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The relationship between coach-created motivational climate and athletes' challenge and threat perceptions

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Abstract

The aim of this research was to examine the relationship between coach-created motivational climate and athletes' perception of challenge and threat states. For this purpose, 257 athletes from individual and team sports between the ages of 13-18 voluntarily participated in the research. Challenge and Threat in Sport (CAT-Sport) Scale, and Empowering and Disempowering Motivational Climate Questionnaire were used as the data collection tools. Descriptive statistics, Pearson correlation analysis and hierarchical regression analysis were conducted in SPSS 17. Pearson correlation analysis showed that challenge was positively and significantly correlated with empowering motivational climate along with its sub-dimensions. Also, threat positively and significantly correlated with disempowering motivational climate and its sub-dimensions. Regression analysis, after controlling for age, gender, sport type, sport experience, number of weekly training and weekly training hours, revealed that empowering motivational climate positively and significantly predicted challenge and disempowering motivational climate positively and significantly predicted threat. In the subscale level, task-involving and autonomy-supportive motivational climates positively and significantly predicted challenge and controlling motivational climate positively and significantly predicted threat. The findings emphasized the importance of the coach-created motivational climate for athletes challenge and threat in youth sports. The findings were discussed in line with the relevant literature and some suggestions for coaches were provided.

Keywords: challenge; threat; coach; disempowering; empowering; motivational climate

Introduction

There are many environmental factors that can affect athletes. One of these environmental factors is sports coaches. Therefore there are many up to date studies focusing on how sports coaches affects athletes (Sarı & Köleli, 2020; Sarı, 2019; Sarı & Derhayanoğlu, 2019). Social environment created by coaches can affect athletes. One of the most popular theories explaining coach-created environment is Empowering Disempowering Motivational Climate (EDMC) (Duda and Appleton, 2016) which amalgamates the concepts of Achievement Goal Theory (Nicholls, 1984) and Self Determination Theory (Deci & Ryan, 1985). EDMC integrates the five key components of these theories and proposes five motivational climates. These five motivational climates are named as autonomy supportive, socially supportive and task-involving constituting Empowering

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Climate. The remaining two motivational climates are controlling and ego-involving climates constituting Disempowering Climate.

Task-involving climate comprises learning of new skills, correcting mistakes, striving to be better and development of skills. Ego-involving climate includes comparing abilities and accomplishments against others. In ego-involving climate, athletes aim to be better than others and they only concern about performance results and mostly disregard personal development (Ames, 1992; Ntoumanis, N., & Biddle, 1999). The relevant researches show that task- involving climate enable athletes' sportsmanship attitudes (Gutierrez & Ruiz, 2009), positive engagement (Curran et al., 2015), enjoyment toward sport (Jaakkola et al., 2016) and autonomous motivation (Ruiz et al., 2017). On the contrary, ego-involving climate results in negative outcomes regarding athletes' sportsmanship attitudes (Gutierrez & Ruiz, 2009), mental toughness (Nicholls et al., 2016), satisfaction (Bekiari & Syrmpas, 2015) and social cohesion (Boyd et al., 2014). The other type of motivational climate proposed by EDMC is autonomy supportive climate which indicates providing choice, explaining rationale behind tasks, creating opportunities for initiative taking and giving non-controlling competence feedback for athletes (Mageau and Vallerand, 2003). Autonomy supportive coaching contributes to athletes' well-being (Haerens et al., 2018), performance (Cheon et al., 2015; Gillet et al., 2010), commitment (O'Neil and Hodge, 2020; Pulido et al., 2018) and moral behaviours (Ntoumanis and Standage, 2009; Mallia et al., 2019). On the other hand, controlling coaching climate, which promotes ego-involvement and conditional regard, comprises tangible rewards, controlling feedbacks, excessive personal control and intimidation behaviours (Bartholomew et al., 2009). Some of the negative effects of controlling coaching climate are diminished performance (Haerens et al., 2018), anti-social behaviours (Mallia et al., 2019), doping intentions (Ntoumanis et al., 2017) and burnout (Balaguer et al., 2012). The fifth type is socially supportive coaching climate in which coaches provide social support for athletes, value them as human being disregarding their sportive performance, have empathy for athletes and care for them (Reinboth et al., 2004). The relevant literature supports the fact that socially supportive coaching climate has beneficial effects on athletes (Lu et al., 2018; Malinauskas, 2008).

Sport, by its nature, involves competition and competition can increase certain athletes' stress level which is influential for athletes' various psychological outcomes. The Theory of Challenge and Threat States in Athletes (TCTSA) (Jones et al., 2009) is an attempt to explain how athletes react to competition stress by conceptualizing their perception of challenge and threat in stressful competition situations. TCTSA posits that athletes having high self-efficacy and perception of control as well as adopting achievement goals perceive competition stress as a challenge. On the other hand, athletes having low self-efficacy and low perceived control as well as focusing on avoidance goals recognize competition stress as threat (Jones et al., 2009). Perception of challenging environment positively affects athlete's psychological outcomes, whereas perceiving environmental stimulus as threating can be detrimental. Evidence from the relevant literature supports the fact that challenge state has greater effects on performance than threat state (Blascovich et al., 2004; Hase et al., 2019; Turner et al., 2012; Turner et al., 2013).

Athletes' challenge and threat states are also referred as *pre-competitive states* (Jones et al., 2009; Rossato et al., 2016). If athletes' perceived resources meet or exceed perceived demands required by upcoming performance situations, athletes experience challenge. On the other hand, if athletes' perceived demands eclipse their perceived resources they experience threat (Blascovich and Tomaka, 1996). Namely, athletes'

resource and demand appraisals before a competition can affect their pre-competitive state and subsequent performance (Turner, 2012). Therefore, most studies concerning athletes' challenge and threat states examine the effects of these two concepts on athletic performance (Blascovich et al., 2004; Hase et al., 2019; Turner et al., 2012). However, rather than investigating the performance outcomes alone, it is also important to investigate how athletes' challenge and threat states are linked to their psycho-social environments.

Competition stress perceived by athletes as "challenge" or "threat" can cognitively, affectively and physiologically influence athletes (Blascovich et al., 2004; Chadha et al., 2019; Hase et al., 2019; Turner et al., 2012; Turner et al., 2013). Despite the above mentioned importance of athletes' challenge and threat perception, this is a very less-researched area. Moreover, to the best of authors' knowledge, there is not any research investigating the relationship between coach-created motivational climate and athletes' perception of challenge and threat. Additionally, there are fundamental connections between the components of these two theories in terms of their concepts and diverse consequential effects on athletes. Therefore, there is a need for investigating the link between the two theories. In the light of the above mentioned explanations, the aim of this paper is to examine the relationship between empowering and disempowering motivational climate and athletes' perception of challenge and threat.

Materials and Methods

Participants

A total of 257 adolescent athletes comprised of 117 males and 140 females voluntarily participated in this research. The participants were chosen from a variety of team and individual sports by convenience sampling method (Büyüköztürk et al., 2020: 95). These sports were volleyball, basketball, soccer, field hockey, wrestling, athletics, boxing, weight lifting, taekwondo, judo, swimming, archery, underwater hockey, tennis, kick box and karate. Participants' ages ranged from 13 to 18 years *(M* = 15.76, *SD* = 1.39). They had 4.93 (*SD* = 2.57) years of sports experience, practiced their sport an average of 4.22 (*SD* = 2.07) days and 8.06 (*SD* = 6.64) hours per week.

Data collection tools

Personal information form: This form contained questions regarding athletes' age, gender, the sport they practice, number of training and hours per week, length of sports experience and sport branch.

Challenge and Threat States in Athletes: Challenge and Threat in Sport (CAT-Sport) Scale was used to assess athletes' challenge and threat states (Rossato et al., 2016). The scale comprises of 12 items and two subscales and each item is measured on a 6-point Likert scale, 1 (totally disagree) to 6 (totally agree). 5 items measures challenge (example item: "*I expect that I will achieve success rather than experience failure*") and 7 items measure threat (example item: *I am worrying that I will say or do the wrong things*). The validity and reliability of this scale into Turkish was confirmed by Türkyılmaz ve Altıntaş (2019). The results of CFA confirmed the two factor structure. The model fit indices were lower than the cut off criteria (SRMR = 0.07, CFI = 0.93, RMSEA = 0.08, NNFI = 0.91) with a significant χ test (χ^2 = 108.763, df = 41, χ^2/df = 2.653, p = 0.000). Cronbach alfa values

for internal consistency were found to be higher than the cut off value .70 (Nunnally and Bernstein, 1994) and were reported on table 1.

Empowering and Disempowering Motivational Climate. For the assessment of the coach-created motivational climate Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ-C) containing 34 items with 5 subscales (task involving, autonomy supportive, socially supportive, ego involving and controlling) was used (Appleton et al., 2016) and each item is measured on a 5-point Likert scale, 1 (totally disagree) to 5 (totally agree). The validity and reliability of this scale into Turkish is done by Gözmen Elmas et al., (2018). The sub-dimensions are task involving climate (9 items, example item: "*My coach encouraged players to try new skills"*), autonomy supportive climate (5 items, example item: "*My coach gave players choices and options"*), socially supportive climate (3 items, example item: "*My coach could really be counted on to care, no matter what happened"*) constitutes empowering climate. Ego involving climate (7 items, example item: "*My coach substituted players when they made a mistake"*), controlling climate (8 items, example item: "*My coach was less friendly with players if they didn't make the effort to see things his/her way"*) establish disempowering climate.

Data collection

The research protocol in this study was carried out in accordance with the principles of Helsinki Declaration. Ethical approval for this research was granted by ethics committee of the authors' university. The data was collected by an online form. On the online form, the participants were informed about the aim of the research and they were asked for a voluntary participation. After reading and confirming the consent form, the participants were able to fill in the necessary information to participate in the research.

Data analysis

The data was analysed in SPSS 17 and AMOS 20 softwares. Confirmatory factor analyses (CFA) for the scales' construct validities were conducted in AMOS 20 software. Model fit indices were tested by Root Mean Square Error Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI) values. Also chi square (χ^2), df and χ^2/df values were reported. A value of 0.05 or lower for RMSEA and SRMR shows a very good fit, whereas a value between 0.05 and 0.08 is an indication of an acceptable model fit. If NNFI and CFI values are equal to or above 0.95, it reveals an excellent model fit. However, if these values are between 0.90 and 0.95, this can be interpreted as an indication of a good model Fit (Hooper, Coughlan, & Mullen, 2008; Schermelleh-Engel, Moosbrugger & Müller, 2003; Sümer, 2000). Cronbach alfa values were computed for internal consistencies of the scales. Cronbach alfa value which is higher than .70 is accepted to be reliable (Nunnally and Bernstein, 1994).

The skewness and kurtosis values were computed to decide whether the data is normally distributed. Skewness and kurtosis values were found to be between -2 and +2, which indicated adequate univariate normality (George & Mallery, 2016). These values can be seen on table 1. Descriptive statistics were used to show the general characteristics of the values. The relationships between the variables were inspected by Pearson

correlation analysis. While a correlation coefficient value between 0.10 - 0.39 is considered to be weak and 0.40 - 0.69 is considered to be moderate, a value which is equal to or higher than .70 is accepted as a high correlation (Schober et al., 2018). The relationship of coach-created motivational climates with athletes' challenge and threat states were testes by Hierarchical regression analysis. Athletes' age, gender, sport type, length of sport experience, number of weekly training sessions and weekly training hours were selected as predictor variables in step 1 which were followed by step 2 in which coach-created motivational climates were the predictor variables. In hierarchical regression analysis, five sub-dimensions of empowering and disempowering coaching climates were set as the independent variables in step two to reveal independent contribution of the sub-dimensions to athletes' challenge and threat (tables 3 and 4). Later, total scores for empowering climate and disempowering climate were selected as the independent variables to inspect the integral contribution of the empowering and disempowering climates (tables 5 and 6).

Results

Table 1: Descriptive statistics for coach created motivational climates, challenge and threat

Variables	Mean	SD	Skewness	Kurtosis	Cronbach's Alpha
Threat	2.59	1.17	.518	-.716	.876
Challenge	5.39	0.70	-1.419	1.942	.731
Task Involving	4.58	0.59	-1.627	1.768	.897
Autonomy Support	4.42	0.61	-1.248	1.413	.634
Social Support	4.49	0.71	-1.476	1.713	.681
Ego Involving	2.32	0.96	.633	-.259	.845
Control	2.20	0.75	.774	.380	.796
Empowering	4.50	0.58	-1.503	.,878	.918
Disempowering	2.26	0.81	.722	.076	.828

Table 2: Correlation analysis among coach created motivational climates and challenge and threat states

	Variables	1	2	3	4	5	6	7	8	9
1	**Challenge**	1								
2	**Threat**	-0.05	1							
3	**Task Involving**	0.45**	-0.08	1						
4	**Autonomy Support**	0.44**	-0.04	0.76**	1					
5	**Social Support**	0.37**	-0.06	0.81**	0.69**	1				
6	**Ego Involving**	-0.10	0.14*	-0.43**	-0.35**	-0.43**	1			
7	**Control**	-0.07	0.26**	-0.40**	-0.38**	-0.38**	0.80**	1		
8	**Disempowering**	-0.09	0.21**	-0.44**	-0.38**	-0.43**	0.96**	0.93**	1	
9	**Empowering**	0.46**	-0.06	0.93**	0.89**	0.92**	-0.44**	-0.42**	-0.46**	1

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

Table 2. shows Pearson correlation analysis in which challenge had a moderate positive significant correlation with empowering motivational climate (r = .46), task-involving climate (r = .45), autonomy supportive climate (r = .44) and a weak positive significant correlation with socially supportive climate (r = 0.37). Threat had a weak positive significant relationship with disempowering motivational climate (r = .21), ego involving climate (r = .14) and controlling climate (r = .26). Additionally no significant relationship is found between challenge and threat.

Table 3: Regression analysis regarding sub-dimensions of coach-created motivational climate predicting challenge

	B	SE	Beta	t	Adjusted R^2	R^2 Change	F change
Model 1							
Age	-0.04	0.04	-0.09	-1.22			
Gender	0.12	0.09	0.09	1.35			
ST	0.26	0.12	0.18	2.19*	0.02	0.05	1.98
Experience	0.00	0.02	-0.02	-0.24			
NOWT	0.06	0.03	0.17	1.84			
WTH	0.00	0.01	0.04	0.48			
Model 2							
Age	-0.01	0.03	-0.01	-0.20			
Gender	0.04	0.08	0.03	0.53			
ST	0.20	0.11	0.14	1.86			
Experience	0.00	0.02	0.00	0.03			
NOWT	0.05	0.03	0.15	1.75			
WTH	0.00	0.01	0.02	0.34	0.23	0.22	14.40*
Task Involving	0.38	0.13	0.32	2.96*			
Autonomy Supportive	0.30	0.10	0.27	3.03*			
Socially supportive	-0.04	0.10	-0.04	-0.42			
Ego Involving	-0.01	0.07	-0.01	-0.07			
Controlling	0.12	0.09	0.13	1.41			

Dependent variable: Challenge; *p< .05 ST= Sport type, NOWT= Number of weekly training, WTH= Weekly training hours

Table 3. shows the hierarchical regression analysis in which challenge was the dependent variable. Age, gender, ST, experience, NOWT and WTH have no significant contribution to the model in the first step. After controlling control for age, gender, ST, experience, NOWT and WTH, coach created motivational climate explains 22 percent of the variance in challenge in which task-involving and autonomy supportive climates made significant contributions.

Table 4: Regression analysis regarding sub-dimensions of coach-created motivational climate predicting threat

	B	SE	Beta	t	Adjusted R^2	R^2 Change	F change
Model 1							
Age	-0.13	0.06	-0.16	-2.26*			
Gender	0.23	0.15	0.10	1.49			
ST	0.09	0.20	0.04	0.44	0.03	0.05	2.35*
Experience	-0.02	0.03	-0.03	-0.49			
NOWT	0.10	0.05	0.17	1.88			
WTH	-0.02	0.01	-0.08	-1.07			
Model 2							
Age	-0.13	0.06	-0.16	-2.24*			
Gender	0.37	0.15	0.16	2.49*			
ST	0.15	0.19	0.06	0.76			
Experience	-0.03	0.03	-0.06	-0.97			
NOWT	0.05	0.05	0,.09	0.97			
WTH	-0.01	0.01	-0.06	-0.74	0.12	0.10	5.86*
Task Involving	-0.24	0.23	-0.12	-1.04			
Autonomy supportive	0.16	0.18	0.08	0.89			
Socially supportive	0.05	0.18	0.03	0.26			
Ego Involving	-0.15	0.13	-0.12	-1.16			
Controlling	0.65	0.16	0.42	4.12*			

Dependent variable: Threat; *p<.05 ST= Sport type, NOWT= Number of weekly training, WTH=Weekly training hours

Table 4. shows the hierarchical regression analysis in which threat was set as the dependent variable. The variables in model 1 explain the 5 percent of the variance in threat and between these variables only age was significant. When controlled for age, gender, ST, experience, NOWT and WTH, motivational climate explains an additional 10 percent of variance in threat in which controlling climate made a significant contribution.

Table 5: Regression analysis regarding empowering and disempowering motivational climate predicting challenge

	B	SE	Beta	t	Adjusted R^2	R^2 Change	F change
Model 1							
Age	-.04	.04	-.09	-1.21			
Gender	.12	.09	.09	1.35			
ST	.26	.12	.18	2.19*	0.02	0.05	1.98
Experience	.00	.02	-.02	-.24			
NOWT	.06	.03	.17	1.84			
WTH	.00	.01	.04	.48			
Model 2							
Age	.00	.03	-.01	-.15			
Gender	.05	.08	.04	.64			
ST	.18	.11	.12	1.64			
Experience	.00	.02	-.02	-.29	0.22	0.20	9.85*
NOWT	.05	.03	.14	1.63			
WTH	.00	.01	.01	.14			
Disempowering	.11	.06	.13	1.97			
Empowering	.60	.08	.50	7.85*			

Dependent variable: Challenge; *p< .05 ST= Sport type, NOWT= Number of weekly training, WTH= Weekly training hours

Table 5. shows the regression analysis in which challenge was the dependent variable. When controlled for age, gender, ST, experience, NOWT and WTH, motivational climates explains an additional 20 percent of variance in challenge. An inspection of the significance values revealed that only empowering climate significantly contributed to challenge.

Table 6: Regression analysis regarding empowering and disempowering motivational climate predicting threat

	B	SE	Beta	t	Adjusted R^2	R^2 Change	F change
Model 1							
Age	-0.13	0.06	-0.16	-2.26*			
Gender	0.23	0.15	0.10	1.49			
ST	0.09	0.20	0.04	0.44	0.03	0.05	2.35*
Experience	-0.01	0.03	-0.03	-0.49			
NOWT	0.10	0.05	0.17	1.88			
WTH	-0.01	0.01	-0.08	-1.07			
Model 2							
Age	-0.15	0.06	-0.18	-2.63*			
Gender	0.36	0.15	0.15	2.36*			
ST	0.08	0.19	0.03	0.41			
Experience	-0.03	0.03	-0.07	-1.12	0.09	0.07	9.40*
NOWT	0.06	0.05	0.10	1.10			
WTH	-0.01	0.01	-0.06	-0.83			
Disempowering	.399	.103	.277	3.858*			
Empowering	-.021	.138	-.010	-.149			

Dependent variable: Threat; *p< .05 ST=Sport type, NOWT= Number of weekly training, WTH= Weekly training hours

Table 6. shows the regression analysis in which threat was set as the dependent variable. When controlled for age, gender, ST, experience, NOWT and WTH in model 1, motivational climates explains an additional 7 percent of variance in threat. An inspection of the significance values of motivational climates shows that only disempowering climate significantly contributed to threat.

Discussion

The main object of this study was to examine the relationship between coach-created motivational climate and challenge and threat states of athletes. As expected before the analysis, coach-created motivational climate was significantly correlated with challenge and threat state. More specifically, empowering motivational climate and its sub-dimensions positively and significantly correlated with challenge state whereas disempowering motivational climates along with its sub-dimensions positively and significantly correlated with threat state. After the findings confirmed the pre-considered correlational assumptions, the contribution of coach-created motivational climate to challenge and threat states were tested by regression analysis.

Regression analysis showed that empowering motivational climate contributes to athletes' challenge state and that disempowering motivational climate contributes to their threat state. Hence it can be said that coaches who create empowering motivational climate in their practices and game situations can positively influence athletes' perception of challenge. On the other hand, if coaches create a disempowering motivational climate during their sport-related practices, this can cause athletes to experience a higher threat state. These main findings of the current research are similar to the previous literature which indicate that empowering motivational climate have positive consequences in sports context (Appleton and Duda, 2016; Borrueco et al., 2017; Gutiérrez-García et al., 2019; Krommidas et al., 2016; Mosqueda et al., 2019; Sarı and Köleli 2020) whereas effects of disempowering motivational climate causes negative sport-related outcomes (Appleton and Duda, 2016; Borrueco et al., 2017; Krommidas et al., 2016; Sarı and Köleli 2020).
Regression analysis in the sub-dimension level revealed task-involving and autonomy supportive climates significantly contributed to challenge. As stated by Jones et al., (2009) challenge state comprises of high self-efficacy (*belief about possessing necessary skills to cope with the demand of the situation and execute strategies required to succeed*) and perceived control (*a choice to focus on the aspects of the situation that can be controlled)* along with adoption of approach goals (*demonstration of competence that is determined by self-referenced standards*) all of which are naturally fostered in task-involving and autonomy supportive climates. Task-involving climate promotes learning of new skills, developing previously learned skills, correcting mistakes and striving to be better (Ames, 1992; Ntoumanis, & Biddle, 1999) which contributes to self-efficacy and approach goals. Autonomy supportive motivational climate indicates providing choice, explaining rationale behind tasks, creating opportunities for initiative-taking and giving non-controlling competence feedback for athletes (Mageau and Vallerand, 2003) all of which can contribute to athletes' self-efficacy and perceived control.

It was initially expected in this research that socially supportive climate would also significantly contribute to challenge state as indicated by the significant Pearson correlation analysis between challenge state and socially supportive motivational climate. However, the results of the regression analysis showed no significant contribution in this regard. A possible reason for this insignificant contribution could be that athletes'

perception of challenge is linked to their psychological and affective states regarding sportive performance and performance expectations (Jones et al., 2009). On the other hand, socially supportive motivational climate signifies unconditional support by the coach regardless of athletes' sport performance and abilities (Reinboth et al., 2004).
Regression analysis to predict threat state in the sub-dimension level showed that controlling motivational climate significantly contributed to threat state. Controlling coaching climate, promoting ego-involvement and conditional regard, comprises of tangible rewards, controlling feedbacks, excessive personal control and intimidation behaviors (Bartholomew et al., 2009) all of which can negatively affect athletes' self-efficacy and perceived control which in turn might increase athletes' perception of threat. Therefore, it can be suggested for sports coaches that a controlling motivational climate could lead to higher threat perception of athletes and therefore sport coaches should not adopt behaviors related to such negative motivational type.

Besides, statistical analysis indicated no significant relationship between threat and challenge. This may result from the fact that even though challenge and threat states have opposite meanings in essence, Uphill et al. (2019) implies in their study that athletes can experience either challenge or threat, challenge and threat at the same time or neither challenge nor threat. Uphill et al. (2019) further discuss that current measurement tools (self-assessed and cardiovascular methods) fail to measure challenge and threat states precisely because both methods address this constructs as the opposite ends of a unidimensional continuum rather than two dichotomous states. This argument might indicate a necessity to produce alternative measurement tools for the future studies.

Lastly unlike as expected, the results of the analysis revealed that empowering motivational climate did not negatively and significantly contributed to threat and that disempowering motivational climate did not negatively and significantly contribute to challenge state. It was initially expected that empowering motivational climate would negatively contribute to threat and that disempowering motivational climate would negatively contribute to challenge. This initial assumption was made considering the relevant literature suggesting empowering motivational climate is associated with positive outcomes (Appleton and Duda, 2016; Borrueco et al., 2017; Gutiérrez-García et al., 2019; Krommidas et al., 2016; Mosqueda et al., 2019; Sarı and Köleli 2020) and disempowering motivational climate is linked to negative consequences in sport context (Appleton and Duda, 2016; Borrueco et al., 2017; Krommidas et al., 2016; Sarı and Köleli 2020). Although Pearson correlation analysis showed that empowering motivational climate was negatively and significantly correlated with athletes' threat and that disempowering motivational climate was negatively and significantly correlated with challenge, regression analysis revealed that these empowering and disempowering motivational climates were not the negative contributors in the regression models. One explanation for this could be the control variables we used in the regression analysis. In addition, the studies about challenge and threat states mostly concern about the relationship between athletes' challenge and threat states and their performance (Blascovich et al., 2004; Hase et al., 2019; Turner et al., 2012; Turner et al., 2013). In our opinion, these insignificant findings are worth investigating in future research. This connection can also be tested utilizing cardiovascular indices of challenge and threat states (Blascovich et al., 2004).

Limitations

There are some limitations to this study. First of all the cross-sectional design of the current study limits our ability to deeply investigate the effects of motivational climate on challenge and threat states of athletes. Secondly, self-evaluated measurement tools have been used in this research and these measurement tools can have some limitations compared to their equivalents (Blascovich et al., 2004; Rossato et al., 2016). Lastly, generalizability of this study is limited with the sample group.

Future research

Most studies regarding challenge and threat states of athletes examine the effects of these states on sports performance (Blascovich et al., 2004; Hase et al., 2019; Turner et al., 2012; Turner et al., 2013). In their studies, Rossato et al., (2016) and Jones et al., (2009) refer challenge and threat as pre-competition states that can affect performance. Therefore longitudinal studies examining the effects of motivational climate on athletes' challenge and threat states throughout the competitive seasons coupled with performance assessments could make a substantial contribution to the literature. For example, one possible hypothesis for future studies could be "how coach created motivational climate effects athletes' threat and challenge states during a competitive season and in a subsequent performance?" Additionally, a similar study can be conducted in athletes with different characteristics to further investigate the effects of these characteristics on the relationship between motivational climate and challenge and threat states. Lastly, in the future studies, researchers can prefer different measures to examine the differences between self-evaluated and cardiovascular measurement tools for athletes' challenge and threat states.

Implications for sports coaches

Results of this study further emphasize the importance of coach-created motivational climate in youth sports. Some important recommendations for sports coaches are listed below. These recommendations are derived considering the findings of this research regarding the relationship between motivational climate and athletes' challenge and threat.

- Encourage athletes to learn new skills and develop previously learned ones.
- Pay attention to athletes' opinions and include them in the decision-making process as much as possible.
- Listen to players and explain the rationale behind tasks.
- Provide positive competence feedback to athletes.
- Do not use punishment as a correcting tool in practices and games.
- Equally involve with players.
- Avoid using conditional regard.

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