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Adapting the Emotion Regulation Scale for Athletes for Use with Referees and Examining Its Psychometric Properties

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ORIGINAL ARTICLE

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Abstract

This study has aimed to adapt the Emotion Regulation Scale for Athletes (ERSA) developed by Tingaz and Altun (2021) for referees. Using the convenience sampling method, 355 classified referees active in the Basketball, Football, and Handball federations in 2021-2022 were included in the research. Of the referee group, 52.11% (n=185) were basketball referees, 32.11% (n=114) were Football referees, and 15.77% (n=56) were handball referees. There were 35 (9.86%) female and 320 (90.14%) male referees. The mean age and seniority of the participants were 31.12 and 10.21 years, respectively. Data analysis was done using the SPSS 21 and AMOS programs. Principal component analysis and varimax rotation techniques were used to test the scale's construct validity. Criterion validity was calculated with Pearson's correlation coefficient. As a result, a two-factor structure with eigenvalues greater than one emerged. Internal consistency coefficients were calculated as .84 for the Cognitive Reappraisal and .77 for the Suppression. The CFA analysis revealed x2/df=1.605, RMSEA=.07, CFI=.96, GFI=.94, RMR=.10 NFI=.90, and IFI=96. Overall, the study suggested that the Emotion Regulation Scale for Referees (ERSR) was a valid and reliable tool to measure emotion regulation among referees.

Keywords: Emotion Regulations, Scale Development, Referee, Sport.

Sporcular İçin Duygu Düzenleme Ölçeğinin Hakemler İçin Uyarlanması ve Psikometrik Özelliklerinin İncelenmesi

Özet

Bu çalışmada, Tingaz ve Altun (2021) tarafından geliştirilen Sporcu Duygu Düzenleme Ölçeği'nin (SDDÖ) hakemler için uyarlanması amaçlanmıştır. Kolayda örnekleme yöntemi kullanılarak 2021-2022 yıllarında basketbol, futbol ve hentbol federasyonları bünyesinde aktif olarak görev yapan 355 hakem çalışmaya dahil edilmiştir. Hakem grubunun %52,11'i (n=185) basketbol hakemi, %32,11'i (n=114) futbol hakemi ve %15,77'si (n=56) hentbol hakemidir. Hakemlerin 35'i (%9,86) kadın, 320'si (%90,14) erkektir. Katılımcıların yaş ve kıdem ortalamaları sırasıyla 31,12 ve 10,21 yıldır. Veri analizi SPSS 21 ve AMOS programları kullanılarak yapılmıştır. Ölçeğin yapı geçerliliğini test etmek için temel bileşenler analizi ve varimax rotasyon teknikleri kullanılmıştır. Ölçeğin geçerliliği Pearson korelasyon katsayısı ile hesaplanmıştır. Yapılan analizlerde, özdeğerleri birden büyük olan iki faktörlü bir yapı ortaya çıkmıştır. İç tutarlılık katsayıları Bilişsel Yeniden Düzenleme için .84 ve Bastırma için .77 olarak hesaplanmıştır. DFA analizi sonucunda x2/df=1.605, RMSEA=.07, CFI=.96, GFI=.94, RMR=.10 NFI=.90 ve IFI=96 olarak bulunmuştur. Sonuç olarak, Hakem Duygu Düzenleme Ölçeği'nin (HDDÖ) hakemlerin duygu düzenleme durumlarını ölçmek için geçerli ve güvenilir bir araç olduğu görülmüştür.

Anahtar kelimeler: Duygu Düzenlemeleri, Ölçek Geliştirme, Hakem, Spor.

Introduction

During the competition, referees must perform multiple tasks under pressure to avoid decision-making mistakes and fulfil their other duties. Under pressure and adverse conditions, referees must evaluate and judge actions that take place during the match, make quick decisions, communicate correctly, manage the game, pay attention to multiple aspects of the game, resolve disagreements and problems, and maintain the order of the game (Tuero et al., 2002; Karaçam and Pulur, 2016). From the referees' point of view, they may become concerned about the possibility of making mistakes during a game, which may lead to a loss of confidence, increased anxiety, increased stress levels, burnout, and even mood disorders (Weinberg and Richardson, 1990; Ekmekçi, 2008; Guillén and Feltz, 2011; Ekmekçi, 2016). In addition, the decisions made by a referee are subject to spectator, player, and club scrutiny before, during, and after the competition, especially in popular branches of sport. For this reason, refereeing becomes difficult and wearisome. Despite these negative factors, referees must perform successfully and show strong character (Barr and Hums, 2012; Chelladurai, 2014). In this context, referees must regulate the psychological pressure and variable emotional states they experience during competition. Those who can regulate their emotions correctly during the competition will perform more successfully while fulfilling their duties.

Sports reflect real-life experiences, and the range of emotions and their impact on behaviour in everyday life are also evident in the context of sports. For example, a referee who is highly stressed and anxious may need assistance in effectively carrying out their duties (Ekmekçi, 2016). Referees, unlike other individuals involved in the game, such as players, coaches, and administrators, are unique because they face reactions from both teams' supporters and the players themselves at any given moment. Situations like the crowd and players' reactions to a wrong decision can cause referees to experience rapid emotional changes. At this point, the ability to regulate emotions becomes a vital factor in ensuring referees' consistent performance.

According to Gross (1998), emotion regulation refers to the processes that influence individuals' emotions, including their emotions, when they experience them, and how they experience and express them. There are various approaches to emotion regulation (Parkinson & Totterdell, 1999; Garnefski et al., 2001; Gratz and Roemer, 2004; Berking and Whitley, 2014). However, the most effective, comprehensive, and frequently cited approach is the process model approach developed by Gross (1998) (Bintaş-Zörer and Yorulmaz, 2022). Gross (1998) identifies five regulation processes within two main categories: prior-focused emotion regulation and response-focused emotion regulation, which relate to the periods before and after the emergence of emotional reactions. The former includes four emotion regulation processes: situation selection, modification, attention

deployment, and cognitive change. The latter involves response-focused emotion regulation that occurs after the manifestation of emotional reactions.

Studies investigating the effects of different strategies for regulating emotions in various areas have generated interest. Researchers have explored how these strategies impact emotions, cognition, and social interactions through surveys and experiments (Richards and Gross, 1999, 2000; Gross and John, 2003; Richards and Gross, 2006). In these studies, special attention has been given to cognitive reappraisal, a strategy that involves changing one's thoughts, and Suppression, which focuses on controlling responses. This is because these strategies represent different approaches to managing emotions. Generally, cognitive reappraisal has been found to reduce negative emotional experiences. Using it as a regulation strategy is associated with experiencing less negativity and more positivity and expressing emotions. However, Suppression is linked to increased negative emotional experiences (Gross, 1998; Gross and John, 2003; Szasz et al., 2011; Mohammed et al., 2021).

Gross and John (2003) developed the Emotion Regulation Scale as a significant tool for measuring emotion regulation. Different researchers (Tingaz and Altun, 2021; Eldeleklioğlu and Eroğlu, 2015; Totan, 2015; Yurtsever, 2004) have adapted the scale for various sample groups. However, there has not been a specific adaptation of the scale for referees in the existing literature. Therefore, no measurement instrument is specifically designed or adapted for referees to assess their emotion regulation. Consequently, the items of the emotion regulation scale, originally adapted for athletes by Tingaz and Altun (2021) for sports fields, have been customized exclusively for referees, and their psychometric properties have been examined.

Material and Methods

This section includes the characteristics of the study group and the details of the adaptation process of the scale.

Study group

This study used the convenience sampling method to form the research group. The convenience sampling method, which is based on the principle of accessibility and convenience, is a preferred method used to collect information quickly on certain research subjects (Büyüköztürk, 2018). 355 classified referees active in the Basketball, Football and Handball federations in 2021-2022 were included in the research. Of this group, 52.11% (n=185) were basketball referees, 32.11% (n=114) were Football referees, and 15.77% (n=56) were handball referees. There were 35 (9.86%) female and 320 (90.14%) male referees. The mean age and seniority of the participants were 31.12 and 10.21 years, respectively. The Basketball, Football and Handball Federations have permitted the study where permission was requested for the application. The scale was applied as an online

questionnaire to the classified referees whose leagues continued and undertook active duty despite the Covid 19 epidemic.

It has been stated that the required sample size in the validity and reliability studies of the scales should be five times that of each scale item (Tavşancıl, 2014). While Sapnas (2004) stated that a sample size of 100 was sufficient to reveal the scale's factor structure, in another source, Preacher and MacCallum (2002) stated that the sample size should be between 100 and 250. In this context, the study showed that the defined absolute and relative criteria of 355 people whose data were collected for factor analysis related to the scale coincided.

Data Collection Tools

Referee Emotion Regulation Scale (RERS) Process

The Athlete Emotion Regulation Scale (AERS), developed by Tingaz and Altun (2021), was used to develop RERS. The original structure of the AERS scale is evaluated in a 7-point Likert type (1=I strongly disagree, 4=I am undecided, 7=I strongly agree). The scale has a two-factor structure called Cognitive Reappraisal consisting of 4 items (sample item: I try to think in a way that will help me stay calm when I encounter a stressful situation in a competition or during training), and Suppression, consisting of 4 items (sample item: When I feel positive emotions in competition or during training, I take care not to express them). It was concluded that the internal consistency coefficients of the RERS scale were Cognitive Reappraisal a=.73 and Suppression a=.65. These two factors explain 53.665% of the total variance. The scale's Kaiser Meyer Olkin (KMO) value was 782. As a result of confirmatory factor analysis (CFA) applied RERS, χ/sd=1.617 [χ2=30.71 (sd=19, p<.05)]. SRMR=.436, RMESA=.047, CFI=.972, GFI=.973, AGFI=.949, NFI=.930, and TLI=.958 has been seen.

After obtaining permission from the authors who developed the RERS used for this study, the items in the scale expressing the situations related to the athletes were adapted for the referees. For instance, instead of the expression "I keep the emotions I have experienced in the competition or training to myself", "I keep the emotions I experienced in the competition where I served as a referee to myself." expression is used. The 8-item draft form prepared by the researcher was presented for the opinion of two academics, an academician on sports psychology and a scale development expert, who also served as senior referees in the upper classifications. The expert group stated that the items in the draft were appropriate, and there was no need to add or remove items. Therefore, the 8-item draft form was accepted as the final form. This process also shows that the scale has expert validity.

Data Analysis

In this study, first of all, all application participants were informed about the purpose of the study. The analysis of the data was conducted using SPSS 21 and AMOS programs. The data set was examined in terms of the error value, outliers, normality, and multiple correlations in the data analysis. In order to examine the factor structure of the scale within the scope of validity and reliability analysis, exploratory factor analysis (EFA) was performed on the data. As a result of the EFA, the factors with an eigenvalue greater than 1 were processed (Eroğlu, 2009). Alpha internal consistency coefficient was calculated for the reliability of the scale. Confirmatory Factor Analysis (CFA) was applied to the data using the AMOS program to determine the appropriateness of the structure formed due to EFA.

Findings

Findings Related to the Validity and Reliability Study of RERS

Exploratory Factor Analysis (EFA)

It was stated that the suitability of the data for factor analysis could be examined by the Kaiser Meyer Olkin (KMO) coefficient and the Bartlett Sphericity test (Büyüköztürk, 2018). The KMO coefficient was found to be .76, and the Bartlett Sphericity test result was found to be $\chi 2= 415.336$, df= 28, ($p<.00$) statistically significant, indicating that the data were suitable for factor analysis.

The factor analysis results of RERS are given in Table 1.

Table 1

Factor Analysis Results of RERS

Substances	**Factor co-variance**	**Factor 1. (Cognitive Reappraisal)**	**Factor 2. (Suppression)**
3. I try to think in a way that will help me to stay calm when I encounter a stressful situation in the competition where I serve as the referee.	.40	.62	
5. I change how I think about the situation when I want to feel more positive emotions in the competition where I serve as the referee.	.73	.84	
6. In a competition where I act as a referee, I control my emotions by changing how I think about my situation.	.81	.88	
8. I change my thinking about the situation when I want to feel fewer negative emotions in the competition where I serve as the referee.	.71	.82	

1. I keep to myself the feelings I experienced in the competition where I served as the referee.	.54		.70
2. When I feel positive emotions in a competition where I serve as a referee, I take care not to express them.	.67		.81
4. I control the emotions I have experienced in the competition, where I serve as the referee by not explaining them.	.71		.84
7. If I feel negative emotions in a competition where I serve as the referee, I definitely do not express them.	.53		.69
Explained total variance: % 64.14		%33.57	%30.56
Cronbach alpha:.82		.84	.77

As a result of the factor analysis, two factors were obtained that explained 64.14% of the total variance and had an eigenvalue greater than 1. The first factor explains 33.57% of the total variance, and the second is 30.56%. A criterion considered significant in factor analysis is exceeding 50% of the total variance, as indicated by previous studies (Kline, 2011; Yaşlıoğlu, 2017).

After factor rotation, it was determined that the first factor of the scale consisted of four items (3-5-6-8), and the second factor consisted of four items (1-2-4-7). The Cronbach alpha internal consistency coefficients calculated for the two-factor structure were .84 for the first and .77 for the second factors. Researchers Tabachnick and Fidell (2007) anticipate that the factor loading should be greater than .30, while Costello and Osborne (2005) suggest that it should be even higher, at .50, for each item.

CFA Results of the RERS

CFA analysis was performed using the AMOS program to determine to what extent the factor structure that emerged at the end of the CFA was suitable for the collected data. CFA Results Regarding RERS are shown in Table 2.

Table 2

CFA Results Regarding RERS

χ^2	sd	(χ^2/sd)	RMSEA	CFI	GFI	NFI	RMR	IFI
30.495	19	1.605	.07	.96	.94	.90	.10	.96

According to the CFA results applied to the RERS dataset, the chi-square (χ2) value was 30.495, with a degree of freedom (df) of 19. When considering the ratio of χ2 to the degree of freedom, the computed value was 1.603. This indicates that the examined dataset supports the underlying factor structure (χ2/df = 1.605), which is consistent with previous research (Büyüköztürk, 2002; Yılmaz & Çelik, 2009; Çokluk et al., 2010). Furthermore, the results obtained from the DFA showed acceptable

levels: RMSEA = .07, CFI = .96, GFI = .94, RMR = .10, NFI = .90, and IFI = .96. These results adhere to established standards (Byrne, 1998; Jöreskog & Sörbom, 1993; Thomson, 2004).

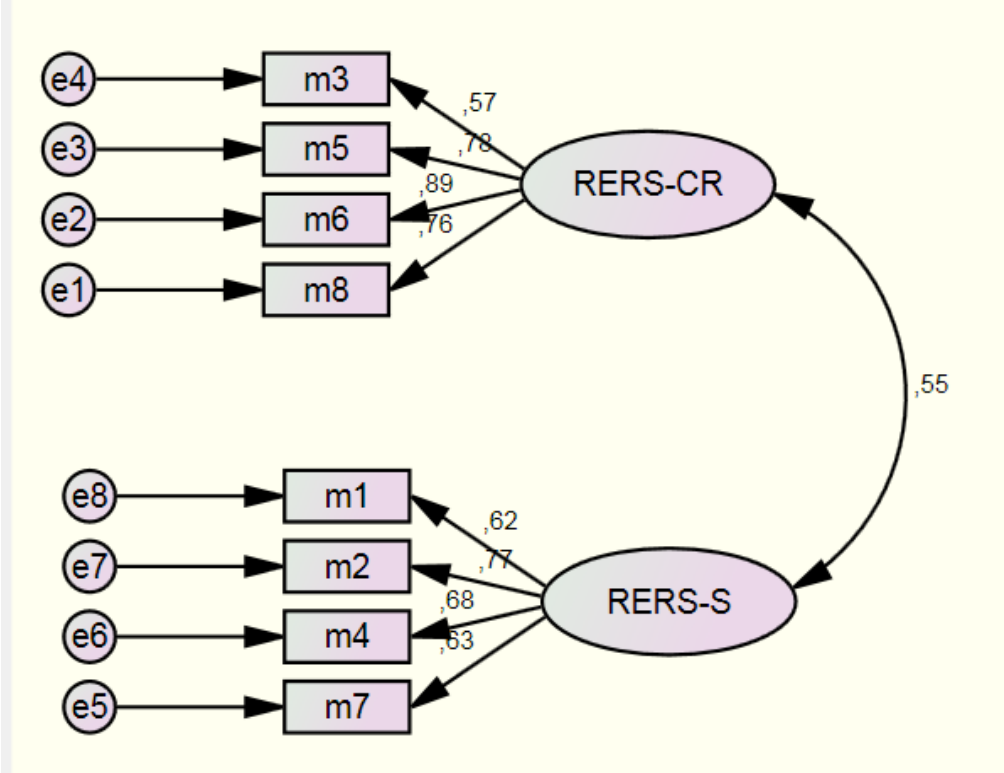

Figure 1. Path Diagram of CFA result of RERS

Figure 1 shows each item's effect amounts and correlation coefficients on the implicit dependent variable. It is seen that the correlation coefficients of the items in the two-factor scale vary between .57 and .89. The findings obtained because of CFA indicate that the factor structure of RERS is compatible with the data obtained.

Criterion Validity Results of RERS

The Correlation results between the Sub-Factors of RERS are given in Table 3.

Table 3

Correlation Between Sub-Factors of RERS

Variables	1	2
1. Cognitive Reappraisal	1.00	.45**
2. Suppression		1.00

**p < .01

The correlation between the scores obtained from the Cognitive Reappraisal and Suppression factors of RERS was found to be .45. This coefficient was significant ($p < .01$). The positive and significant correlation suggests that there is a relationship between the two subscales, which aligns with the bipartite structure of HDDÖ as indicated by previous research (Büyüköztürk, 2002; Field, 2005).

Discussion and Result

This study has aimed to adapt the Athlete Emotion Regulation Scale (AERS) developed by Tingaz and Altun (2021) for use with referees and further examine its psychometric properties. In this context, AERS was designed as the Referee Emotion Regulation Scale (RERS). In this way, the adapted form was checked for validity by experts in the initial stage. Afterwards, exploratory and confirmatory factor analysis and criterion validity were performed. Cronbach's alpha internal consistency coefficient was used to ensure the reliability of the study.

Within the scope of the validity study, Kaiser–Meyer–Olkin (KMO) value and the Bartlett Sphericity Test were applied to the data. As a result of the analysis, the KMO value was found to be .76. KMO, a value of .60 or above, indicates that the data is suitable for factor analysis (Büyüköztürk, 2002; Field, 2005). Considering the KMO value calculated in this study, it was clear that the data were suitable for factor analysis. In addition, the Bartlett sphericity test results were significant [$\chi 2 = 415.336$, $df = 28$, $p = 0.000$]. The result of the Bartlett sphericity test show that the data comes from a multivariate normal distribution.

As a result of the factor analysis, two factors with an eigenvalue greater than 1, accounting for 64.14% of the total variance, were obtained. The factors were "Cognitive Reappraisal" and "Suppression", as in the original form of the scale. The Cognitive Reappraisal factor accounted for 33.57% of the total variance, and the Suppression factor 30.56%. The fact that the total variance exceeds 50% is an essential criterion in factor analysis (Kline, 2011; Yaşlıoğlu, 2017).

After factor rotation, it was determined that the Cognitive Reappraisal factor consisted of four items (3-5-6-8), and the Suppression factor consisted of four items (1-2-4-7). The factor loads of the items in the Cognitive Reappraisal factor vary between .62 and .88, while the factor loads of the items in the Suppression factor are between .69 and .84. Factor loading is expected to be over .30 (Tabachnick and Fidell, 2007) or .50 for each item (Costello and Osborne, 2005). The present results achieved a higher threshold criterion of .50. The Cronbach alpha internal consistency coefficients calculated for the two-factor construct were .84 for the cognitive reappraisal factor and .77 for the Suppression factor.

CFA analysis was carried out using the AMOS program to determine to what extent the factor structure that emerged at the end of the exploratory factor analysis was suitable for the data obtained. According to the CFA, results applied to RERS, the chi-square ($\chi 2$) value is 30.495, and the degree of freedom (df) is 19. When the chi-square/degree of freedom is examined, the value appears to be 1.603. This finding shows that the data set supports the factor structure ($\chi 2$/sd = 1.605). In terms of fit indices, it is stated that if $\chi 2$/sd is less than 5, the model shows an acceptable fit, and if it is less than 2.5, it indicates a perfect fit (Büyüköztürk, 2002; Yılmaz and Çelik, 2009; Çokluk et al., 2010). The scale shows a perfect fit when the fit index values are examined. In addition, the obtained CFA results were RMSEA = .07, CFI = .96, GFI = .94, RMR = .10, NFI = .90 and IFI =96. Yılmaz and Çelik (2009), Byrne (1998) and Jöreskog and Sörbom (1993) interpret the RMSEA and RMR values below .10 as an acceptable level of the model. Similarly, Byrne (1998) and Jöreskog and Sörbom (1993) consider 0.80 and above acceptable for CFI and NFI values. Several criteria are used, such as Byrne (1998), and Jöreskog and Sörbom (1993), where the GFI and IFI must be greater than .90, and the CFI must be greater than .95. When the fit index values obtained from the scale are examined, they are found to have an acceptable level of fit.

When the amount of effect and correlation coefficients for each item on the latent dependent variable are examined, it is seen that the correlation coefficients of the items in the two-factor scale vary between .57 and .89. The findings obtained as a result of CFA indicate that the factor structure of RERS is consistent with the data obtained. Considering all these criteria, the two-factor structure has a solid model.

In the analyses performed for the criterion validity of RERS, the correlation between the scores obtained from Cognitive Reappraisal and Suppression factors of RERS was found to be .45, and this coefficient was significant. The positive and significant correlation value obtained can be interpreted to suggest a bipartite structure of the RERS.

Evaluating all the data obtained regarding RERS, it was found that RERS with 8 items and two sub-factors, "Cognitive Reappraisal" and "Suppression", is a valid and reliable measurement tool for measuring the emotion regulation of referees. In studies to be conducted with a referee sample, it is recommended that the sub-dimensions be evaluated within themselves rather than using the total score.

Authorship Contribution

Study and concept design is the first author; acquisition data is the second author, analysis and interpretation of data is the fifth author, drafting of the manuscript is the sixth author, critical revision

of the manuscript for important intellectual content is the fourth author; statistical analysis is the second author and administrative, technical and material support is done by the third author.

Conflict of Interest Declaration

The authors have not disclosed any potential conflicts of interest.

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