Perceived Stress and Prevalence of Traumatic Stress Symptoms Following Athletic Career Termination

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Undesired career termination represents a critical life event for professional athletes. This study examined traumatic stress resulting from (a) a career-ending event and (b) the athlete’s separation from his or her social support network. Data were collected from 40 professional athletes who were members of the German National Ski Team, using standardized (Impact of Event Scale; Posttraumatic Diagnostic Scale) and partially standardized (psychosomatic stress reaction) questionnaires. Correlations between the impact of termination and traumatic stress symptoms were observed over a period of 8 months. Athletes who experienced supportive termination (involving discussion with coaches) endorsed fewer symptoms than those who experienced socially disintegrative termination (lacking support of coaches). Nearly 20% of participants endorsed clinically relevant levels of traumatic stress at 3 and 8 months posttermination.

Keywords: life-event, PDS, IES, social disintegration, retirement

Historically, much of the sport psychology literature regarding stress and stress reactions has concentrated on the various forms of chronic stress that athletes experience during training and performance. More recently, however, life-event research in clinical psychology has prompted sport psychologists to examine how athletes respond to acute stress situations, including both normative (e.g., age-related) and nonnormative (e.g., sudden and unexpected) life events (Cecić Erpič, Wylleman, & Zupančič, 2004; Wylleman, Alfermann, & Lavallee, 2004). Normative life events include developmental tasks that all athletes experience as part of their natural development, such as graduating from one age bracket to another and approaching retirement. Nonnormative life events (commonly referred to as “critical life events”) occur with far less frequency than do normative events and are typically unwanted and unforeseen (Filipp, 1995). These critical life events have been linked with numerous negative consequences, including social losses (Ben-Zur, 2002), depressed mood (Kendler, Karkowski, & Prescott, 1998, 1999;
Kessler, 1997), changes in locus of control (Braukmann & Filipp, 1995; Eriksen & Ursin, 1999), physical and psychological symptoms (Ben-Zur, 2002; Theorell, Blomkvist, Lindh, & Evengård, 1999), and the development of exhaustion syndromes (Appels & Mulder, 1989). While the extent to which career termination in professional sports constitutes a critical life event has been a topic of considerable theoretical discussion, to date it has received little empirical investigation (Ogilvie & Howe, 1986; Ogilvie & Taylor, 1993; Pankey, 1993; Wippert, 2003). Thus, the current study seeks to shed more light on this important topic by examining traumatic stress responses among a group of professional athletes following dismissal from the German National Ski Team.

**Critical Life Events and Traumatic Stress**

The theoretical literature has linked unexpected career termination to loss of established beliefs about personal identity (Bette, Schimank, Wahlig, & Weber, 2002). Rosenberg (1984) refers to this situation as a type of “social death,” in which intrapsychic adjustment processes involving beliefs about personal identity often established in childhood, as well as social values and skills acquired in a very specific environment, suddenly become meaningless. These losses can lead to severe emotional disturbances and can pose a threat to an individual’s physical and psychological integrity (Ehlers, 1999). How threatening or stressful a critical life event is and whether the event leads to serious traumatic symptoms depends upon a number of factors, including the individual’s judgment, evaluation processes, attribution of blame (Lazarus, 1995), and perception of meaning associated with the event (Butollo & Gavranidou, 1999).

Commonly employed etiological models of traumatic stress reactions have been developed from psychodynamic, behavioral, cognitive, and neurobiological perspectives (Flatten, Hofmann, Reddemann, & Liebermann, 2004). According to psychodynamic models, traumatic stress symptoms develop as a result of either intensified and extended coping efforts (e.g., denial, intrusion, working through, etc.; see Horowitz, 1987) or obstruction of normal coping mechanisms (Steil, 1999). In contrast, behavioral models of traumatic stress suggest that traumatic reactions occur to the extent that the perceived severity and intensity of threat alters an individual’s fundamental capacity to experience and tolerate distress. According to research conducted by Foa and colleagues (Foa & Meadows 1997; Foa & Rothbaum, 1989, 1995, 1998), for example, it is primarily the severity and processing of the fear reaction that determines whether a given individual develops symptoms of posttraumatic stress. In cognitive models, however, symptoms of traumatic stress result from the alteration of the individual’s fundamental beliefs about the integrity of the self and the dependability of the external world. Collapse of these basic sources of security in turn results in uncertainty about what the future may entail (Ehlers & Clark, 2000). Finally, in neurobiological models, the symptoms of traumatic stress are typically explained in terms of acute and chronic physiological reactions, involving both autonomic arousal and neurotransmitter activity, which occur in the context of trauma-reactive sensitization (Flatten et al., 2004).

In keeping with the behavioral and cognitive models of traumatic stress, recent research findings indicate that the potential for development of traumatic stress symptoms depends significantly upon personal evaluation of event severity
and risk—as well as upon the presence of protective factors such as adequate social supports (Sloan & Marx, 2004). The existing literature on the persistence of traumatic stress symptoms over time suggests that the duration of symptoms is related to the subjective intensity of the stress. For example, Perry and colleagues found that levels of perceived stress immediately preceding a traumatic event is correlated with later development of traumatic stress symptoms (Perry, Difede, Musngi, Frances, & Jacobsberg, 1992). In addition, the perception of events as uncontrollable and unpredictable is believed to contribute to long-term development of traumatic stress reactions. Foa and Rothbaum (1989), as well as Shalev, Peri, Canetti, and Schreiber (1996), discovered that trauma victims who subsequently developed posttraumatic stress disorder (PTSD) experienced different symptoms immediately following the trauma than victims who did not develop PTSD. Specifically, those who later developed PTSD typically experienced higher levels of intrusion, avoidance, depression, and fear in the week following the trauma.

Evaluating the significance of a stressful or potentially traumatic event involves not only assessing individual differences in response styles but also variation in social and contextual factors (Belschner & Kaiser, 1995). For a professional athlete, for example, a career-ending injury can lead not only to changes in perceptions of the self, but also to structural changes in established social networks. No longer belonging to a network of sports professionals can bring about a profound loss of personal status and social roles (Wippert, 2002). Additionally, similar difficulties may arise in the athlete’s personal relationships, especially when those relationships developed as a result of the individual’s athlete status. These processes of social disintegration may lead to a reduction in overall social support, which is considered to be an important protective factor in the development of stress disorders (Flatten et al., 2004).

As several studies have shown, social supports seem to buffer the effects of excessive physiological and psychological stress (Fischer & Riedesser, 2003; Kudielka & Kirschbaum, 2001; von Känel, 2002, 2003). Metaphorically speaking, the disintegration of an individual’s social network, which often follows a career-ending injury, represents a breakdown of the athlete’s “social immune system” (Röhrle, 1994). Furthermore, the manner in which an athlete’s career concludes and how his or her relationships within sport-related social networks are changed are crucial factors in modifying the effects of stress. Studies in outplacement counseling (Berg-Peer, 2003; Hartmann & Hamm, 2000) and in sport science (Alfermann, 2000; Alfermann, Stambulova, & Zemaityte, 2004; Blinde & Stratta, 1992; McPherson, 1980; Taylor & Ogilvie, 1994, 2001; Webb, Nasco, Riley, & Headrick, 1998) have indicated that the termination process itself may contribute to a shift in perceived locus of control (from internal to external) and that this shift can considerable influence the way event-related stress is experienced.

Thus, the formation of traumatic stress symptoms following a traumatic life event depends upon a variety of factors (Brewin, Andrews, & Valentine, 2000; Green, 1994; Meichenbaum, 1994; Ozer, Best, Lipsey, & Weiss, 2003), including (a) objective aspects of the event (e.g., type, intensity, duration, irreversibility); (b) subjective experience (e.g., individual appraisal processes, experience of blame, sense of control); (c) individual differences in reactivity (e.g., autonomic sensitivity, emotionality); and (d) the presence or absence of social support and related variables (e.g., low socioeconomic status, availability of social supports).
Purpose

This study addressed several aspects of traumatic stress responses that arise from career altering events. First, it attempted to measure the level of subjectively perceived stress caused by a career-terminating event and to observe how this perception of stress contributed to the development of traumatic stress symptoms. Second, it examined the levels of stress resulting from a supportive termination experience (i.e., one in which coaches or trainers provide the athlete with supportive communication) and a disintegrative termination experience (i.e., one in which the athlete learns of termination from third parties and is without supportive communication). Drawing upon findings of previous research regarding career-ending events and the formation of traumatic stress symptoms, the following hypotheses were considered:

1. Athletes subjectively experience the communication of career termination as a stressful and potentially traumatic event.
2. Athletes who experience a disintegrative dismissal from a sports organization perceive their career termination as more stressful than do those who experience a supportive dismissal involving members of their sport-related social network.
3. The occurrence and persistence of traumatic stress symptoms following career termination is positively correlated with the intensity of the perceived stress posttermination.

Method

Participants

Forty athletes from the German National Ski Team (World and Eurocup team) participated in the study. At baseline, all participants \((n = 40)\) were active members of the German National Ski Team. Ten days after the collection of baseline data, however, some athletes were dismissed from the national ski team by the German Ski Association. Involuntary dismissal essentially led to immediate and uncontrollable career termination, as the pursuit of a skiing career outside of the German Ski Association is largely impossible for these athletes. The dismissals provided the division into the two groups: an experimental group (those whose careers had been terminated) and a control group (those who were still active). Of the original 40 athletes, 5 men and 14 women \((n = 19)\), with a mean age of 20 years \((SD = 3.63)\) were dismissed, thus comprising the career termination group. Twelve men and 9 women \((n = 21)\) with a mean age of 18 years \((SD = 2.1)\) remained active members of the German National Ski Team and represented the control group.

Assessment of the athletes prior to their division into groups indicated that they did not differ significantly on key personality variables or other psychological dimensions. Scores on 12 scales of the Freiburg Personality Inventory (FPI; Fahrenberg, Hampel, & Selg, 1989) did not differ between the groups. FPI scales used included life satisfaction, social orientation, performance orientation, inhibition, arousal, aggressiveness, stress, physical complaints, health worries,
openness, extroversion, and emotionality. Similarly, the two groups did not differ on the following measures: (a) a German version of the Berger scales for assessing self-acceptance and acceptance of others (Bergemann & Johann, 1985); (b) a German translation of the Beck Depression Inventory (BDI; Hautzinger, 1984); and (c) a German-language measure of competence and perceived locus of control (Krampen, 1991).

Measures

**Impact of Event Scale.** The degree of individual stress resulting from the termination event was measured using the Impact of Event Scale (IES), which is a frequently used measure of posttraumatic stress reactions following a life event (Ferring & Filipp, 1994). This scale is a German translation of the self-report questionnaire developed by Horowitz, Wilner, and Alvarez (1979) to measure traumatic stress reactions. The IES consists of 16 items assessing the frequency of specific stress responses. The participant rates each stress response on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*often*). The IES consists of two subscales: Intrusion and Avoidance. The IES Intrusion subscale describes reactions in which the stressful event feels imminent and threatening, while the IES Avoidance subscale describes reactions marked by extensive suppression of uncomfortable experiences. Both subscales have a minimum score of 0 and a maximum score of 24. High total scores are considered indicators of clinically significant intrusive thoughts and memories, as well as a strong tendency to engage in avoidance. Internal consistency (Cronbach’s $\alpha$) of the scale for the present sample was .97 for the IES Intrusion subscale and .98 for the IES Avoidance subscale.

**Posttraumatic Diagnostic Scale.** Symptoms of traumatic stress were measured using the German version (Ehlers, Steil, Winter, & Foa, 1996) of the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). This 17-item scale assesses the presence and frequency of posttraumatic stress symptoms and measures both common symptoms of traumatic stress and the degree of social impairment associated with these symptoms. The PDS assesses all criteria for PTSD as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM–IV–TR*; American Psychiatric Association [APA], 2000).

**Psychosomatic Stress Reaction.** The measure used for assessing psychosomatic responses involved totaling scores from a series of seven different questionnaires, including scales assessing sleep, health behaviors, alcohol use, reactions to the traumatic event, and event appraisal. The process of totaling the scores across questionnaires involved dichotomizing results on each questionnaire into two groups (0 = low to intermediate scores; 1 = high to very high scores). Thus, the combined total score for all seven questionnaires could range from 0 to 7 points. The scales were taken from the following questionnaires: (a) the Jenkins Sleep Scale (Jenkins, Stanton, Niemcryk, & Rose, 1988); (b) brief scales concerning physical health and alcohol consumption (Jonsson, Rosengren, Dotevall, Lappas, & Wilhelmson, 1999); (c) two 4-item scales regarding short- and long-term reactions to the traumatic event; and (d) the IES Intrusion and Avoidance subscales. The Jenkins Sleep Scale consists of four items focusing on common sleep problems
(i.e., difficulties falling asleep, waking during the night, difficulties returning to sleep, and waking up tired). High sleep quality is indicated by a low score on the Jenkins scale. Health behaviors and alcohol use were assessed by four items: (a) “Have you been ill in the last 10 days?” (b) “What type of illness?” (c) “How high was your alcohol consumption over the last 10 days (number of glasses)?” and (d) “What type of alcohol did you consume?” To assess reactions to a traumatic event, a measure was used that includes two subscales pertaining to both short- and long-term stress reactions. Examples of items from the short-term subscale include, “I was relieved” and “I couldn’t believe it.” Sample items from the long-term subscale include, “The future just seemed to be cut off” and “My world just collapsed.” Both of these subscales used a 5-point Likert scale ranging from 1 (doesn’t apply at all) to 5 (applies completely). Finally, the IES Intrusion and Avoidance subscales were used to assess the participants’ judgments regarding the potentially traumatic event (Ferring & Filipp, 1994). The internal consistency (Cronbach’s α) of the combination of four measures in the present sample was .60.

Procedure

Data were collected in the framework of a larger longitudinal study (Munich Ski Longitudinal Analysis) on the personal development of active and former athletes over eight months. To assess perceived stress and event-related symptoms, a series of self-report measures were administered at three measurement times: 10 days, 3 months and 8 months posttermination. It should be noted, however, that the measure of psychosomatic stress reaction was administered only at 10 days posttermination, the IES was administered only at 10 days and 8 months posttermination, and the PDS was administered only at 3 months and 8 months posttermination. In addition, measurements pertaining to the influence of relationships on the level of perceived stress and the development of posttraumatic stress reactions were administered only to the experimental group of dismissed athletes.

The assessments were conducted using an online portal. Participants were able to log on with a personalized access code and password. This process enabled the participants to complete the tests on their own time without being tied to one location, and it ensured maximum confidentiality. The online assessments were available for 10 days at each measurement time. Participants were informed about the assessment period via electronic media (e.g., e-mail) to help ensuring participant compliance.

Athletes in the career termination group were further subdivided according to the subjective quality of their termination experiences. The supportive termination (ST) group consisted of those who had been involved in a personal conversation and who had received a detailed explanation of their dismissal. In contrast, the disintegrative termination (DT) group consisted of those who were not informed of their dismissal by their association or trainer via a personal conversation. Instead, these athletes learned of their dismissal and subsequent career termination only by chance or through third parties. Since a number of athletes failed to provide full responses regarding the nature of their termination process, the sample for analyzing the influence of this experience was reduced to 10, with 5 participants in the ST group and 5 participants in the DT group.
Results

Descriptive and inferential statistics were used to evaluate the extent of event-induced stress in the terminated athletes group. Differences in stress perception across time were examined using t tests for dependent samples. In the terminated athletes group, scores on measures completed within the first 10 days following termination indicated a moderate level of event-related distress. The mean score on the IES Intrusion subscale at 10 days posttermination was 11.0 (SD = 8.4). On the IES Avoidance subscale at that same measurement time, the mean score was 10 (SD = 6.6). Eight months after the event, however, mean scores for both IES subscales had declined (Intrusion mean = 6.6; SD = 5.8; Avoidance mean = 6.4, SD = 5.6), though only the decline in the IES Avoidance subscale represented a statistically significant change, IES Intrusion t(9) = 1.39, ns; IES Avoidance t(9) = 3.9, p < .01.

Total scores on the measure of psychosomatic stress reactions, completed at 3 and 8 months posttermination, revealed low to moderate levels of distress (mean = 2.9; SD = 2.1; see Table 1). Six participants, however, endorsed symptoms of PTSD (except for criterion A) at either 3 or 8 months posttermination, and one participant endorsed these same symptoms at both 3 and 8 months following termination. The control group, in contrast, endorsed no symptoms associated with traumatic stress.

Due to the study’s small sample size, differences between the ST (supportive termination) and DT (disintegrative termination) groups were tested nonparametrically (Wilkoxon signed rank test). As shown in Table 2, analyses revealed that within 10 days of termination, the two groups exhibited significant differences on the IES. Specifically, the ST group (mean = 7.8, SD = 4.6) had significantly lower scores on the IES Intrusion subscale than the DT group (mean = 18.8, SD = 5.0), z = -2.26, p < .05. In contrast, the difference between groups on the IES Avoidance subscale (ST: mean = 11.3, SD = 5.1; DT: mean = 14.4, SD = 3.7) was not significant (z = -0.99, ns). These between-group differences on the IES Intrusion subscale were not, however, maintained 8 months posttermination. At the 8-month measurement point, differences in group means on both the IES Intrusion subscale (ST: mean = 6.50, SD = 9.0; DT: mean = 9.25, SD = 4.8; z = -.87, ns) and IES Avoidance subscale (ST: mean = 5.25, SD = 7.1; DT: mean = 9.75, SD = 4.5; z = -1.32, ns) were not significant.

On the psychosomatic stress reaction measure (minimum = 0; maximum = 7), which was given only at 10 days posttermination, the difference between the two groups was sizable. The mean for the ST group (mean = 1.3, SD = 1.7) on this scale was a full 3 points lower than the mean for the DT group (mean = 4.4, SD = 1.3), z = -2.21, p < .05.

The study’s third hypothesis—that the severity of traumatic stress symptoms varies according to the perceived severity of the stressor—required examination of the relationship between the IES Intrusion and Avoidance subscales and the occurrence of traumatic stress symptoms over time. Results were calculated by means of correlational analyses (correlation τ; Kendall, 1970) including (a) IES scores obtained at 10 days and 8 months posttermination and (b) PDS scores collected at 3 and 8 months posttermination. As shown in Table 3, higher scores on the IES...
overall were associated with the presence of traumatic stress symptoms. Scores on the IES Avoidance subscale at 10 days posttermination correlated with the presence of traumatic stress symptoms at 3 months posttermination. In addition, endorsement of traumatic stress symptoms at 3 months posttermination was correlated with both the IES Intrusion and IES Avoidance subscale scores at 8 months posttermination. In addition, endorsement of traumatic stress symptoms at 8 months posttermination was only correlated with IES Intrusion subscale scores.

Table 1  Extent of Subjectively Experienced Stress Induced by the Career-Ending Event (Total Termination Group, n = 19)

<table>
<thead>
<tr>
<th></th>
<th>10 days(^a)</th>
<th>8 months(^a)</th>
<th>10 days vs. 8 months(^a)</th>
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<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>t (9)</td>
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<tr>
<td>IES Intrusion</td>
<td>11.0 (8.36)</td>
<td>6.64 (5.78)</td>
<td>1.39</td>
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<tr>
<td>IES Avoidance</td>
<td>10.0 (6.63)</td>
<td>6.36 (5.60)</td>
<td>3.85**</td>
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<tr>
<td>Psychosomatic Stress Reaction</td>
<td>2.90 (2.13)</td>
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\(^{**}\) \(p < .01\)
\(^a\) Overview of results in the total group of dismissed athletes, n = 19

Table 2  Differences in the Severity of Stress Resulting from the Type of Termination Process (n = 10)

<table>
<thead>
<tr>
<th></th>
<th>Supportive Termination(^a)</th>
<th>Disintegrated Termination(^b)</th>
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<tbody>
<tr>
<td>10 Days After Event Onset</td>
<td>M (SD)</td>
<td>M (SD)</td>
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<tr>
<td>IES Intrusion(^c)</td>
<td>7.75 (4.57)</td>
<td>18.8 (5.02)</td>
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<tr>
<td>IES Avoidance(^c)</td>
<td>11.25 (5.12)</td>
<td>14.40 (3.65)</td>
</tr>
<tr>
<td>Psychosomatic Stress Reaction(^c)</td>
<td>1.40 (1.67)</td>
<td>4.40 (1.34)</td>
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<thead>
<tr>
<th></th>
<th>Supportive Termination(^a)</th>
<th>Disintegrated Termination(^b)</th>
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<tr>
<td>8 Months After Event Onset</td>
<td>M (SD)</td>
<td>M (SD)</td>
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<tr>
<td>IES Intrusion(^c)</td>
<td>6.50 (8.96)</td>
<td>9.25 (4.79)</td>
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<tr>
<td>IES Avoidance(^c)</td>
<td>5.25 (7.09)</td>
<td>9.75 (4.50)</td>
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\(^*\) \(p < .05\)
\(^n = 5\); The supportive termination group includes athletes who were informed in detail about the reasons for their dismissal and received supportive communication from trainers and coaches.
\(^b\) \(n = 5\); The disintegrative termination group includes athletes who were not informed about their termination by their trainer or other organization representative in personal conversation but learned from third parties after the decision had been announced to others.
\(^c\) IES Intrusion and Avoidance subscales (minimum = 0, maximum = 24); psychosomatic stress reaction scale (minimum = 0, maximum = 7).
This study examined both the subjective stress experienced by athletes following the termination of their careers and the specific effects of contextual factors that influence both the level and duration of that stress. It was hypothesized that the communication of career termination would prove stressful to all athletes, and that those whose careers ended with a negative termination experience (disintegrative) would exhibit greater subjective distress following termination. In addition, it was hypothesized that the occurrence of traumatic-stress-related symptoms following termination would be positively correlated with the intensity of perceived stress posttermination.

Study results supported the first hypothesis, indicating that the communication of career termination was very stressful for the affected athletes. Within the first 10 days following dismissal, measures of traumatic stress revealed moderate scores on subscales pertaining to intrusive thoughts and memories (IES Intrusion) and efforts to avoid trauma-related thoughts and emotions (IES Avoidance). Six participants met criteria for PTSD with the exception of criterion A at either 3 or 8 months posttermination, while one participant met these same criteria at both measurement times. These results are not surprising, since only the dismissed athletes had suffered a loss pertaining to identities and social roles. According to Rosenberg’s (1984) theory of “social death,” the terminated athletes were likely to have experienced a significant threat to their social identity following the abrupt removal from social relationships they had formed during years of interaction with a single cohort. For these individuals, termination marked the end of their social roles as athletes (Bette et al., 2002; Goebel & Schmidt, 1998) and forced them to consider alternate means of achieving life goals.

Findings from the study also suggest that the nonnormative event of career termination can tax an individual’s coping resources (Fischer & Riedesser, 1998), which may not be immediately up to the task of restoring self-esteem and

<table>
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<th>IES Avoidance 10 days after</th>
<th>IES Intrusion 8 months after</th>
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<tr>
<td>Traumatic Stress</td>
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<td>Symptoms (PDS)</td>
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<td>3 months after</td>
<td>.35</td>
<td>-.61#</td>
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<tr>
<td>Traumatic Stress</td>
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<td>Symptoms (PDS)</td>
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<td>8 months after</td>
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<td>-.21</td>
<td>-.67*</td>
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*p < .05; #p < .10; Correlation value is Kendall’s τ

*Termination group: Combined group of athletes who experienced either supportive or disintegrative termination.

Discussion

This study examined both the subjective stress experienced by athletes following the termination of their careers and the specific effects of contextual factors that influence both the level and duration of that stress. It was hypothesized that the communication of career termination would prove stressful to all athletes, and that those whose careers ended with a negative termination experience (disintegrative) would exhibit greater subjective distress following termination. In addition, it was hypothesized that the occurrence of traumatic-stress-related symptoms following termination would be positively correlated with the intensity of perceived stress posttermination.

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Findings from the study also suggest that the nonnormative event of career termination can tax an individual’s coping resources (Fischer & Riedesser, 1998), which may not be immediately up to the task of restoring self-esteem and
establishing new life roles. In fact, subsequent case analyses revealed that athletes with significant traumatic stress reactions engaged in prolonged coping efforts (see also Steil, 1999). Especially the protective short-term increase in internal control perception and self-efficacy in the first days after the event, was missing or not adequately present among these participants (Wippert, in press). In addition, the interplay between risk and protective factors has been reported to play a part in the efficacy of chosen coping methods and the development of traumatic stress symptoms (Flatten et al., 2004).

The second hypothesis addressed the question of whether, and to what extent, the quality of the termination process influenced the athletes’ levels of perceived stress and their subsequent traumatic stress responses. When compared with athletes who experienced a supportive termination process, the group that endured a socially disintegrative termination scored approximately three times higher on measures assessing sleep disturbance, alcohol use, and negative event appraisal. In addition, IES scores for the disintegrative termination group indicated that these athletes experienced more intrusive thoughts and engaged in more efforts to avoid their emotional experience than did those in the supportive termination group. Moreover, subsequent analyses of individual cases revealed that several in the disintegrative termination group reported persistent difficulties with falling asleep and staying asleep, as well as acute health problems and increased alcohol consumption. In contrast, athletes in the supportive termination group, who were informed in detail about the reasons for their dismissal and had an opportunity to discuss the perspectives of trainers and coaches, displayed significantly lower stress reactions.

The third hypothesis addressed the possibility of a positive correlation between the intensity of perceived stress at the time of termination and the emergence and persistence of traumatic stress reactions over time. Results indicated that the immediately perceived severity of the termination event, as measured on the IES scale at 10 days posttermination, was modestly positively correlated with the emergence of traumatic stress symptoms, as measured on the PDS, at 3 months posttermination. The correlation between IES scores at initial measurement (10 days posttermination) and traumatic stress symptoms was maintained over time, though the magnitude of the correlations was diminished at 8 months. IES Avoidance subscale scores collected at 10 days posttermination showed greater correlation with traumatic stress symptoms at 3 and 8 months than did IES Intrusion scores collected at that initial measurement point.

Overall, the correlation between perceived event stress, as reported on the IES, and the presence of traumatic stress symptoms, as reported on the PDS, became more pronounced with the passage of time. Yet, study findings also suggested that efforts to avoid trauma-related experiences in the period immediately following an event might be more closely related to the formation of traumatic stress symptoms than the intrusiveness of trauma-related thoughts and memories experienced during that period. This result supported previous research findings indicating that emotional avoidance is a predictor of traumatic stress symptoms (Sloan & Marx, 2004). Conversely, the present results also suggested that as time passes, the perceived intrusiveness of trauma-related experiences becomes increasingly relevant to the number of traumatic stress symptoms endorsed, while perceived attempts at suppression of trauma-related experiences play a less important role. This may
suggest that early avoidance may be related to the development of posttraumatic symptoms, while intrusive/ruminative thought processes might be related to the long-term maintenance of those symptoms.

**Limitations and Future Research**

When evaluating the results of this study, certain methodological limitations should be considered. First, the sample was derived from a very specific population (professional German alpine ski athletes), which raises questions regarding the generalizability of the study’s findings. Second, the sample sizes used for analyses were very small, especially following exclusion of participants who did not provide sufficient data. While this is not unusual in life-event research given the difficulties inherent in finding participants of the same age and background who are coping with the same life event at the same time, it warrants caution and suggests that the present findings are preliminary. As such, it is important to replicate these findings using larger sample sizes. Third, the results do not directly specify predictor variables for understanding the development of traumatic stress over time, nor do they provide empirical support for any causal inferences. Rather, the results provide a general picture of traumatic responses to a given life situation. Fourth, the data were collected using self-report questionnaires, which may be less effective at capturing traumatic stress reactions than other techniques, such as structured clinical interviews.

There are also several questions that should be addressed regarding the diagnostic and clinical status of stress reactions to potentially traumatic life events. The event under examination in this study, career termination, would not satisfy *DSM-IV-TR* (APA, 2000) criterion A for posttraumatic stress disorder, as the event did not involve actual or threatened death, serious bodily injury, or threat to the physical integrity of the participants. As a result, a PTSD diagnosis would be inappropriate for participants in this study, even though some individuals met all other criteria for the disorder and clearly experienced significant psychological distress. Thus, are we studying a clinically significant phenomenon when examining these reactions? Although there have been numerous discussions in the clinical literature regarding the significance of symptoms and correct use of terminology in describing event-related stress (see Gold, Marx, Soler-Baillo, & Sloan, 2005; Prigerson et al., 1999; Scott & Stradling, 1994), no consensus exists (McNally, 2003). Researchers have noted, however, that it is often difficult to assess how a given individual is likely to perceive the severity or intensity of a life event (Gast, Hofmann, Liebermann, & Flatten, 2004), and they suggest reexamination of the *DSM-IV-TR* categories pertaining to traumatic stress (Ziksook, Chentsova-Dutton, & Shuchter, 1998). Evidence from the current study suggests that such a review is needed.

Finally, data from this study warrant further consideration of traumatic stress-related preventative measures. For example, seminars on problem-oriented coping behavior for full-time athletes may facilitate development of new social identity structures after retirement (Grove, Lavallee, & Gordon, 1997; Stambulova, Stephan, & Jäphag, 2007) and may offer protective coping strategies (Sharon, 2005) in the event of abrupt career termination.
Conclusion

This study provides useful groundwork for future interventions and clinical research related to traumatic stress reactions and athletic career termination. The findings could be used when developing new approaches to dealing with professional athletes, especially when communicating news of a potentially career-ending event. The athletic career termination process requires improvement if it is to prepare athletes for the transition to life after professional sports (Kudielka et al., 2005; Lavallee, 2005; Sinclair & Orlick, 1993; Stephan, Bilard, Ninot, & Delignières, 2003). With only minimal investment, it may be possible to help athletes in transition avoid long-term psychological distress and associated difficulties with physical health.

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References


