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Sport Burnout in Student-Athletes: The Role of Cognitive Flexibility, Task and Ego Orientation in Sport and Sport Anxiety

Sporcu Öğrencilerde Spor Tükenmişliği: Bilişsel Esneklik, Sporda Görev ve Ego Yönelimi ile Spor Kaygısının Rolü

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ABSTRACT

This study examined the mediating role of sport anxiety, task, and ego orientation in the relationship between cognitive flexibility and sport burnout. The study participants consisted of 397 sport high school students, 155 female (39%) and 242 male (61%). The ages of the students participating in the study ranged from 13 to 19 ($\bar{x}$=16.26, SD=1.218). Cognitive Flexibility Inventory, Task and Ego Orientation in Sport Questionnaire, Sports Anxiety Scale, and Sports Burnout Inventory were used to collect data for the study. According to the findings of this study, sport anxiety and ego and task orientation factors mediate the relationship between cognitive flexibility and sport burnout. Sport high school students with high cognitive flexibility effectively cope with the anxious situations they encounter in sport. These students with reduced sport anxiety and increased ego and task orientation tend to experience reduced sport burnout due to perceiving stimuli in their environment as less disturbing. To protect students from sport burnout, the school curriculum and preventive strategies should be designed to reduce sport anxiety and ego orientation and increase task orientation. Extending cognitive flexibility and task orientation learning outcomes in high school sport programs can help protect students from burnout and improve their functionality in sport. Considering the effect of team sport enhancing task orientation, including more team sport in addition to individual sport in sport high schools will be effective in preventing sport burnout.

Keywords: *Sport burnout, Sport anxiety, Task and ego orientation in sport, Cognitive flexibility*

ÖZ

Bu çalışma bilişsel esneklik ve spor tükenmişliği arasındaki ilişkide spor kaygısı, görev ve ego yöneliminin aracılık rolünü incelemiştir. Araştırmanın katılımcıları 155 kız (39%) ve 242 erkek (61%) olmak üzere toplam 397 spor lisesi öğrencisinden oluşmaktadır. Araştırmaya katılan öğrencilerin yaşları 13 ila 19 arasında değişmektedir ($\bar{x}$=16.26, SD=1.218). Çalışma için verilerin toplanmasında Bilişsel Esneklik Envanteri, Sporda Görev ve Ego Yönelimi Ölçeği, Spor Kaygısı Ölçeği ve Spor Tükenmişliği Ölçeği kullanılmıştır. Bu çalışmanın bulgularına göre spor kaygısı ile ego ve görev yönelimi faktörlerinin bilişsel esneklik ve spor tükenmişliği arasındaki ilişkiye aracılık ettiği saptanmıştır. Yüksek bilişsel esnekliğe sahip spor lisesi öğrencileri sporda karşılaştıkları kaygılı durumlarla etkili bir şekilde baş etmektedirler. Spor kaygısı azalan, ego ve görev yönelimi artan spor lisesi öğrencileri için çevrelerindeki uyarıcıların daha az rahatsızlık verici olarak algılanması sayesinde spor tükenmişlikleri azalma eğilimindedir. Spor lisesi öğrencilerinin spor tükenmişliğinden korunması adına okul müfredatının ve önleyici stratejilerin spor kaygısı ile ego yönelimini azaltma ve görev yönelimini artırmaya yönelik dizayn edilmesi önemli görülmektedir. Bilişsel esneklik ve görev yönelimini hedef alan kazanımların spor lisesi programlarında yaygınlaştırılması öğrencilerin tükenmişlikten korunarak sporda işlevselliklerinin artmasına yardımcı olabilir. Takım sporlarının görev yönelimini artırıcı etkisi göz önüne alındığında spor liselerinde bireysel sporların yanında takım sporlarının da yaygınlaştırılmasının spor tükenmişliğinin önüne geçilmesinde etkili olacağı düşünülebilir.

Anahtar Kelimeler: *Spor tükenmişliği, Spor kaygısı, Sporda görev ve ego yönelimi, Bilişsel esneklik*

INTRODUCTION

There is growing research on the relationship between sport burnout and the sport outcomes, like the sense of accomplishment and sport participation of those seeking sport specialization (Lin et al., 2022). High school athletes are one of these groups seeking sport specialization (Karataş and Karataş, 2022; Macovei and Mihailescu, 2021; Miles et al., 2024; Yazıcı and Somoğlu, 2023). Burnout in support is a serious issue for young starters and can even be the reason for quitting sport (Yang et al., 2023). Burned-out high school athletes have numerous needs, such as positive thinking training (Tabrizi et al., 2021) and mindfulness interventions (Golestaneh, 2017) to cope with burnout in sport. More importantly, because sport specialization causing competition has been found to be related to sport burnout, sport high school students are more likely to experience more burnout in sport than other high school students (Giusti et al., 2020).

Previous studies have demonstrated a correlation between elevated levels of burnout in support and various factors, including perfectionism (Valdez and Juan, 2020), elevated stress levels (Ayyıldız, 2022), inadequate mental fortitude (Sajedi and Kirkbir, 2020), inefficient coping strategies (Jafari, 2018), and obsessive passion (Martínez-Alvarado et al., 2021). This correlation suggests that individuals experiencing high levels of burnout in support may also exhibit reduced personal fulfillment symptoms (Martínez-Alvarado et al., 2016).

As indicated in the extant literature, the factors that have been identified as contributing to the phenomenon under study include thoughts about finalizing sport (Schorb et al., 2023), inadequate personal resources (Verardi et al., 2015), interpersonal conflicts (Derelioğlu and Sabah, 2023), anxiety (Doğan, 2019; Liu et al., 2022; Pan et al., 2024), and high ego and low task orientations (Harris and Smith, 2009). Most importantly, the literature has a consensus on the relationship between cognitive flexibility and sport burnout (Gholami et al., 2022; Levillain et al., 2024; Tei and Fujino, 2024). Nonetheless, there is a need to explore the underlying mechanisms between this association because there is a dearth of research regarding the mediators between these variables (Gholami et al., 2022).

Cognitive flexibility is defined as an individual's capacity to consider a situation in multiple ways by applying mental switching according to current circumstances (Humenik et al., 2020). Cognitive flexibility helps individuals quickly adapt to new situations and maintain optimal functioning within society (Highgate and Schenk, 2021; Olegário et al., 2023; Parr et al., 2024). As an adaptive behavior, cognitive flexibility is effective when responding to any environmental change (Lage et al., 2023; Uddin, 2021; Xu et al., 2021). Sport's high school athletes face new tasks and situations to strengthen their abilities and reach success (Eraslan, 2014). That is why cognitive flexibility should be considered a critical psychological construct for their high school years.

Cognitive flexibility is a critical defence mechanism protecting individuals from adverse outcomes (Harel et al., 2023). The crucial role of cognitive flexibility was also confirmed in sport research (Gholami et al., 2022). Cognitive flexibility supports decreasing sport anxiety (Han et al., 2011), enabling high school students to become more resilient to school burnout by avoiding anxious events that can possibly trigger sport burnout. In this regard, Asıcı and Sarı (2021) suggest that increased cognitive flexibility contributes to positive coping strategies, in turn precipitating positive well-being among high school students. Considering the negative relationship between well-being and anxiety (Dias Lopes, 2020), high cognitive flexibility can alleviate anxiety for student-athlete, leading to low sport burnout. Therefore, sport anxiety can play a mediating role in the association between cognitive flexibility and burnout in sport for student-athlete.

Other vital concepts in sport research are ego and task orientation (Bezci, 2016; Lochbaum et al., 2017; Shala et al., 2022; Tracey et al., 2021). Ego orientation is related to how individuals position themselves relative to others within

settings they perform when evaluating their success (Kimotsuki et al., 2024). Apart from ego orientation indicating extrinsic motivation of individuals, task orientation refers to assessing one's performance by considering self-referenced criteria, such as the quality of the learning process and mastering the ability (Assar, 2021). According to Dagsdóttir et al. (2023), favorable sport outcomes require high task orientation and low ego orientation. This suggests that cognitive flexibility may have a positive impact on sport burnout by increasing task orientation and decreasing ego orientation. In another thesis study, Bjarnadóttir (2023) indicates the importance of team sport in boosting task orientation by highlighting that individual sport promote ego orientation. From this perspective, confirming the mediating effects of ego and task orientations on school burnout may provide valuable implications for high schools specializing in sport to arrange their curriculum to ensure healthy development for their pupils.

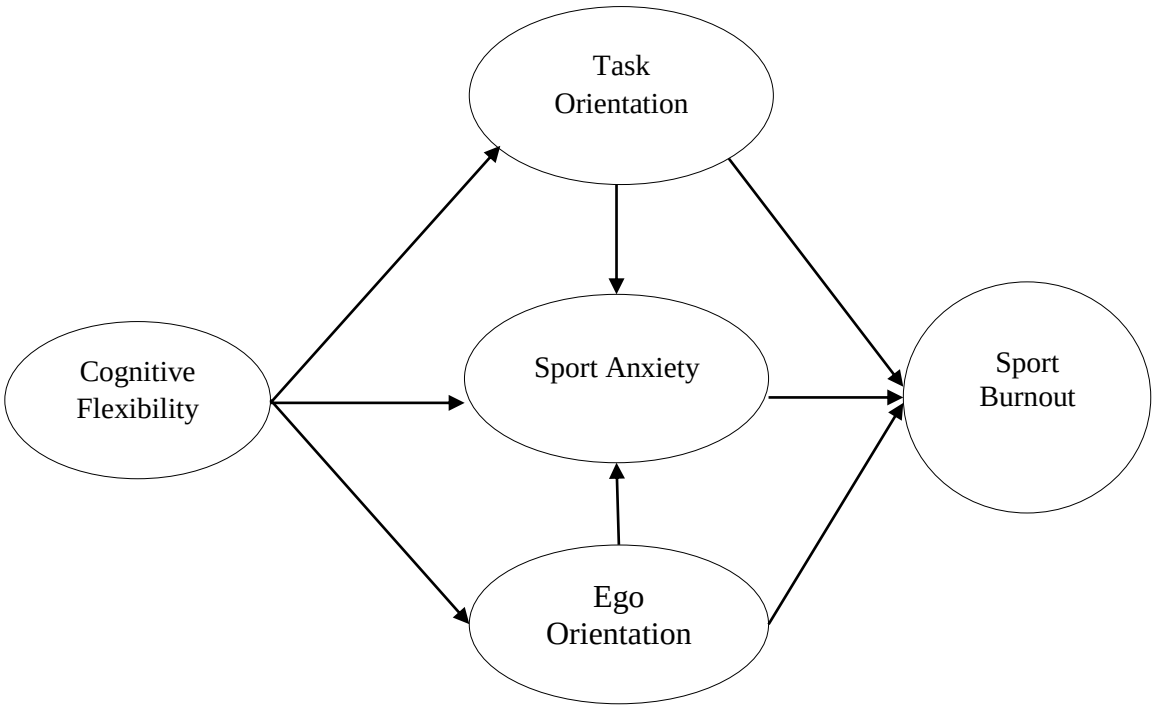
The existing literature discussed above indicates the crucial role of cognitive flexibility as a critical psychological construct that considerably impacts sport anxiety (Aslan, 2021; Rahman and Husain, 2022; Sabzevari et al., 2023), ego and task orientation (Jena et al., 2019; Yalçın and Kurnaz, 2021), and sport burnout (Gholami et al., 2022). Considering these relationships, a valuable effort is to explore the factors that may provide effective intervention and prevention strategies to protect students from burnout in sport and strengthen their current status for better sport specialization. Especially in Turkish culture, current research on sport specialization has focused chiefly on university students and adults (Akyol and Taşkıran, 2023; Bedir, 2023; Duran and Ateş, 2022; Güngör, 2019; Menteş and Saygın, 2019; Yarayan et al., 2023). In contrast, high school students seeking specialization in sport have remained neglected in the literature.

As a theoretical basis of this study, the stress coping theory is crucial to give explanations for mediators in avoiding sport burnout. Lazarus and Folkman (1984) proposed the stress coping theory, which indicates that some forms of coping can lead to positive emotions while others may result in negative emotions. At this point, coping causes satisfactory and unsatisfactory encounter outcomes depending on cognitive appraisal. In other words, stress coping theory explains encounter outcomes as satisfactory or unsatisfactory according to individual cognitive appraisal. When individuals assess environmental stimuli through cognitive appraisal, they may identify them as threatening, challenging, or harmful. This perception can lead to increased stress and negative emotions. Conversely, if individuals successfully resolve these stressors through cognitive appraisal, they may experience positive emotions (Biggs et al., 2017; Folkman et al., 1986; Folkman and Lazarus, 1988; Lazarus and Folkman, 1984). From this perspective, stressors can be resolved favorably when stimuli in sport environments undergo cognitive appraisal by establishing self-referenced criteria stemming from task orientation. Conversely, ego orientation that relies on extrinsic motivation and sport-related anxiety can lead to heightened stress levels. These factors can cause individuals to perceive environmental stimuli as disruptive. Consequently, the inability to find solutions and the urgency for new coping strategies may increase the individual's burnout risk.

Thus, the recent study aims to investigate the mediator roles of sport anxiety, task, and ego orientation in the relationship between cognitive flexibility and sport burnout among high school students. With this aim, the following research questions were addressed: (H1) sport anxiety would mediate the relationship between cognitive flexibility and sport burnout; (H2) task orientation would mediate the relationship between cognitive flexibility and sport burnout; (H3) ego orientation would mediate the relationship between cognitive flexibility and sport burnout; (H4) task orientation and sport anxiety would mediate the relationship between cognitive flexibility and sport burnout; and (H5) ego orientation and sport anxiety would mediate the relationship between cognitive flexibility and sport burnout. The hypothetical model for this study is given in Figure 1.

Figure 1

Hypothetical Model



METHOD

Participants: Participants were selected using a convenience sampling strategy, which allows for the inclusion of individuals who are both suitable and willing to contribute to the investigation's general purpose and problem. A total of 397 Sport High School students participated in the study. Of these, 155 (39%) were female, and 242 (61%) were male. The age range of the participants was between 13 and 19 years, with an average age of 16.26 (SD = 1.218).

The study's participants were students' athletes who were enrolled in sport high schools. The inaugural sport high school in Türkiye was established in İstanbul during the 2004–2005 academic year. In addition to the overarching objectives of secondary education, sport high schools aspire to impart fundamental knowledge and competencies in the domain of physical education and sport, while concurrently functioning as a reservoir for cultivating qualified individuals in these fields. In the 2024–2025 academic year, the number of sport high schools reached 102. Of these institutions, 38 have been designated as thematic sport high schools (Ministry of National Education, 2024). These institutions are established with the objective of organizing sport high schools according to Olympic disciplines and cultivating athletes who will represent Türkiye in the international sport community by specializing in Olympic sport (Ministry of National Education, 2024). These institutions are designed to facilitate student specialization in their chosen sport disciplines, thereby enabling them to pursue academic and athletic excellence concurrently.

Prior to the commencement of the study, approval was obtained from the school administrations regarding the study's aims and execution processes. Following the acquisition of approval from the school administrations, the participants were identified after the announcements made in the classrooms. All volunteer participants and parents were provided with a brief overview of the purpose of the study and were asked to submit the written consent form. All procedures performed in studies involving human participants with the 1964 Helsinki declaration and its later

amendments or comparable ethical standards. The questionnaires were completed by the participants under the supervision of their teachers in approximately 20 minutes. The demographic data about the participants is presented in Table 1. The study was approved by Erzincan Binali Yıldırım University Human Researches Educational Sciences Ethics Committee with the decision dated 31.07.2024 and numbered 12/03.

Table 1

Frequency and Percentage Distributions of Participants' Personal Information

		n	%
Gender	Female	155	39.0
	Male	242	61.0
Class Level	Grade 9	96	24.2
	Grade 10	95	23.9
	Grade 11	114	28.7
	Grade 12	92	23.2
Sport Branch	Individual sport	135	34.0
	Team sport	262	66.0
Competitiveness Level	School team	161	40.6
	Club team	201	50.6
	Other	35	8.8
National Level Athlete	Yes	28	7.1
	No	369	92.9
Total		397	100

Measures:

Cognitive flexibility inventory (CFI): The inventory was initially developed by Dennis and Wal (2010) to measure an individual's cognitive flexibility in response to any given event or situation. Sapmaz and Doğan (2013) adapted the Turkish version of the CFI. The factor analysis findings indicate that the scale has a two-factor structure. The Cronbach's alpha reliability value for the CFI is .90 for the entire scale, .90 for the 'alternatives' sub-dimension, and .84 for the 'control' sub-dimension. In the present study, the alpha reliability value for the entire scale was .84, .87 for the "alternatives" sub-dimension, and .74 for the "control" sub-dimension. The results demonstrated that the CFI is a valid and reliable instrument for measuring and evaluating students' cognitive flexibility. The CFI was evaluated on a five-point Likert scale. Scores range from 1 (indicating that the item is "not at all appropriate") to 5 (indicating that the item is "completely appropriate"). The total score is obtained from the scale in three different ways. As the scores increase, so does cognitive flexibility (Sapmaz and Doğan, 2013).

Task and ego orientation in sport questionnaire (TEOSQ): The 'Task and Ego Orientation in Sport Questionnaire,' developed initially by Duda and Nicholls (1992), was subsequently adapted into Turkish by Toros (2001). The scale comprises 13 items: seven items that assess task orientation and six items that assess ego orientation. The internal consistency coefficient for the 5-point Likert-type scale was .79 for task orientation and .81 for ego orientation. The alpha coefficients obtained in this study were .83 for task orientation and .78 for ego orientation.

Sports anxiety scale (SAS): The Sports Anxiety Scale initially developed by Smith et al. (1990) and revised by Smith et al. (2006). The scale comprises fifteen items and employs a 4-point Likert-type rating system. It encompasses three factors: somatic anxiety, anxiety, and concentration disorder, each comprising five items. The Turkish validity and reliability study on adolescent students was conducted by Karadağ and Aşçı (2020). Accordingly, the alpha coefficients of the scale were found to be .65 for somatic anxiety, .78 for anxiety, and .67 for concentration disorder. In this study, the

alpha coefficients for the somatic anxiety, anxiety, and concentration disorder factors were found to be .78, .86, and .78, respectively.

Sports burnout inventory (SBI): Sport Burnout was measured with a modified SBI, the SpBI-DC (Sport Burnout Inventory-Dual Career). It involves the development of a modified version of the SpBI-DC (Sorkkila et al., 2020). The scale comprises 10 items, which are designed to assess three dimensions of sport burnout: (a) exhaustion from one's sport (4 items; e.g., *I feel overwhelmed by my sport*); (b) cynicism about the meaning of one's sport (3 items; e.g., *Sport no longer interests me*); and (c) feelings of inadequacy as an athlete (3 items; e.g., *I often feel that I am not performing well in my sport*). The data were collected through the administration of a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). An increase in scores on the scale corresponds to a higher level of sport burnout among student-athletes. The Cronbach α reliability for the three subscales was 0.74, 0.80, and 0.78, respectively. The Cronbach α reliability for the total scale was determined to be 0.85. Çam et al. (2019) adapted the measurement tool into Turkish. The alpha internal consistency values of the adapted scale are .81 for the whole scale, .61 for the Exhaustion dimension, .69 for the Depersonalization dimension and .61 for the Inadequacy dimension. In this study, the alpha internal consistency values were found to be .86 for the whole instrument, .68 for exhaustion in sport, .78 for depersonalization towards the meaning of sport, and finally, .67 for athlete incompetence.

Data Analysis: The initial stage of the analysis entailed examining whether the requisite assumptions for SEM had been met. This was conducted using the SPSS 26 program. Descriptive statistics (skewness and kurtosis scores) and correlation analyses were conducted to assess the univariate normality assumption, the initial assumption to be evaluated. It was established that the scores exhibited a normal distribution, with a range between ±1 (Tabachnick and Fidell, 2013). Pearson's correlation coefficient was employed to ascertain the nature of the relationship between the variables in question. Subsequently, Z-scores were analysed to identify any univariate extreme values. Accordingly, one observation exceeding ±4 was removed from the data set. Multivariate normality indicates that the relationship between pairs of variables is linear (Mertler and Vannatta, 2005; Tabachnick and Fidell, 2013). Since the scatter plots of the variable pairs belonging to the sets are like an ellipse, linearity and multivariate normality are ensured (Mardia et al., 1979; Stevens, 2009). Correlation coefficients between variables, VIF and Tolerance values were analysed, and no multicollinearity was found. The assumption of independence of residuals was tested using the Durbin–Watson statistic, which was 1.75, suggesting that the residuals were independent. Since the variance inflation factor (VIF) values are less than 10 (between 1.14 and 1.45) and the tolerance values are greater than 0.10 (between .68 and .87), it is seen that there is no multicollinearity problem (Hair et al., 1998). Multivariate outlier analysis was conducted by examining the Mahalanobis distance values (Tabachnick and Fidell, 2001) and four observations with Mahalanobis distance values $\chi^2(4) = 13.27$ ($p < .01$) above χ^2 (4) were identified as multivariate outliers and removed from the data set. Consequently, following the preliminary analyses, the data set comprised 392 normally distributed observations. Subsequent analyses were conducted on this data set.

AVE (Average Variance Extracted) is a value that measures the similarity between the items of a factor, while CR (Composite Reliability) is a value that measures the internal consistency of a factor. The results of the calculation yielded AVE: 1.67 and CR: 1.37. In order for convergent validity to be deemed sufficient, the AVE value must exceed .50 (Shrestha, 2021). In addition, the literature emphasises that the CR coefficient should be higher than .70 (Hair et al., 2014). In this case, it was seen that the predicted variable in the study provided convergent validity and composite reliability.

Joreskog and Sorbom (1996) outlined that general structural equation models comprise two fundamental components. The first is the 'measurement model,' which is applied by connecting the observed variables to the latent variables through confirmatory factor analysis; the second is the 'structural model,' which is applied by connecting the latent variables to each other with simultaneous equation systems. The measurement model constitutes an integral component of the overall model. The measurement model represents the initial stage of structural equation modeling (SEM) analysis (Anderson and Gerbing, 1988). In other words, the initial step of SEM was conducted using the measurement model. Upon analysis of the results of the measurement model, it becomes evident that they demonstrate a satisfactory data fit model. This indicates that the hypothetical model illustrated in Figure 1 can be utilized for subsequent analyses. A two-stage data analysis process was employed to evaluate the proposed hypothetical model depicted in Figure 1.

Within the model, the scale of task and ego orientation in sport is represented by two sub-dimensions: task orientation and ego orientation. It is important to note that the total score cannot be obtained from the scale of task and ego orientation in sport. Consequently, within the structural model, these two sub-dimensions were employed as latent variables, as opposed to being observed variables. This approach is necessitated by the requirement to incorporate items that would adequately measure each sub-dimension (Chandler et al., 2011). It is further hypothesised that this approach is necessary due to the presence of negative estimated variances. In this regard, the opinion of experts in the field was sought, specifically from the measurement and evaluation department, and support was obtained in the statistical and methodological context.

In the second stage of the analysis, the hypothetical model was employed to investigate whether cognitive flexibility predicts sport burnout in high school students engaged in sport activities through the mediating variables of sport anxiety, task orientation, and ego orientation. The results of the measurement and structural model were interpreted using fit statistics. A fit of .90 or greater for the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) indicates an adequate data-model fit; similarly, a Root Mean Square Error of Approximation (RMSEA) of .08 or less and a Standardized Root Mean Square Residual (SRMR) of .08 or less indicate an adequate data-model fit (Hooper et al., 2008; Kline, 2015). These two indices ' values of .05 or less indicate a close data-model fit. Furthermore, the 2000 bootstrap method was employed to examine indirect effects, which revealed that 95% confidence intervals indicated significant indirect effects (Preacher and Hayes, 2008). This method enables the demonstration of indirect effects between variables within a specified confidence interval. All data analyses were conducted using JASP and SPSS 26 software.

RESULTS

The relationships between the variables were analysed using Pearson correlation analysis. Accordingly, it was observed that sport burnout exhibited a negative correlation with cognitive flexibility ($r = –.239$; $p < .01$) and task orientation ($r = –.137$; $p < .01$) and a positive correlation with ego orientation ($r = .100$; $p < .05$) and sport anxiety ($r = .425$; $p < .01$). Table 2 presents the descriptive statistics for the variables.

Table 2

Correlation Matrix and Descriptive Statistics

	1	2	3	4	5
1.SB	--				
2.CF	–.239**	--			
3.TO	–.137**	.358**	--		
4.EO	.100*	.147**	.475**	--	
5.SA	.425**	–.346**	–.069	.011	--
Mean	24.56	72.08	27.36	21.22	31.64
Sd	8.91	10.91	5.09	4.91	9.92
α	.86	.84	.83	.78	.91
Skewness	.309	.346	–.618	–.216	.441
Kurtosis	–.255	–.060	.350	–.214	–.392

Note: n = 392; *Sd* = Standard deviation α = Internal reliability coefficients in this study; **p < .01, *p < .05. SB: Sport Burnout, CF: Cognitive Flexibility, TO: Task Orientation, EO: Ego Orientation, SA: Sport Anxiety

Measurement Model: The measurement model of this study was carried out with the JASP statistical program. JASP is a statistical software program that features a graphical user interface and is characterized by its user-friendliness and cost-free availability. The software is capable of executing a range of traditional methods, including correlation, t-test, and SEM (Goss-Sampson, 2022; Navarro et al., 2019; Walker et al., 2022). A distinguishing feature of JASP is its emphasis on reproducibility and dynamic analyses, which traverse from descriptive methods to advanced techniques such as SEM (Rosseel, 2012). Firstly, it prioritizes reproducibility and dynamic analyses, progressing from descriptive methods to advanced techniques such as SEM (Rosseel, 2012). Secondly, JASP facilitates the acquisition of valid and reliable intervals, which are essential for indicating the range of plausible values and thereby quantifying the precision of the point estimate (Rosseel, 2012). Additionally, JASP has demonstrated notable efficacy in facilitating the teaching-learning process of quantitative analysis topics, as evidenced by positive empirical evidence (Agawin, 2020; Campayo et al., 2022).

AMOS and JASP exhibit divergent approaches to handling missing data. For instance, AMOS typically utilizes listwise deletion or the EM (Expectation-Maximization) algorithm, whereas JASP employs the FIML (Full Information Maximum Likelihood) approach by default. Additionally, given its R-based foundation, the JASP statistical program undergoes frequent updates. A salient feature of the education system is its capacity for immediate adaptation as novel statistical methodologies are incorporated. New generation package programs, including Jasp and Jamovi, have a "plugins" system, allowing modules to be installed as needed (e.g., SEM, GLM, and GAML).

The evaluation of the model's accuracy and validity was conducted by employing item parceling within the framework of Amos, as part of the alternative modeling study. Accordingly, the two-factor and one-factor item parceling methods were applied to the relevant items of task and ego orientation variables in sport. Subsequently, the measurement model was subjected to renewed analysis. However, this analysis failed to yield a statistically significant model. Instead, values were obtained that were even lower than the existing measurement model's goodness of fit values.

In the two-stage SEM process proposed by Anderson and Gerbing (1988), the measurement model was first subjected to confirmatory factor analysis. In the measurement model, all coefficients between latent variables and observed variables were found to be significant at the p < .001 level. The model fit values were obtained as follows: (χ^2 (179) = 482.03, p < .001, χ^2/df = 2.69, RMSEA = .066, SRMR = .071, CFI = .90, TLI = .88.)

One of the most common procedures used to include a parameter in the model is to select the highest modification index value. These modifications are predominantly based on covariance error matrices that are not observed in the

original model but indicate the amount of chi-squared to be added to or removed from the model (Bollen, 1989 Schumacker and Lomax, 2004; Mulaik, 2009; Byrne, 2010). In this context, in line with the model modification suggestions, a common relationship was established between item 4 (*I feel very successful in sport when others are not as successful as me*) and item 6 (*I feel very successful in sport when I succeed and others fail*) of the ego orientation latent variable (I4 ↔ I6, β = .406, p < .001). The semantic homogeneity of these statements enabled the establishment of a relationship between these two items. From a theoretical standpoint, this relationship is deemed appropriate on account of the fact that the two item sets are under the same factor structure and are parallel in terms of content. It was predicted that these relationships would enhance the model's fit index values and reduce the chi-square value by approximately 44 points. If a modification suggested by the modification indices corresponds to a very large decrease in the Chi-square value of the model, this indicates that the proposed modification is a very critical modification for the model (Sümer, 2000). Following the modification, the final fit values of the measurement model were obtained as follows: (χ^2(178) 438,115, p < .001, χ^2/df = 2.461, RMSEA = .061 [90% confidence interval (CI) = .054 - .068], SRMR = .068, CFI = .91, TLI = .90.)

Structural Model: To test the structural model, the advantages of the two-stage approach over the one-stage approach were taken into consideration, as well as the fact that Anderson and Gerbing's (1988) two-stage SEM process are widely utilized (Kline, 2011). Therefore, confirmatory factor analysis of the measurement model was performed first, and then the structural model was tested. In the structural model, cognitive flexibility, task orientation in sport, ego orientation in sport, sport anxiety and sport burnout variables were used as latent variables. Within the model, the sub-dimensions of CFI, SAS and SBI scales, in addition to the items belonging to the sub-dimensions of task orientation in sport and ego orientation in sport of TEOSQ, were designated as observed variables.

Following the satisfactory validation of the measurement model, the structural model was analysed. It was found that the model was a good fit to the data set. The results yielded a chi-square value of 521.421 with 178 degrees of freedom, indicating a robust fit ($\chi^{2/df}$=2.929, RMSEA=.070). The regression coefficients in the model demonstrated that ego orientation did not have a statistically significant direct effect on sport anxiety (β = .15, SE = .403, p > .05). To consider the potential indirect effect of the pathway from ego orientation to sport anxiety on sport burnout, the model was analysed further. The structural model was modified to establish a common relationship between items 8 (*I feel very successful in sport when I work hard*) and 13 (*I feel very successful in sport when I do my best*) of task orientation. This modification resulted in the final fit values for the structural model being (χ^2(180) = 472.626, p < .001, $\chi^{2/df}$ = 2.626, RMSEA = .064 (90% confidence interval (CI) = .057 - .072), SRMR = .07, CFI = .90, TLI = .90.)

Table 3

Values of the Structural Model for Direct Effects

Structural Relationships			β	S. E	CR (t)
CF	→	EO	.667	.02	6.714***
CF	→	TO	.975	.029	5.599***
CF	→	SA	–.221	.079	–2.203*
SA	→	SB	.475	.057	8.379***
TO	→	SB	–.305	.404	–3.584***
EO	→	SB	.294	.347	3.371***
EO	→	SA	.145	.403	1.429

Note: n = 392; *p < .05, ***p <. 001, β: Standardized effect, SB: Sport Burnout, CF: Cognitive Flexibility, TO: Task Orientation, EO: Ego Orientation, SA: Sport Anxiety, *β (SE)* = Standardized maximum likelihood estimates (Standard error)

Table 4

Values of the Structural Model for Direct Effect (Final Model, with (EO -> SA Removed)

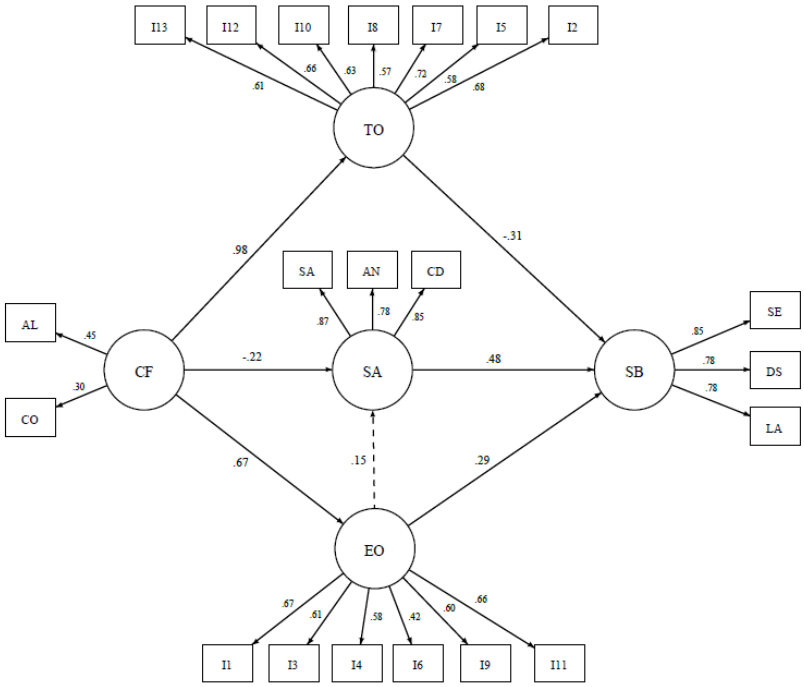
Structural Relationships			β	S. E	CR (t)
CF	→	EO	.667	.02	6.714***
CF	→	TO	.975	.029	5.599***
CF	→	SA	–.221	.079	–2.203*
SA	→	SB	.475	.057	8.379***
TO	→	SB	–.305	.404	–3.584***
EO	→	SB	.294	.347	3.371***

Note. *p < .05, ***p < .001, β: Standardized effect, *β (SE)* = (Standard error), SB: Sport Burnout, CF: Cognitive Flexibility, TO: Task Orientation, EO: Ego Orientation, SA: Sport Anxiety, *β (SE)* = Standardized maximum likelihood estimates (Standard error)

As indicated in Table 3 and Table 4, when the standardized regression coefficients are considered, there is a positive and statistically significant relationship between cognitive flexibility and ego orientation (β= .667, SE= .02, p < .001) and task orientation (β= .975, SE= .029, p < .001). A negative correlation was observed between cognitive flexibility and sport anxiety (β = –.221, SE = .079, p < .05). Considering these findings, it can be concluded that an increase in cognitive flexibility scores among students is associated with a tendency toward task and ego-orientation in sport, while sport anxiety levels are reduced. Conversely, elevated levels of sport anxiety (β= .475, SE= .057, p < .001) and ego orientation (β= .294, SE= .347, p < .001) are associated with increased sport burnout. In contrast, task orientation was found to have a negative predictive effect on sport burnout (β = –.305, SE = .404, p < .001). In other words, the possession of task-oriented skills by sport high school students is associated with a reduction in the experience of burnout. Finally, the direct effect between ego orientation and sport anxiety (β= .145, SE= .403, p >.05) was found to be but not statistically significant. This finding does not indicate the existence of a significant direct relationship between ego-oriented skills and sport anxiety. Accordingly, the pathway from ego orientation to sport anxiety was excluded from the model.

Figure 2

Structural Model Showing Mediation Effect



Note. All coefficients greater than .21 are significant at p < .001

Figure 2 depicts a structural model illustrating the mediating influence of task and ego orientation and sport anxiety on sport burnout. All direct and indirect effects between the latent variables depicted in this figure are greater than .21 and statistically significant. Moreover, in contrast with the hypothetical model proposed at the study's outset, the present findings indicate that ego orientation does not directly affect sport anxiety. Instead, it indirectly affects sport burnout through the variables of cognitive flexibility and sport anxiety. This is due to the absence of a statistically significant relationship between these two latent variables.

The statistical significance of all path coefficients between the variables in Figure 2 indicates that the hypothetical structure is supported if the indicators, i.e., the observed variables, can be predicted by the latent variables that explain them. However, if such a fit is not possible, a revised structural hypothesis should be developed and tested. In the structure in Figure 2, the fact that the structural coefficients related to the link between latent variables and indicators are significant indicates the existence of a harmonized structure.

Table 5

Indirect Effects of the Structural Model

Structural Relationships	%95 Confidence Intervals		Std. (β)
	Lower	Upper	
CF --> EO --> SA --> SB	0,065	0,309	0,097**
CF --> TO --> SB	0,05	0,231	–0,161***
CF --> SA --> SB	0,047	0,184	0,069**
Total Indirect Effect	0,198	0,456	0,363***

Note. **p < .01, ***p < .001, β: Standardized effect, SB: Sport Burnout, CF: Cognitive Flexibility, TO: Task Orientation, EO: Ego Orientation, SA: Sport Anxiety

Table 5 presents the findings of the indirect effects analysis between the latent variables. The results indicate a significant relationship between cognitive flexibility and sport burnout, mediated by ego orientation and sport anxiety (indirect $\beta = .097$, $p < .01$). The standardized indirect effect of cognitive flexibility on sport burnout is 0.097. In other words, the indirect effect of cognitive flexibility on sport burnout indicates that an increase of one standard deviation in cognitive flexibility is associated with a .097 standard deviation increase in sport burnout. This is in addition to any direct (unmediated) effect of cognitive flexibility on sport burnout. Furthermore, cognitive flexibility significantly indirectly affects sport burnout via task orientation (Indirect $\beta = –.161$, $p < .001$). The results indicate that cognitive flexibility among high school athletes facilitates the development of task-oriented skills, reducing sport burnout. Furthermore, cognitive flexibility is associated with sport burnout through sport anxiety (Indirect $\beta = .069$, $p < .01$). The total indirect effect values in the model are statistically significant ($\beta = .363$, $p < .001$).

DISCUSSION

The objective of this study was to explore the mediating effect of sport anxiety, task orientation, and ego orientation on the association of cognitive flexibility and sport burnout. The results confirmed the H1 hypothesis by revealing that sport anxiety plays a mediating role in the relationship between cognitive flexibility and sport burnout. The findings of this study align with prior research showing the predictive effect of cognitive flexibility on sport anxiety (Han et al., 2011). This can be attributed to the positive coping strategies emerging with cognitive flexibility (Asıcı and Sarı, 2021). High school student-athletes with high cognitive flexibility can effectively deal with anxious situations they face

in sport. In turn, their sport burnout may decrease when they feel relieved from sport anxiety. Today's intense competition in sport is more likely to generate numerous adverse outcomes for student-athletes (Giusti et al., 2020). To protect these students, removing them from a competitive environment is not possible for their career choice, but maintaining their optimal functioning is quite possible by boosting their resources and safeguarding them. In this sense, cognitive flexibility should be centered on at-risk student-athletes because a lack of cognitive flexibility puts student-athletes in danger of sport anxiety and burnout. Student-athletes are not always exposed to identical sport experiences. Furthermore, student-athletes sometimes need to mentally switch between different tactics and options by weighing their winning and losing experiences. This is the stage where cognitive flexibility comes into play. Without it, student-athletes may experience anxiety due to the risk of losing control and being overwhelmed by the multitude of options, leading to sport burnout. Students' cognitive flexibility should be strengthened before an increase in anxious events during sport. Otherwise, sport burnout is inevitable for student-athletes.

This study's findings proved the H2 hypothesis by demonstrating the mediating role of task orientation in the association of cognitive flexibility and sport burnout. The results, showing the positive effect of cognitive flexibility on task orientation, were parallel with the study of Dagsdóttir et al. (2023). The importance and effectiveness of cognitive flexibility increase with the emergence of high task orientation because favorable sport outcomes depend on student-athletes task orientation levels. In consideration of the presence of task orientation in conjunction with intrinsic motivation (Tomczak et al., 2020), it is evident that when student-athletes are intrinsically motivated, they are not compelled to achieve beyond their capabilities by observing the accomplishments of others. Instead, they possess the capacity to establish attainable criteria for themselves. This is a significant opportunity for the student-athlete to establish rational developmental objectives by reflecting on their desires and necessities in sport. The establishment of more rational developmental objectives, as opposed to unattainable and ambiguous goals, has the potential to mitigate sport burnout. Logical and certain decisions require cognitive flexibility, offering thinking multiple ways and feeling control over their options. Since student-athletes with high cognitive flexibility tend to direct their resources on mastering their abilities and increasing their learning quality (Assar, 2021), more obvious and focused goals boost task orientation, decreasing sport burnout. Moreover, when student-athlete task orientation levels increase with cognitive flexibility, options, and especially overwhelming decisions may get limited. Thus, cognitive flexibility alleviates sport burnout when task orientation emerges.

This study evidenced the H3 hypothesis by suggesting the mediating effect of ego orientation in the relationship between cognitive flexibility and sport burnout. Previous research indicated that ego orientation produces less favorable outcomes (Dagsdóttir et al., 2023). From this point of view, cognitive flexibility can be expected to diminish ego orientation in student-athlete. In contrast, the findings put forward that cognitive flexibility has a positive predictive effect on ego orientation. In other words, student-athlete with high cognitive flexibility show high ego orientation, leading to more sport burnout. Because cognitive flexibility is an adaptive behavior to respond to any environmental change appropriately (Lage et al., 2023; Uddin, 2021; Xu et al., 2021), today's competitive world may force student-athlete to position themselves according to others in sport and education settings, so cognitive flexibility promotes ego orientation as well as task orientation for adaptation to the competitive environment.

The results did not prove the H4 hypothesis by indicating that task orientation and sport anxiety do not mediate the relationship between cognitive flexibility and sport burnout. On the other hand, the findings confirmed the H5 hypothesis by showing the mediating role of ego orientation and sport anxiety in the relationship between cognitive

flexibility and sport burnout. As a theory of Lazarus and Folkman (1984), cognitive appraisal defines individuals' environmental stressors as elements that can be solved or are disturbing. In this context, sport burnout may decrease due to reduced anxiety from increased choice and a greater sense of control, which stem from cognitive flexibility. Task orientation in sport has been shown to reduce sport burnout thanks to the options and increased sense of control provided by cognitive flexibility. However, the prevalence of ego orientation in sport may have hindered the participants from reaping equivalent benefits from cognitive flexibility compared to those observed in task-oriented individuals. While task orientation sets more achievable and realistic goals for cognitive appraisal, ego orientation may cause burnout due to the individual being stressed and perceiving the stimuli as disturbing.

Owing to today's conditions necessitating ranking every person in sport and education, cognitive flexibility may evolve to inevitably consider and control options by focusing on others-centered criteria when performing in sport settings. This can be quite challenging for student-athlete. Arranging themselves according to self-centered criteria may remain inadequate for student-athlete in today's world. Nonetheless, applying others-centered criteria is overwhelming for them, so they are more likely to feel sport burnout. Cognitive flexibility may enhance ego orientation, but this is not ideal for student-athlete due to the risk of sport burnout. Nevertheless, the results illustrated a more significant relationship between cognitive flexibility and task orientation than ego orientation. Also, task orientation is a more significant mediator in the relationship between cognitive flexibility and sport burnout compared to ego orientation. These suggest the crucial role of task orientation for student-athlete. Protecting student-athlete from sport burnout requires more team sport participation, considering the task orientation boosting feature of these sport in contrast to individual sport (Bjarnadóttir, 2023). All things considered, high schools specializing in sport should incorporate a curriculum boosting task orientation and preventing anxiety and ego orientation. The coaches and teachers must take a manner that is sensitive to student-athlete self-centered criteria when these students perform in sport so that sport burnout can decrease.

Despite the valuable implications mentioned earlier, the current study has a few limitations that should be considered. The present study employing a cross-sectional approach does not provide causality. For this reason, future research should consider a longitudinal approach to determine the change over time. This study relied on self-report measures to obtain data from student-athlete. Future research can use various data collection approaches, such as qualitative data and data derived from teachers, to support self-report measures for more reliable findings. Considering the study's participant group, sport high school students from five provinces of Türkiye, future studies should employ diverse and large samples to increase the generalisability of findings. A total of 392 students participating in sport constituted the sample of the study. Given that the sport burnout inventory utilized in this study was employed for diverse age groups in both the original and adapted versions, it can be concluded that this inventory is applicable to a broad spectrum of age ranges. Consequently, it is important that the adaptation process be re-examined with an appropriate sample. This adaptation is required to ensure the reliability and validity of the scale for future applications, and it would be useful for future research to also adapt the age group in the original scale. Future studies must be conducted to investigate the development and predictors of sport burnout over time. Additionally, the possible influence of the sport season must be considered. It is important to acknowledge that data collection may be subject to seasonal variability, particularly among student-athlete’s participants, which could introduce potential limitations to the study. Furthermore, the incorporation of control variables may be regarded as a potential limitation of this study.

CONCLUSION

The present study ascertained the mediating roles of sport anxiety, task, and ego orientation in the relationship between cognitive flexibility and sport burnout for high school students specializing in sport. This study is novel in terms of its study group because sport high school students have been neglected for these sport outcomes while the literature has focused on university student-athlete and adult athletes. Cognitive flexibility and task orientation should be incorporated into the curriculum targeting student-athlete. Sport burnout in these students requires prevention and intervention strategies to decrease sport anxiety and ego orientation. Additionally, team sport should accompany every aspect of the high school education of student-athlete in order to shape more task orientation. This study emphasized the significance of cognitive flexibility in decreasing sport burnout through sport anxiety, task, and ego orientation for high school students specializing in sport.

This study provides insights into the adaptation and cognitive flexibility of student-athletes experiencing low levels of sport burnout. Cognitive flexibility offers practical implications for personalized training and interventions. Therefore, relating individual changes to anxiety becomes important from an applied perspective. Furthermore, coaches can make sense of the difference between sport anxiety and burnout to assess cognitive performance and perception of competition among student-athletes with strong ego orientation. Coaches and sport psychologists can identify students with high levels of sport anxiety and burnout affecting performance and assist these students in developing skills to assess and manage these states so that the impact of anxiety and burnout is less disruptive. Finally, the impact of cognitive flexibility on sport burnout is mediated by task orientation, which enhances sport performance. Researchers could examine relevant contextual factors, including emotional and motivational states and various psychological factors in terms of sport performance.

Author Contribution:

1. **Ahmet Emin ARI:** Idea/Concept, Design, Checking, Data Collection and Processing, Analysis-Interpretation, Writing, Critical Review
2. **Burak Can KORKMAZ:** Analysis-Interpretation, Writing, Critical Review

Information about Ethical Board Permission

Committee Name: Erzincan Binali Yıldırım University Human Researches Educational Sciences Ethics Committee

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