



The effects of goal priming on cortisol responses in an ego-involving climate



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ABSTRACT

Objectives: This study examined the potential for a motivational priming session to buffer the psychophysiological stress response to an ego-involving climate in a physical activity setting. Research in Achievement Goal Perspective Theory (AGPT) suggests that creating a caring/task-involving climate can have beneficial effects on participants in physical activity settings, even buffering the physiological response to stress. However, less is known about how individuals might buffer that response when an ego-involving climate is occurring beyond their control.

Design: Male college students ($N = 38$) between the ages of 18 and 30 years ($M_{age} = 20.68$, $SD = 2.66$) were randomly assigned to either a control group with no exposure to AGPT or an experimental (i.e., AGPT motivational priming) group, and took part in an ego-involving juggling session. Psychophysiological stress responses (e.g., cortisol) were assessed.

Method: Prior to juggling, the experimental group received a motivational priming session that briefly reviewed the body of AGPT literature, while the control group received information on the history of Sport Psychology as a professional field. Cortisol was measured at five time points throughout the study via saliva samples. Participants also completed pre- and post-measures of self-reported anxiety and self-confidence (CSAI-2).

Results: Results showed a marked increase in cortisol (as measured by percent change from baseline) in the control group, but not the experimental group. Psychological responses were stable across groups.

Conclusion: Providing athletes and exercisers with nothing more than basic information on AGPT can reduce their physiological markers of psychosocial stress in ego-involving climates. Such education may be a beneficial practice for coaches, physical educators, and trainers.

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Researchers have suggested that rising rates in obesity over the last two decades are related to physical inactivity, aside from dietary habits (Ladabaum, Mannalithara, Myer, & Singh, 2014). Currently, less than three in 10 high school students get the recommended 60 min of daily physical activity (CDC, Division of Nutrition, Physical Activity, and Obesity, 2014). With U.S. youth obesity rates (ages 6–19) stagnating at just over a third of the population in 2012, physical inactivity is a significant public health concern (Ogden, Carroll, Kit, & Flegal, 2014).

Aside from the physical health benefits, individuals who are inactive or unhappy during physical activity also miss out on the

numerous, noted benefits for their psychosocial development (Smoll, Smith, Barnett, & Everett, 1993). Research shows that these positive outcomes are highly dependent on the interactions between group members and group leaders (Mageau & Vallerand, 2003) and the overall environment of a group as it is defined by leader behavior (Gano-Overway, 2013). A significant factor in the decline of sport participation is the high percentage of people that are exposed to ineffective coaching practices. Barnett, Smoll, and Smith (1992) found that young athletes exposed to coaches who were not trained in creating effective coach-athlete relationships were five times more likely to quit the team the next season. These effects seem to be evident despite ability, as negative developmental experiences are happening to young athletes at every level of sport participation (Gearity, 2012).

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1. Achievement goal perspective theory

Research in achievement goal perspective theory (AGPT; Nicholls, 1984, 1989) has provided valuable insight as to how coaches, physical educators, and parents can keep their athletes engaged in and benefitting from sport and physical activity. Specifically, research on motivational climates (i.e., caring, task-, and ego-involving climates) has shed light on effective and ineffective leader behaviors. Nicholls (1989) suggests two types of motivational climates exist. A task-involving climate is characterized by an emphasis on effort, personal improvement, mastering of skills, and seeing mistakes as part of the learning process. An ego-involving climate (EIC) places greater importance on performance outcomes and demonstrating abilities, encourages rivalry, and punishes mistakes. Newton et al. (2007) found evidence for an additional climate dimension that is distinct from, but highly positively correlated with a task-involving climate. This additional dimension, referred to as a caring climate, communicates to group members that they are respected, valued, and in a safe, secure place when amongst each other. These combined features create a caring/task-involving climate (C/TIC), which research suggests is highly beneficial.

People exposed to C/TIC in sport report greater satisfaction, enjoyment (Fry & Gano-Overway, 2010), and effort (Ntoumanis & Biddle, 1999), and reduced anxiety (Smith, Smoll, & Cumming, 2007), than those exposed to EICs. In contrast, individuals exposed to leader behaviors consistent with EICs showed evidence of reduced self-esteem and depressive symptoms (Gervis & Dunn, 2004), use of maladaptive coping strategies (Kristiansen, Roberts, & Abrahamsen, 2008), amotivation, and antisocial attitudes (see Harwood, Keegan, Smith, & Raine, 2015, for a recent review of the physical activity literature). While many of the above examples are in team or group-based physical activity settings, it is important to note that AGPT is a theory based in education. The motivational climate aspect of this theory is applicable to any learning and performance context consisting of more than one person (Nicholls, 1989). Findings examining correlates of the perceived motivational climate have been mostly consistent across settings, including individual and group physical activities (Harwood et al., 2015).

Due to the benefits associated with positive motivational climates, attention has been paid to the development and evaluation of strategies for creating these climates in physical activity settings (Brown & Fry, 2014; Li, 2015). Despite this, EICs remain prevalent throughout sport as evidenced by research (Gearity, 2012), as well as the increasing attention given to ineffective and/or damaging coaching behaviors in the media (Cohen, 2015).

The ubiquity of EICs in such settings is concerning. People who are exposed to EICs in their sport not only miss out on many of the potential benefits of participation, but can also suffer detrimental consequences. Aside from the negative psychological outcomes described earlier, perhaps the most tangible example of these consequences is chronic stress. In fact, stress from training is believed to be largely responsible for the number of collegiate athletes reporting experiences with burnout symptoms, as high as 47% in one study (Kaufman, 2014).

2. Stress

Chronic stress is considered a major contributor to many prominent health concerns, as will be described in more detail in the following sections. However, the distinction of *chronic* stress is an important one that warrants explanation. The difference between acute and chronic stress is predominantly based on the type of stressor and individuals' ability to cope with that stressor.

Psychosocial stressors (e.g., deadlines, financial issues,

interpersonal problems) are different because they are often subjective, persistent, and we can both anticipate them and ruminate over them. It is these types of stressors that stress researcher Robert Sapolsky argues are generally the roots of stress-related health problems (2004). To relate this concept of psychosocial stress back to physical activity, athletes and habitual exercisers who feel they are performing inadequately, or who feel they are not being accepted or valued, are likely to feel this way regularly and experience chronic stress if they are unable to resolve or otherwise cope with the problem. Because of the constancy of psychosocial stressors and the health implications of chronic stress, it is important to further our understanding of chronic stress, as well as effective strategies for improving our coping abilities.

2.1. Cortisol

One of the most well documented markers of stress is the cortisol response (Kirschbaum & Hellhammer, 1994). Cortisol has been used as a measure in a vast body of research on the physiological response to acute psychological stressors. In an extensive review of the literature, Dickerson and Kemeny (2004) found that salivary cortisol levels reliably rose in response to stressors, peaking 21–40 min following onset, and that the duration of the psychosocial stressor does not significantly impact cortisol effect sizes. Furthermore, if exercise intensity and duration can be controlled, cortisol can be used as a measure of psychosocial stress in certain physical activity settings as well. Those findings combined with non-invasive methods of collection (e.g., saliva samples) establish cortisol measurement as an efficient tool to assess the stress response to a wide variety of stressors.

Cortisol is important in stress research, as it has been shown to be a significant contributor to the negative effects of chronic stress on overall health. Chronically increased levels of cortisol have been associated with impaired immunological, cardiovascular, and neurological functioning and have been identified as a factor in the expression of disease (McEwen & Stellar, 1993). Heightened cortisol levels have also been associated with increased use of protein in metabolic functioning (Kraemer et al., 2004) as well as impairments to the body's ability to build muscle and recover from physical exertion (Kraemer et al., 2009). Reducing stress and, subsequently, reducing chronically high cortisol levels should be a priority for every individual, especially those in the athletic and physical activity domains.

2.2. Motivational theories of stress

Lazarus (1993) proposes a conceptualization of stress that takes individuals' motivation into account. Stress should be thought of in terms of individuals' interactions with their environment (usually in the form of other people) and how they appraise those interactions in relation to personal goals (e.g., Is the interaction relevant to a personal goal, and if so, which one and in what way?).

Lazarus and Folkman (1984) identified three main types of primary appraisal: (a) harm/loss, in which the individual has already sustained some damage (in the context of physical activity, this may be an injury or damage to the social self), (b) threat, wherein an individual anticipates some sort of harm or loss, and (c) challenge, in which an individual perceives stress but focuses on the potential for gain or inherent growth. In line with Lazarus and Folkman (1984), Dickerson, Grunewald, and Kemeny's (2004) social self-preservation theory (SSPT) posits that threats to the social self can activate the physiological stress response similar to threats to the physical self.

Two of the most common emotions resulting from a perceived threat, and of particular relevance to sport and physical activity, are

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