury, competition defeat, hard training or due to stressful events and/or pathogenic conditions, athletes often report disturbed mood but nevertheless it remains the case that an iceberg profile, when plotted against student normative data, is the *norm* for athletes and is therefore unlikely to be especially predictive. It is not immediately apparent why researchers continue to focus on whether athletes report iceberg profiles, ignoring the sport-specific norms in the process, and indeed why peer-reviewed journals continue to publish articles on the subject (e.g., Covassin & Pero, 2004).

This should not be seen as a criticism of Morgan's extensive efforts. His scientific contribution to the field, which continues unabated, has been immense. The criticism is aimed at those who continue any line of enquiry without asking probing questions about the underlying theoretical rationale or methods of measurement they are using. We are also not implying that mood profiles, assessed by whichever measure and plotted against whichever set of norms, do not provide useful information for both the researcher and practitioner. In fact, we believe the opposite to be true – mood profiles have many good uses – but there are

several important conceptual, measurement and applied issues to be considered if these uses are to have legitimacy.

The present symposium is structured to systematically address some of the key issues. First, Dr. Chris Beedie will address definitional issues and their impact on measurement. In particular, he will discuss how the origins of the POMS influence contemporary uses of the measure, highlight the limitations of single adjective items, and reflect on how distinctions between moods and emotions have significant implications for researchers and practitioners. Next, Prof. Andy Lane will address the theoretical basis for research into mood and performance and assess how this influences the measurement of mood. In doing so, he will review the way in which theoretical developments have guided measurement and will propose future challenges for researchers within the field. Finally, Prof. Peter Terry will provide an overview of the implications for practitioners. He will focus discussion on some of the many applied uses for mood profiling, identify guidelines for best practice, and critically appraise the use of mood management strategies.

The symposium will be interactive, promoting debate among the presenters and encouraging audience involvement. An important objective of the presentations will be to evaluate contemporary research methodology in the area of mood and emotions, and stimulate new and innovative research initiatives.

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Symposium Schedule

1. Introduction to the Symposium:

The Iceberg has Melted: Theoretical, Measurement and Applied Developments in the Area of Mood and Physical Activity

Terry (5 minutes)

2. Presentation #1:

It's the POMS, it Measures Mood – Doesn't it?

Beedie (15 minutes) followed by discussion (10 minutes)

3. Presentation #2:

Mood and Sport: Measurement and Theory Issues

Lane (15 minutes) followed by discussion (10 minutes)

4. Presentation #3:

In the Mood: Mood Profiling Applications and Mood Regulation Strategies

Terry (15 minutes) followed by general discussion (20 minutes) [End]

It's the POMS, it Measures Mood – Doesn't it?

Christopher J. Beedie

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The study of mood and performance in sport has spanned almost four decades; producing well over 300 peer reviewed papers. By far the most frequently used measure of mood has been the Profile of Mood States (POMS: McNair, Lorr & Droppelman, 1971) and its derivatives. The POMS is designed to assess the mood dimensions of tension, depression, anger, vigour, fatigue and confusion. Its popularity in sport owes much to the research efforts of William Morgan and his co-workers, whose early research demonstrated that, when compared with a battery of psychometric tests from general psychology, POMS scores were the most predictive of *athletic success*. Morgan proposed that athletes experience more positive mental health than the general population, noting that the typical POMS profile of the elite athlete, when represented graphically, depicted an iceberg with scores for the five negative dimensions falling below population norms (representing the *waterline*), whereas scores for vigour were well above the waterline, representing the tip of the iceberg.

Although the POMS is reported to be the most widely used measure in applied sport psychology (Vealey & Garner-Hollman, 1998), it has been criticised from several perspectives (e.g., Renger, 1993; Rowley, Landers, Kyllö & Etnier, 1995). Criticism has tended to focus on three areas: the generally negative orientation of POMS dimensions; the (arguably) weak relationships between POMS scores and subsequent performance; and the lack of a theoretical basis for mood-performance relationships, which has led to many conceptual and methodological inconsistencies. Strong counters to these criticisms have been presented (e.g., Terry, 1995) and, in many respects, the jury is still out. In this presentation, it is proposed that the POMS suffers from two significant failings; firstly that items represent constructs unrelated to mood, and secondly that items do not take into account potentially significant distinctions between emotion and mood.

Mood or Mood Disorder?

The POMS was originally developed to assess responses to psychoactive drugs among patients with clinical mood *disorder*. It is not surprising then that constructs related to mood disorder were incorporated into the measure as indicators of patient progress. Some items could certainly be described as mood descriptors (e.g., *depressed* and *irritable*) although others are more traditionally seen as emotions (e.g., *angry*), cognitions (e.g., *confused*), somatic states (*fatigued*), or general descriptors (e.g., *strong*). The origins of the measure raise several issues relevant to the development of mood theory in sport. In relation to the iceberg profile, it is not surprising those athletes who report symptoms similar to mood disorder do not perform as well as those who don't, but is this really a theory of mood? Given that in sport the POMS has been successful in the detection of staleness and overtraining – conditions often described as mood disorders – it is clear that the measure demonstrates adequate validity in its intended application among athletes. It can also be argued that the continued widespread use of the POMS in applied settings in both sports and general psychology suggest that scores on the POMS are useful indicators of *something*. However, just what that something is – mental health, mental and physical energy, or even recovery or preparedness – is hard to say. In sport-related research, it appears that an attitude of “if the POMS measures it, then it's a mood” has prevailed, and that mood theory has been constrained by the limitations of the measure used. Although the POMS appears to have utility in several applications, it is recommended that for mood theory to progress, a measure

that includes mood states hypothesised to be of great significance to athletes, such as hope, calmness, contentedness and relaxation, should be developed.

Distinctions between Moods and Emotions

A significant ambiguity inherent in the POMS and other similar scales relates to the differentiation between mood and emotion. They are strongly related psychological phenomena; both are affective states, and as such are experienced as either positively or negatively valenced subjective feelings; both seem to serve as a signal to individuals, indicating their subjective status in relation to their environment and priorities, and both are common everyday experiences often simply described as *feelings*. However, perhaps of most significance to the present discussion, it has been proposed that many affective states, such as anxiety and anger, can occur as either emotions or moods.

Many theorists in the general psychology literature have argued that mood and emotion can, and should, be distinguished via a number of criteria, including antecedents, duration, object-relatedness and consequences. Theoretically, emotion is brief and intense, and is caused by, focused on, and about, a specific object. Mood is enduring and diffuse, and is neither caused by, focused on nor about anything in particular (see Ekman & Davidson, 1994). Thus, despite an emotion or mood state feeling very similar to the individual – and hence sharing the same label, for example *anxious*, in common speech - emotional anxiety may be a different construct to an anxious mood. Emotional anxiety may result from a distinct set of emotion-specific environmental or cognitive antecedents, and may result in distinct sets of emotion-specific behavioural or cognitive consequences. The same patterns may be true of mood. Translated to the sports setting, this could mean that an athlete experiencing non-optimal emotional anxiety prior to competition may require a different coping strategy to an athlete experiencing a non-optimal anxious mood. For example, a tennis player anxious that she has never beaten her next opponent may respond well to a cognitive intervention aimed at boosting confidence, whereas another player experiencing anxiety with no specific cause or focus may respond more positively to a behavioural intervention such as a relaxation technique or a more thorough warm-up. Also, given the proposal (Davidson, 1994) that mood biases cognitions and emotion biases behaviour, an anxious mood may cause a person to think anxious thoughts whereas emotional anxiety may bring on a strong desire to physically move away from the cause of the anxiety.

Recent research suggests that emotion and mood can be distinguished effectively when the context in which the feeling state occurs is considered. A content analysis of 65 published papers addressing emotion-mood distinctions, and interview data from 106 participants, identified 16 distinguishing criteria (Beedie, Terry & Lane, 2003) and a subsequent study explored the practical utility of these distinctions (Beedie, Lane, & Terry, 2001, in press). It was demonstrated that the most promising distinction was *subjective context*. This means that if an individual perceives a feeling to be caused by a specific object, is focused on that object (i.e., it is *about* the thing that appeared to cause it), and seems to have potential behavioural consequences, then the individual is more likely to label the feeling an *emotion*. On the other hand, if an individual perceives that a feeling is neither caused by nor focused on a specific object and seems to influence thought processes, they are more likely to label the feeling a *mood*.

A key proposal of Beedie and colleagues is that the context of the feeling must be measured alongside the feeling itself. Single adjective items such as those on the POMS (and indeed most other scales that claim to measure mood, emotion, affect or feelings) provide no such contextual information and thus may reflect either emotion or mood. Given that emotions and moods may have very different cognitive and behavioural consequences, and bearing in mind the equivocal findings of mood-performance research, doubt over whether

the POMS assesses mood or emotion may have significant implications for both practitioners and researchers in the sport psychology field.

Implications for Use of the POMS in Sport

It has been proposed that items of the POMS may not represent mood *per se* but instead may assess several phenomena including moods, emotions, cognitions, and somatic states – not surprising given the measure's origins in the area of mood disorder. It has also been proposed that single adjective items do not allow for distinctions to be made between emotions and moods. Future mood research should focus on developing measures of moods, and only moods, specific to the sports domain. In the meantime, researchers using the POMS should exercise caution in how they describe what they have measured and should attempt to better define their constructs of interest.

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Mood and Sport: Measurement and Theory Issues

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Introduction

Mood research in sport has progressed from espousing the benefits of an iceberg profile to searching for reasons why mood states might influence cognition and behaviour. If researchers are to develop a stronger theoretical appreciation of the influence of mood states in sport, it is imperative that the mood construct be operationalised in line with theoretical predictions. Construct definition is imperative to establishing the validity of psychometric measures as it defines what the construct does and does not assess. Lane and Terry (2000) defined mood as “*a set of feelings, ephemeral in nature, varying in intensity and duration, and usually involving more than one emotion* (p. 16). This definition was prompted in part by an absence of a commonly-accepted definition in the sport psychology literature. Historically, mood research has been characterised by use of the Profile of Mood States (POMS: McNair, Lorr, & Droppleman, 1971) with researchers tending to focus on exploring group differences in mood reports between athletes of different achievement levels, somehow hoping to identify the mood of the champion athlete, but often with scant regard for the nature of the mood construct itself or consideration of how and why the mood dimensions assessed might influence performance.

Developments in Theory and Measurement

Building on their definition of mood, Lane and Terry developed a conceptual framework to help explain how mood influences performance, which was based upon the POMS measurement model. Meta-analysis of mood research had indicated that POMS subscales have some predictive validity but identified a need to explain why anger and tension are associated with good performance in some studies and poor performance in others (Beedie, Terry, & Lane, 2000). Lane and Terry argued that depressed mood determines the functional impact of anger and tension on performance. Without depressive symptoms, anger and tension are proposed to enhance determination, whereas with depressive symptoms they are proposed to provide information that confirms task difficulties are beyond ability. Subsequent investigations have supported the central tenets of Lane and Terry’s model (e.g., Janover & Terry, 2002; Lane, Terry, Beedie, Curry, & Clark, 2001; Lane, Terry, Beedie, & Stevens, 2004) and has provided support for the notion that depressed mood moderates the functional effects of anger and tension on performance.

Over the past few years, the same group of researchers have also sought to address measurement issues in the area, providing normative data for the original POMS relevant to athletic samples (Terry & Lane, 2000) and developing, via a rigorous validation process, a 24-item shortened version of the measure that is suitable for use with adolescent and adult athletes (Terry, Lane, & Fogarty, 2003; Terry, Lane, Lane, & Keohane, 1999).

A limitation commonly pointed at scales such as the POMS is that they have a fixed, and by implication inadequate, content. However, using the list of affective states reportedly experienced by athletes as a guide (see Hanin, 2000) it can be seen, for example, that the majority of items in the 24-item BRUMS scale are commonly cited by athletes as important competition feelings. It could be argued that differences between individualized scales and some standardized scales simply reflect the choice of words used to describe the construct, rather than differences with the construct itself. If an athlete reports that feeling *anxious* is an important feeling, s/he should be able to respond to items such as *nervous* and *worried* in a

consistent way provided s/he understands the terms. To this end, Terry et al's (1999) measure was developed for use with adolescents and so should be readily understood by adult athletes. If Lane and Terry's definition of mood is accepted, then existing measures such as the BRUMS provide a valid and internally reliable method for investigating mood responses. However, if their definition is **not** accepted, then the choice of which measure to use becomes more difficult. An obvious limitation of Lane and Terry (2000)'s definition is that emotion and mood are defined by one other. There is, however, a wealth of research within general psychology that has sought to establish definitions that distinguish mood and emotion (see Ekman & Davidson, 1994). Theoretically, mood is proposed to be more enduring, diffuse and without clear links to the cause of feelings, whereas emotions are proposed to be relatively short, more intense, and triggered by a specific antecedent. A limitation of single adjective scales such as the POMS (or versions of it) is that they cannot distinguish feelings that are triggered by a specific antecedent (emotion) from those unrelated to a specific antecedent (mood).

Beedie, Lane, and Terry (2001, in press) provided tentative evidence of an anxiety scale with discernable mood and emotion components. The measure includes phrases rather than single items; hence some exploration of the antecedents of feelings is possible. Emotion items are linked to specific antecedents whereas mood items are not. A limitation of the measure is that it focuses only on anxiety rather than a broader range of feelings relevant to sport performance, and it is clear that further development of the measure is required. Another potentially fruitful line of investigation is to explore athlete's understanding of differences between mood and emotion. A recent study by Ruiz and Hanin (2004) used a symbolic representation method to explore how athletes describe performance-related states through the use of metaphors (c.f., Hanin & Stambulova, 2002). As expected, data were highly individualized but responses did help to distinguish emotions from moods, emphasizing that qualitative techniques have clear potential to allow athletes to explain the context and personal meaning of affective states experienced in competition. Ruiz and Hanin used Lazarus' (2000) work on emotion to inform mood-emotion distinctions, a strategy that would allow qualitative researchers to test existing theory and thereby offer a means through which knowledge of mood and emotion in sport might differ in practice.

It is suggested that researchers interested in investigating the nature of mood and emotion within sport should consider the principles underlying the work of Beedie and colleagues in developing new scales. Alternatively, an array of qualitative techniques suggested by Hanin (2003) could be used to explore the nature of emotion and mood from the perspective of athletes, in line with the strategy suggested by Jones (2003) of addressing mood-emotion distinctions from an applied perspective. Both of these suggestions might provide a focus for future research.

Conclusions

Theory and measurement are inextricably linked and only through the use of valid methods will a clearer understanding of the nature of mood and emotion in sport emerge. Lane and Terry (2000) provided a definition and conceptual model of mood, on which Terry and colleagues have developed a valid measure. It is recommended that fruitful lines of future enquiry would include (a) extending the work of Beedie and colleagues to assess a broader range of moods and emotions experienced by athletes, (b) developing a measure from first principles that can distinguish mood from emotions, and (c) using qualitative techniques to explore the nature of these differences among athletes.

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In the Mood: Mood Profiling Applications and Mood Regulation Strategies

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Introduction

Getting in the *right* mood is seen by many as an important part of mental preparation for athletic competition and the success or failure to do so is often presented by athletes as an attribution to explain performance outcomes. The purpose of this presentation is to move on from the conceptual and measurement issues addressed by my colleagues to look at the implications of mood assessments for practitioners. First, the potential uses of mood profiling are reviewed, primarily from an applied perspective although new research directions are suggested. The focus then switches to mood management, where the current state of knowledge on the subject is discussed and new data is presented on the popularity and perceived effectiveness of mood regulation strategies utilised by athletes.

The problems associated with defining and measuring the mood construct might at first glance appear to detract from the applied usefulness of mood scores. For example, given the problems of differentiating mood from emotion, as outlined in the previous presentation, can we be sure that the POMS actually assesses mood or that the PANAS assesses affect and not mood? In both cases, the answer must be *no* because in neither scale is the measured construct operationalised clearly enough to really judge with any certainty. Also, given the number of performance-relevant emotions reported by Hanin and his colleagues (see Hanin, 2000), do forced-choice measures such as the POMS capture the whole spectrum of feelings that contribute to moods? Once again, logically, the answer is *no*. Does this mean that the information gleaned from such measures is invalid? This is a more complex question to answer. Empiricists would argue that a test is invalid if it does not, in fact, measure what it purports to measure. Pragmatists would argue that the numbers generated from such tests have been shown to be predictive of important outcomes such as sport performance and therefore they are very useful, even if they might possibly be mislabelled. In this presentation, it will be argued that there are many ways in which mood profiles can be put to good use in an applied setting.

Mood Profiling Applications

Pre-competition mood scores have been shown, when certain conditions are met, to be significantly predictive of subsequent performance (see Beedie, Terry, & Lane, 2000), although the links between mood responses and performance appear to be highly individualised (e.g., Lane & Chappell, 2002; Diment & Terry, 2003). For some individuals, performance is very mood-dependent whereas for others it appears to be quite independent of mood. Hence, prediction of performance may rely on individualised assessment of idiosyncratic mood-performance relationships.

Regular assessment of moods may also facilitate systematic evaluation of adaptations to training demands, potential risk of staleness and burnout (see Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987), recovery from overtraining syndrome, effectiveness of the pre-competition taper period (see Hall & Terry, 1995), and adaptations to travel fatigue and jetlag. Mood profiling may also have a role to play in screening for pathogenic behaviours. For example, mood scores have been shown (Terry, Lane, & Warren, 1999) to be predictive of eating disorder risk (as assessed by other measures) and recently were shown to be 91% effective at screening out athletes that were *not* at risk (Terry & Galambos, 2004). In the area of sports injuries, mood profiles can be used to monitor psychological recovery from

injury or as an index of the effectiveness of a particular rehabilitation program. More generally, mood profiles have been reported to be effective as a mechanism for early problem identification and resolution, or simply as a catalyst for discussion, and may come into their own most in an elite sport environment (see Terry, 1995, 2004).

Many of these proposed applied uses raise thorny methodological and procedural issues, such as how often to monitor mood, by whom, when, under what conditions, using what scales, and using what response timeframe; and interpretational issues, such as how much can be read into a single profile, what tables of norms represent the best point of reference, which mood dimensions provide the most important information, and so on – all issues that will be addressed during the presentation.

Mood Regulation Strategies

Although the promotion of mood regulation strategies among athletes is not new (see Bond, 1990) evidence about the efficacy of such strategies in sport is scarce. In the general psychology literature, there is relative consensus that people tend to monitor and evaluate their moods, and also that they develop and implement personal self-regulation strategies (see Wegner & Pennebaker, 1993). Therefore, the role of the applied practitioner may be to monitor and help direct this naturally occurring process. The list of strategies used by different individuals is long and varied with at least 162 mentioned in the literature (see Parkinson & Totterdell, 1999). A study by Thayer, Newman, and McClain (1994), which investigated the incidence and efficacy of different categories of mood-regulating behaviours among the general population, found the most common behaviours to reduce nervousness, tension, or anxiety in the short term to be, in descending order of popularity, affiliative-communicative (e.g., call, talk to, or be with, someone), exercise, relaxation techniques, rest, music, and food. To enhance the energy component of mood, Thayer et al. found that the most effective strategies were to control thoughts through self-talk, listen to music, take a shower, exercise, take a nap, do something to keep busy, eat something, or drink a caffeinated beverage. Age and gender were found to moderate choice of strategy.

In one of very few studies among athletes, Stevens and Lane (2000) found that athletes reported exercise, listening to music, talking to or being with someone, and thought control as the most common mood-regulating strategies, although their relative effectiveness was not established. A recent, as yet unpublished, study among 195 athletes, which focused on the popularity and perceived effectiveness of strategies to regulate various aspects of mood at the pre-competition stage (Terry, Dinsdale, Karageorghis, & Lane, in preparation) showed (a) that strategies varied considerably depending on the target mood dimension, (b) that the most popular strategies were not always the most effective, and (c) that type of sport moderated choice of strategy but age and level of competition did not. Given the paucity of completed research in this area, it is clear that further investigations are required to better understand the effective use of mood regulation strategies in sport.

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