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The Instrumental Role of Forgiving in the Relationship Between Cognitive Flexibility and Decision-Making and Happiness in Athletes

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Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.

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Abstract

This study aimed to examine the mediating role of forgiveness in the relationships between decision-making, cognitive flexibility, and happiness among active athletes. The participants consisted of 618 licensed athletes aged 18 years and older. Data were collected using the Forgiveness Decision Scale, Cognitive Flexibility Scale, Natural Decision-Making Scale, and Happiness Scale. The study employed a quantitative correlational design, and analyses were conducted through Structural Equation Modeling (SEM). In Model 1, forgiveness fully mediated the relationship between decision-making and happiness. The direct path from decision-making to happiness was significant before introducing forgiveness ($\beta = 0.11$, $t = 2.09$, $p < .01$) but became nonsignificant after inclusion ($\beta = 0.04$, $p > .01$), confirming full mediation. In Model 2, forgiveness partially mediated the relationship between cognitive flexibility and happiness (direct effect $\beta = 0.54$, $t = 12.20$, $p < .01$; reduced effect $\beta = 0.52$, $p < .01$). These findings indicate that forgiveness serves as a psychological mechanism through which athletes' cognitive and emotional competencies jointly enhance happiness. Athletes with higher forgiveness levels tend to make more adaptive decisions and experience greater well-being. The study underscores the importance of promoting forgiveness-oriented interventions in sport settings to strengthen athletes' emotional regulation, resilience, and overall happiness.

Keywords: Forgiveness, Decision-Making, Happiness, Cognitive Flexibility, Mediating Role, Athlete.

Özet

Sporcularda Bilişsel Esneklik ve Karar Verme ile Mutluluk Arasındaki İlişkide Affetmenin Aracı Rolü

Bu araştırmanın amacı, aktif sporcular arasında karar verme, bilişsel esneklik ve mutluluk arasındaki ilişkide affetmenin aracılık rolünü incelemektir. Araştırmanın çalışma grubunu, 18 yaş ve üzeri 618 lisanslı sporcu oluşturmaktadır. Veriler, Affetme Karar Ölçeği, Bilişsel Esneklik Ölçeği, Doğal Karar Verme Ölçeği ve Mutluluk Ölçeği kullanılarak toplanmıştır. Çalışma nicel ilişkisel tarama deseninde yürütülmüş ve analizler Yapısal Eşitlik Modellemesi (SEM) ile gerçekleştirilmiştir. Model 1'de affetme, karar verme ile mutluluk arasındaki ilişkide tam aracılık göstermiştir. Karar vermenin mutluluk üzerindeki doğrudan etkisi affetme dâhil edilmeden önce anlamlıdır ($\beta = 0.11$, $t = 2.09$, $p < .01$); ancak affetme eklendikten sonra bu etki anlamsız hâle gelmiştir ($\beta = 0.04$, $p > .01$). Model 2'de ise affetme, bilişsel esneklik ile mutluluk arasındaki ilişkide kısmi aracılık rolü üstlenmiştir

(doğrudan etki β = 0.54, t = 12.20, p < .01; azalan etki β = 0.52, p < .01). Bu bulgular, affetmenin sporcuların bilişsel ve duygusal yeterliklerini bütünleştirerek mutluluğu artıran temel bir psikolojik mekanizma olduğunu göstermektedir. Affetme düzeyi yüksek sporcuların daha uyumlu kararlar verdikleri ve daha yüksek öznel iyi oluş yaşadıkları görülmektedir. Çalışma, spor ortamlarında affetme temelli psikolojik müdahalelerin sporcuların duygusal düzenleme, dayanıklılık ve genel mutluluk düzeylerini güçlendirebileceğini vurgulamaktadır.

Anahtar Kelimeler: Affetme, Karar Verme, Mutluluk, Bilişsel Esneklik, Aracı Rol, Sporcu.

INTRODUCTION

Being happy, which is one of the situations we aim for in our lives, is a situation that everyone can desire. In positive psychology, happiness is seen as a part of mental health and a positive emotional state that improves life interpretation (1,2,3). Being in a happy state is a situation that can affect the sports life as well as the healthy fulfillment of daily activities. Happiness is defined as the psychological state of health, joy and peace (4). Seligman (5) stated that being happy consists of three dimensions: positive emotion, commitment to life and meaning of life. Positive emotion is based on having positive emotions about the past, present and future, and learning the skills necessary to increase the intensity of these emotions. In the dimension of being connected to life, the individual is expected to do activities that he enjoys in his business life, interpersonal relationships or in his spare time. Finally, in the dimension of the meaning of life, it requires the individual to use his talents and strengths for the benefit of society. In summary, the concept of happiness is based on the ability to control negative emotions and turn them into positive ones. In order for an individual to be happy, he must control his attitudes and reactions to the events he encounters. Therefore, this aspect of happiness is associated with the concept of forgiveness.

Developing forgiveness improves a person's positive outlook and happiness. In a way, forgiveness is a concept that contains negative emotions. Edwards (6) stated that forgiveness begins in pain, anger, insecurity and confusion and sprouts in hatred. In other words, at its core is the ability to control these negative emotions and to look at the glass half full. In this respect, the concept of forgiveness is very important in terms of social relations and health. Fitzgibbons et al. (7) defined forgiveness as an affective, intellectual and moral reaction to unjust behavior by people. In this respect, it is possible to say that the concept of forgiveness opens a door to happiness. As a matter of fact, being able to control negative emotions in order to establish healthy relationships can positively strengthen our human relationships. In this context, this positive emotional state that emerges in our human relationships can increase the happiness level of individuals. Worthington (8), in his pyramid model of forgiveness, suggested that individuals' ability to forgive others in mutual relationships may be related to their level of happiness and well-being. Maltby et al. (9) concluded that there is a significant positive relationship between happiness and forgiveness. In another study, Chan (10) found that there is a significant positive relationship between forgiveness and happiness. Forgiveness is not only a term that includes emotional processes, but also a concept that has cognitive processes (11). Karremans, Van Lange, Ouwerkerk and Kluwer (12) found that happiness and the concept of forgiveness were positively related in their study. Again, Kaya and Orçan (13) found that happiness has a mediating role between empathy, life satisfaction and forgiveness. In another study, Adam-Karduz and Sarıcam (14) found that there were significant relationships between forgiveness and happiness. Athletes frequently encounter forgiveness and happiness in sports settings. Because people who participate in sporting activities can feel better psychologically and physically, get away from stress and worries, improve their human relations, and feel happy by increasing their motivation (15). This emotional state obtained in the sports environment can sometimes be experienced intensely by people who play sports professionally or as amateurs. Because athletes who constantly participate in competitions or competitions may be happy or unhappy at the end of the match. This situation may also affect their level of forgiveness. In addition, this situation can positively or negatively affect the performance of athletes in the next competition. As a matter of fact, sport can be expressed as a whole that includes various concepts such as competition, purpose, effort and excitement. The fact that athletes feel these emotions intensely can be quite decisive in their attitude towards the opponent and their performance.

Cognitive flexibility helps athletes adapt behaviors and choose the best options, supporting happiness. For this reason, it can be expressed as an expected product that people with high cognitive flexibility are

happier as a result of their correct choices. Because people with high cognitive flexibility, which is expressed as the ability to quickly move from one situation to another (16), can easily change their minds in sudden situations (17). Cognitive flexibility, defined by Kara et al. (18) as the way of thinking towards the task that the individual has, can be a stepping stone to happiness. Therefore, it can be stated that the decisions made by an athlete with high cognitive flexibility in order to be happy may be more appropriate. As a matter of fact, Asıcı and Ikiz (19) found that there are significant and positive relationships between cognitive flexibility and happiness levels of individuals in their study. In addition, Yıldız (20) found that cognitive flexibility has a moderate and significant relationship with subjective well-being and that the predictor variables explain 60% of the total variance in subjective well-being. In another study, Satan (21)concluded that cognitive flexibility significantly predicted subjective well-being. Demirtaş (22) concluded that cognitive flexibility is positively related to happiness and cognitive flexibility predicts happiness. Similarly, Asıcı and Sarı (23) found that cognitive flexibility directly predicts happiness.

Although being happy is a state of emotion, it is one's choices that drive happiness. When making choices, athletes also make a judgment among different situations. Decision making is a way of minimizing doubts and uncertainties (24) by voluntarily choosing one of the possible options (25). Dilmaç and Bozgeyikli (26) found a significant relationship between subjective well-being and decision-making styles in their study. In another similar study, Tekkurşun-Demir et al. (27) found a significant relationship between decision-making styles and mental well-being. Yıldız and Eldekioglu (28) concluded in their study that decision-making styles were significantly predicted in terms of happiness variable. Bubic and Erceg (29) found that the tendency to maximize during decision making is positively correlated with all three orientations towards happiness.

This study investigates whether forgiveness mediates the relationship between decision-making, cognitive flexibility, and happiness among athletes. When the related studies were examined, the motivation of the study was that there was no study investigating whether the forgiveness variable included in the process had a mediating effect in the relationship between decision-making and cognitive flexibility of athletes and their happiness. There is no existing model that examines decision-making, cognitive flexibility, and happiness together in sports. It is also considered important to model these relationships between variables and to visualize and address these models in the context of structural equation modeling (SEM). The motivation for examining the study with structural equation modeling is to examine the terms whose possible relationships are presented and whose conceptual relationships are discussed. The theoretical presentation of the causality relations of the models created reveals the importance of the examination. Before moving on to the models to be investigated within the scope of the study, the dependent, independent and mediating variables that are the subject of the research will be explained in the conceptual framework and the models predicted by the literature will be tested in this direction.

The aim of this study is to determine how the relationship between decision making, cognitive flexibility and happiness changes when forgiveness is included in the process. The belief that these factors will contribute to the success of athletes reveals the importance of the study.

Happiness and Sport

The concept of happiness, which is a part of our human emotions, can be shown as one of the determining factors in terms of the level of human life quality. Happiness corresponds to the evaluation of the level of quality of life of the individual in relation to his/her whole life (30). Happiness is expressed as a cognitive and affective evaluation of life. Accordingly, an individual's frequent experience of positive emotions such as joy, pride, confidence and excitement; less frequent experience of negative emotions such as anger, fear, anxiety and hatred; and high satisfaction with family, work, career and similar areas of life can be explained as indicators of happiness (31). In a sense, it can be inferred that feeling positive emotions frequently increases our daily life quality. Myers and Diener (32) defined happiness as the quantity and superiority of positive feelings about one's life.

Seligman (5) stated that happiness consists of three dimensions: positive emotion, connectedness to life and meaning of life. Positive emotion refers to having positive emotions about the past, present and future and learning the necessary skills to increase the intensity of these emotions; being connected to life refers to

doing and enjoying activities that the individual enjoys in his/her work life, social relationships or leisure time; and living a meaningful life refers to the ability to use one's talents and strengths to serve the society. In this context, it is possible to associate the concept of happiness with sports. Because sport is a concept that allows the discharge of negative emotions and it contains concepts such as success, purpose, winning and perseverance. Therefore, it is possible to say that the gains obtained in these concepts can bring happiness. As a matter of fact, human beings live for a purpose and make an effort to fulfill this purpose. Likewise, the concept of sport, which contains many goals, is related to happiness in this respect. Regarding this issue, according to Farabi, happiness is a goal that every human being desires, it is preferred and desired for the human being himself at any time (33). The effort of athletes to be successful can be seen as an important component of happiness in sports.

Forgiveness and Sport

Human beings have a structure that contains many emotions by nature. In this context, it can be said that the thinking power of human beings, who are thinking beings, is affected by a wide variety of emotional functions. These functions can be classified as positive and negative emotions. Therefore, the ability to control these emotions in the right way is an important factor in maintaining a healthy life. Because the emotional control required by social life affects our interpersonal relationships. As a matter of fact, people encounter many negative situations or events while interacting with their environment. In the face of this situation, the individual who is not forgiving towards his/her environment may isolate himself/herself from the society. The concept of forgiveness is seen as an interpersonal process to maintain and improve the quality of human relationships (34). It is important to internalize the concept that affects our relationship with our environment so much.

Forgiveness helps individuals replace negative emotions with positive or neutral feelings (35). This concept, which is based on the removal of negative emotions, is related to the fact that sport is a concept that allows the discharge of negative emotions. Interaction in the sports environment provides the discharge and control of emotions. Individuals participating in sportive activities have the opportunity to express their emotions through movements. This enables the discharge and control of negative emotions such as anger, aggression, shyness, jealousy (36). The fact that forgiveness sprouts as a result of negative emotions (6) means that it emerges as a result of the removal of these emotions. Therefore, the concept of forgiveness is seen to be related to sports since the opportunity to get away from negative emotions in a sports environment can enable an individual full of anger to discharge his/her emotions.

Cognitive Flexibility and Sport

The situations we face in daily life push us to think alternatively among different options. The choices we make as a result of thinking determine the course of our lives. Therefore, having the cognitive abilities to make the right choices is important for the positive progress of our lives. At this point, it is possible to talk about the concept of cognitive flexibility. Cognitive flexibility is the ability to consider multiple options before making a choice (37). In other words, cognitive flexibility is a form of fluid intelligence determined by the ability to bring alternative solutions to different situations (38). In other words, it can be said to be able to adapt our cognitive processes according to the situations we encounter. In this sense, the concept of sport can be mentioned to support cognitive control. Because the concept of cognitive flexibility, which is at the basis of executive functions, is known to provide conscious control of actions, thoughts and emotions (39). Considering the areas where sports interact with the brain, it is possible that our cognitive control is supported by sports. Sports increase the release of serotonin and dopamine, which support decision-making processes in the brain. In this context, these oscillations, which increase with sports, are important in terms of predicting which decision may be correct. Therefore, it can be said that there is a relationship between sports and cognitive flexibility.

Decision making and Sport

The choices we face in our lives often lead us to choose one of these choices. In doing so, it is necessary to make a decision about which choice is the right one and to think about every aspect. Because we can be happy or sad as a result of the decisions we make. Decision making involves choosing the best option by reducing doubts and uncertainties (40). In other words, decision making is knowing what to do in a given or

emerging situation (41). Akpınar et al. (42) explained decision making as a behavior taken to eliminate the difficulty experienced when there are at least two or more options that will lead to an object, person or situation that is thought to satisfy the need. In this respect, the phenomenon of decision-making is also present in sports, which contains difficulties. Because the decisions made by referees, coaches or athletes in sports are decisive in being successful. In the sports environment where we often have to exhibit decision-making behavior, athletes are obliged to think in many ways and choose the most appropriate option. The decision to apply the wrong technique in a challenge can result in failure. In this respect, it is extra important for athletes to think in multiple ways to make the right decision. In addition, the changes that occur in the brain during sports can improve decision-making.

From a neurological perspective, the dorsolateralalprefrontal cortex and ventromedialprefrontal cortex regions, which are the regions responsible for decision-making behavior in our brain, help in thought processes and making choices among various alternatives. In addition, brain imaging shows that regions linked to short-term memory also support cognitive flexibility and decision-making in the light of various contexts (43). When the effects of exercise on the nervous system are examined, it has been found that it improves synaptic structures in the brain, especially in regions related to cognitive functions such as the anterior hippocampus and prefrontal lobe, and accelerates neurogenesis, angioe-nesis, and cerebral blood flow (44). Therefore, developments in these regions, which are responsible for the decision-making mechanism in the brain with sports and exercise, are important in terms of making the right decisions. In this context, it can be said that there is a relationship between decision-making and sports.

The theoretical models planned based on the existence of the relationships between the variables above are visualized below in accordance with the purpose of the research. The theoretical models created for the concepts explained are presented in Figure 1 and Figure 2 and the hypotheses written for these models are indicated below the figures.

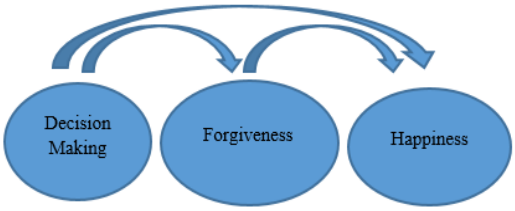

Figure.1

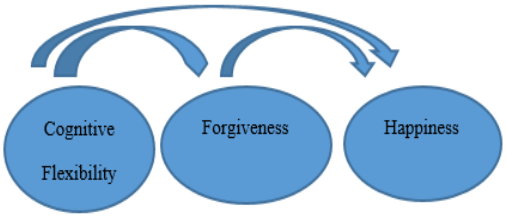

Figure.2

Hypothesis 1: There is a significant positive relationship between decision making and forgiveness in athletes.

Hypothesis 2: There is a significant positive relationship between decision making and happiness in athletes.

Hypothesis 3: There is a significant positive relationship between forgiveness and happiness in athletes.

Hypothesis 4: When forgiveness is activated in athletes, the relationship between decision making and happiness decreases.

Hypothesis 5: There is a significant positive relationship between cognitive flexibility and happiness in athletes.

Hypothesis 6: There is a significant positive relationship between cognitive flexibility and forgiveness in athletes.

Hypothesis 7: When forgiveness is activated in athletes, the relationship between cognitive flexibility and happiness decreases.

Within the framework of the hypotheses covering Figure.1 and Figure.2, the main problem statement can be expressed as "What is the mediating role of forgiveness in the relationship between cognitive flexibility, decision making and happiness in athletes?".

METHOD

Research Model

This study was designed within the scope of relational survey models in which possible theoretical causal relationships between athletes' cognitive flexibility, decision making, happiness and forgiveness were examined. Researchers do not intervene in the relationships in relational survey models. The researcher, who can provide clues in relational research, does not look for a relationship related to causes and effects (45). Structural Equation Modeling (SEM) was selected due to its capacity to simultaneously test complex relationships among latent and observed variables while accounting for measurement errors (70). Prior to structural analysis, measurement models were validated using confirmatory factor analysis (52) and model fit was assessed based on conventional indices (68). These steps ensured the constructs' validity and reliability before hypothesis testing.

Study Group

The athletes participating in the study were selected through a convenience sampling method from individuals actively registered in various sports clubs and provincial directorates of youth and sports across different regions of Türkiye. The inclusion criteria required that participants be licensed athletes who had been continuously training and competing for at least one year in their respective disciplines. The sample included both team (e.g., football, volleyball, basketball) and individual sports (e.g., athletics, taekwondo, swimming), ensuring diversity in sport type and performance level. Convenience sampling was preferred due to its practicality in reaching a large and heterogeneous group of active athletes within a limited timeframe (46).

Ethical approval and institutional permission

The study was approved by the Mersin University Faculty of Sport Sciences Ethics Committee (Decision Date: 22.06.2023, Decision No: 036). Informed consent forms were obtained from all participants in accordance with the principles of the Declaration of Helsinki. The authors declare that non-original language editing and minor formatting corrections were supported by an artificial intelligence–based assistant (OpenAI ChatGPT). All analyses, interpretations, and conclusions presented in this study are entirely the authors' own and were not generated by any artificial intelligence tools.

Data Collection Tools

Forgiveness Decision Scale

The Decision to Forgive Scale, adapted to Turkish culture by Ekşi et al. (47), consists of 6 items and a single dimension. The scale, which does not have reverse items, is a 5-point Likert-type scale ranging from Strongly Disagree (1) to Strongly Agree (5). A high score indicates a person's high decision to forgive. For the adaptation study of the Forgiveness Decision Scale to Turkish Culture, 297 pre-service teachers over the age of 18 participated. The Cronbach's alpha reliability coefficient calculated to obtain the reliability evidence of the scale was 0.91, and this value revealed that the scale is a highly reliable measurement tool. In addition, the item-total correlations of the items were examined to obtain evidence of the construct validity of the scale and it was found that these values ranged between 0.59 and 0.84. The correlation coefficients were also found to be statistically significant. In the present study, the Cronbach's alpha reliability coefficient for the Forgiveness Scale was found to be 0.87, demonstrating good internal reliability.

Cognitive Flexibility Scale

The Cognitive Flexibility Scale developed by Bilgin (48) consists of 19 items. The scale items consist of pairs of adjectives (e.g. I can, I cannot, - I am successful, I am unsuccessful). The lowest score that can be obtained from the scale is 19 points, and the highest score is 95 points. Reliability and validity were tested using a sample of 637 adolescents. The higher the scores obtained from the scale, the closer the individual is to cognitive flexibility. In the reliability study conducted on the scale, the Cronbach's alpha coefficient for the whole scale was found to be 0.92. The item-total correlations of the items ranged between 0.49 and 0.63. The test-retest correlation coefficient was 0.77 and the halving coefficient was 0.87 over an eight-week interval. In the present study, the Cronbach's alpha reliability coefficient for the Cognitive Flexibility Scale was found to be 0.95, indicating high internal consistency.

Natural Decision Making Scale

Developed by Sundu and Yaşar, (49) the Natural Decision Making Scale consists of 6 items and one dimension. The Cronbach's Alpha coefficient calculated for the whole scale is 0.80. There are no reverse coded items in the scale, which has a 5-point Likert structure ranging from Strongly Agree to Disagree. Natural decision making, which is the subject of the research, was preferred in the scale created with 554 participants over the age of eighteen who are working in different professions, since it is seen as the process of focusing on and choosing the most appropriate one among various options. In addition, the factor loadings of the Natural Decision Making scale items ranged from 0.68 to 0.87 and all of them were statistically significant. In the present study, the Cronbach's alpha reliability coefficient for the Decision-Making Scale was calculated as 0.72, showing excellent internal consistency among the items.

Happiness Scale

The Happiness Scale developed by Demirci and Eksi (50) has a unidimensional structure consisting of 6 items. The scale, which does not contain any reverse-coded items, has a 5-point Likert structure (1: Not at All Suitable for Me, 5: Completely Suitable for Me). The Happiness Scale, developed with 900 participants over 18 years old, showed a Cronbach's alpha of 0.83, a test-retest reliability of 0.73 over three weeks with 62 participants, and item factor loadings between 0.59 and 0.78. Confirmatory factor analysis (CFA) was conducted to reveal the psychometric qualities of the data collection tools used in this study. The aim of CFA is to discover the factor or factors based on the relationships between variables by revealing the sources of variance and covariance (51). To assess the reliability and convergent validity of the scales, AVE values were calculated and presented in Table 1. CR values should exceed 0.50 for construct reliability (52), and for convergent validity, AVE should meet the CR≥AVE≥0.50 condition (53); however, if AVE is below 0.50, a CR value of ≥0.7 is considered acceptable. In the present study, the Cronbach's alpha reliability coefficient for the Happiness Scale was found to be 0.86, indicating satisfactory internal reliability.

Although all scales included in the analysis were unidimensional, discriminant validity indices such as Maximum Shared Squared Variance (MSV) and Average Squared Variance (ASV) were also examined to confirm that each construct was statistically distinct from the others. The results demonstrated that MSV and ASV values were lower than the Average Variance Extracted (AVE), indicating satisfactory discriminant validity among the constructs.

Table 1. Reliability and Validity Findings of The Scales Used

Scales	CA	CR	AVE	CA	CR	Convergent Validity
Happiness	0.87	0.84	0.49	✓	✓	✓
Cognitive Flexibility	0.95	0.94	0.44	✓	✓	✓
Natural Decision Making	0.70	0.70	0.40	✓	✓	✓
Forgiveness	0.86	0.86	0.54	✓	✓	✓
Criteria	≥.70	≥.70	≥.70>CR	≥.70	≥.70	AVE<CR

When the results of Table.1 are taken into consideration, it is concluded that all measurement tools used within the scope of the research provide reliable and valid measurements. It can be said that the AVE value obtained in Table 1 is low but acceptable. This is because Fornell and Larcker (53) emphasized that in cases where the CR value is higher than 0.60, AVE less than 0.50 is acceptable and construct validity is sufficient (54).

Collection of Data

The necessary ethical permission was obtained from the relevant committees before the study. Ethics committee approval was obtained from Mersin University. Voluntary participants were informed that the information received would only be used within the scope of the current study and would remain confidential. Scale forms including demographic information were applied to the participant athletes online for approximately 15 minutes and data were collected. The study group consists of undergraduate students.

Data Analysis

This study was conducted with structural equation modeling (SEM) in order to reveal the mediating relationships of forgiveness in the relationship between cognitive flexibility, decision making and happiness in active licensed athletes. SEM, which is a statistical method that predicts the causal relationships that observed and latent variables may have, puts forward a theoretical framework (55, 56, 57). The main purpose of SEM is to reveal the relationship patterns of the data obtained as well as the latent variables (58). SEM, based on a theoretical foundation (59, 60), is widely used to test observed and latent variables in fields such as economics, medicine, and psychology (61, 62), and differs from traditional methods by accounting for measurement errors of latent variables (63, 16).

Before performing SEM, which is a multivariate statistical technique, assumptions were examined. Within the scope of the assumptions, since the data were collected online, no missing or missing data were found. Then, single and multiple outliers were examined. In this context, the standardized Z values for single outliers ranged between (-3.54, 1.58), and the 445th observation with a value of -4.37 was excluded from the analysis because it produced a single outlier. In this context, since all observations were within the limits of $4 \geq z \geq 4$ (51), the analysis continued without any single outlier. As a result of the degrees of freedom comparison (64) for the remaining 621 observations, 3 observations (163rd, 390th and 546th) that produced values above the values of Mahalonobis distances (χ23, 0.001=16.27) were excluded from the analysis and the analyses continued with the remaining 618 observations. The hypothesis analyses continued with testing the multicollinearity problem and Variance Inflation Factor (VIF) and Tolerance values were analyzed. In this context, the tolerance values ranged between (0.922, 0.974) and all values were above 0.20; the VIF values ranged between (1.027, 1.084) and all observation values were below 5, indicating that there was no multicollinearity problem among the items (51). The Durbin–Watson statistic, which tests for autocorrelation among residuals rather than multicollinearity, was found to be 1.93. A value close to 2 indicates that the residuals are independent from each other (65). Additionally, to examine multicollinearity, Variance Inflation Factor (VIF) and Tolerance values were calculated. The corresponding results (VIF = 1.11–1.26; Tolerance = 0.79–0.90) are presented below Table 2, confirming that there was no multicollinearity problem among the variables.

Testing the measurement model is one of the basic assumptions of SEM analyses. Table.2 presents the goodness of fit and poorness of fit values of the measurement model including all the variables within the scope of the study and the criterion criteria against which these values will be compared.

Table 2. Measurement Model Results

Variables	X^2/sd	RMSEA	SRMR	CFI	NFI	NNFI	
CFA Measurement Model	2555/823	0.08	0.05	0.95	0.93	0.95	**DW=1.93 VIF= 1.11-1.26 TOLERANCE=0.79-0.90**
Perfect fit	≤ 3	≤.05	≤.05	≥.95	≥.95	≥.95	
Good fit	3≤ x^2/sd ≤ 5	.05≤RMSEA≤.08	.05 ≤ SRMR ≤.10	.90≤CFI <.95	90≤NFI<.95	90≤NFI<.95	

Note. VIF = Variance Inflation Factor; DW = Durbin–Watson statistic. No multicollinearity problem was detected (VIF < 10; Tolerance > 0.10).

Considering the goodness of fit statistics found in Table 2 and the literature criteria, it is observed that the tested measurement models match with excellent and good fit criteria. The testing of measurement models is an important assumption of SEM analysis (66), and the model-data fit evaluation is evaluated in Table 2 by considering excellent and acceptable fit values (67, 68, 69, 70). In evaluating model fit, RMSEA assesses how well the model would fit the population covariance matrix, with values below .08 considered acceptable, while SRMR indicates the standardized difference between observed and predicted correlations, where values below .08 reflect good fit. Similarly, CFI and NFI compare the hypothesized model to a null model, with values above .90 suggesting acceptable fit and values above .95 indicating excellent fit. NNFI, also known as the Tucker-

Lewis Index, adjusts for model complexity and suggests excellent fit when values approach or exceed .95 (68). It is recommended to report RMSEA, x^2 degrees of freedom and significance values, SRMR and CFI values as a minimum in studies based on CFA (70). The measurement model tested with the dependent, independent and mediator variables in the study matches with excellent fit and good fit indicators.

In this study, mediation was examined within a structural equation modelling (SEM) framework. Rather than relying solely on traditional stepwise criteria, the presence of mediation was primarily evaluated on the basis of the indirect effect of the independent variable on the dependent variable through the mediator. Indirect effects (a×b) were estimated using a bias-corrected bootstrap procedure with 5,000 resamples (71), and 95% confidence intervals (CI) were used to determine statistical significance. In addition, the magnitudes and significance levels of the direct paths were examined in order to distinguish between full and partial mediation. All mediation analyses were conducted using LISREL 8.8 with the bias-corrected bootstrap method (5,000 resamples), and the indirect, direct, and total effects were evaluated based on the LISREL output. Therefore, the bootstrap-based significance of the indirect paths was taken as the main criterion for mediation rather than relying solely on stepwise regression procedures.

The conceptual approach of Baron and Kenny (71) was used only as a supplementary guideline for interpreting the pattern of relationships between the independent, mediator, and dependent variables; however, the significance of the bootstrapped indirect effect was taken as the main criterion for establishing mediation (72). Consequently, it was not required that all pairwise relationships between the variables be statistically significant. Before testing the mediation models, the bivariate relationships among the variables hypothesised for Model 1 and Model 2 were examined on the basis of the measurement model outputs and are presented in Table 3 and Table 4.

Table 3. Correlations Between Study Variables

Variables	Happiness	Decision Making
Happiness	---	
Decision Making	.11**	---
Forgiveness	.23**	.30**
** $p < .01$		

Table 4. Correlations Between Study Variables

Variables	Happiness	Cognitive Flexibility
Happiness	---	
CognitiveFlexibility	.54**	---
Forgiveness	.23**	.14**
** $p < .01$		

Therefore, within the scope of mediation, hypotheses 1,2,3,4,5,6,7 of the theoretical models in Figure 1 and Figure 2 were confirmed and the prerequisites for the mediation study were provided.

FINDINGS

In this section, mediation analyses were carried out in stages on the two models whose theoretical frameworks were drawn. In the first stage, the direct relationship between the dependent and independent variables and the t values revealing the significance of this relationship, and in the second part; the magnitude (status) of the relationship between the independent variable and the dependent variable obtained by adding the mediating variable to the models and the t values calculated for this relationship are included.

Model-1

The results of the mediation test conducted for model-1, which investigates whether forgiveness is a mediating variable in the relationship between decision making and happiness, are presented. Figures 3.a and 3.b show the standardized loadings and t values of the structural model between decision making, which is the independent variable in the research, and happiness, which is the dependent variable of the research. In SEM analysis, β (beta) reflects the strength and direction of the relationship between variables, while R^2 (R-squared) indicates how much of the variance in the dependent variable is explained by the independent variables. Within Model 1, the indirect effect of decision making on happiness through forgiveness (a×b) was tested using LISREL's bias-corrected bootstrap analysis (5,000 resamples). The indirect path was statistically significant, whereas the direct effect became non-significant in the presence of forgiveness, indicating a full mediation pattern between decision making and happiness.

Although demographic variables such as gender, age, sports branch, type of sport (team/individual), and contact level (contact/non-contact) were recorded in the dataset, they were not included as control variables in the structural model. This decision was made to focus on the direct and indirect effects of the main psychological constructs (decision-making, forgiveness, and happiness) and to prevent model complexity from exceeding the recommended sample size ratio. However, the exclusion of these control variables is acknowledged as a potential limitation that may affect the internal validity of the findings.

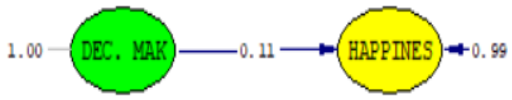

Figure 3. A. Standard Path Coefficients For The Binary Model

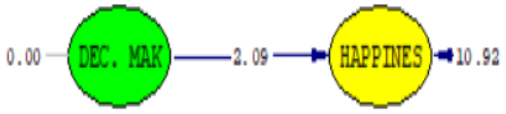

Figure 3. B. T-Values For The Binary Model

Figure 3.b reveals that there is a significant positive relationship between decision making and happiness levels of athletes (t=2.09; p<.01). Figure 3.a also shows that there is a theoretically weak causal relationship between athletes' decision making and their happiness levels (β=0.11; p<.01). Decision-making of athletes predicts their happiness levels by 0.01% (R^2). The model data goodness of fit results obtained for this model are summarized in Table 5.

Table 5. Model Fit Values for The Relationship Between Decision Making and Happiness

Variables	X^2/sd	RMSEA	SRMR	CFI	NFI	NNFI
CFA Measurement Model	186/53	0.066	0.044	0.96	0.95	0.95
Perfect fit	≤ 3	≤.05	≤.05	≥.95	≥.95	≥.95
Good fit	3≤ x^2/sd ≤ 5	.05≤RMSEA ≤.08	.05 ≤ SRMR ≤ .10	.90≤CFI <.95	90≤NFI<.95	90≤NFI<.95

When the goodness of fit criteria in Table 5 are examined, it is concluded that the values of the model between the independent variable decision-making and the dependent variable happiness comply with the criteria of excellent and good fit. In the next stage of the mediation model, the mediator variable "forgiveness" was added to the model and figures 4.a and 4.b were obtained.

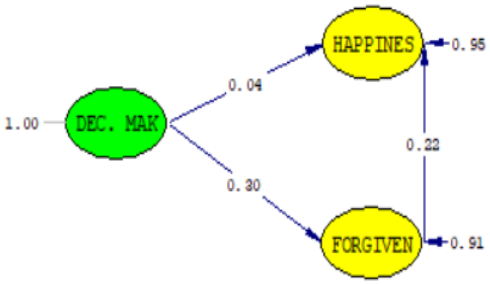

Figure 4.a. Standard Path Coefficients for The Triplet Model

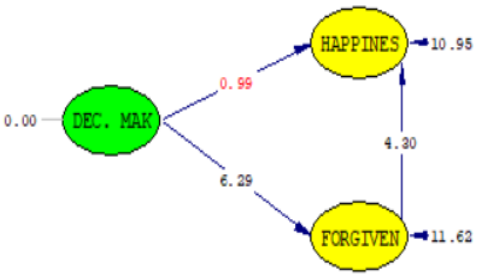

Figure 4.b. T-Values for The Triplet Model

In the model in which athletes' forgiveness levels assumed the mediating role, it was found that the relationship between decision making and happiness became insignificant (β=0.04 p>.01). The bias-corrected bootstrap analysis conducted in LISREL 8.8 (5,000 resamples) confirmed that both the direct and indirect effects were significant, and the 95% confidence intervals did not include zero, supporting a partial mediation effect of forgiveness between cognitive flexibility and happiness.

On the other hand, the relationship between the independent variable decision-making and the mediating variable forgiveness was found to be positively significant (t=6.00; p<.01) and decision-making explained 9% (R^2) of the change in forgiveness. The t-value findings of the relationships between variables are presented in Figure 4.b. Baron and Kenny (71) emphasized that there may be a mediation relationship if the relationship between the dependent variable and the independent variable decreases or disappears completely when the mediator variable is activated. Considering the significance levels of the relationships in the model, it can be said that forgiveness plays a full mediating role in the relationship between decision making and happiness. Table 6 presents the goodness of fit values for the mediation modeling.

Table 6. Model Fit Values for The Mediating Role of Forgiveness in The Relationship Between Decision Making and Happiness

Variables	X^2/sd	RMSEA	SRMR	CFI	NFI	NNFI
CFA Measurement Model	420/117	0.067	0.047	0.95	0.94	0.95
Perfect fit	≤ 3	≤.05	≤.05	≥.95	≥.95	≥.95
Good fit	3≤ x^2/sd ≤ 5	.05≤RMSEA ≤.08	.05 ≤ SRMR ≤ .10	.90≤CFI <.95	90≤NFI<.95	90≤NFI<.95

When the goodness of fit measures given in Table 6 and SEM values given in Figure 4.a and Figure 4.b are analyzed; it is seen that the relationship between decision making and happiness is explained by forgiveness. When athletes' forgiveness levels are included in the model, the model goodness of fit values have excellent and good fit indicators.

Model -2

In Model-2 created within the scope of the research, the mediating role of forgiveness in the relationship between athletes' cognitive flexibility levels and happiness levels is questioned. In the model, cognitive flexibility as the independent variable, happiness as the dependent variable and then forgiveness as the mediating variable were included in the process. Figure 5.a and 5.b show the results of the structural model.

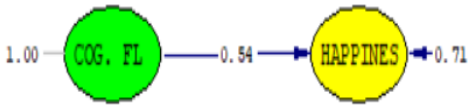

Figure 5.a. standard path coefficients for the binary model

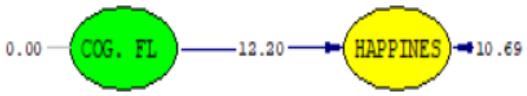

Figure 5.b. t-values for the binary model

Figure 5.b shows that there is a significant positive relationship between athletes' cognitive flexibility levels and their happiness levels (t=12,20; p<.01). Figure 5.a also shows that there is a moderate relationship between athletes' cognitive flexibility and their happiness levels (β=0.54; p<.01). Athletes' decision-making predicts their happiness levels by 0.29% (R^2). The model data goodness of fit indices for the model between the two latent variables, which constitutes the first stage of mediation, are presented in Table 7.

Table 7. Model Fit Values for The Relationship Between Cognitive Flexibility and Happiness

Variables	X^2/sd	RMSEA	SRMR	CFI	NFI	NNFI
CFA Measurement Model	1858/574	0.011	0.062	0.95	0.94	0.95
Perfect fit	≤ 3	≤.05	≤.05	≥.95	≥.95	≥.95
Good fit	3≤ x^2/sd ≤ 5	.05≤RMSEA ≤.08	.05 ≤ SRMR ≤ .10	.90≤CFI <.95	90≤NFI<.95	90≤NFI<.95

The goodness of fit measures obtained in Table 7 have excellent and good fit indicators. The standardized path coefficients for the model investigating whether forgiveness plays a mediating role in the relationship between cognitive flexibility and happiness and the t-values giving information about the significance of these coefficients are presented in figures 6.a and 6.b.

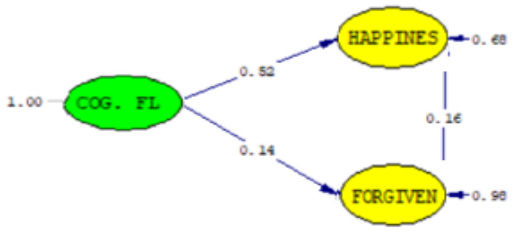

Figure 6.a. standard path coefficients for the triplet model

Figure 6. b. t-values for the Tripartite Model

In the model in which athletes' forgiveness levels assumed the mediating role, it was concluded that the relationship between cognitive flexibility and happiness maintained its significance (β= 0.52; p<.01). Baron and Kenny (71) state that if the relationship between the independent and dependent variables weakens or slightly decreases when the mediator is introduced, it indicates partial mediation (72). Based on this information, it can be stated that the relationship between the dependent and independent variables decreased compared to the first stage (r=0,52; p<.01), so forgiveness played a partial mediating role between these two variables. The t-value findings of the relationships between the variables are presented in Figure 6.b. Table 8 presents the goodness of fit values for the mediation modeling.

Table 8. Model Fit Values for The Mediating Role of Forgiveness in The Relationship Between Cognitive Flexibility and Happiness

Variables	X^2/sd	RMSEA	SRMR	CFI	NFI	NNFI
CFA Measurement Model	2141/431	0.087	0.061	0.95	0.94	0.95
Perfect fit	≤ 3	≤.05	≤.05	≥.95	≥.95	≥.95
Good fit	3≤ x^2/sd ≤ 5	.05≤RMSEA ≤.08	.05 ≤ SRMR ≤ .10	.90≤CFI <.95	90≤NFI<.95	90≤NFI<.95

Considering the model goodness and model badness criteria for the model in which forgiveness plays a mediating role in the relationship between cognitive flexibility and happiness, it was concluded that this model also met the criteria of perfect fit and acceptable fit from a multiple evaluation perspective.

DISCUSSION AND CONCLUSION

The dynamic structure of sport reveals the importance of more than one component in the process leading to success. Therefore, it can reveal the importance of cognitive and affective characteristics of athletes as well as their physical competencies. Thus, this study used SEM to test how forgiveness influences the link between athletes' cognitive flexibility, decision-making, and happiness. It was determined that the SEM results were statistically significant and satisfactory and the models constructed in the theoretical framework were confirmed by the data obtained from the athletes.

Preliminary analyses confirmed significant relationships among decision-making, cognitive flexibility, forgiveness, and happiness. Depending on these relationships, two different SEM models, Model-1 and Model-2, were constructed. In Model-1, it was tested whether forgiveness has a mediating role in the relationship between decision making and happiness of athletes and according to the results, it was determined that forgiveness is a full mediator. Again, in Model-2, which was constructed to determine whether forgiveness has a mediating role in the relationship between athletes' cognitive flexibility and their happiness, it was found that forgiveness is a partial mediator.

The results showed a significant positive relationship between happiness and decision-making. When the literature is examined, Dilmaç and Bozgeyikli (26) concluded that there is a significant relationship between subjective well-being and decision-making styles of prospective teachers. In another study, Bubic and Erceg (29) found that there was a significant positive relationship between students' decision-making styles and subjective well-being. This positive relationship suggests that athletes with higher levels of happiness are more likely to make effective and adaptive decisions in challenging sport contexts. Positive emotions enhance cognitive flexibility, attention control, and the ability to evaluate alternatives without excessive rumination, which in turn supports sound decision-making under pressure. In contrast, lower levels of happiness are often associated with indecisiveness and maladaptive decision tendencies due to heightened negative affect and cognitive interference. These findings are consistent with recent studies indicating that emotional well-being facilitates goal-directed thinking, self-regulation, and situational awareness during athletic performance (30, 31).

Another result obtained is that there is a significant and positive relationship between happiness and forgiveness. In the related literature, Yasar (73) found that subjective well-being is positively related to psychological resilience and forgiveness. Eke (74) concluded that there is a significant positive relationship between adults' forgiveness scores and their subjective well-being. This finding indicates that individuals with higher levels of happiness tend to exhibit greater forgiveness toward themselves and others. Positive affect and emotional well-being promote empathy, tolerance, and cognitive reappraisal, which reduce rumination and facilitate letting go of negative emotions. In other words, happier people are more capable of forgiving because their emotional resources allow them to regulate interpersonal stress more effectively. These results are supported by recent studies showing that positive emotions foster forgiveness by enhancing psychological resilience and perspective-taking abilities (75, 76).

A significant and positive relationship was also found between decision-making and forgiveness, which is another important finding. Looking at similar studies, Demirtas (75) concluded that there are significant

positive relationships between psychological resilience, forgiveness and cognitive control variables. According to this result, it was interpreted that people with psychological resilience have the ability to control and manage their negative emotions and thoughts and create alternative coping strategies, and thanks to these features, they are more forgiving. This relationship suggests that individuals who demonstrate effective decision-making skills are also more capable of forgiveness. Rational and confident decision-makers tend to regulate their emotions better, evaluate interpersonal conflicts more objectively, and are less driven by impulsive or revenge-oriented reactions. The cognitive control and self-regulation involved in decision-making contribute to the ability to process negative experiences constructively and adopt a forgiving perspective. Similarly, forgiveness may facilitate clearer decision-making by reducing emotional rumination and cognitive load during stressful situations. These interpretations are consistent with studies indicating that self-regulatory strength and emotional intelligence are common mechanisms underlying both forgiveness and decision-making competence (77, 78).

Another important result of the study is the significant and positive relationship between happiness and cognitive flexibility. When the literature is examined, Balta (76) found a significant positive relationship between cognitive flexibility and happiness scores of adult individuals. In a similar study, Sagar (77) concluded that cognitive flexibility significantly predicted subjective well-being at school.

One of the findings of the study is the significant and positive relationship between cognitive flexibility and forgiveness. In his study, Kara (78) found that there was a significant negative relationship between the recognition sub-dimension of forgiveness flexibility and cognitive flexibility, and a significant positive relationship between the internalization and implementation sub-dimensions and cognitive flexibility. In another study, Akın (79) found a significant relationship between cognitive flexibility and forgiveness.

One of the important results in the study is that forgiveness, which is included in the process in the relationship between decision-making and happiness in Model-1, reduces the level of the relationship and loses its significance, as a result, forgiveness assumes a full mediating role. In this context, decision-making behaviors and happiness of athletes are affected by their forgiveness levels. For this reason, it can be said that as the forgiveness levels of athletes increase, their happiness levels due to decision-making will change. Since forgiving athletes in order to be more successful will increase their happiness levels, it is important to organize non-athlete factors such as coaches within this framework. In particular, coaches can play a critical role by implementing strategies that promote forgiveness among athletes, thereby enhancing their psychological resilience and overall well-being. This relationship suggests that individuals who demonstrate effective decision-making skills are also more capable of forgiveness. Rational and confident decision-makers tend to regulate their emotions better, evaluate interpersonal conflicts more objectively, and are less driven by impulsive or revenge-oriented reactions. The cognitive control and self-regulation involved in decision-making contribute to the ability to process negative experiences constructively and adopt a forgiving perspective. Similarly, forgiveness may facilitate clearer decision-making by reducing emotional rumination and cognitive load during stressful situations. These interpretations are consistent with studies indicating that self-regulatory strength and emotional intelligence are common mechanisms underlying both forgiveness and decision-making competence (77, 78).

In Model-2, which we can express as another important factor for the current research, the forgiveness factor included in the process in the relationship between athletes' cognitive flexibility and their happiness affects the degree of the relationship and reveals forgiveness as a partial mediating variable. In other words, the relationship between athletes' cognitive flexibility and their happiness decreased when forgiveness was included in the process and forgiveness assumed a partial mediating role. These results indicate that cognitive flexibility contributes to athletes' happiness not only directly but also indirectly through forgiveness. In this context, athletes who can flexibly adapt their thoughts and perspectives appear more capable of forgiving themselves and others, which in turn enhances their emotional well-being. Therefore, forgiveness acts as a psychological pathway through which cognitive flexibility promotes greater happiness among athletes.

RECOMMENDATIONS

In addition to the belief that the study will contribute to the field, it may be suggested to the researchers to look at the mediating relationships of athletes in future studies in terms of athletes competing in team sports

or individual sports. In addition, examining the distinction of athletes in the categories of contact sports or non-contact sports will also help to increase the contribution of the study to the field. Finally, alternative model specifications (e.g., reversing the direction of some paths or adding additional covariances between constructs) were not tested in the present study. Future research may estimate and compare such alternative models in order to further examine the robustness of the current findings and to rule out competing explanations.

In the current study, convenience sampling was used as a sampling technique, and in order for this technique not to cause problems in terms of generalizability to the population, a sufficient number of athletes (n=618) were reached. In this context, studies that can be created similar to the current study can also be created using simple random sampling technique. The study can be expanded by analyzing more cognitive factors for the success of athletes and contribute to the field. Trying to contribute to the analysis of the failure factors of athletes who do very good physical training but cannot take a place on the rostrum has revealed the importance of the research.

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