An Examination of the Relationship Between Early Maladaptive Schemas, Coping, and Emotional Response to Athletic Injury

Brian V. Gallagher and Frank L. Gardner
La Salle University

The present study examined the relationship between cognitive vulnerabilities, coping strategy, and emotional response to athletic injury among 40 NCAA Division I injured athletes. It was hypothesized that the presence of early maladaptive schemas (EMS) and avoidant coping strategies would predict greater emotional distress among injured athletes. Early maladaptive schemas were assessed by the Young Schema Questionnaire-Short Form, which injured athletes completed upon injury. Coping strategies were measured by the Coping Response Inventory Adult Form, which was completed upon the completion of recovery. The Profile of Mood States was used to assess mood, and was completed during three phases of injury: upon injury, middle of rehabilitation, and upon recovery. As predicted, hierarchical multiple regression analysis demonstrate that EMSs and avoidance-focused coping were associated with higher levels of negative mood among injured athletes. The results also indicate that the relationship between EMS and mood vary based on the phase of injury, suggesting that different EMSs are differentially related to subtle differences in stressors encountered during each phase of the injury process.

Key Words: cognitive vulnerabilities, coping strategy, mood, stressors, rehabilitation

The chances of experiencing an injury in competitive athletics are extremely high, especially the longer an athlete is involved in sport participation. Depending on the sport played, the National Collegiate Athletic Association (NCAA; 2001) reports injury rates ranging from one injury every 30 games to two injuries per game. While it appears that most athletes only experience mild symptoms of distress following injury and typically recover rapidly from this distress (Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998), there remain a substantial number of athletes who experience clinically significant levels of distress following injury and subsequently have poor recovery outcomes. Often, the amount of personal distress

The authors are with the Dept of Psychology, La Salle University, Philadelphia, PA 19141, E-mail: gardner@lasalle.edu.
will vary according to the athlete’s stage of recovery. For instance, as athletes move through the recovery process, negative emotions naturally decline from their highest levels (upon injury), and positive emotions tend to increase as full recovery nears (Macchi & Crossman, 1996; McDonald & Hardy, 1990; Morrey, Stuart, Smith, & Wiese-Bjornstal, 1999; Quackenbush & Crossman, 1994; Smith, Stuart, Wiese-Bjornstal, Millner, O’Fallon, & Crowson, 1993). Quinn and Fallon (1999) found that while athletes often experienced tension, depression, anger, fatigue, and confusion immediately following injury, these negative emotions decreased over the rehabilitation period, and this change was accompanied by an increase in positive emotions.

**Individual Differences**

While situational factors such as the history of injury (Durham, 1999) and type of injury (Wasley & Lox, 1998) have been shown to be related to increased negative emotions and increased anxiety in response to injury, individual differences may better account for those who have more difficulty adjusting to an injury. There have been numerous investigations of individual factors that influence response to athletic injury. Such investigations have primarily focused on individual differences in cognitive appraisals and behavioral coping responses.

**Cognitive Appraisals**

Although various models of response to injury have been applied to athletic populations (Mainwaring, 1999; Rose & Jevne, 1993; Wiese-Bjornstal et al., 1998), cognitive-behavioral stress process models have to date garnered the most empirical support (Brewer, 1994). One such model is Wiese-Bjornstal and colleagues’ (1998) Integrated Model of Response to Sport Injury and Rehabilitation Process, which is similar to other cognitive models of stress developed by Folkman and Lazarus (1991) and Moos and Swindle (1990). In these models, cognitive appraisal is regarded as the critical component in the development of emotional and behavioral responses to injury. From this perspective, there are a variety of situational factors (playing status, teammate influences, rehabilitation environment, etc.) and personal factors (injury severity, history of injury, gender, age, personality, coping skills, etc.) that influence cognitive appraisals and subsequent behavioral processes. At the core of Weise-Bjornstal and colleagues’ integrated model is the bidirectional dynamic process of cognitive appraisals, emotion, and behavior. In this process, a rather linear relationship exists in which cognitions influence affective states, and affective states in turn influence behavioral choices.

Cognitive appraisals throughout the entire injury experience have been associated with emotional responses. For instance, positive appraisals of social support during rehabilitation have been shown to be related to overall well-being and less emotional distress (Green & Weinberg, 2001; Robbins & Rosenfeld, 2001). Athletes who perceive that rehabilitation will be difficult have been shown to experience significantly more distress than those who do not (Daly, Brewer, Van Raalte, Petittpas, & Sklar, 1995). Further, cognitive appraisals implying personal control over the injury have been related to less emotional distress and quicker perceived recovery (Laubach, Brewer, Van Raalte, & Petittpas, 1996).
Cognitive appraisals are also directly related to the coping strategies employed by the injured athlete. Anshel, Jamieson, and Raviv (2001) found that while some athletes appraise their injury as a threat, other athletes view their injury as a non-threatening challenge. According to Anshel and colleagues, the type of coping strategy employed by the athlete may therefore be an important factor.

**Coping Strategies**

There appear to be two primary coping strategies that impact response to injury among athletes. According to Anshel and colleagues (2001), *approach-focused* coping strategies were positively correlated with athletes’ appraisals of injury as a challenge, and *avoidance-focused* coping strategies were more likely to be used by individuals possessing threat appraisals. Approach-focused coping can be described as the process of initiating actions toward a stressor in order to reduce its intensity. On the other hand, avoidance-focused coping can be regarded as efforts at reducing the effects of the stressor (i.e., thoughts and/or emotions) by engaging in behavioral efforts to disengage from the source of stress. Avoidance coping is conceptually similar to the construct of experiential avoidance commonly discussed in the behavioral psychology literature. Experiential avoidance can be defined as an unwillingness to experience and/or remain in contact with internal events (negative emotion, distressing thoughts, physical pain) and the subsequent use of a variety of behaviors to avoid those experiences (Hayes, Wilson, Gifford, Follete, & Strosahl, 1996). Experiential avoidance is a factor implicated in a variety of forms of psychological maladjustment. Considering that experiential avoidance is a similar construct to avoidance-coping strategies, it is not surprising that in a variety of non-athlete samples, avoidance coping has also been associated with higher degrees of emotional distress (Blalock & Joiner, 2000; Fukunishi, Hosaka, Negishi, Moriya, Hayashi, & Matsumoto, 1997; Kuyken & Brewin, 1999).

Research suggests that while athletes engage in a variety of coping strategies in response to injury, they tend to rely on problem-focused or approach-focused strategies (Quinn & Fallon, 1999). Gould, Udry, Bridges, and Beck (1997a) described the predominant coping strategy used by a sample of elite athletes as “driving through,” a strategy most similar to an approach-focused strategy. These athletes generally remained determined, set goals, and worked towards those goals during rehabilitation. Avoidance and social isolation were the least used coping strategies among this sample of elite injured athletes.

Coping strategies also appear to be related to level of adherence to post-injury rehabilitation programs. Interestingly, coping strategies have also been shown to vary as a function of *stage* in rehabilitation, and injured athletes appear to employ more coping strategies during the initial stages of injury (Johnson & Carroll, 2000). Fortunately, not only do most athletes tend to rely on approach-coping strategies following injury (Gould et al., 1997a), but these approach strategies also seem to be related to better adherence to rehabilitation programs (Scherzer et al., 2001). Emotional distress, on the other hand, has been shown to have an inverse relationship to adherence to rehabilitation protocols (Daly, Brewer, Van Raalte, Petitpas, & Sklar, 1995). These are important findings, as adherence to rehabilitation is positively correlated with belief in the efficacy of treatment, perceived social support, and self-motivation (Brewer, Van Raalte, Cornelius, & Petitpas, 2000; Duda, Smart, & Tappe, 1989).
Personality Factors

According to Wiese-Bjornstal and colleagues’ (1998) Integrated Model of Response to Sport Injury and Rehabilitation Process, personality factors can influence the dynamic process of cognitions, emotions, and behavior, and subsequently impact response to injury. Yet, more stable and enduring individual differences that may influence the cognitive-affective process have not been widely examined in the sport injury literature, even though more stable personality characteristics may in fact be predictive of maladjustment to injury. In other populations, enduring personality factors have been theorized and shown to play a role in the development of disease and a variety of health-related outcomes. In their meta-analysis of the development of a variety of health problems and personality characteristics, Friedman and Booth-Kewley (1987) found evidence to suggest the existence of a general disease-prone “personality” that involves characteristic traits of anger, depression, and anxiety. In addition, positive dispositional characteristics such as optimism and beliefs in one’s personal control have been shown to be associated with better mood and better immune response (Segerstrom, Taylor, Kemeny, & Fahey, 1998; Taylor & Armor, 1996). In the sports medicine literature, Andersen and Williams’ (1988) Stress and Injury Model suggests that dispositional variables may even influence the occurrence of athletic injury. Dispositional variables within this model include various factors such as history of stressors, coping resources, and social support, all of which can affect the stress response. Subsequently, a maladaptive stress response is thought to result in physiological consequences such as muscle tension, fatigue, and decreased attention, thus potentially leading to an increased probability of injury. This model has gained some support in a number of studies (Hanson, McCullagh, & Tonymon, 1992; Kolt & Kirby, 1994).

Within social cognitive theory, stable and enduring personality characteristics are often called cognitive schemas. Generally, a schema is a cognitive generalization about the self that helps the individual organize and process information contained within the individual’s social experience (Markus, 1977; Young, 1999). It is important to remember that schemas are not comprised of simple self-worth assumptions or statements about the person, but are instead highly complex cognitive generalizations (Linville, 1987) that form the lens through which the individual sees the self and his or her relation to the world. An individual’s cognitive schemas are derived from his or her experiences and early learning history, and are often called early maladaptive schemas (EMSs). Beck (1967) conceptualizes a schema as

...a cognitive structure for screening, coding, and evaluating the stimuli that impinge on the organism. On the basis of the matrix of schemas, the individual is able to orient himself in relation to time and space and categorize and interpret experience in a meaningful way. (p. 283)

The schema is thought to influence emotional, interpersonal, and more peripheral cognitive processes and thus may represent a more stable individual difference that can be readily applied to cognitive stress and coping models. In support of this idea, recent research suggests that processing at the schematic level has stable, traitlike qualities (Beevers & Miller, 2004) and as such, can be regarded as core cognitive-affective components of personality. Schemas have also been shown...
to influence emotional responses to stress and have been viewed as a cognitive vulnerability to depression (Beck, 1967; Linville, 1987).

Pioneered by Beck (1967) and fully conceptualized by Young (1999), most of the discussion of cognitive schemas has occurred in the clinical psychology domain. However, Brewer (1993) incorporated both self-complexity and self-worth assumptions into the identification of an athletic self-schema. The Athletic Identity Measurement Scale (AIMS) consists of statements such as “other people see me mainly as an athlete,” which reflects the complexity of the athlete’s identity, and “I need to participate in sport to feel good about myself,” which reflects self-worth contingencies (Brewer, 1993). An exclusive athletic identity was found to be a specific cognitive vulnerability associated with greater negative emotional response to injury (Brewer, 1993).

Young’s (1999) current schema theory is an elaboration of Beck’s (1967) earlier work. While it is not intended to be a complete theory of personality or psychopathology, the early maladaptive schema (EMS) is regarded as an important component of personality functioning, as schemas are thought to influence cognitive, emotional, and interpersonal processing. EMSs are suggested to contain cognitive and affective components that when triggered by an environmental event can lead to psychological distress and maladaptive methods of coping. They are hypothesized to develop primarily through individual biological predispositions and (most importantly) early learning experiences with significant caretakers. EMSs are regarded as enduring cognitive structures that are resistant to change and represent a significant part of an individual’s overall personality makeup.

Young (1999) hypothesizes that there are numerous maladaptive schemas that fall into five overarching domains: (1) the Disconnection and Rejection domain is characterized by the expectation that one’s needs for acceptance, security, and nurturance will not be met consistently by others; (2) the Impaired Autonomy and Performance domain is characterized by the expectation that one will not be able to survive, function independently, or perform successfully in their social environment; (3) the Impaired Limits domain is best understood as a deficiency one has with internal limits and in feeling responsible towards others; (4) the Other Directedness domain, on the other hand, is the domain in which one has an excessive focus on the desires, feelings, and responses of others, at the expense of one’s own needs; and (5) the Overvigilance and Inhibition domain is characterized by a restriction of spontaneous feelings and impulses in order to maintain adherence to strict internalized rules of behavior and performance. Recent investigations have found that EMSs are associated with increases in psychological distress and psychopathology (Schmidt, Joiner, Young, & Telch, 1995; Stopa, Thorne, Waters, & Preston, 2001; Waller, Meyer, & Ohanian, 2001).

When the cognitive and affective components of an EMS are triggered by events in the environment that have stimulus characteristics relevant to a particular schema, maladaptive coping behaviors are often used for the purpose of immediate reduction of distress. These coping strategies have the paradoxical effect of confirming and reinforcing the schema. For instance, an individual hypersensitive to rejection (an EMS in the Disconnection and Rejection domain) may feel distress after misinterpreting cues from significant others as rejection. This person may begin to isolate themselves from others to avoid any unwanted affective experiences. This coping behavior would serve to further alienate the individual from others, thereby confirming their EMS.
The athletic injury experience is hypothesized to bring with it a variety of stressors that may readily trigger a variety of EMSs. For example, the loss of interpersonal relationships with teammates and coaches may trigger schemas within the Disconnection and Rejection domain. The physical experience of pain or the stress of decreasing performance ability during injury may be particularly relevant to schemas within the Impaired Autonomy and Performance domain. Schemas within this domain are associated with fears and beliefs that an imminent catastrophe may occur that cannot be prevented, and beliefs that one is incompetent in relation to others.

Based on the aforementioned theoretical constructs, the proposed study is intended to examine the relationship between EMSs, emotional response, coping behaviors, and athletic injury. It is hypothesized that the presence of EMSs and the use of avoidance-coping strategies will predict a more severe negative emotional response throughout an athletic injury experience.

Method

Participants
Following appropriate institutional review board approval, participants were recruited from the athletic department of a mid-sized university in the northeastern United States. Athletic training staff assisted in identifying athletes recently diagnosed with an injury. Athletes were included in the study if the severity of the injury required 1 week or more of non-participation in practice or competition. Forty NCAA Division I injured athletes (30 males and 10 females) participated in the study. Nine different sports were represented: basketball \((n = 4)\), baseball \((n = 4)\), football \((n = 16)\), soccer \((n = 2)\), track and field \((n = 8)\), swimming \((n = 1)\), volleyball \((n = 3)\), field hockey \((n = 2)\), and softball \((n = 1)\). Thirty of the 40 injured athletes had injuries that lasted 4 weeks or more.

Measures

Coping Response Inventory. The Coping Response Inventory-Adult Form (CRI-AF; Moos, 1994) is a 48-item measure of coping responses to stressful life events. The CRI-AF is proposed to measure both method of coping (behavioral vs. cognitive) and focus of coping (emotion and problem focused). The measure is comprised of eight scales that are categorized as either approach focused (logical analysis, positive reappraisal, seeking guidance and support, and problem solving) or avoidance focused (cognitive avoidance, resignation, seeking alternative rewards, and emotional discharge). Internal consistency was reported using Cronbach’s alpha. Correlations for the eight scales range from .58 to .74.

Since the CRI-AF assesses coping responses to general stressful life events (not sport-specific injury), permission was granted by the publisher to modify the measure to make it more relevant to the athletic injury experience. For instance, one item on the original inventory reads, “When this problem occurred, did you think of it as a challenge?” The modified version simply substituted the word problem with injury.
Profile of Mood States. The Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) is a psychometric inventory that is widely used in clinical and sport psychology domains (LeUnes, 2000; LeUnes & Burger, 2000; Terry & Lane, 2000). The measure is designed to assess an individual’s mood states and level of distress. The POMS consists of 65 adjectives describing mood, which are rated on a 5-point Likert scale where 1 = not at all; 2 = a little; 3 = moderately; 4 = quite a bit; and 5 = extremely. The 65 adjectives yield six mood scores, which include “tension-anxiety,” “depression-dejection,” “vigor-activity,” “fatigue-inertia,” and “confusion-bewilderment.” A total negative mood score based on these six mood factors can be determined. Internal consistency reported as K-R 20 values ranged from .84 to .95.

The Young Schema Questionnaire-Short Form. The Young Schema Questionnaire-Short Form (YSQ-SF; Young, 2002) is a 75-item self-report measure of 15 early maladaptive cognitive schemas that fall under five overarching schema domains. These five schema domains include: (1) Disconnection and Rejection (emotional deprivation, abandonment, mistrust/abuse, social alienation, defec-tiveness); (2) Impaired Autonomy and Performance (incompetence, dependency, vulnerability to harm); (3) Impaired Limits (entitlement and insufficient control); (4) Other Directedness (enmeshment, subjugation of needs, self-sacrifice); and (5) Overvigilance and Inhibition (emotional inhibition, unrelenting standards). Items are rated on a 6-point Likert scale where 1 = completely untrue of me; 2 = mostly untrue of me; 3 = slightly more true than untrue; 4 = moderately true of me; 5 = mostly true of me; and 6 = describes me perfectly. Higher scores indicate the presence of a maladaptive cognitive schema.

Recent studies have shown adequate psychometric properties of the YSQ-SF (Stopa, Thorne, Waters, & Preston, 2001; Waller, Meyer, & Ohanian, 2001; Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002). Welburn et al. (2002) reported adequate internal consistency of the YSQ-SF with alpha levels ranging from .76–.93 on each of the 15 subscales. Stopa et al. (2001) found alpha levels greater than .70 for 13 of the 15 subscales, and Waller et al. (2001) reported alpha levels greater than .80 for each of the subscales.

It is important to note that there has been some question in the literature as to whether the schema domains exist as hypothesized by Young (1999) (Cecero, Nelson, & Gillie, 2004; Lee, Taylor, & Dunn, 1999; Schmidt, Joiner, Young, & Telch, 1995), and the majority of the research on the YSQ has only examined the longer version of the schema questionnaire and not the short form of the measure (YSQ-SF). One exception is an investigation by Calvete, Estevez, Lopez de Arroyabe, and Ruiz (2005). Calvete et al. conducted a factor analysis using a Spanish version of the YSQ-SF involving more than 400 participants, and found evidence for three empirically derived higher order factors: (1) Impaired Autonomy (failure, dependence, enmeshment, vulnerability to harm, insufficient self-control, abandonment, and subjugation); (2) Disconnection (emotional inhibition, emotional deprivation, social isolation, defectiveness, mistrust); and (3) Exaggerated Standards/Over Control (unrelenting standards, self-sacrifice, entitlement).

Due to the small sample size in the present study, regression analyses using each of the 15 subscales of the YSQ-SF was not possible. However, two separate regression analyses were conducted. The first regression analysis used Young’s five
hypothesized domain factors, and the second analysis used the three higher order empirically derived factors found by Calvete and colleagues (2005).

**Procedure**

After each participant provided written informed consent, participants completed measures during three phases of the injury experience. During phase 1, which was defined as within 72 hr of injury/diagnosis of injury, athletes completed a demographics questionnaire, the POMS, and the YSQ-SF. They were instructed to complete the POMS based on how they had been feeling since the injury occurred. Phase 2 was defined as the approximate midpoint of the expected rehabilitation period. This approximate midpoint was established by using training staff ratings of anticipated length of recovery. At this time, athletes were instructed to complete the POMS again, yet during this administration, they were instructed to base their responses on how they had been feeling over the past few days. Phase 3 began when trainers cleared the athletes to return to full practice/competition. At this time, the CRI-AF was completed along with the third administration of the POMS. Athletes were instructed to complete the POMS based on how they had been feeling since being cleared to return to play.

**Results**

Initially, the emotional responses of the athletes at each phase of injury were examined. The POMS mood scores for tension, depression, anger, fatigue, and confusion were added and then divided by four to determine the Total Negative Mood (TNM) score. Negative mood scores decreased from phase 1 to phase 3 of injury (59.2, 42.9, 25.3, respectively). A 1-way ANOVA was performed to determine whether phase of injury had a significant effect on negative mood. The dependent variable used in this analysis was the derived TNM score. A significant main effect for phase of injury was found $F(2, 107) = 7.184, p < .001$. Scheffe post hoc tests were run to determine where significant changes in mood occurred among phases of injury. A significant difference in TNM was found between phases 1 and 3 ($p < .001$). However, TNM scores did not significantly differ between phases 1 and 2, or phases 2 and 3.

Table 1 provides the intercorrelations between the main variables. While it appears as though the athletes used each coping strategy to the same degree, the correlations between coping strategies and mood scores suggest that approach and avoidance-focused strategies had different relationships with mood. Approach-focused coping was negatively correlated with TNM at each phase of the injury, and this correlation reached significance during the last phase of injury ($r = -0.354, p = 0.05$). On the other hand, avoidance-focused coping strategies were positively correlated with TNM at each phase of injury, and were significantly correlated at phases 1 and 3.

It is also apparent that higher scores on the YSQ-SF (indicating the presence of EMSs) are positively correlated with negative mood at each phase of injury. The total YSQ-SF score was strongly correlated with negative mood at phase 1 ($r = 0.583, p < .01$), phase 2 ($r = 0.493, p < .01$), and phase 3 ($r = 0.680, p < .01$). Specific schema domains showed more variability in their relationship with negative mood. For
instance, at phase 1, each of the YSQ-SF schema domain scores (excluding Impaired Limits) were significantly correlated with TNM, and Disconnection and Rejection was highly correlated ($r = .627, p < .01$). At phase 2, only the domains of Disconnection and Rejection ($r = .470, p < .01$) and Other Directedness ($r = .392, p < .05$) were significantly correlated with negative mood. At phase 3, Other Directedness was moderately correlated with negative mood, while Disconnection and Rejection ($r = .698, p < .01$) and Impaired Autonomy and Performance ($r = .692, p < .01$) were highly correlated with negative mood. Negative mood scores at each phase were moderately correlated with each other.

Another interesting relationship was between coping strategy and schema score. There were significant negative correlations between approach-focused coping and total YSQ-SF score ($r = -.509, p < .01$), and between approach-focused coping and the specific schema domains Disconnection and Rejection ($r = -.452, p < .01$), Impaired Autonomy and Performance ($r = -.425, p < .05$), and Other Directedness ($r = -.408, p < .05$). Higher approach-focused coping scores were related to lower scores on these YSQ-SF scales.

To address the primary research question, a series of three hierarchical multiple regression analyses were performed to determine the extent to which coping strategy and EMSs predicted negative mood during three phases of injury. The dependent variable, negative mood, was defined as the TNM score derived from the POMS

Table 1  Correlations—Main Variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. YSQ-SF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. YSQ-DR</td>
<td>.873**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. YSQ-IAP</td>
<td>.730**</td>
<td>.676**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. YSQ-OD</td>
<td>.678**</td>
<td>.432**</td>
<td>.553**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. YSQ-OI</td>
<td>.514**</td>
<td>.332*</td>
<td>-.046</td>
<td>.193</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. YSQ-IL</td>
<td>.643**</td>
<td>.364*</td>
<td>.254</td>
<td>.386*</td>
<td>.408**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. TNM (Phase 1)</td>
<td>.583**</td>
<td>.627**</td>
<td>.400*</td>
<td>.402*</td>
<td>.398*</td>
<td>.158</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. TNM (Phase 2)</td>
<td>.493**</td>
<td>.470**</td>
<td>.280</td>
<td>.392*</td>
<td>.258</td>
<td>.250</td>
<td>.384*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. TNM (Phase 3)</td>
<td>.680**</td>
<td>.698**</td>
<td>.692**</td>
<td>.403**</td>
<td>.152</td>
<td>.242</td>
<td>.436*</td>
<td>.507**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Approach</td>
<td>-.509**</td>
<td>-.452**</td>
<td>-.425**</td>
<td>-.408*</td>
<td>-.179</td>
<td>-.276</td>
<td>-.075</td>
<td>-.229</td>
<td>-.354*</td>
<td></td>
</tr>
</tbody>
</table>

Note. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).
YSQ-SF = Young Schema Questionnaire-Short Form Mean score; YSQ-DR = Disconnection/Rejection Domain; YSQ-IAP = Impaired Autonomy and Performance Schema Domain; YSQ-OD = Other Directedness Schema Domain; YSQ-OI = Overvigilance and Inhibition Schema Domain; YSQ-IL = Impaired Limits Schema Domain; Approach = Approach Focused Coping Scale (CRI-AF); Avoidance = Avoidance Focused Coping Scale (CRI-AF)
factor scores. For phase 1, immediately following injury, the regression analysis was performed in two steps. Approach and avoidance coping strategies were initially entered. Subsequently, total score on the YSQ-SF was entered.

Phase 1 of injury regression yielded a significant model at step 1 ($F = 3.944, p < .031, \Delta R^2 = .160$), which accounted for 16% of the variance. Avoidance coping was positively associated with TNM ($\beta = .467, p < .01$). At step 2, with both coping and schema variables entered, a significant model was also found ($F = 9.708, p < .0001, \text{Adj}R^2$ for set = .457, $\Delta R^2 = .296$). Approximately 46% of the variance contributing to negative mood at phase 1 was accounted for by the combination of variables entered into the model. YSQ-SF total score accounted for an additional 29.6% of the variance beyond that of coping approach alone. Two significant predictor variables resulted from the regression, with both avoidance coping ($\beta = .348, p < .018$) and YSQ-SF total score ($\beta = .647, p < .0001$) positively associated with TNM at phase 1 of injury.

For the second phase (midpoint of rehabilitation) and the third phase of injury (return to play) regressions, TNM from previous phases of injury were entered into the regression at step 1. As mood scores at each phase were moderately correlated with each other, this was done to account for the influence of previous negative mood states on subsequent mood.

At phase 2 of injury, after all variables were entered (including the first step of initial mood state), the regression model was significant ($F = 5.449, p < .003, \text{Adj}R^2$ for set = .372, $\Delta R^2 = .083$) and accounted for 37.2% of the variance. However, the addition of coping responses and YSQ-SF score did not contribute significantly to an increase in the variance accounted for beyond phase 1 TNM alone, and no significant predictors emerged. At step 1, the regression model including phase 1 TNM alone ($F = 13.401, p < .001, \text{Adj}R^2 = .292$) was the only significant predictor of phase 2 TNM ($\beta = .459, p < .013$).

As can be seen in Table 2, at phase 3 of injury, step 1 of the regression entering TNM at phases 1 and 2 did not result in a significant model ($F = 6.025, \text{ns}, \text{Adj}R^2 = .251$). After entering approach and avoidance coping at step 2, a significant model emerged ($F = 5.075, p < .004, \text{Adj}R^2$ for set = .352, $\Delta R^2 = .138$). The addition of avoidance coping at step 2 of the model accounted for an additional 14% of the explained variance ($\Delta R^2 = .138$), with avoidance coping manifesting a significant negative relationship with TNM ($\beta = -.340, p < .043$). At step 3, the YSQ-SF total schema score was added into the model. After all variables were entered, the resulting model was significant ($F = 7.809, p < .0001, \text{Adj}R^2$ for set = .532, $\Delta R^2 = .171$) and accounted for 53.2% of the variance contributing to TNM. Total schema score contributed an additional 17.1% of the variance beyond that of coping and previous mood scores. At phase 3 of injury, avoidance-focused coping ($\beta = .451, p < .006$) and YSQ-SF total score ($\beta = .673, p < .003$) were positively associated with TNM.

To more fully understand the relationships among individual schema domains and negative mood, another series of regressions was performed in which the mean of the schema domain scores replaced the total schema score in the regression analysis.

At the first step of the phase 1 of injury regression (using the schema domains), a significant model emerged ($F = 3.944, p < .031, \text{Adj}R^2 = .160$), with avoidance coping demonstrating a significant positive relationship to TNM ($\beta = .467, p < .01$).
At step 2, after all variables were entered, the regression yielded a significant model accounting for 53.7% of the variance \((F = 6.134, p < .001, \text{Adj}R^2 = .537, \Delta R^2 = .428)\). There were two significant predictors of negative mood during phase 1, avoidance-focused coping \((\hat{\beta} = .369, p < .011)\) and the Disconnection and Rejection domain score \((\hat{\beta} = .454, p < .047)\). The addition of the Disconnection and Rejection domain score to avoidance coping contributed an additional 42.8% of the variance beyond that of avoidance coping alone. The schema domains Overvigilance/Inhibition \((\hat{\beta} = .367, p < .054)\) and Other Directedness \((\hat{\beta} = .319, p < .055)\) each approached significance.

For the phase 2 of injury regression, phase 1 TNM was entered at step 1 with coping approach added at step 2 and schema domain scores subsequently added at step 3. At the first step of the regression, a significant model emerged \((F = 13.401, p < .001, \text{Adj}R^2 = .292)\), with phase 1 TNM being positively associated with phase two TNM \((\hat{\beta} = .562, p < .001)\). TNM at phase 1 accounted for 29.2% of the variance contributing to negative mood at the second phase of injury. At step 2, coping approach was added to the regression, which resulted in a significant model \((F = 5.356, p < .005, \text{Adj}R^2 = .303, \Delta R^2 = .057)\). While the model resulting from step 2 was significant, the addition of approach and avoidance coping added only 6% to the explained variance and neither approach nor avoidance coping demonstrated a significant relationship to TNM at phase 2. Once again, only TNM at phase 1 demonstrated a significant relationship to TNM at phase 2 \((\hat{\beta} = .459, p < .013)\). While the model resulting from the third step of the regression approached

### Table 2: Summary of Hierarchical Regression Analysis for Variables Predicting Negative Mood in Injured Athletes After Recovery, Including Total Schema Score (Phase 3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>(\beta)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>(F = 6.025, p &lt; .007, \text{Adj}R^2 = .251)</td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>.254</td>
<td>.195</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.364</td>
<td>.067</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>(F = 5.075, p &lt; .004, \text{Adj}R^2 = .352, \Delta R^2 = .138)</td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>.148</td>
<td>.436</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.230</td>
<td>.227</td>
</tr>
<tr>
<td>Approach</td>
<td>-.340</td>
<td>.043</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.341</td>
<td>.060</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>(F = 7.809, p &lt; .0001, \text{Adj}R^2 = .532, \Delta R^2 = .171)</td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>-.169</td>
<td>.373</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.026</td>
<td>.880</td>
</tr>
<tr>
<td>Approach</td>
<td>-.110</td>
<td>.480</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.451</td>
<td>.006</td>
</tr>
<tr>
<td>YSQ-SF</td>
<td>.673</td>
<td>.003</td>
</tr>
</tbody>
</table>
significance \( (F = 2.382, p < .051, \text{Adj}R^2 \text{ for set} = .269, \Delta R^2 = .091) \), neither coping strategies nor the added schema domain scores contributed significantly to the incremental variance.

As can be seen in Table 3, the regression analysis for phase 3 of injury did not result in a significant model at step 1 with TNM at phases 1 and 2 entered into the analysis \( (F = 6.025, p = \text{ns}, \text{Adj}R^2 = .251) \). At step 2, with approach and avoidance coping added, a significant model emerged, accounting for an additional 14% of the variance \( (F = 5.075, p < .004, \text{Adj}R^2 \text{ for set} = .352, \Delta R^2 = .138) \). Approach coping was significantly negatively related to TNM at phase 3 \( (\beta = –.340, p < .043) \) and avoidance coping approached a significant positive relationship \( (\beta = .341, p < .06) \). The regression analysis at step 3 yielded a significant model after all variables were entered \( (F = 6.678, p < .0001, \text{Adj}R^2 \text{ for set} = .630, \Delta R^2 = .303) \). Sixty-three percent (63%) of the variance contributing to TNM at phase 3 was accounted for by the variables entered into the regression, with an additional 30% of the variance accounted for by the addition of the schema domains. The significant predictor variables that resulted from the final regression model were avoidance coping \( (\beta = .470, p < .004) \) and the Impaired Autonomy and Performance schema domain \( (\beta = .576, p < .009) \). Interestingly, with the addition of the schema domains into the regression model, approach coping was no longer significantly associated with phase 3 TNM.

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 ( F = 6.025, p &lt; .007, \text{Adj}R^2 = .251 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>.254</td>
<td>.195</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.364</td>
<td>.067</td>
</tr>
<tr>
<td>Step 2 ( F = 5.075, p &lt; .004, \text{Adj}R^2 = .352, \Delta R^2 = .138 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>.148</td>
<td>.436</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.230</td>
<td>.227</td>
</tr>
<tr>
<td>Approach</td>
<td>–.340</td>
<td>.043</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.341</td>
<td>.060</td>
</tr>
<tr>
<td>Step 3 ( F = 6.678, p &lt; .0001, \text{Adj}R^2 = .630, \Delta R^2 = .303 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TNM (phase 1)</td>
<td>–.278</td>
<td>.160</td>
</tr>
<tr>
<td>TNM (phase 2)</td>
<td>.060</td>
<td>.696</td>
</tr>
<tr>
<td>Approach</td>
<td>–.052</td>
<td>.714</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.470</td>
<td>.004</td>
</tr>
<tr>
<td>Disconnection/Rejection</td>
<td>.294</td>
<td>.191</td>
</tr>
<tr>
<td>Impaired Autonomy/Performance</td>
<td>.576</td>
<td>.009</td>
</tr>
<tr>
<td>Other Directedness</td>
<td>.022</td>
<td>.904</td>
</tr>
<tr>
<td>Overvigilance/Inhibition</td>
<td>.294</td>
<td>.074</td>
</tr>
<tr>
<td>Impaired Limits</td>
<td>–.148</td>
<td>.329</td>
</tr>
</tbody>
</table>
Similar results were found when, rather than using Young’s (1999) theoretically derived schema domains, the three empirically derived higher order factors (Impaired Autonomy, Disconnection, and Exaggerated Standard/Over Control) found by Calvete and colleagues (2005) were entered into subsequent regression analyses. Consistent with the results found when using the theoretically derived schema domain scores, after all variables were entered, a significant model ($F = 6.112, p < .001$) accounted for 45% of the variance contributing to TNM at phase 1 of injury, with avoidance coping ($\beta = .336, p < .05$) and Disconnection ($\beta = .489, p < .01$) being the significant predictor variables. Once again, consistent with the results when using the theoretically derived schema domain scores, the addition of the coping and EMS variables to the model did not contribute significantly to the incremental variance accounting for TNM at phase 2 of injury. Only phase 1 mood ($\beta = 3.661, p < .001$) was a significant predictor variable in the model, accounting for approximately 30% of the variance ($F = 13.401, p < .001$).

At phase 3 of injury, a significant model was found after all variables were entered ($F = 6.881, p < .001$), which accounted for approximately 58% of the variance contributing to TNM. As was the case when using the theoretically derived schema domains, avoidance coping ($\beta = .422, p < .008$) and Impaired Autonomy ($\beta = .414, p < .011$) were significant predictor variables. However, when using the empirically derived schema domains, Disconnection ($\beta = .445, p < .023$) also emerged as a predictor variable of phase 3 TNM.

Discussion

Athletic injury is an event that often results in personal distress and disruption of an athlete’s life. The purpose of the present study was to enhance the understanding of the relationship between coping style, cognitive vulnerabilities, and emotional response to injury. The results support and extend previous findings that have described athletes’ emotional responses to injury (Macchi & Crossman, 1996; McDonald & Hardy, 1990; Quackenbush & Crossman, 1994; Smith et al., 1993). Negative emotions were experienced at their highest levels upon injury and subsequently declined throughout the injury process.

The results of this study also supported several of the primary hypotheses regarding the relationships between EMSs, coping strategy, and emotional response to athletic injury. The presence of EMSs predicted higher degrees of negative emotional response to injury. There was also substantial evidence suggesting that particular EMS domains may be more relevant in predicting emotional response depending on the phase of injury. This is an intuitively logical finding given an understanding that different phases of injury will present different stimulus demands that may be more or less relevant to a particular schema. Gould, Udry, Bridges, and Beck (1997b) found that psychological and social concerns such as lack of contact with one’s team and feelings of inadequacy were more prominent sources of stress than specific physical concerns. Feelings of separation, loneliness, and guilt due to being unable to contribute to the team are also common following injury (Tracey, 2003). In interviews conducted with athletes during various phases of injury, Tracey (2003) found that athletes in the early phases of rehabilitation reported significant feelings of loss subsequent to the separation from their team, and that the task of going to practice while injured was particularly stressful. Consistent with these
reported findings, the results of the present study indicate that the Disconnection and Rejection schema domain (Young’s hypothesized domain) and the empirically derived Disconnection factor (Calvete et al., 2005) are predictive of higher levels of distress during the first phase of injury. Some of the specific EMSs that comprise each of these higher order factors are emotional deprivation, mistrust and abuse, and social isolation.

In addition, following injury, the stress of dealing with medical and rehabilitation issues is introduced (Gould et al., 1997b). This added stress may be particularly relevant to athletes with a significant emotional deprivation schema (in the Disconnection domain), which is characterized by the belief that emotional needs will not be met by significant others. The interpersonal demands of developing effective working relationships with treatment providers (trainers or doctors) may activate this particular schema. For athletes with a social isolation schema (also in the Disconnection domain), characterized by beliefs that one is not part of any group and that one is always on the outside looking in, dealing with injury may be particularly difficult because of the perceived separation from their team. Injury is likely to exacerbate any painful thoughts and feelings consistent with this schema.

The period of re-entry into competition has not received a great deal of attention within the sport injury literature. The challenges that are present during this particular phase of injury are (1) gaining confidence in the injured body part and (2) gaining confidence in situations where the injury occurred (Evans, Hardy, & Fleming, 2000). In addition, fear of re-injury and concern over declines in fitness and performance are significant sources of stress for injured athletes (Gould et al., 1997b; Tracey, 2003), and these particular sources of stress may be especially relevant when an athlete is returning to play. In the present study, both the theoretically derived and empirically derived Impaired Autonomy factor was found to predict a more severe negative mood during this last phase of injury. Each of these factors is comprised of the specific vulnerability to harm and failure/incompetence schemas, which appear to have relevance given the aforementioned sources of stress. The vulnerability to harm schema is characterized by a belief and fear of imminent catastrophe. Consistent with schema theory, individuals with this schema may become preoccupied with re-injury. On the other hand, the failure/incompetence schema is characterized by the expectation that one will not succeed and is inadequate compared to peers. It is logical to think that an athlete with this schema may be prone to preoccupation with any declines in fitness and performance they observe when returning to practice among their peers.

The total score on the YSQ-SF approached statistical significance in predicting emotional distress during the second phase of injury. However, no single schema domain was better at predicting TNM at the midpoint of an injury than the initial emotional response to being injured. This outcome may be due to the variability of responses within this phase of injury. For instance, inclusion into the study was only limited by the severity of injury, defined as 1 week or more requiring non-participation. This made it possible to include numerous injuries that required varying lengths of recovery time. This phase of injury was thus likely to be a highly variable phase in terms of the experiences of the athletes. It is possible that the second phase of injury was experienced quite differently based on a myriad of factors not assessed in this study, including perception of pain, availability of social support, coach and teammate reaction, success or failure of the team, and
so on. For example, 1 week into an injury lasting only 2 weeks is likely to have a much different response than the midpoint of an injury lasting one full year. The first and last phases of injury likely represent more distinct phases. Thus, each of these two phases present similar challenges regardless of whether an athlete has been injured for 1 month or 1 year.

As expected, coping style was also found to be an important factor during injury. Athletes engaged in a variety of coping strategies, both approach and avoidance focused. This is consistent with previous research findings that have demonstrated athletes use both strategies (Gould et al., 1997a; Quinn & Fallon, 1999). It is likely that athletes attempt a variety of strategies to achieve the best outcome, yet contrary to previous research (Gould et al., 1997a; Quinn & Fallon, 1999), a reliance on approach-focused strategies was not found in the current study. This may have been due to the method of measuring coping response and the fact that the CRI-AF was only given at the end of the rehabilitation. There may have been differences found between coping strategies used during different phases of injury, although both Johnson and Carroll (2000) and Quinn and Fallon (1999) examined this question and found that type of coping strategy did not vary through phases of injury. Rather, they found that the overall amount of coping behaviors used decreased through the injury period, a finding that was not assessed in the current study.

As expected, and consistent with previous research (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), avoidance coping strategies were significantly and positively related to increased emotional distress. Reliance on this particular coping strategy was predictive of more distress throughout the injury experience. The relationship found between avoidance coping and mood is consistent with previous research involving other populations. For instance, Fukunishi et al. (1997) found that patients who tested positive for HIV that relied on avoidance coping strategies experienced higher levels of depression. Kuyken and Brewin (1999) found that avoidance coping was positively related to increased depression and intrusive memories in a population of women with a reported history of physical or sexual abuse. Sloan (2004) found that individuals who used avoidance coping strategies in response to a stressor were more prone to affective extremity. Finally, avoidance coping has also been shown to predict negative outcome in the treatment of alcoholism (Moos, Brennan, Fondacaro, & Moos, 1990).

The relationship between mood and avoidance coping may have implications for Young’s (1999) theory of EMSs. The principal schema maintenance behaviors outlined by Young (1999) can be categorized as either avoidance or overcompensation. The behaviors associated with each strategy, while categorized separately, serve the same underlying function, which is to avoid experiencing the aversive emotional and cognitive components of the early maladaptive schema. In this manner, the function of these coping strategies is similar to the construct of experiential avoidance. As previously noted, while not empirically demonstrated to be equivalent to experiential avoidance, avoidance coping as measured by CRI-AF is conceptually quite similar. Research demonstrates that negative outcomes are associated with avoidance coping, and Hayes and colleagues (Hayes et al., 1996) suggest that this is clear evidence of the maladaptive nature of experiential avoidance. As noted earlier, experiential avoidance is conceptualized as an individual’s unwillingness to remain in contact with particular internal experiences (i.e., thoughts, emotions, bodily sensations) and the associated psychological and behavioral maneuvers aimed at altering the form
of these experiences and the contexts in which they occur (Hayes et al., 1996). This construct has been implicated in the formation and maintenance of a variety of forms of psychopathology, and may have relevance in the activation and formation of EMSs. For instance, studies examining the nature of experiential avoidance have found that thought suppression (a form of experiential avoidance) is an ineffective coping strategy that has the paradoxical effect of increasing levels of the suppressed thought (Wegner, Schneider, Carter, & White, 1987; Wenzlaff, Wegner, & Klein, 1991). This line of research has also demonstrated that attempts at suppressing thoughts related to a negative emotionally laden situation actually increase the negative affective experience associated with that situation (Roemer & Borkovec, 1994).

Young (1999) emphasizes that EMSs are maintained through reinforcement contingencies associated with maladaptive behaviors. The previously described research on thought suppression may offer further insight into how EMSs are chronically activated and maintained. For instance, the data from this study suggest that an athlete with a significant vulnerability to harm schema (in the Impaired Autonomy domain) is likely to be more vulnerable to an injury response that includes distressing thoughts and fears regarding injury recurrence. If this athlete uses cognitive avoidance as a primary coping strategy to avoid the activation of the schema, it is theoretically possible that he or she will paradoxically experience increased levels of the distressing cognitions related to the schema. This would most likely occur in contexts similar to the one in which the injury previously occurred (i.e., practice or game).

**Implications**

The results of the present study have a variety of implications for developing treatments and preventative interventions that may be effective with injured athletes, particularly for those athletes who are experiencing or are at-risk for more distress than would normally be expected in response to injury. Given the relationships outlined thus far among avoidance coping (and inferentially, experiential avoidance), EMSs, and mood, helpful interventions may be those that are problem focused, that encourage athletes to remain actively engaged in their rehabilitation, and that address the emotional disruption and activation of EMSs. When working with injured athletes, one such option is the use of solution-focused brief counseling (SFBC; Gutkind, 2004). This is a collaborative approach that emphasizes the establishment of realistic goals and effective ways to achieve these goals. The intervention takes a future-oriented approach and maintains an expectation of change.

Individuals who maintain significant EMSs, however, are often resistant to change. Therefore, for athletes who seem resistant to intervention, Young’s (1999) schema-focused approach to therapy may be particularly useful. This approach was developed particularly for individuals with significant EMSs, especially those manifesting clinical difficulties. However, while this approach may be particularly useful for individuals who appear resistant, its primary goal is significant personality change. Thus, by nature, it is likely to be a lengthier form of intervention. The decision to use this approach will therefore likely be based on the presence of widespread difficulties that include, but are not limited to maladjustment to injury. It will probably not be suited for generally well-functioning athletes who identify injury as a time-limited problem and expect intervention to end upon recovery. An alternative approach is the use of acceptance-based behavioral interventions that focus on enhancing approach
behaviors while developing a capacity to tolerate (but not necessarily reduce) distressing thoughts and emotions (Gardner & Moore, 2004; Hayes et al., 1999).

Limitations

There are several limitations within the present study. Because of the relatively small sample size, care must be taken in generalizing the present results to other populations. Future studies should use a larger sample, thus allowing for an examination of the role of each of the EMSs. The present study examined only the contribution of schema domains as hypothesized by Young (1999) and the three higher order factors empirically identified by Calvete and colleagues (2005). Some caution should be used in interpreting the results of this study due to the uncertainty regarding the factor structure of the YSQ-SF. However, the significant conceptual overlap between hypothesized domains and the empirically supported factors, and the similar results found in this study when using either theorized domains or empirically derived factors, suggest support for the importance of early maladaptive schemas as a cognitive vulnerability for emotional response to injury. It also suggests the necessity for future studies to further examine the role of EMSs and responses to athletic injury.

Due to the limited sample size of this study, it was also not feasible to analyze the numerous contextual factors that may impact the relationship between EMSs and mood. Wiese-Bjornstal et al.’s (1998) Integrated Model of Response to Sport Injury and Rehabilitation Process outlines a variety of contextual factors that may impact emotional response to injury. These include type of injury, severity of injury, type of sport (team vs. individual), and whether the injury occurs in season or during the off season. For an individual with a *subjugation* schema (*Impaired Autonomy* and *Other Directedness* domains), in which there is a tendency to focus on the needs of others at one’s own expense, an injury during a season may significantly moderate the impact of the activation of this schema compared to an injury experienced during the off season. For example, a football player with a *subjugation* schema may ignore pain and attempt to play through an injury that occurs during a season when it may not be in his best interest (as he could be risking long-term damage and other significant consequences).

In addition, the results of this investigation are not completely consistent with previous research on the relationship between stressors, EMSs, and mood. Schmidt and Joiner (2004) found that following a stressor, individuals with significant EMSs experience less disruption of mood than individuals without significant EMSs. This finding was hypothesized to be the result of EMSs being chronically activated, so a particular significant stressor does not have a substantial impact on mood. From this perspective, it is possible that in the current investigation, the activation of EMSs were caused not by the stress of injury, but rather, by environmental stimuli unrelated to the injury experience.

Future research should also address the question of whether injured athletes become preoccupied with or experience distress related to injury in a manner consistent with the particular EMS they endorse, by evaluating the content of the automatic thoughts that occur during the injury process. Supporting this type of investigation, Calvete and colleagues (2005) found significant associations between EMSs, mood states, and automatic thoughts. Automatic thoughts related to an
inability to cope were related to a dependence schema, and a failure/incompetence schema was associated with thoughts relating to negative self-concept (both in the Impaired Autonomy domain). It would be theoretically consistent to hypothesize that the cognitive content of injured athletes’ automatic thoughts would be consistent with the particular schemas they endorse.

Finally, an assumption that is being made herein is that more severe emotional distress is counterproductive during the recovery process. Yet, emotional distress does not necessarily equal maladjustment. A degree of mood fluctuation is expected given any significant stressor and often may be a motivating factor to cope with the stressor. However, as it has been described thus far, Young’s theory suggests that not only are EMSs related to chronic levels of negative mood, but also that they are maintained by maladaptive behaviors. It may be expected that not only would EMSs be related to increased levels of distress as demonstrated in the present study, but also that they are likely to contribute to problematic coping behaviors during rehabilitation (such as poor adherence and attendance), which in turn may contribute to poor recovery outcomes. The present study did not investigate the relationship between attendance and adherence behavior and EMSs. However, it did demonstrate an inverse relationship between the presence of EMSs and approach-focused coping strategies. As such, it is perhaps reasonable to infer that in response to injury, individuals endorsing EMSs may manifest some problematic rehabilitation behaviors. In previous studies, less emotional distress, active coping strategies, and positive appraisal of social support have been shown to have a positive relationship with attendance and adherence to rehabilitation protocols (Brewer et al., 2000; Daly et al., 1995; Duda et al., 1989), and adherence to rehabilitation is believed to be associated with better recovery outcomes (Brewer, 1998). Future studies aimed at determining the relationship between EMSs, avoidance coping, and recovery outcomes with competitive athletes are clearly warranted.

**Conclusion**

During injury, athletes do not simply experience the disruption of competitive play, but also experience varying levels of heightened personal distress. The purpose of the present study was to investigate the relationship between coping style, cognitive vulnerabilities, and emotional response to injury among NCAA Division I competitive athletes. Findings indicate that early maladaptive schemas among injured athletes predict a greater negative emotional response to injury, and that depending on the phase of injury, particular schemas are more relevant in predicting emotional distress. In addition, the use of avoidance coping strategies is also predictive of increased negative emotions during injury. Such findings can be used to better understand the general injury process among athletes, to develop preventative programs for at-risk athletes, and to develop intervention protocols that effectively target the underlying processes that contribute to injury maladjustment.

**References**


