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A Comparison Of Female And Male Youth Across Skill Level In Their Stress Appraisal, Perceived Controllability, And Coping Function In Sports

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ABSTRACT

More than half of adolescents in the United States participate in organized sports, yet increasing rates of athlete dropout are associated with poor coping skills related to social pressures and perceptions of competence. This study examines coping processes of youth athletes to support the development of evidence-based interventions to improve athlete coping. In this study, 310 youth volleyball athletes were surveyed immediately following a High Performance tryout. The athletes were compared across gender and skill level regarding their self-reported coping experiences, stress appraisal, perceived controllability, perceived coping effectiveness, and performance self-rating. Greater perceived controllability was associated with more problem-focused coping, more emotion-focused coping, and less avoidance-focused coping. Males were more likely to use avoidance-focused coping compared to females. The relationships between how athletes coped and perceived coping effectiveness were not moderated by their perception of control, but greater perceived controllability, problem-focused coping, and emotion-focused coping predicted greater perceived coping effectiveness. Greater perceived controllability also predicted higher performance self-rating. These results suggest differences in coping according to gender and skill level and have important implications for future research and leveraging positive psychology in the development and implementation of mental skills training programs for youth athletes.

Keywords: Student athletes, coping, stress, performance.

Introduction

More than half (56%) of U.S. adolescents reported participating in at least one organized sport during the previous twelve months (Black et al., 2022), which is a promising statistic given that participation in youth sports has been linked to a variety of positive behaviors, attitudes, and outcomes, such as better physical health, academic grades, and self-concept (Merkel, 2022). With such important benefits to be gained through sport participation, the sizable decline in youth sport participation across the U.S. from 2008-2018 is concerning (Aspen Project Play, 2019) . Recently, there has been a gradual rebound in overall sport participation in children ages six to seventeen, though the rates of team sport participation continue to drop (State of Play, 2022). This decline has been attributed to athletes' poor coping skills related to social pressures and perception of competence (Crane & Temple, 2015). Participation in youth sports can expose athletes to stressful or threatening experiences, such as pain, fear, lack of confidence, performance anxiety, pressures and expectations from parents or coaches, social attention and evaluation, conflicts with teammates and opponents, injury and rehabilitation, performance slumps, and the general demands of playing a sport (Neal et al., 2015; Nicholls & Polman, 2007; Reeves et al., 2009; Tamminen & Holt, 2010). Excessive stress is linked to psychological and physiological disruption, which may then lead to performance difficulties, chronic fatigue, injuries, emotional control problems, burnout, and decreased satisfaction with sport (Crocker et al., 1988; Crum et al., 2013; Gould et al., 1996; Heffer & Willoughby, 2017; Kowalski & Crocker, 2001). Therefore, in order to limit athlete dropout in sports, it is imperative for student athletes to successfully manage and cope with the combination of both general and sport-specific

stressors they face so they may successfully maintain their roles as both students and athletes.

For the purpose of this review, coping strategies will be characterized into the three 'functional dimensions' most often observed in the literature: problem-focused coping (PFC), emotion-focused coping (EFC), and avoidance-focused coping (AFC; Nicholls & Polman, 2007). PFC strategies serve the function of actively changing the person-environment relationship. These strategies may include increasing effort and concentration, utilizing one's performance strengths, goal planning, and seeking critical feedback to improve oneself (Folkman & Lazarus, 1985; Ntoumanis & Biddle, 1998). Conversely, EFC strategies serve to manage the emotional and physiological distress generated by stressors while still remaining in the stressful environment and include venting, relaxation, utilizing social supports and humor, and reimagining one's anxiety as constructive (Kowalski & Crocker, 2001). AFC involves distancing oneself or disengaging from the stressful situation with psychological distancing such as cognitive blocking or decreasing effort or behavioral distancing such as physically removing oneself from the stressful environment or task (Lazarus & Folkman, 1984; Poczwardowski & Conroy, 2002).

Research indicates athletes, particularly youth athletes, often fluctuate between using all three functional types of coping strategies (Nicholls et al., 2005). Research consistently demonstrates employing more adaptive coping strategies in response to stressors is associated with better life adjustment (Heffer & Willoughby, 2017; Weiten & Lloyd, 2008), better physical and psychological health outcomes (Crum et al., 2013; Penley et al., 2002), and better performacne in sport (Doron & Martinent, 2017; Lewis et al., 2017). However, reported differences in youth athletes' coping (Nicholls et al., 2009; Reeves et al., 2009) suggest the need for researchers to further investigate youth athletes (Nicholls & Polman, 2007) to enhance the currently underdeveloped literature on child and adolescent coping in sport.

Folkman (1991; 1992) suggested a useful method of studying coping effectiveness (CE) would be assessing the quality of one's coping rather than the outcomes associated with the strategies. Folkman (1991; 1992) proposed the goodness-of-fit model of coping effectiveness, which is underpinned by the transactional model of stress and coping (Lazarus & Folkman, 1984) and the cognitive-motivational-relational theory (Lazarus, 1991), and assesses two 'fits.' The first fit refers to the match between what is actually happening in an individual's person-environment transaction and his or her appraisal of the personal significance of that transaction. The second fit refers to the match between an individual's appraisal of his or her controllability of the coping transaction and the function of his or her coping strategies employed (Folkman, 1991; 1992).

Several studies provide empirical support for the goodness-of-fit hypotheses by evidencing that situational appraisals and perceived controllability are associated with coping function among athletes (e.g., Kowalski et al., 2005; Poliseo & McDonough, 2012). Nicholls and Ntoumanis (2010) posited that the goodness-of-fit model has been one of the most commonly applied models in sport research, yet there remains a dearth of studies examining the model among athletes, particularly youth athletes. Therefore, this study aims to further examine the relationships between stress appraisals, perceived controllability, and coping strategies to better understand youth athletes' coping processes.

Little is known regarding how coping effectiveness and other coping-related variables may differ across youth athletes' gender or skill level (Nicholls et al., 2007). Some researchers found gender differences in adolescent coping processes (Britton et al., 2019) while other studies found no gender differences among coping strategies at all (Kim & Tamminen, 2022). The discrepancies among these findings suggest that the overall influence of gender on youth athletes' coping processes remains unclear and, therefore, warrants further examination. Minimal studies have compared stress appraisal, controllability, or coping function across athletes' skill level and none have investigated these among youth athletes. In their study of 749 undergraduate athletes, Nicholls and colleagues (2007) found preliminary evidence that coping strategies and coping effectiveness vary based on athletes' skill level; international athletes (the sample's most skilled athletes) reported their

technique-oriented coping and relaxation strategies as more effective compared to club and university athletes. This is important to consider when tailoring interventions or trainings for athletes of different skill levels and therefore warrants further examination of the influence of skill level on the coping process.

This study examines the coping processes of youth athletes by evaluating how coping function, stress appraisal, perceived controllability, perceived coping effectiveness, and performance self-rating differ across gender and skill level. Additionally, while preliminary support for using the matching hypothesis of the goodness-of-fit model as a way to assess coping effectiveness exists, limited research has specifically assessed the coping processes of youth athletes during competitive sport situations based on this conceptual framework. Therefore, this study will discuss whether youth participants' perceived coping effectiveness ratings align with the matching hypotheses of the goodness-of-fit model according to their perceived controllability and coping function. Finally, this study will fill a sizable methodological gap by examining adolescent athletes' appraisal of, and coping response to, the same stressful event, rather than an unspecified event from their past. Such findings can then inform the development of future coping skills interventions from both a theoretically and methodologically sound perspective.

Method

This study represented a descriptive-comparative correlational design, wherein the relationships between variables were examined across the participants' gender (males vs. females) and skill level (less-skilled athletes vs. more-skilled athletes). All data were collected from self-report surveys that were administered to volleyball athletes immediately following their participation in a tryout to be selected for the state's High-Performance teams.

Demographic information including age, gender, and race/ethnicity was collected from each athlete (see Table 1). Athletes' skill level, which served as the second predictor variable, was measured according to the outcomes of the High Performance Tryout. The athletes were evaluated by a panel of Florida's elite volleyball coaches, from both the juniors and collegiate levels. For the purpose of this study, athletes who were not selected to attend an advanced training camp based on coaches' evaluation of their tryout performance were categorized as "skill level 1", which represented the less-skilled group. Conversely, those athletes who were selected to attend the Florida Region's High Performance Training Camp were categorized as 'skill level 2', which represented the more-skilled group.

Table 1: Demographics of High School Athletes in High Performance Volleyball Tryout

	N = 310	%
Female	226	72.9
Male	84	27.1
African American, of African or Caribbean Descent, or Black	26	8.4
Asian or Asian American	9	2.9
Caucasian, White, of European descent or European	167	53.9
Hispanic, Latina(o)	56	17.9
Native Hawaiian or Pacific Islander	5	1.6
Native American or Alaska Native	1	0.3
Multiethnic/racial identities	43	14.0
Did not disclose	3	1.0
Age	Mean (Standard Deviation) = 14.5 (1.66)	
Years playing volleyball	Mean (Standard Deviation) = 4.5 (2.00)	

The criterion variables of interest in this study included stress appraisal, perceived controllability, perceived coping effectiveness, performance self-rating, and coping function (i.e., PFC, EFC, and AFC). Participants appraised their stress level specific to the tryout event via

the stress thermometer, which is a one-item measure asking participants to indicate the amount of stress they experienced in a given situation by using a scale ranging from 0 (no stress at all) to 100 (extreme stress; Kowalski & Crocker, 2001). Athletes' perceived controllability was assessed using three items from Hart and Cardozo (1988), which measured their perceived control over their emotions ("I felt in control of my emotions"), their performance ("I felt in control of my performance"), and the situation ("I felt in control of the situation"). An additional 'overall control' item ("Overall, I felt in control") was added, thereby creating a four-item scale. Participants rated each item using a five-point rating scale ranging from 0 (not at all) to 4 (a great deal). The sum of these four ratings ranged from 0 to16 and comprised the athlete's total 'perceived controllability' score, wherein higher scores indicated greater perceived control.

Athletes' perceived coping effectiveness was measured by one question: "On a scale ranging from 0 (completely ineffective) to 100 (completely effective), how would you rate the overall effectiveness of your coping skills during the High Performance tryout"? This 0 to 100 value, wherein higher scores indicated greater perceived coping effectiveness, represented the 'coping effectiveness' variable. To discern how athletes perceived their own performance during the tryout, athletes rated their overall tryout performance on a 0 (worst performance) to 100 (best performance) scale. This 0 to 100 value, wherein higher scores indicated more successful performance, represented the 'performance self-rating' variable.

Coping function refers to the intended purpose behind selecting a given strategy to manage a stressor (e.g., PFC, EFC, AFC). In order to measure coping function, the athletes completed the Coping Function Questionnaire (CFQ; Kowalski & Crocker, 2001), an 18-item measure, divided into three subscales: PFC, EFC, and AFC. All items were rated on a five-point scale ranging from 1 (not at all) to 5 (very much). Since the athletes completed the CFQ in response to how they coped during the tryout, some of the CFQ items were modified to include language that more closely matched the tryout situation (e.g., referring to the "tryout experience").

The participants were among the approximately 400 youth volleyball athletes who attended one of the 2017 High Performance tryouts hosted by Florida Region of USA Volleyball. Inclusion criteria for this study required that all participants (1) were youth athletes ages 10 to 19 trying out for a position on one of the Florida Region's High Performance teams, and (2) provided a signed consent form from a parent or guardian if the participant was younger than 18 years of age. The study was approved by the PI's Institutional Review Board. The principal investigator informed interested participants that the incentives included a free tee-shirt and the opportunity to be entered into a prize drawing for an Apple iPad Air 2. The total sample of 310 youth athletes (N = 310) was comprised of 72.9% females (n = 226) and 27.1% males (n = 84).

The first set of researcher questions were: "what is the relationship between youth volleyball athletes' perceived controllability and (1) PFC, (2) EFC, and (3) AFC? and How do these relationships vary according to youth volleyball athletes' (1) gender and (2) skill level?" To answer the first part of this research question, three correlational analyses were conducted: (1) perceived controllability with PFC, (2) perceived controllability with EFC, and (3) perceived controllability with AFC. For the second part of the question, athletes' gender and skill level each served as predictor variables across which these correlations were further compared. Finally, to compare the correlations across gender and skill level, respectively, the correlation coefficients were transformed to z-scores and compared for statistically significant differences using Fisher's Test. A post-hoc power analysis revealed power of .99 to demonstrate a medium effect size (d = .30) with a Bonferroni corrected α-level set at $.00\overline{3}$. It was hypothesized that higher ratings of perceived controllability will correlate with higher scores of PFC and lower scores of EFC and AFC, the strength of the correlations between perceived controllability and coping function will be stronger among males and more skilled athletes.

The second research question was: "does stress appraisal, perceived controllability, coping function, perceived coping effectiveness, and performance self-ratings differ across youth

volleyball athletes' (1) gender and (2) skill level?" To answer this question, a 2x2 multivariate analysis of variance (MANOVA) was conducted to compare seven dependent variables (i.e., stress appraisal, perceived controllability, PFC, EFC, AFC, perceived coping effectiveness, and performance self-ratings) between (1) males and females and (2) skill level 1 and skill level 2. A post-hoc power analysis revealed power of .99 to demonstrate a medium effect size ($f = .25$).

The third research question was: "does perceived controllability, coping function (i.e., PFC, EFC, AFC), and the interaction between perceived controllability and coping function predict youth volleyball athletes' (1) perceived coping effectiveness and (2) performance self-rating?" To answer this question, multiple linear regressions were conducted to assess the impact of coping function, perceived controllability, and their interaction on perceived coping effectiveness and performance self-rating, respectively. A post-hoc power analysis revealed power of .99 to demonstrate a medium effect size ($f^2 = .15$) with a Bonferroni corrected α-level set at .008.

Results

To explore the relationships between perceived controllability and (1) PFC, (2) EFC, and (3) AFC, three Spearman's rank-order correlational analyses were conducted across the sample. Greater perceived controllability, which was calculated as the sum of the ratings from the four control statements, was associated with more PFC ($\rho = .21$, $p < .001$), more EFC ($\rho = .18$, $p = .002$), and less AFC ($\rho = -.29$, $p < .001$). Each of these three statistically significant correlations represented small effect sizes (Cohen, 1988), although the correlation between perceived controllability and AFC was nearing a medium effect size.

Then, to examine how these correlations varied according to the participants' gender, the data were split according to males and females, and the same correlational analyses were run. For female participants, perceived controllability was significantly correlated with PFC ($\rho = .24$, $p < .001$), EFC ($\rho = .24$, $p < .001$), and AFC ($\rho = -.20$, $p = .002$). Although each of these correlations represented small effect sizes, these findings suggested that greater perceived controllability was associated with more PFC and more EFC, but less AFC for female participants. For male participants, a nearly opposite phenomenon occurred, such that perceived controllability was not significantly correlated with PFC ($\rho = .17$, $p = .131$) or EFC ($\rho = .07$, $p = .514$); however, perceived controllability was significantly associated with AFC ($\rho = -.51$, $p < .001$) and represented a large effect. These results indicated that greater perceived controllability was associated with less AFC for male participants. To compare whether these respective correlations were significantly different between males and females, the correlation coefficients were transformed to z-scores and compared for statistical differences using Fisher's Z Test (Preacher, 2002). When comparing males and females, the differences between the correlations of perceived controllability with PFC ($Z = 0.58$, $p = .565$) and with EFC ($Z = 1.27$, $p = .203$) were not statistically significant. However, the difference between the correlations of perceived controllability with AFC ($Z = 2.70$, $p = .007$) was statistically significant. This finding suggests that the inverse relationship between perceived controllability and AFC was significantly stronger for male participants as compared to females.

Next, the original data were split according to skill level 1 (less-skilled) and skill level 2 (more-skilled) to determine how these correlations varied according to the participants' skill level. For participants rated as skill level 1, perceived controllability was significantly associated with PFC ($\rho = .24$, $p < .001$), EFC ($\rho = .19$, $p = .005$) and AFC ($\rho = -.21$, $p = .002$), such that greater perceived controllability was correlated with more PFC and EFC and less AFC. These correlations represented small effects. For the skill level 2 participants, perceived controllability was significantly correlated with AFC ($\rho = -.47$, $p < .001$); this finding represented a medium effect and indicated that greater perceived controllability was associated with less AFC. However, perceived controllability was not associated with PFC ($\rho = .15$, $p = .172$) or EFC ($\rho = .12$, $p = .270$) in those participants rated as more skilled. Again, to compare whether these

respective correlations were significantly different between skill level 1 and skill level 2 athletes, the correlation coefficients were transformed to z-scores and compared for statistical differences using Fisher's Z Test (Preacher, 2002). When comparing skill level 1 and skill level 2 participants, the differences between the correlation coefficients of perceived controllability with PFC ($Z = 0.74$, $p = .459$) and with EFC ($Z = 0.54$, $p = .589$) were not statistically significant. However, the difference between the correlation coefficients of perceived controllability and AFC was significant ($Z = 2.27$, $p = .023$). This finding indicates that the inverse relationship between perceived controllability and AFC was stronger for more-skilled athletes compared to less-skilled athletes.

To assess whether stress appraisal, perceived controllability, coping function, perceived coping effectiveness, and performance self-ratings differ across youth volleyball athletes' (1) gender and (2) skill level, a 2x2 multivariate analysis of variance (MANOVA) was conducted to compare seven dependent variables (i.e., stress appraisal, perceived controllability, PFC, EFC, AFC, perceived coping effectiveness, and performance self-ratings) between (1) males and females and (2) skill level 1 and skill level 2. MANOVA excludes cases according to listwise deletion, which removes all cases that have a missing value for one the variables being tested. Therefore, 301 participants were included in the following MANOVA analyses. Table 2 displays the descriptive statistics for the criterion variables according to gender, skill level, and gender by skill level.

Table 2: Descriptive Statistics for Stress Appraisal, Perceived Controllability, Perceived Coping Effectiveness, Performance Self-Rating, and Coping Function for Gender, Skill Level, and Gender by Skill Level

Variables	Gender	Skill level	M	SD	N
Stress Appraisal (0-100 scale)	Male	1	43.45	25.26	62
		2	41.8	26.54	20
		Total	43.05	25.42	82
Stress Appraisal (0-100 scale)	Female	1	39.60	26.51	154
		2	35.85	24.83	65
		Total	38.49	26.02	219
	Total	1	40.71	26.16	216
		2	37.25	25.21	85
		Total	39.73	25.90	301
Perceived Controllability (0-16 scale)	Male	1	13.08	3.02	62
		2	12.85	4.15	20
		Total	13.02	3.31	82
	Female	1	12.02	3.77	154
		2	13.26	2.65	65
		Total	12.39	3.51	219
	Total	1	12.32	3.60	216
		2	13.16	3.05	85
		Total	12.56	3.47	301
Perceived Coping Effectiveness (0-100 scale)	Male	1	74.29	23.76	62
		2	75.25	26.31	20
		Total	74.52	24.25	82
	Female	1	72.61	21.60	154

		2	75.71	20.13	65
		Total	73.53	21.17	219
	Total	1	73.09	22.20	216
		2	75.60	21.57	85
		Total	73.80	22.02	301
Performance Self-Rating (0-100 scale)	Male	1	72.03	19.11	62
		2	70.40	28.01	20
		Total	71.63	21.43	82
	Female	1	69.38	19.31	154
		2	74.92	15.90	65
		Total	71.03	18.50	219
Performance Self-Rating (0-100 scale)	Total	1	70.14	19.25	216
		2	73.86	19.33	85
		Total	71.19	19.31	301
Problem-Focused Coping (1-5 scale)	Male	1	3.51	0.89	62
		2	3.48	1.16	20
		Total	3.51	0.96	82
	Female	1	3.59	0.95	154
		2	3.78	0.91	65
		Total	3.65	0.94	219
	Total	1	3.57	0.94	216
		2	3.71	0.97	85
		Total	3.61	0.95	301
Emotion-Focused Coping (1-5 scale)	Male	1	3.50	0.92	62
		2	3.60	1.11	20
		Total	3.53	0.96	82
	Female	1	3.65	0.88	154
		2	3.93	0.83	65
		Total	3.73	0.87	219
	Total	1	3.61	0.89	216
		2	3.85	0.91	85
		Total	3.68	0.90	301
Avoidance-Focused Coping (1-5 scale)	Male	1	1.39	0.82	62
		2	1.48	0.90	20
		Total	1.41	0.84	82
	Female	1	1.23	0.53	154
		2	1.21	0.57	65
		Total	1.22	0.54	219
	Total	1	1.28	0.63	216
		2	1.27	0.67	85
		Total	1.28	0.64	301

There was not a significant interaction between gender and skill level (Pillai's Trace = .012, F (7, 291) = 0.48, p = .846), and the interaction only accounted for 1.2% of the variance in the criterion variables. Similarly, there was no main effect for skill level (Pillai's Trace = .015, F (7, 291) = 0.62, p = .742), which only accounted for 1.5% of the variance. However, there was a main effect for gender (Pillai's Trace = .048, F (7, 291) = 2.10, p = .043), which accounted for 4.8% of the variance

in the dependent variables. To further assess the significant main effect for gender, post-hoc between-subjects effects were conducted. The results indicated that male and female participants were only significantly different regarding AFC ($F (1, 297) = 5.16$, $p = .024$). Male participants reported significantly more use of AFC ($M = 1.43$, $SE = 0.08$) compared to female participants ($M = 1.22$, $SE = 0.05$). Otherwise, males and females were not significantly different regarding stress appraisal ($F (1, 297) = 1.63$, $p = .203$); perceived controllability ($F (1, 297) = 0.41$, $p = .524$); perceived coping effectiveness ($F (1, 297) = 0.04$, $p = .852$); performance self-rating ($F (1, 297) = 0.11$, $p = .744$); PFC ($F (1, 297) = 1.83$, $p = .177$); and EFC ($F (1, 297) = 3.23$, $p = .073$).

The third research question assessed wheter perceived controllability, coping function (i.e., PFC, EFC, and AFC), and the interaction between perceived controllability and coping function predict youth volleyball athletes' (1) perceived coping effectiveness and (2) performance self-rating. The addition of the interaction terms between coping function (i.e., PFC, EFC, or AFC) and perceived controllability did not significantly predict either perceived coping effectiveness or performance self-rating. The PFC model significantly predicted perceived coping effectiveness, explaining 24% of its variance. See Table 3. PFC and perceived controllability both significantly predicted perceived coping effectiveness. See Table 4. The EFC model also significantly predicted perceived coping effectiveness, and its predictors together accounted for 24% of the variance in perceived coping effectiveness. EFC and perceived controllability both significantly predicted perceived coping effectiveness. Finally, the AFC model also significantly predicted perceived coping effectiveness, and its predictors together explained 19% of the variance in perceived coping effectiveness. However, perceived controllability significantly predicted perceived coping effectiveness, while AFC did not.

Table 3: Summaries of the PFC, EFC and AFC Regression Models Predicting Perceived Coping Effectiveness and Performance Self-Rating

				Change Statistics				
Model	Block	R	R^2	R^2 Change	F Change	df 1	df 2	p
Perceived Coping Effectiveness								
PFC Model	1[a]	.486	.236	------	46.13	2	299	< .001
	2[b]	.487	.237	.001	0.50	1	298	.480
EFC Model	1[c]	.486	.236	------	46.18	2	299	< .001
	2[d]	.487	.237	.001	0.44	1	298	.508
AFC Model	1[e]	.432	.187	------	34.29	2	299	< .001
	2[f]	.435	.189	.003	0.93	1	298	.337
Performance Self-Rating								
PFC Model	1[a]	.397	.158	------	28.16	2	301	< .001
	2[b]	.400	.160	.003	0.83	1	300	.362
EFC Model	1[c]	.397	.158	------	28.14	2	301	< .001
	2[d]	.397	.158	.000	0.01	1	300	.921
AFC Model	1[e]	.401	.161	------	28..81	2	301	< .001

2[f]	.401	.161	.000	0.00	1	300	.989

[a] Predictors included PFC and perceived controllability
[b] Predictors included PFC, perceived controllability, and PFC*perceived controllability
[c] Predictors included EFC and perceived controllability
[d] Predictors included EFC, perceived controllability, and EFC*perceived controllability
[e] Predictors included AFC and perceived controllability
[f] Predictors included AFC, perceived controllability, and AFC*perceived controllability

The PFC model significantly predicted performance self-rating, explaining 16% of its variance. See Table 3. The EFC model also significantly predicted performance self-rating, and its predictors together accounted for 16% of the variance in performance self-rating. Finally, the AFC model also significantly predicted performance self-rating, and its predictors together explained 16% of the variance in performance self-rating. However, only perceived controllability significantly predicted performance self-rating in each model. See Table 4.

Table 4: Examining Coping Function and Perceived Controllability as Predictors of Perceived Coping Effectiveness and Performance Self-Rating

		Predictors			Model Statistics			
		B[1]	t	p	R^2	F	df	p
Perceived Coping Effectiveness								
PFC Model					0.24	46.13	2	< .001
	PFC	5.36	4.48	< .001				
	Perceived Controllability	2.45	7.49	< .001				
EFC Model					0.24	46.18	2	< .001
	EFC	5.61	4.49	< .001				
	Perceived Controllability	2.48	7.59	< .001				
AFC Model					0.19	34.29	2	< .001
	AFC	-1.62	-0.86	.390				
	Perceived Controllability	2.64	7.59	< .001				
Performance Self-Rating								
PFC Model					0.16	28.16	2	< .001
	PFC	-0.23	-0.21	.833				

	Perceived Controllability	2.22	7.41	< .001				
EFC Model					0.16	28.14	2	< .001
	EFC	-0.13	-0.11	.913				
	Perceived Controllability	2.22	7.42	< .001				
AFC Model					0.16	28.81	2	< .001
	AFC	-1.79	-1.07	.286				
	Perceived Controllability	2.12	6.86	< .001				

[1]unstandardized regression coefficients

Discussion

Question 1: The Relationship Between Perceived Controllability and Coping Function.

Athletes who perceived greater controllability over their emotions, their performance, and the situation, were more likely to use PFC and EFC, while they were less likely to use AFC. The positive correlation between perceived controllability and PFC aligns with Folkman's (1991; 1992) matching hypothesis of the goodness-of-fit model of coping effectiveness. Conversely, unlike Folkman's model (1991; 1992), the findings of this research suggested a small positive relationship between perceived controllability and EFC. While Folkman's (1991; 1992) model of coping effectiveness does not specifically discuss AFC, this study found that athletes were more likely to use AFC when their perceived controllability was low. However, long-term avoidance of stressors is not an effective coping technique, and as we consider the skills that are important to teach young athletes to help them learn to cope with stress throughout their lives, these participants would benefit from interventions that enhance their coping repertoire.

The findings regarding gender were unique, such that most of the correlations that were significant for females were not significant for males. Females who perceived greater controllability were more likely to use PFC and EFC, but there was no association between perceived controllability and PFC or EFC for males. However, males and females both rated a significant inverse relationship between perceived controllability and AFC, with this correlation significantly stronger for males and representing a large effect. Taken together, these results suggest more gender differences than similarities in regard to the relationships between perceived controllability and coping function. Future coping skills interventions and other mental skills training programs would likely be more potent and effective if they assess for pre-existing coping styles and account for possible cultural and developmental influences related to gender.

The results of these correlational analyses according to skill level also revealed differences between the skill groups. Unlike the more-skilled athletes, less-skilled athletes (i.e., skill level 1) who perceived greater controllability were more likely to use PFC and less likely to use AFC. Although the relationship between perceived controllability and AFC was significant for both skill groups, the correlation was significantly stronger for the more-skilled athletes. This finding suggests that better athletes were much less likely to use strategies like distraction or disengagement to cope with the stress of the tryout when they perceived higher controllability. On the other hand, less-skilled athletes who perceived greater controllability were more likely to expend more resources on PFC, while more-skilled athletes did not report this same association. Perhaps, these more skilled athletes are generally more comfortable with the stressors related to performance and therefore less likely to need to implement strategies for coping with stress.

Question 2: Comparing Stress, Control, Coping, and Performance Between Gender & Skill Level.

Results from the MANOVA revealed that there was no statistically significant interactions between gender and skill level across the seven dependent variables. Similarly, there was no significant main effect for skill level. These nonsignificant gender differences corroborate with previous studies in the coping in sport literature (Bebetsos & Antoniou, 2003; Nicholls et al., 2007). Although the statistical results of the MANOVA were generally unremarkable, the findings will be anecdotally discussed according to the pattern of responses across gender and skill level based on means (Table 1) to explore trends in the data.

In the less-skilled group (i.e., skill level 1), females endorsed worse performance self-ratings compared to males. However, this pattern reversed in the more-skilled group (i.e., skill level 2), such that the more-skilled females rated their performance more favorably than the more-skilled males. Regarding perceived stress during the tryout, less-skilled males rated more stress than less-skilled females. However, for more-skilled athletes, this gender gap in stress appraisal was less prevalent.

Regarding coping effectiveness, males in both skill groups perceived that they coped more effectively than their female counterparts. Similarly, males in both skill groups perceived higher levels of controllability over their emotions, their performance, and the tryout situation compared to females; however, this gender discrepancy was much smaller for the more-skilled athletes. Regarding coping function, females in both skill groups rated higher use of EFC than males in both skill groups; this pattern matched previous findings that youth female athletes use EFC more than male athletes (Crocker & Graham, 1995; Kowalski & Crocker, 2001). There was no gender difference for PFC among less-skilled athletes; however, the female athletes in the more-skilled group rated greater use of PFC skills than their male counterparts. This might suggest that the use of PFC is a salient characteristic that separates more-skilled female athletes from less-skilled female athletes, although this phenomenon may not be as prevalent for males.

Question 3: Control and Coping Function as Predictors of Coping Effectiveness and Performance.

The original regression analyses were adjusted to exclude the interaction terms between coping function (i.e., PFC, EFC, or AFC) and perceived controllability because the addition of interaction did not significantly increase the predictive utility of the PFC, EFC, or AFC models in predicting either perceived coping effectiveness or performance self-rating. One explanation why this sample of youth athletes did not appear to follow Folkman's (1991; 1992) model of coping effectiveness by consistently using PFC when controllability is high and less when controllability is low, is that the athletes may perceive effective coping differently than Folkman's model hypothesized. The athletes may have considered factors such as their mood or feedback from parents and coaches as part of their assessment of how effectively they coped. Perhaps youth athletes' appraisal of coping skills do not account for the influence of perceived controllability in the selection of a coping strategy, or perhaps youth athletes operationalize effective coping in a unique way.

The adjusted PFC, EFC, and AFC models significantly predicted coping effectiveness and performance self-rating. Participants who rated higher perceived controllability, greater PFC, or greater EFC also generally rated more effective coping during the tryout. Only perceived controllability significantly predicted performance self-rating within each of the three models. These results extend the previous findings from Haney and Long (1995), which indicated that female athletes with greater perceived control also performed better, to both male and female athletes.

Given that PFC and EFC were associated with greater perceived coping effectiveness, sport coaches should focus on teaching youth athletes a repertoire of both PFC and EFC strategies that are appropriate for use during performance situations. Moreover, mental skills training programs should aim to teach athletes how to apply Folkman's (1991; 1992) matching hypothesis of the model of coping effectiveness to their coping style and reduce their use of AFC. Youth should be encouraged to assess their

perceived controllability over a stressor in order to inform their selection of a coping strategy. When perceived controllability is high, PFC is most appropriate, while EFC is most effective when perceived controllability is low (Folkman 1991; 1992). Importantly, such skills do not need to be reserved for the sport environment. Instead, these skills can be taught in both the classroom and home environment in order to help youth effectively cope with the variety of stressors they encounter.

Limitations

Given that these participants were recruited directly from tryout events, the sample represented a sample of convenience. Also, not all of the athletes who attended the tryouts opted to participate in the study. Some athletes were also unable to participate because they did not have a parent or legal guardian present with them at the tryout, and therefore the athletes could not provide appropriate informed consent. This study also exclusively studied youth athletes who play volleyball. Although the national high school sports statistics demonstrate that volleyball is a popular sport for girls and a budding sport for boys (NFHS, 2015), these findings may not readily generalize to youth athletes from other sports.

This study relied heavily on self-reported data from participants ages 10 to 19 and, therefore, is subject to potential validity concerns and social desirability biases. In addition, perceived controllability was measured as a single variable as the sum of a four-item scale that assessed control over emotions, control over performance, control over the situation, and overall control. It is possible that individually examining these different aspects of perceived control would have yielded more detailed findings. Finally, to assess coping function, this study used the Coping Function Questionnaire (CFQ); however, completing the CFQ items in a reliable manner may have been particularly challenging for the younger athletes in this study, as the self-reflective processes required to answer the CFQ likely develop at different stages across adolescence.

A limitation of this descriptive-comparative correlational research design is that it was not a true experimental design that includes a control group, random assignment, and manipulation of the independent variable. Therefore, any conclusions drawn from these findings do not evidence causality. Finally, these findings may have also been limited by the decision to divide athletes into only two skill groups, although skill level is likely better captured on a sliding scale with more variability (e.g., beginner, intermediate, advanced, elite).

Future Directions

Several directions for future research are provided based on the findings and limitations of this study. First, regarding methodology and measurement, future research should assess whether the internal consistency of the CFQ subscales (i.e., PFC, EFC, AFC) changes across age groups. Such information could better inform researchers as to the reliability of the CFQ for youth and adolescence. Next, given the findings that perceived controllability was related to perceived coping effectiveness and performance self-rating, future research is warranted to determine whether perceived controllability may be an important cognitive construct that distinguishes more-skilled athletes from their less-skilled peers. In addition, future research should assess perceived controllability as a more dynamic construct by examining how the different dimensions of control (i.e., emotional, situational, performance-related, overall) relate to coping function and perceived coping effectiveness. Finally, future studies should more distinctly explore how participation in other specific sports may impact youth's coping processes. This study's results suggest a need for researchers to continue examining the complex coping processes of youth athletes in an effort to leverage positive psychology to inform coping skills interventions that are both evidence-based and effective.

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