
Visiting the Muses

Creativity, Coping, and PTSD in Talented Dancers and Athletes

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Although exposure to traumatic events runs high among Americans, only a few—about 8.7 percent—of those exposed to such events develop symptoms that warrant a diagnosis of Posttraumatic Stress Disorder (PTSD). The authors investigate two groups—dancers and athletes, including some who suffered from PTSD and some who did not—and found a higher frequency of PTSD diagnoses than would be expected in the general population and more so among the dancers than the athletes. Both groups indicated that the creative process was a positive experience, but the PTSD group reported more anxiety and emotional-oriented coping while creating and during stressful situations. The authors conclude that, although engaging in adult forms of play may not eliminate PTSD, participating in preferred physical activities may enhance the self-efficacy and self-management of those who do suffer from it. Participation in these activities certainly offers them pleasure and meaning. **Key words:** coping strategies, creativity, emotion regulation, overexcitability, play, Posttraumatic Stress Disorder (PTSD)

WHEN CHILDREN ENGAGE in pretend play, they exercise their creativity while also developing tolerance to name and accept intense emotions. According to Jessica Hoffman and Sandra Russ (2012), a clinical psychologist and developmental researcher respectively, creativity and play naturally merge; children employ fantasy, symbolism, and divergent thinking as they construct stories and characters (Russ and Wallace 2013). Encouraging children to engage in elaborate role play regularly, a process that incorporates imagination and acting out a part, promotes even more creativity (Mottweiler and Taylor 2014). Participating in sports during childhood can also enhance creativity in later adulthood but only if the children who do so engage equally in both organized and unstructured sports.

Matthew Bowers and his colleagues (2014) found that if either form dominated, creativity was not enhanced. The same appeared true for adult dancers.

Contemporary or modern dancers, whose *métier* calls for the highest level of creativity, had enjoyed more unstructured activities than jazz and musical theater dancers. Ballet dancers, who follow prescribed choreography, had experienced the lowest levels of free play. This pattern reflects the degree of training and performance constraints in each dance form (Fink and Woschnjak 2011). In another study, creativity increased in pre-vocational dancers when teachers supported exploratory (improvisational) dance along with dance skill education (Watson, Nordin-Bates, and Chappell 2012).

Creativity, emotion regulation, and unstructured play increase well-being and improve the quality of life. Hence, implementing creative therapy modalities enhances the treatment of psychological disorders, including posttraumatic stress disorder (PTSD) (Gregerson 2007). Marie Forgeard, a creativity researcher, demonstrated that perceptions of increased creativity significantly promoted posttraumatic growth (the subjective feeling of increased strength and a capacity to recover from traumatic events) rather than PTSD (2013). This study did not suggest that trauma augmented creativity; rather accessing creativity enhanced growth and healing after a trauma. In another study, Einat Metzl (2009) demonstrated that individuals who employed flexible thinking managed the devastation experienced during Hurricane Katrina better. Flexible thinking is an ability to generate multiple strategies and shift thoughts; it is a capacity associated with higher creativity and originality. Creativity researchers, Metzl and Malissa Morrell (2008), further suggested that creativity enhances resilience, an ability to recover from adversity. These findings lend support to task-oriented strategies such as actively seeking solutions to manage the cause of stress (i.e., the stressor) and implementing responses to meet the demands of the stressor. Stressful situations range from daily challenges, such as exams or routine deadlines, to extraordinary events, such as natural disasters or sexual or nonsexual violence. Creative resilience is a capacity for generating flexible problem solving during stressful events rather than avoiding them or emotionally collapsing in anxiety that actually increases stress responses (Endler and Parker 1994). Task-oriented behaviors are effective means to cope with stressful situations.

Although exposure to traumatic events in the United States is common—some reports suggest that 89.7 percent of the population will experience at least one such event in a lifetime (Elhai et al. 2012)—only about 8.7 percent of those exposed to them develop symptoms that warrant a diagnosis of PTSD as defined by the *Diagnostic and Statistical Manual of Psychiatric Disorders (DSM-5)* (American Psychiatric Association 2013). This low rate of PTSD diagnoses

compared to exposure to traumatic events suggests that human resilience prevails (Lukaschek et al. 2013). To be diagnosed with PTSD, an individual must have been exposed to or have witnessed a life-threatening traumatic event, and the resulting symptoms must persist for at least one month after such exposure. PTSD symptoms include physiological and psychological arousal (racing heart, exaggerated startle response, emotional volatility); intrusive symptoms (nightmares, flashbacks, physiological reactions to internal or external traumatic cues); avoidance responses (numbing, blocking memories of traumatic events, activity restrictions); and negative thoughts about the world, others, and the self, coupled with decreased ability to experience positive moods (American Psychiatric Association 2013). A diagnosis of PTSD often includes a range of co-occurring serious disorders that may include substance abuse, depression, anxiety, dissociation (failure to integrate experience, a subjective alienation from self or world), irritable bowel syndrome, cognitive impairment, chronic pain, and suicidal tendencies (Kessler 2000; Liebschutz et al. 2007; Yule 2001). Given the broad symptom spectrum in PTSD, individuals with a PTSD diagnosis inevitably struggle to tolerate and manage difficult negative emotions (O'Bryan et al. 2014). Effective coping strategies under stress collapse for those with PTSD (Myers et al. 2013).

Methods

Study Purpose

For this study, we investigated coping strategies, creative experiences, and personality traits in talented dancers and athletes. Some of the subjects had been diagnosed with PTSD; others had not. We included only dancers and athletes exposed to at least one traumatic event that met the criteria for a potential diagnosis of PTSD. To include a sample of individuals who demonstrated well-being, we selected a nonclinical group of physically fit and active participants, all deemed talented by virtue of their level of expertise and accomplishments. We included a group of both preprofessional and professional dancers ($n = 118$, 56 percent) and a group of regionally or nationally ranked athletes ($n = 90$, 43.3 percent).

We hypothesized that the PTSD group ($n = 42$, 20.2 percent) would resemble the no-PTSD group ($n = 166$, 79.8 percent) for creative experiences and personality traits typically found in talented individuals, such as intrinsic motivation, determination, openness to experience, and resilience. We based

our criteria for creative engagement as a subjectively perceived “lived” creative experience along with the fundamental meaning derived during the creative experience, regardless of any external evaluation of the creative product (Nelson and Rawlings 2009). Our athletes identified creative moments during a game, and our dancers described creative experiences during the making or performance of a dance. The personality traits we examined included overexcitability (OE). Overexcitability persists throughout the lifespan, evidenced more in gifted (intellectual) and talented (artistic and athletic) individuals (Limont et al. 2014). The five factors involved in overexcitability are psychomotor (OE-P) (surplus energy and expressions of emotional tension); sensual (OE-S) (heightened experiencing of sensory and aesthetic pleasures and displeasures and seeking outlets for inner tensions); imaginative (OE-I) (frequent daydreaming, free play of imagination and fantasy, and low tolerance for boredom); intellectual (OE-T) (intensified and accelerated activity of the mind and love of solving problems); and emotional (OE-E) (extremes of feeling, affective memory, anxieties, and expressions of meaningful relationships) (Ackerman 2009; Falk et al. 1999).

Overexcitability reflects heightened physiological responses to internal and external sensory stimuli. These heightened responses in childhood frequently predicts later achievement in talented individuals, at least in part because young athletes or dancers with elevated psychomotor traits direct this innate behavioral trait into acquiring athletic or dance skill and targeting them towards their adult careers as athletes or dancers (Ackerman 2009; Mendagli and Tillier 2006; Mika 2005; Subotnik, Olszewski, and Worrell 2011). We also included fantasy proneness among the personality traits because both performing artists and athletes employ increased imaginative strategies to augment performance (Thomson and Jaque 2015).

Our second hypothesis, based on previous studies about PTSD, posited that the PTSD group would have more difficulty regulating emotion (O’Bryan et al. 2015) and would employ more emotion-oriented coping strategies (Myers et al. 2013).

Participants and Procedures

We incorporated a sample ($n = 208$) of dancer and athlete participants invited into a larger psychophysiological study of the effects of stress on performing artists and athletes. In this investigation, 72 males (34.6 percent) and 136 females (65.4 percent) with a mean age of 23.59 ($sd = 5.82$, minimum = 18, maximum

= 59) participated. Criteria for inclusion in the study required participation in dance or athletics for five or more years and participation in at least one professional performance or competition at the regional or national level; exposure to one or more traumatic events that met the PTSD diagnostic criteria; current engagement in dance or athletic activities; and no restrictions for gender, race, or ethnicity.

All participants completed an informed consent form; a brief biographical questionnaire (to gather training and performance or competitive background); and five self-report instruments to assess their position on the PTSD diagnostic scale, their difficulty in emotion regulation, coping strategies under stressful situations, overexcitability, and proneness to fantasy. Participants completed these measures in the studio or laboratory two weeks prior to a public performance or competition. This timeline decision addressed the need to measure psychological variables without the imminent stress of performance or competition.

Measurements

COPING INVENTORY FOR STRESSFUL SITUATIONS (CISS). The CISS (Endler and Parker 1990), a forty-eight item, five-point Likert scale, measures three main coping strategies: task-oriented focus (dealing with the problem at hand); emotion-oriented focus (concentrating on the resultant emotions); and avoidance-oriented coping (trying to avoid the problem). In each coping strategy scale, sixteen items exist. The Likert scale ranges from 1 (not at all) to 5 (very much), and the questions ask participants to indicate how much they engage in various coping activities during a stressful situation. The CISS has a stable factor structure, excellent internal validity, adequate test-retest reliability, and good construct validity (Cosway et al. 2000; Endler and Parker 1990; McWilliams, Cox, and Enns 2003). In this study, Cronbach's alpha includes task-oriented focus (α of .844), emotion-oriented focus (α of .897), and avoidance-oriented focus (α of .862).

DIFFICULTIES IN EMOTION REGULATION SCALE (DERS). The DERS (Gratz and Roemer 2004), a self-report, thirty-six item Likert scale, ranges from 1 (almost never) to 5 (almost always). Higher scores indicate more difficulty regulating emotion. A mean score of all items exists, as do six subscales: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion-regulation strategies, and lack of emotional clarity. This instrument demonstrates high internal consistency and good test-retest reliability, and excellent Cronbach alpha for global emotion regulation existed ($\alpha = .939$) in our study.

THE EXPERIENCE OF CREATIVITY QUESTIONNAIRE (ECQ). Developed from qualitative research, this instrument offers a means to implement quantitative methods to gather more phenomenological information—a research method designed to allow and identify the emergence of subjective experiences (Nelson and Rawlings 2009). Adequate reliability resulted for each Cronbach alpha subscale score. Part A consists of forty-four items (five-point Likert rating) assessing experiential dimensions: Distinct Experience assesses the creative process ($\alpha = .788$); Anxiety probes for a sense of vulnerability during the creative process ($\alpha = .642$); Absorption examines deep absorption and a state of inspiration ($\alpha = .762$); Power-Pleasure examines a sense of control, power, and pleasure ($\alpha = .775$); and Clarity-Preparation probes for feelings of certainty and clarity about the direction of the creative work and how the work elicits moods related to the work ($\alpha = .448$). Part B, a nineteen-item section, attempts to understand the existential dimensions of the creative process: Transformation determines how the creative process enables a deeper engagement with the self and the world and operates as a powerful force in the individual's life ($\alpha = .762$); Centrality focuses on the meaning and purpose garnered from engaging in the creative process, offering a spiritual and healing component for the individual's life ($\alpha = .800$); and Beyond the Personal investigates the concern with the context of the artwork at the interpersonal level, a process of meaning making that connects the creative work and the creator with a larger subjective relational field ($\alpha = .779$).

INVENTORY OF CHILDHOOD MEMORIES AND IMAGININGS (ICMI). Developed by Sheryl Wilson and Theodore Barber (Lynn and Rhue 1988; Wilson and Barber 1983), the ICMI, a dichotomous self-reporting, fifty-two-item instrument, probes experiences and memories from childhood and adulthood (twenty-three items for childhood experiences and twenty-nine items for adult experiences). Adequate reliability and validity existed in this study, along with excellent internal consistency ($\alpha = .892$).

OVEREXCITABILITY QUESTIONNAIRE-II (OEQ-II). The OEQ-II (Falk et al. 1999), a fifty-item, self-rating measurement assesses the five forms of overexcitability (OE). Each OE subscale (psychomotor, sensual, imaginal, intellectual, and emotional) derives mean scores from ten five-point Likert items ranging from 1 (not at all) to 5 (very much like me). No OE cutoff scores that identify giftedness exist; however, scores above the seventy-fifth percentile can be regarded as elevated overexcitability. The OEQ-II has high internal reliability, internal consistency, and good content validity. Gender differences exist in this measure (Bouchet and Falk 2001): Females score higher on emotional and

sensual OE; Males scored higher on intellectual and psychomotor OEs (van den Broeck et al. 2014). In our study, Cronbach alpha scores include OE-P (psychomotor) ($\alpha = .836$); OE-S (sensual) ($\alpha = .873$); OE-I (imaginational) ($\alpha = .880$); OE-T (intellectual) ($\alpha = .884$); and OE-E (emotional) ($\alpha = .827$).

POSTTRAUMATIC STRESS DIAGNOSTIC SCALE (PDS). The PDS (Foa 1995) assesses posttraumatic stress symptoms and determines a PTSD diagnosis based on the DSM-5 (American Psychiatric Association 2013) criteria. This forty-nine-item, self-report instrument has excellent psychometric properties (Foa et al. 1997). The PDS has four sections. Section 1 determines types of traumatic events, and section 2 measures a single event that has caused disturbance in the previous month and determines if the criteria of exposure to a traumatic event has been met. Section 3 assesses the seventeen PTSD symptoms in the DSM-5 and includes several criteria: reexperiencing events, avoidance symptoms, and hyperarousal symptoms. Section 4 assesses significant distress and impaired functioning. In this study, the symptom severity scale had a Cronbach alpha score of .937.

Analysis

We used SPSS version 22.0 in our statistical analyses. First, we conducted descriptive statistical analyses. To compare the group with PTSD to the group without PTSD, we conducted several multivariate analyses of covariance (MANCOVA) (with age and gender as the covariates) to determine whether there were significant group differences. We included age and gender as covariates because our sample contained an uneven distribution of males and females and a wide range of ages. We plotted data prior to analyses to ensure normal distribution, and we then normalized any nonnormal distributions. We first compared the no-PTSD and PTSD groups on the posttraumatic severity scores, difficulty in emotion regulation, and coping strategies under stress. In the second MANCOVA, we calculated group differences for creative experience scales. In the third MANCOVA, we included the five overexcitability dimensions and fantasy proneness. In the MANCOVA analyses, investigators used Bonferroni alpha (.05) corrections to determine the nature of the differences between the group means.

Lastly, we tested frequency distributions to determine categorical differences between the PTSD and no-PTSD dancer and athlete groups and the full PTSD group differences in this sample compared to the general population distribution. We used the Fisher's Exact Test to compute a two-tailed probability of obtaining a distribution of values in a 2 x 2 contingency table (significant at

$p < .05$). We calculated this analysis to add to our descriptive understanding of dancers and athletes diagnosed with PTSD.

Results

Figures 1 and 2 present descriptive statistical mean results and standard deviations, along with MANCOVA significant results. The Fisher Exact Test demonstrated significant distribution differences for PTSD in dancers (25.4 percent) compared to PTSD in athletes 13.3 percent ($p = .04$) and between the full sample of dancers and athletes (20.2 percent) compared to 8.7 percent reported in the DSM-5 ($p = .024$). Although unknown, these elevated distributions may be typical in a sample drawn from a large urban community. Inclusion in this study required exposure to at least one traumatic event, but more participants in the no-PTSD group experienced accidents (34.5 percent) and natural disasters (26.7 percent), all of which were either nonhuman or nonintentionally perpetrated traumatic events. On the other hand, the PTSD group experienced accidents (24.4 percent), plus intentionally perpetrated acts of violence such as sexual assault (24.4 percent), or medical trauma or bullying (14.6 percent). A very small percentage of both the no-PTSD and PTSD groups experienced nonsexual assaults.

The series of MANCOVA calculations to determine group differences between the no-PTSD and PTSD groups (with gender and age as covariates) yielded several interesting results.

Significant PTSD group differences resulted, determined by MANCOVA (with gender and age as covariates) for emotion regulation scales (difficulty in emotion regulation, posttraumatic stress symptoms, and coping strategies) (Wilks's $\Lambda = .531$, $F[5, 133] = 23.468$, $p = .000$, $\eta^2 = .469$, Levene's test $p > .05$) for all scales except task-oriented and avoidant-oriented coping. No significance resulted for age ($p = .084$) and gender ($p = .383$) covariates (see figure 2 for mean scores, standard deviations, and between subject results).

A significant PTSD group difference resulted, determined by MANCOVA (with gender and age as covariates) for creative anxiety (one of the eight creativity scales) (Wilks's $\Lambda = .803$, $F[8, 94] = 2.877$, $p = .007$, $\eta^2 = .197$, Levene's test ($p > .05$) for all scales except for the clarity subscale. No significance resulted for age ($p = .892$) and gender ($p = .291$) covariates (see figure 1 for mean scores, standard deviations, and between subject results).

No significant PTSD group differences resulted, determined by MAN-

	No-PTSD	PTSD
ECQ-Experience	29.27(7.03)	32.54(8.31)
ECQ-Anxiety	18.70(5.30)	20.92(5.00)*
ECQ-Absorption	35.17(8.39)	36.96(8.94)
ECQ-Power/Pleasure	40.25(9.09)	38.17(9.91)
ECQ-Clarity	14.79(3.36)	16.29(6.85)
ECQ-Certainty	31.85(8.61)	30.29(9.91)
ECQ-Transformation-Ln	26.15(7.06)	25.17(8.06)
ECQ-Beyond Personal	10.12(3.16)	9.58(3.72)

Abbreviation: ECQ = Experience of creativity questionnaire; Ln = natural log

MANCOVA (age and gender covariates) comparison of mean scores showing significant group differences between no-PTSD and PTSD groups

*p < .05

Figure 1. Mean descriptive statistics and standard deviations (SD) for experience of creativity

	No-PTSD <i>n</i> = 160	PTSD <i>n</i> = 42
DERS-Ln	2.16(.62)	2.55(.67)**
PTSD-sss-Ln	4.05(7.23)	21.59(9.10)***
Task oriented	58.31(11.45)	57.79(13.48)
Emotion oriented	42.46(11.84)	51.69(11.20)***
Avoidance oriented	50.22(11.29)	51.24(14.07)
Fantasy proneness	22.09(8.59)	25.19(9.43)
OE-P	3.61(.72)	3.81(.65)
OE-S	3.56(.78)	3.72(.82)
OE-I	2.39(.79)	2.66(.92)
OE-T	3.42(.74)	3.63(.82)
OE-E	3.41(.74)	3.79(.66)*

Abbreviations: DERS = Difficulties in emotion regulation; Ln = natural log; PTSD-sss = Posttraumatic Stress Diagnostic symptom severity score; OE-P = psychomotor overexcitability; OE-S = sensual overexcitability; OE-I = imaginal overexcitability; OE-T = intellectual overexcitability; OE-E = emotional overexcitability

MANCOVA (age and gender covariates) comparison of mean scores showing significant group differences between no-PTSD and PTSD groups.

*p < .05, **p < .01, ***p < .001

Figure 2. Mean descriptive statistics and standard deviations (SD) for emotion regulation and personality variables

COVA (with gender and age as covariates) for overexcitability dimensions and fantasy proneness (Wilks's $\Lambda = .949$, $F[6, 161] = 1.441$, $p = .202$, $\eta^2 = .051$, Levene's test $p > .05$). No significance resulted for the covariate, age ($p = .677$), but significance existed for gender ($p = .000$) (see figure 2 for mean scores, standard deviations, and between subject results). In the follow-up univariate analysis, significantly greater OE-Emotional existed in the PTSD group ($p = .022$).

Discussion

The high frequency of participants diagnosed with PTSD (20.2 percent) compared to the general population norms (8.7 percent) raises concerns. Dancers had an even higher distribution (25.4 percent) compared to athletes (13.3 percent). Perhaps the nature of expressing the human condition in the performing arts actually encourages a lack of resolution for past trauma and loss, a finding demonstrated in an earlier study that investigated actors (Thomson and Jaque 2012). Athletes, on the other hand, do not need to probe past losses and traumas directly to enhance their athletic performance. The limitations of this study design include an inability to determine whether this distribution is typical for all dancers and athletes or whether the urban geographical region where our study took place increases the likelihood of experiencing more traumatic events. Perhaps large urban settings have a higher percentage of individuals with PTSD, or the reported national average may reflect an underdiagnosis of PTSD (Liebschutz et al. 2007). The traumatic events that had the highest frequency in the PTSD group suggest that intentionally perpetrated trauma (sexual assault and nonsexual assault) was more psychologically difficult to manage compared to the unintentional nonhuman traumatic events experienced by the no-PTSD group (accidents and natural disasters) (Liebschutz et al. 2007).

The PTSD group also reported greater difficulty with emotional regulation, and they employed more emotion-oriented coping strategies under stress. Emotion-oriented coping, related to the personality trait of neuroticism, poorly addresses stress; whereas task-oriented coping, inversely related to neuroticism, effectively manages stress (McWilliams et al. 2003). Emotion-oriented coping indicates greater internal awareness regarding the feelings experienced along with an inability to detach from this distressing awareness (Endler and Parker 1990). Although the PTSD group had higher scores on emotion-oriented coping, no differences existed between the PTSD and no-PTSD group for the

higher functioning task-oriented and avoidance-oriented coping strategies. These results suggest that the elevated emotion-oriented coping may be a by-product of PTSD, or it may relate to the elevated emotional overexcitability reported by the PTSD group. No fantasy-prone differences emerged between PTSD and no-PTSD groups; however, a greater ability to imagine events can increase emotional distress such as anxiety (Thomson and Jaque 2012a, 2012b) and shame (Thomson and Jaque 2015). Many individuals with histories of intentionally perpetrated trauma do report higher fantasy proneness, demonstrating an imaginative escape-coping strategy to manage distress (Klinger, Henning, and Janssen 2009).

The PTSD group experienced more exposure to intentional relational trauma (sexual and nonsexual assault) compared to the no-PTSD group who experienced more nonintentional events, such as natural disasters or car accidents; this fact may lead to an increase in more PTSD symptoms. Again, traumatic events such as sexual assault may elicit an emotional coping response. Unfortunately, employing emotion-oriented coping increases psychological distress (McWilliams et al. 2003), and difficulties regulating negative emotions exacerbate PTSD symptoms (O'Bryan et al. 2015). The study presented in this article replicated these findings. The PTSD group had greater difficulty managing emotions, especially negative emotions; they employed more emotion-oriented coping strategies; and they reported higher emotional overexcitability. Despite these difficulties, both groups actively participated at relatively high levels of performance. Because all participants willingly and actively engaged in their preferred activities, they derived pleasure and meaning from these adult forms of play. Engaging in adult play may ameliorate PTSD symptom distress.

Although the PTSD group had greater difficulty with emotion regulation and copings under stress, they demonstrated no differences in creative experiences, with the exception of greater anxiety when engaged in creative activities. When children are able to generate more creative solutions during pretend play and when they are able to employ more emotional words in their discourse, enhanced emotional regulation results (Hoffman and Russ 2012). Both PTSD and no-PTSD groups expressed similar abilities to identify distinct creative experiences, such as an awareness of a loss of self, a sense of contact with a force beyond themselves, and greater emotional engagement during the creative process. The PTSD group scored lower when claiming that the creative experience coexisted with a stabilization of emotional states, but the difference between the two groups was not significant. They both claimed a heightened awareness

during the creative activity and a heightened sense of technical and expressive abilities, including spiritual awareness. The two groups were able to experience deep absorption and a state of inspiration, including a sense of discovery and of being receptive to the creative activity. They could move between absorption and the distancing process of critical awareness with a sense of control, power, and pleasure during the analytic aspect of the creative process. Both groups had a sense of clarity and certainty about the direction of their creative work and how the work could elicit specific moods related to it. Even more importantly, during creative experiences, both groups endorsed a deeper engagement with the self and the world; they focused on the meaning garnered from engaging in the creative process and that it offered a spiritual and healing component for individual lives. The participants equally expressed that the creative experience entailed meaning making; it facilitated a sense that a creator existed in a larger subjective relational field.

These findings indicate that engaging in the creative process, although more anxiety provoking for the PTSD group, allowed a deep and meaningful connection during the experience. Such experiences may promote the resilience manifested in these talented dancers and athletes. Many studies support the implementation of play therapy and expressive art therapy when treating traumatized children (Lantz and Rais 2003; Reyes and Asbrand 2005). The participants in this study, although not directly engaging in dance or sport for therapeutic purposes, may inherently understand that self-efficacy and self-management during physical activities enhances emotional resilience in general (Dishman et al. 2005). Focusing on positive experiences may buffer negative emotional experiences for these dancers and athletes (Tugad and Frederickson 2004).

The limitations of this study include a gender imbalance, although it is typical for a dance sample to contain more female than male participants. Females, compared to males, tend to indicate higher emotional overexcitability (Bouchet and Falk 2001), and they receive a diagnosis of PTSD more often than males (Elhai et al. 2012). Controlling for gender differences in the multivariate analyses addressed this imbalance. The use of self-report instruments increases subjective biases. To manage this problem, a clinical psychologist confirmed our diagnosis of PTSD. The high proportion of participants with a diagnosis of PTSD (20.2 percent) may be unique to a sample gathered from a university and community setting in a large urban city, and so the findings may not be replicated in other settings. This cross-sectional study did not support an identification of cause-effect variables. Only a longitudinal study would determine

pre- and posttraumatic exposure and PTSD diagnosis including the degree of emotional regulation and coping strategies employed under stress before and after the trauma. Despite these limitations, we see evidence that dancers report more emotional vulnerability compared to athletes, perhaps because they must incorporate both positive and negative emotional expression when performing (Thomson and Jaque 2015).

We recommend encouraging medical practitioners to assess their clients for PTSD (Liebschutz et al. 2007). Developing public health plans and treatment protocols may decrease suffering and, consequently, the demand on health-care services (Kessler 2000; Santiago et al. 2013). Encouraging individuals exposed to traumatic events to engage in their preferred physical activities as well as inviting them to embrace their creative experiences may alleviate PTSD suffering. Asking them to reflect on the components of creativity (clarity, certainty, vulnerability, meaning making, absorption, pleasure, and self-appraisal) may shift attention from emotion-oriented coping strategies to more task-oriented and self-efficacious strategies. In short, engaging in adult forms of play, although it may not eliminate PTSD, may allow individuals greater pleasure and meaning.

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