Exquisite Moments

Achieving Optimal Flow in Three Activity-Based Groups Regardless of Early-Childhood Adversity

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Flow experiences (also known as optimal performance) occur when people engage in activities they enjoy. The authors discuss such events in their study that examined a number of healthy, active individuals (performing artists, athletes, and others engaged in a range of recreational activities) and divided these into three groups based on adverse childhood experiences. They found that, although flow is higher among the individuals who experienced more adversity in childhood, this same group also had more difficulty regulating emotions and more frequently employed emotion-oriented coping strategies under stress. They also discovered that, compared to the athletes and regularly active individuals, performing artists suffered significantly more adversity in childhood and engaged in more emotional-oriented coping strategies. All three groups, however, enjoyed high autotelic flow experiences, which—so the authors suggest—indicates that the subjects derived meaning from their preferred activities. Overall, the authors claim, their study's findings reinforce the psychological benefits of flow-based experiences. **Key words:** adverse childhood experiences (ACE), coping strategies, dispositional flow, flow experiences and athletes, flow experiences and dancers, regulation of emotions

Participating in enjoyable activities can help achieve the kind of optimal performance Mihalyi Csikszentmihalyi (1990) calls *flow*. Flow refers to a state of focused absorption in a pleasurable activity. Action and awareness merge, and the perception of time expands or compresses (Chavez 2008; Harmison 2006; Kirchner, Bloom, and Skutnick-Henley 2008). Regardless of whether an individual is a beginner or an elite performer, the possibility of achieving flow occurs when acquired skills match the challenge of an activity. The balance between skills and challenges creates both an internal sense of control and a simultaneous feeling of freedom. Csikszentmihalyi suggests that intrinsic motivation augments

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flow. Winning competitions and receiving money, all external motivators, do not promote flow. Regardless of the difficulty, risk, or pain, intrinsically motivated individuals eagerly seek challenges in athletics, performing arts, and scientific investigation. They crave the engagement.

Individuals who achieve flow report receiving immediate and unambiguous feedback from the environment and from their internal perceptions as they encounter it. This feedback reinforces their goals. For example, dancers modulate their motor patterns to complete multiple rotations during a pirouette, and variables such as slippery or sticky floors influence how they perform such turns. Athletes and performing artists employ high levels of concentration to execute their complicated feats so self-conscious distractions do not compromise their performances (Csikszentmihalyi 1990). Individuals can experience flow anytime, whether working on a career or playing a game. Surgeons working in operating rooms and rock climbers scaling mountains frequently achieve flow states. Anxiety and self-doubt disappear during these flow moments (de Manzano et. al. 2010; Harmison 2006). The nature of flow involves positive perceptions of the self as competent, the body as adept, time as sufficient, and the world as inviting (Harmison 2006).

According to Csikszentmihalyi (1990), an individual who regularly transforms potential threats into enjoyable flow experiences possesses a personality that readily adapts to stressful conditions. He describes these individuals as autotelic. Derived from the Greek word "auto" meaning self and "telos" meaning goal or end, these autotelic individuals stay engaged in the hardships they experience. They actively seek to overcome hardships, even if doing so means learning new skills. Scientific findings suggest that autotelic individuals who effectively manage their emotional and physical responses during highly stressful events express a sense of self-efficacy and demonstrate better health (Anderson, Winett, and Wohcik 2007; Maes and Karoly 2005; Rasmussen et al. 2006), including better quality of life (de Manzano et al. 2010). In general, autotelic individuals not only experience more fulfilling flow states, they also include more playfulness in their daily activities (Tan and Chou 2011). Personality studies of the Big Five personality factors (neuroticism, agreeableness, conscientiousness, extraversion, and openness) have demonstrated that autotelic individuals are less neurotic and agreeable but more conscientious, open, and extraverted (Ross and Keiser 2014; Ullen et al. 2012).

An autotelic personality influences the coping strategies that emerge under stressful situations such as those athletes face when competing or performing artists encounter on stage (Moos and Holahan 2003). According to Endler and

Parker (1990), individuals under stress adopt one of three primary coping orientations—task oriented, emotion oriented, or avoidance oriented. These three strategies strongly relate to personality traits, and some consider them traits in and of themselves (DeLongis and Holtzman 2005; Cosway et al. 2000). Task-oriented responses to stress aim at solving problems, such as handling errors during competitions or performances and cognitively restructuring them in an attempt to alter the situation. Individuals who use task-oriented strategies manage stressful situations more effectively than others (Moss and Holahan 2003). Emotion-oriented individuals are more preoccupied with their self and their own responses, often fantasizing about escaping problems rather than facing them. Unexpected errors in competition or performance often lead emotion-oriented athletes and performers to focus on their own distress. Negative feelings such as shame, fear, and guilt consume emotion-oriented athletes and performers. Emotion-oriented coping strategies harm the individual's ability to adapt: they actually increase stress and decrease good health. They may also increase psychopathologies such as anxiety disorders (Cosway et al. 2000; McWilliams, Cox, and Enns 2003; Robinaugh and McNally 2010). Avoidance-oriented individuals cope with stress by ignoring the situation or engaging in distracting activities. Avoidance does not produce change during stress and can, over time, drain the ability to cope (Myers et al. 2013). For avoidance-oriented athletes or performers, distractions compromise their ability to acquire skills and reduce their achievements during performance.

In this study, we examined dispositional flow (a measure indicating the more trait-like personality features of flow during identifiable, preferred activities) and coping strategies in three activity-based groups: a group of preprofessional and professional performing artists (actors, singers, musicians, dancers); a group of regional or nationally ranked athletes (individual and team sports); and a control group of healthy, active individuals. The healthy, active individuals of the control group participated in some recreational activities but not at a high-skill level or on a regular basis. All participants identified an activity that they found pleasurable, meaningful, and playful when they answered our self-report questionnaires. We also examined childhood adversity experiences to determine whether an association existed with dispositional flow, emotional regulation, and coping strategies. Robust research demonstrated that greater childhood adversity (physical, emotional, and sexual abuse; physical and emotional neglect; or such family dysfunction as mental illness, imprisonment, divorce, domestic violence, or

substance abuse) leads to increased pathology, both physical (cardiovascular and metabolic disorders) and psychological (anxiety and mood disorders) (Felitti and Anda 2010). We wanted to explore these variables (flow, coping strategies, and childhood adversity) in a sample of healthy individuals who participated in activities that commonly elicit flow experiences.

Methods

Participants and Procedures

We investigated adverse childhood experiences (ACE), coping strategies, dispositional flow, and emotion regulation in talented individuals and healthy, active participants, as well as three groups: a group with no ACE; one with ACE; and a third group with two or more ACE. We selected physically fit and active participants (n = 601). We deemed two groups of participants talented by virtue of their level of expertise and accomplishments in performing arts or athletics. Preprofessional and professional performing artists (n = 415, 69.1 percent), a group of regionally or nationally ranked athletes (n = 68, 11.1 percent), and healthy, active participants (n = 118, 19.6 percent) accepted invitations to participate in a larger psychophysiological study that investigated the effects of stress on performing artists and athletes.

We recruited 159 males (26.5 percent) and 442 females (73.5 percent), ranging in age from eighteen to fifty-nine years (See figures 1 and 3 for mean age for the groups). The criteria we used for participation in the study required that the performing artists and athletes had participated in performing arts or athletics for five or more years and had at least one professional engagement or one regional- or national-level competition. We required each participant to be currently engaged in activities we identified as enjoyable—running, dancing, singing, soccer, basketball, softball, volleyball, or martial arts. And we placed no restrictions for gender, race, or ethnicity.

All participants completed an informed consent form, a brief biographical statement (so we could gather activity history) and four self-report instruments that enabled us to assess adverse childhood experiences, coping strategies under stressful situations, difficulty in emotion regulation (i.e., impulse-control difficulties, a lack of awareness about emotional responses, or an inability to focus on goals), and dispositional flow scale (flow experiences that usually occur when engaging in a preferred activity). To avoid increasing participants' stress, we

asked them to complete the measurements in the studio or laboratory two weeks prior to any performance or competition.

Measurements

Adverse Childhood Experiences (ACE). The ACE measurement assesses categories of childhood abuse, neglect, and household dysfunctions (Felitti and Anda 2010). It is a dichotomous, ten-item, self-report instrument and a total score of yes responses are derived, regardless of frequency (number of times the childhood adversity occurred) or intensity (severity of abuse, neglect, or dysfunction). The abuse category probes for emotional, physical, and sexual abuse. The neglect category probes for emotional and physical neglect. The household dysfunction category includes a mother treated violently, substance abuse, parental separation or divorce, and a household member imprisoned or suffering from a mental illness. Based on a mean split for total ACE measurement scores, we divided the participants into three groups—no ACE, one ACE, two or more ACE. The test-retest reliability calculation for the ACE was stable ($r = .86$, $p < .01$).

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, emotion oriented, and avoidance oriented. In each coping strategy scale there are sixteen items. 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 calculations include task-oriented focus ($\alpha = .879$), emotion-oriented focus ($\alpha = .898$), and avoidance-oriented focus ($\alpha = .874$).

Difficulties in Emotion Regulation Scale (DERS). The DERS (Gratz and Roemer 2004), a thirty-six item, self-report, Likert scale, measure ranges from 1 (almost never) to 5 (almost always). Higher scores indicate greater difficulty in emotion regulation. The mean score of all items comprises the global score, a marker of general emotional distress. Six subscales indicate specific emotional difficulties: 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 has high internal consistency, good test-retest reliability, and excellent Cronbach alpha for global emotion regulation ($\alpha = .930$).

Dispositional Flow Scale-2 (DFS2). The DFS2 (Jackson and Eklund 2004), a thirty-six item, self-report instrument, assesses the construct of dispositional flow during a specific activity. Researchers calculated mean scores for the nine dimensions of flow (each with four items) plus a mean global flow score. A five-point Likert scale ranging from 1 (never) to 5 (always) is used. A low agreement (ranging from 1 to 2) suggests that an individual's experience was not substantially flow-like. A moderate level (ranging from 2 to 4) indicates some endorsement of flow experiences. A high level (ranging from 4 to 5) indicates the respondent frequently or always experienced flow in the selected activity. The DFS2 has adequate reliability, construct validity, and internal consistency (Jackson and Eklund 2004). In our study, the Cronbach's alpha calculations included global dispositional flow ($\alpha = .934$); challenge-skill balance (CSB: $\alpha = .805$); merging of action and awareness (MAA: $\alpha = .819$); clear goals (CG: $\alpha = .559$); unambiguous feedback (UF: $\alpha = .900$); concentration on the task at hand (CTAH: $\alpha = .861$); sense of control (SC: $\alpha = .883$); loss of self-consciousness (LSC: $\alpha = .883$); transformation of time (TT: $\alpha = .836$); and autotelic experience (AE: $\alpha = .640$). The global-scale score assesses the general experience of flow; however, each of the nine scales factor differently in this mean global score (Jackson and Eklund 2002; Jackson, Martin, and Eklund 2008).

Analysis

We used SPSS version 22.0 for all statistical analyses. First, we conducted descriptive statistical analyses. Fisher's Exact Test computation provided a two-tailed probability of obtaining a distribution of values in a 2 x 3 contingency table (significant at $p < .05$). This analysis added to the descriptive understanding of activity-based and adverse childhood experience groups.

We conducted several multivariate analyses of covariance (MANCOVA) (with age and gender as the covariates) to determine whether significant differences existed between subject effects for the groups. First, we investigated differences between the performing-artist group, athlete group, and active-participant group. We then examined differences by dividing the sample into three childhood adversity groups (no childhood adversity, one adversity, and two or more adversities). Because of the large age range and an uneven distribution of males and females, we included age and gender as covariates, a decision that removes these effects in the calculations. Because MANCOVA analyses require normal distributions for all variables, before our analyses, we plotted the variables of flow, emotion regulation, and coping orientations to determine distribution patterns.

We normalized all nonnormal distributions. We first compared the groups based on activity and then groups based on childhood adversity. In the first MANCOVA calculations, comparing performing artists, athletes, and healthy participants, we assessed four variables: adverse childhood experiences, dispositional global flow, difficulty in emotion regulation, and coping strategies under stress. In the second MANCOVA calculations comparing the same three groups, we assessed the flow subscale variables. We repeated this sequence of MANCOVA calculations for the three ACE groups. The third MANCOVA calculation assessed three variables: dispositional global flow, difficulty in emotion regulation, and coping strategies under stress. The fourth MANCOVA calculation assessed the flow subscale variables. In all MANCOVA analyses, Bonferroni alpha (.05) corrections determined the nature of the differences in the group means.

Results

The descriptive statistics include mean scores and standard deviations (displayed in the four figures). Of note, the performing artists had a greater distribution of participants with two or more adverse childhood experiences (67.9 percent) compared to the athletes (12.5 percent) and healthy controls (19.6 percent). This difference was statistically significant ($p = .000$) based on the Fisher Exact Test (Freeman-Halton Extension).

In the first MANCOVA (with gender and age as covariates), we calculated the group differences of performing-artist, athlete, and control groups for total adverse childhood experiences, global dispositional flow, coping strategies (task, emotional, avoidance), and difficulties with emotional regulation. The MANCOVA results demonstrated no significant main effects for group (Wilks's $\Lambda = .916$, $F(12, 406) = 1.519$, $p = .114$, $\eta^2 = .043$; Levene's test $p > .05$ for all scales). Gender had no significant covariate effect ($p = .174$); however, the covariate "age" significantly affected avoidance coping ($p = .002$). All other variables were not affected by age. In the follow-up univariate analyses, only emotion-oriented coping ($p = .021$) significantly differed; the performing-artist group had higher mean scores compared to the athlete and control groups. See figure 1 for mean scores.

In the second MANCOVA (with gender and age as covariates), we calculated group differences between performing-artist, athlete, and control groups for the flow subscales in the DFS2. The MANCOVA had significant main effects (Wilks's $\Lambda = .819$, $F(18,854) = 4.980$, $p <= .000$ $\eta^2 = .095$; Levene's test $p > .05$

for all scales). Gender ($p = .001$ for loss of self-consciousness and transformation of time) and age ($p = .028$ for autotelic experiences) were significant covariates in the analysis. In the comparisons among the performing-artist, athlete, and control groups, the athlete group scored significantly higher than the other two groups on several variables: skill-balance challenge (athletes endorsed flow activities that matched their skills with the level of competition) ($p = .000$); merging action and awareness (athletes claimed that their awareness of competing merged with the engagement in the competition) ($p = .000$); unambiguous feedback (athletes described experiences of clear feedback while competing) ($p = .013$); challenge for the task at hand ($p = .022$); sense of control (athletes identified a feeling of control while competing) ($p = .000$); and loss of self-consciousness (athletes attended to the demands of competition without self-conscious distracting thoughts) ($p = .000$). There were no group differences for the variables of clear goals, transformation of time, and autotelic experiences. See figure 2 for mean and standard deviation scores.

In the third MANCOVA (with gender and age as covariates), we calculated group differences between no ACE, one ACE, and two or more ACE groups for global dispositional flow, coping strategies (task, emotional, or avoidance), and difficulties with emotional regulation. The MANCOVA demonstrated no significant main effects (Wilks's $\Lambda = .923$, $F(10, 408) = 1.658$, $p <= .089$, $\eta^2 = .039$; Levene's test $p > .05$ for all scales). The covariate of gender did not have significant effects ($p = .113$); however, the covariate of age significantly affected the results ($p < .005$). Age-related influences on avoidance coping significantly differed, with younger age employing more avoidance-oriented strategies ($p = .002$). All other variables had no significant age-related effects. In the follow-up univariate analyses, significant differences for emotion-oriented coping ($p = .002$) and difficulty with emotion regulation ($p = .022$) existed, but the group with two or more ACE employed significantly more emotion-oriented coping strategies and greater difficulty regulating emotional responses compared to the group with no ACE. See figure 3 for mean and standard deviation scores.

In the fourth MANCOVA (with gender and age as covariates), researchers calculated group differences between no ACE, one ACE, and two or more ACE groups on the flow subscales in the DFS2. The MANCOVA revealed no significant main effects (Wilks's $\Lambda = .939$, $F(18,844) = 1.525$, $p <= .074$, $\eta^2 = .031$; Levene's test $p > .05$ for all scales). The covariate of age significantly affected the analysis ($p = .022$) for autotelic experiences, with older participants endorsing more autotelic experiences. The covariate of gender, significantly affected

	Performing artists	Athletes	Control group
Age	23.93(8.19)	23.57(3.74)	25.96(8.79)
ACE total	1.86(1.98)	1.62(2.36)	1.73(2.32)
Task-oriented coping	58.23(11.81)	59.91(11.36)	60.22(11.14)
Emotional-oriented coping	46.35(12.41)	41.21(11.85)	42.04(11.63)*
Avoidance-oriented coping	50.57(11.87)	49.85(10.89)	53.96(13.25)
DERS-Ln	2.27(.63)	2.11(.58)	2.13(.62)
DFS2-global	3.80(.61)	4.06(.59)	3.81(.49)

Abbreviations: ACE = adverse childhood experiences; DERS-Ln = natural log of difficulty with emotion regulation; DFS2 = dispositional global flow

MANCOVA (age and gender as covariates) comparison of mean scores showing significant group differences for dancers, opera singers, and elite athlete groups

*p < .05

Figure 1. Mean descriptive statistics and standard deviations (SD) for activity-based groups

	Performing artists	Athletes	Control group
DFS2-CSB	3.91(.65)	4.19(.65)	3.71(.66)**
DFS2-MAA	3.58(.69)	4.08(.66)	3.54(.66)**
DFS2-CG	4.11(1.03)	4.30(.67)	4.03(.67)
DFS2-UF	3.91(.76)	4.18(.63)	3.82(.69)*
DFS2-CTAH	3.82(.74)	4.10(.70)	3.86(.64)*
DFS2-SC	3.73(.76)	4.25(.64)	3.91(.62)**
DFS2-LSC	2.99(.93)	3.75(.87)	3.46(.87)**
DFS2-TT	3.50(.88)	3.69(.84)	3.49(.71)
DFS2-AE	4.34(.68)	4.50(.57)	4.26(.67)

Abbreviations: DFS2 = Dispositional Flow Scale; CSB = Challenge-skill balance; MAA = Merging actions and awareness; CG = Clear goals; UF = Unambiguous feedback; CTAH= Challenge of the task at hand; SC = Self-control; LSC = Loss of self-consciousness; TT = Transformation of time; AE = Autotelic experiences

MANCOVA (age and gender covariates) comparison of mean scores showing significant group differences for dancers, opera singers, and athlete groups

*$p < .05$; **$p < .001$

Figure 2. Mean descriptive statistics and standard deviations (SD) for activity-based groups flow scales

the variables: CSB (p = .037), MAA (p = .037), UF (p = .043), SC (p = .046, LSC (p = .018) and TT (p =. 013). Surprisingly, in the follow-up univariate analysis only TT (p = .008) and AE (p = .023) significantly differed. The no ACE group scored significantly lower than the group with two or more ACE. See figure 4 for mean and standard deviation scores.

Discussion

The findings in this study suggest that all groupings (activity based and childhood adversity based) experienced global dispositional flow experiences (a general measure indicating more trait-like personality features of flow during identifiable preferred activities). Athletes, however, experienced more specific flow dimensions. In competition, they matched their skills with the challenges of the play, their awareness of competing merged with their physical actions, and they concentrated on the activity with a greater sense of control. The athletes endorsed more experiences of unambiguous feedback between their internal perceptions and the environmental demands of competition, and their ability to concentrate unselfconsciously offered them greater flow experiences. The three activity-based groups endorsed similar autotelic personality traits. Surprisingly, the group with more childhood adversity endorsed higher levels of autotelic experience and transformation of time. Although difficult to determine based on the current study design, perhaps this group, who experienced more childhood adversity, engaged in flow-based activities to derive meaning and pleasure in life. Opportunities to experience the positive effects of flow increase self-efficacy (Anderson, Winett, and Wohcik 2007; Maes and Karoly 2005; Rasmussen et al. 2006), and quality of life (de Manzano et al. 2010). Unfortunately, this group that experienced a high level of adversity in childhood also had greater difficulty regulating emotional responses, and they employed more emotion-oriented coping under stressful situations. They identified emotional preoccupation patterns that dominated their attention and incapacitated their ability to shift focus away from distressing feelings. This finding suggests that, despite the positive effects of autotelic experiences, greater adversity in childhood did presage a later increase in emotional difficulties. Of note, this finding may be related to the large number of performing artists in the sample who had two or more adverse childhood experiences (67.9 percent) compared to the athlete group (12.5 percent) and the control group (19.6 percent). The performing-artist group also employed

	No ACE	1 ACE	2 + ACE
Age	23.46(5.50)	24.00(4.80)	23.93(6.05)
Task-oriented coping	58.35(11.34)	61.23(10.73)	58.42(12.17)
Emotional-oriented coping	41.20(11.91)	44.53(12.34)	47.80(11.92)**
Avoidance-oriented coping	50.67(13.15)	51.79(11.28)	51.51(11.51)
DERS-Ln	2.08(.55)	2.21(.67)	2.34(.63)*
DFS2-global	3.85(.64)	3.93(.62)	3.78(.51)

Abbreviations: ACE = adverse childhood experiences; DERS-Ln = natural log of difficulty with emotion regulation; DFS2-global = global dispositional flow

MANCOVA (age and gender as covariates) comparison of mean scores showing significant group differences for dancers, opera singers, and elite athlete groups

*p < .05; **p < .01

Figure 3. Mean descriptive statistics and standard deviations (SD) for ACE groups

	No ACE	1 ACE	2 + ACE
DFS2-CSB	3.84(.69)	4.00(.65)	3.93(.63)
DFS2-MAA	3.63(.70)	3.68(.74)	3.65(.69)
DFS2-CG	4.10(1.19)	4.20(.64)	4.10(.64)
DFS2-UF	3.92(.72)	3.99(.80)	3.91(.72)
DFS2-CTAH	3.88(.68)	3.92(.72)	3.82(.77)
DFS2-SC	3.82(.72)	3.95(.82)	3.82(.70)
DFS2-LSC	3.21(.92)	3.27(1.01)	3.16(.76)
DFS2-TT	3.39(.83)	3.58(.90)	3.65(.79)**
DFS2-AE	4.25(.70)	4.41(.69)	4.42(.50)*

Abbreviations: DFS2 = Dispositional flow scale; CSB = Challenge-skill balance; MAA = Merging actions and awareness; CG = Clear goals; UF = Unambiguous feedback; CTAH= Challenge of the task at hand; SC = Self-control; LSC = Loss of self-consciousness; TT = Transformation of time; AE = Autotelic experiences

MANCOVA (age and gender covariates) comparison of mean scores showing significant group differences for dancers, opera singers, and athlete groups

*p < .05. **p < .01

Figure 4. Mean descriptive statistics and standard deviations (SD) for ACE group flow scales

more emotion-oriented coping strategies. The artist group that had experienced more adversity in childhood evidenced greater difficulties managing distressful emotions, and under stress, its members relied on more emotion-oriented coping strategies. These responses suggest that the artists who experienced greater adversity in childhood struggle more with emotional regulation compared to the athlete and those in the control groups.

The positive-flow findings in our study reinforce studies identifying mental toughness and dispositional flow experiences. In fact, mental toughness and flow strongly predict each other with greater flow experiences related to greater mental toughness and vice versa (Crust and Swann 2013). Preliminary findings suggest that dispositional flow is a personality trait, a factor strongly influenced by genetic inheritance (Mosing et al. 2012). Studies further indicate that individuals with autotelic personalities are under increased dopaminergic control in the basal ganglia (de Manzano et al. 2013), and a transient state of hypofrontality enables a temporary suppression of the analytical cortical functions (Dietrich 2004). These neurobiological conditions indicate the positive nature of flow (high dopamine levels), especially suggesting that the higher analytic regions of the brain do not interfere with the sensorimotor responses that facilitate optimal physical performance in preferred and practiced activities.

The results from this study indicate that childhood adversity did not limit general global flow experiences. In fact, those with more adversity had higher autotelic personalities. Our nonclinical sample may reflect individuals who are more resilient or hardy, in part because this sample of participants did not need clinical treatment to manage their childhood adversity. Support for our findings include one study that demonstrated lifetime adversity at moderate levels might actually make us stronger (Seery, Holman, and Silver 2010). Some individuals can overcome childhood adversity, reporting no physical or mental-health problems. McGloin and Widom (2001) found that 22 percent of abused and neglected children met criteria for resilience. Whether resilience is related to hardiness or autotelic personality is not yet known, but evidence suggests that highly neurotic individuals (a big-five personality trait indicating more difficulty regulating negative emotions) are not more reactive to adverse events (Endgelhard, van den Hout, and Lommen 2009). Although surprising, neurosis does not equate with ineffectual behaviors during stressful events.

Personality researchers, Belen Mesurado and his colleagues (2013), demonstrated that flow is positively influenced by the Big Five personality traits of extraversion, openness to experience, and conscientiousness. Noteworthy,

autotelic personality traits included low neuroticism and agreeableness in the Big Five assessments (Ross and Keiser 2014; Ullen et al. 2012). Environmental factors that positively influence flow experiences included perceived support in childhood from parents, adolescent peer relationships, positive adult experiences, love relationships, and personality traits (Collishaw et al. 2007; Rutter 2006). In a study on emotional contagion, positive emotions may crossover from one person to another, including between teachers and students. The contagion effect augments flow experiences for both (Bakker 2005). Individuals with an autotelic personality enjoy long-term academic success, a further indicator that enhanced flow experiences reinforce resilience and optimal performances (Busch et al. 2013).

These positive-flow findings of resilience, optimal performance, flow contagion, and the importance of relational support reflect our results. Perhaps our sample experienced optimal autotelic flow because they participated in activity-based experiences (performing arts, athletics, and such recreational activities as running, soccer, or martial arts) within environments that potentially offered supportive and meaningful relationships, especially for the athlete group, who had strong relationships with their coaches and team players. Engaging in these activities may mediate the negative self-schemas created during adverse childhood experiences (Wright, Crawford, and del Castillo 2009). The findings in this study suggest that athletes demonstrated the strongest ability to cope effectively in stressful situations, manage difficult emotions, and enjoy more intense flow experiences.

Limitations in this study include a gender imbalance. Researchers managed this imbalance by including gender as a covariate in the multivariate analyses. The use of self-report instruments increases subjective biases. Studying the relationship between variables (correlational design) deters the ability to determine causal effects of flow on individuals with more childhood adversity. Longitudinal studies could address this limitation.

Robust evidence demonstrates that childhood adversity operates like a dose-response effect, with greater adversity associated with increased potential for a diagnosis of a psychiatric disorder (Pietrek et al. 2013), including depression (Heim, Plotsky, and Nemeroff 2004), nonsuicidal self-injury (Goldstein et al. 2009; Kaess et al. 2013), and adult medical diseases (Felitti and Anda 2010). Childhood adversity accounts for 29.8 percent of all disorders across countries (Kessler et al. 2010), with long-term health outcomes that persist with aging (Danese and McEwen 2012; Springer et. al. 2003). Like these, our study also indicates that greater childhood adversity is associated, in particular, with

more difficulty regulating emotions and employing more emotion-oriented coping strategies. These are strong reasons to create policies to address childhood adversity, including decreasing the incidence of childhood abuse and neglect and increasing the opportunities to engage in meaningful relationships while participating in preferred positive play-based activities. The study findings support play-based activities such as athletics and the performing arts as a means of increasing opportunities for flow experiences, experiences that enhance resilience and provide greater satisfaction in life (Anderson et al. 2007; Rasmussen et al. 2006).

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