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Validity And Reliability Study of The Motivation Scale For Modern Sports And E-Sports (MSE-MÖ)

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ABSTRACT

Purpose: The purpose of this study is to develop the "Motivation Scale for Modern Sports and E-Sports (MSE-MÖ)" that can evaluate the motivation levels of traditional (modern) athletes and e-sports players on a common theoretical basis.

Method: A 28-item candidate pool, prepared based on Self-Determination Theory, was submitted to expert opinions; as a result of the Lawshe method analysis, the Content Validity Index (CVI) was determined to be 0.91. Construct validity analyses were conducted on data collected from 134 students actively participating in sports and e-sports at Adıyaman University.

Results: As a result of the Exploratory Factor Analysis (EFA) performed, 4 items that did not fit the structure were eliminated, and the scale reached its final structure with 18 items and a single factor. The data were found to be perfectly suitable for factorization (KMO=0.960; Bartlett $p<0.001$) and explained 73.881% of the total variance. Confirmatory Factor Analysis (CFA) findings [$\chi 2/df=1.957$; RMSEA=0.085; CFI=0.99] confirmed that the model fit the data at a high level. Item factor loadings ranged from 0.74 to 0.93. The reliability analysis of the scale revealed a Cronbach Alpha internal consistency coefficient of 0.979, proving that the instrument is highly homogeneous and reliable.

Conclusion: In conclusion, the MSE-MÖ has been added to the literature as a valid and reliable original measurement tool that can examine physical and digital sports disciplines from a holistic motivational perspective.

Keywords: Modern Sports, E-Sports, Motivation, Self-Determination Theory, Scale Development.

ÖZET

Modern Sporlar ve E-Spor İçin Motivasyon Ölçeğinin (MSE-MÖ): Geçerlik ve Güvenirlik Çalışması

Amaç: Bu araştırmanın amacı, geleneksel (modern) sporcular ile e-sporcuların motivasyon düzeylerini ortak bir kuramsal paydada değerlendirebilecek olan "Modern Spor ve E-Spor İçin Motivasyon Ölçeği'nin (MSE-MÖ)" geliştirilmesidir.

Yöntem: Öz-Belirleme Kuramı temel alınarak hazırlanan 28 maddelik aday havuzu, uzman görüşlerine sunulmuş; Lawshe yöntemi analizi sonucunda Kapsam Geçerlik İndeksi (CVI) 0,91 olarak saptanmıştır. Adıyaman Üniversitesi'nde aktif spor ve e-spor yapan 134 öğrenciden toplanan veriler üzerinden yapı geçerliği analizleri yürütülmüştür.

Bulgular: Yapılan Açımlayıcı Faktör Analizi (AFA) sonucunda, yapısal uyum sağlamayan 4 madde elenmiş ve ölçek 18 madde, tek faktörlü nihai yapısına kavuşmuştur. Verilerin faktörleşmeye mükemmel düzeyde uygun olduğu (KMO=0,960; Bartlett $p<0,001$) ve toplam varyansın %73,881'ini açıkladığı belirlenmiştir. Doğrulayıcı Faktör Analizi (DFA) bulguları [$\chi 2/sd=1,957$; RMSEA=0,085; CFI=0,99], modelin verilerle yüksek düzeyde uyum sağladığını doğrulamıştır. Maddelerin faktör yüklerinin 0,74 ile 0,93 arasında değiştiği görülmüştür. Ölçeğin güvenirlik analizi sonucunda Cronbach Alpha iç tutarlılık katsayısı 0,979 olarak saptanmış, bu değer aracın yüksek derecede homojen ve güvenilir olduğunu kanıtlamıştır.

Sonuç: Sonuç olarak MSE-MÖ; fiziksel ve dijital spor disiplinlerini motivasyonel açıdan bütüncül bir yaklaşımla inceleyebilecek, geçerli ve güvenilir özgün bir ölçme aracı olarak literatüre kazandırılmıştır.

Anahtar Kelimeler: Modern Spor, E-Spor, Motivasyon, Öz-Belirleme Kuramı, Ölçek Geliştirme.

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INTRODUCTION

Motivation, one of the cornerstones of psychology, is among the most important factors shaping an individual's behavior. Although it is difficult to define this concept with a single word in Turkish, it is generally used synonymously with “motivation” in academic literature (Yıldırım, 2020). Although these two concepts are used interchangeably in everyday language, both are based on the phenomenon of “motivation.” According to the Turkish Language Association (2021), motivation is the force that drives and triggers individuals to engage in certain behaviors(Dağ, 2022). Motivation, on the other hand, is the totality of processes that prompt one or more people to take action(Kesler, 2020). Derived from the French and English word “motive,” this concept is used to explain the desires and needs underlying human behavior (Uluç, 2022).Konur (2006) defines drive (motive) and motivation as a psychological force that directs human behavior.

One of the focal points of sports psychology is motivation. Analyzing the factors that affect athletes' motivation is critical for them to perform optimally (Bora, 2013).Sports motivation is, in general terms, the set of behaviors that arouse individuals' desire to participate in sports and enable them to make efforts to achieve their goals (Demir, 2022).In sports science literature, athletes' training discipline, development processes, and competition successes are largely attributed to their motivation levels and sources. In this context, understanding the factors that drive individuals to participate in sports is fundamental for both improving physical performance and ensuring the sustainability of sports.

The transformation centered on Information and Communication Technologies (ICT) has forced change not only in social life but also in sports culture. The professionalization of digital games within certain standards has led to these activities being referred to in the literature as “electronic sports” (e-sports). While traditional sports retain their audiences, technological innovations have expanded the sports industry to enormous proportions. While academic debates continue regarding whether e-sports is an alternative to modern sports, the sector's growth deepens these discussions. This new formation, which synthesizes the dynamics of modern sports with technological capabilities, is establishing a central position in the future of sports with its pace in the global sports market(Szablewicz, 2016; Yılmaz & Yılmaz, 2019).

Classifying every digital game as an e-sport can lead to misunderstanding of the concept. For a discipline to be accepted as an e-sports branch, it must have the following characteristics:

• It must have a professional league or tournament structure (such as the Super League or World Championship),

• The existence of corporate clubs and teams,

• A competitive structure with winners and losers,

• Employment of professional players,

• Appeal to a wide audience both offline and online,

• Accessibility,

• Live broadcasting of competitions via the internet or television (Argan et al., 2007; Üstün & Öz, 2019).

One of the fundamental approaches used to explain the source of motivation, the Self-Determination Theory, examines not only individuals' behaviors but also their personal development and well-being processes (Cihangir Çankaya 2009;Deci ve Ryan 2000).According to this theory, there are three types of motivation: an individual's participation in an activity solely for pleasure and satisfaction is defined as intrinsic motivation; participation for external rewards or success outcomes is defined as extrinsic motivation; and the absence of any reason for the behavior is defined as amotivation (Ingledew et al., 2004; Sarı & Sağ, 2021).This theoretical framework provides a universal basis for explaining athlete behavior in both traditional sports arenas and digital e-sports arenas.

A review of the literature reveals the existence of well-established tools for measuring motivation in modern sports; examples of these include the Sports Activities Volunteer Motivation Scale (SGMÖ) (Yıldız et al., 2016),the Sports Motivation Scale (SMÖ) (Demir, 2022),the Physical Activity Participation Motivation Scale (FAKMÖ) (Tekkurşun Demir & Cicioğlu, 2018),the Recreational Exercise Motivation Scale (REMM) (Dinç & Yavaş, 2019),and the Exercise Participation Motivation Scale (EKMÖ) (Namlı & Tekkurşun Demir, 2024),Similarly, for the rapidly growing e-sports field, the Digital Game Playing Motivation Scale (DOOMÖ) (Hazar, 2018),the E-Sports Participation Motivation Scale (EPMS) (Üstün & Öz, 2019),and the Digital Sports Games Motivation Scale (DSGMS) (Kilci, 2020). Data obtained from research on motivation for participation in sports provides important strategic information to coaches and sports administrators (Sarı & Sağ, 2021).However, with the examination of sports motivation in new disciplines, the need for new measurement tools

specific to the nature of these groups is also increasing (Sarı & Sağ, 2021).A fundamental shortcoming in the current literature is that it treats these two disciplines as separate universes. However, the modern understanding of sports combines physical and digital competition under the common denominator of 'sports.' Existing tools focus either solely on physical activity or solely on motivation to play games; this makes it impossible to examine the motivational dynamics of both groups on the same scale and with the same terminology. There is a need for a comprehensive measurement tool that recognizes e-sports as a discipline equivalent to modern sports, measures the motivation of both groups on the same conceptual ground without any distinction, and creates a scientific field for comparison. For this reason,

it is necessary to develop a valid and reliable measurement tool that can analyze the motivational orientations of both physical and digital athletes on a common ground. This is of great importance in filling this methodological gap in the modern sports science literature and even in theoretically grounding the future transformation of sports.

METHODS

Ethical Considerations

Ethical approval for this study was obtained from [Adıyaman Üniversitesi Sosyal ve Beşerî Bilimler Etik Kurulu] Ethics Committee (Date: [9/01/2026], Decision No: [03/02/2026- 21]

Research Design

This research is a methodologically planned study. The study examined the validity and reliability of the Modern Athlete and E-Athlete Motivation Scale. During the creation of the item pool, a literature review was conducted, and written opinions were obtained from a total of five experts to examine the suitability of the items for measurement technique and structural analysis for content validity.

Participants

The population of the study consists of Adıyaman University students, while the sample consists of students actively participating in sports and e-sports activities within the university. In scale development and adaptation studies, it is stated that the sample size should be at least 5 to 10 times the number of items in order to perform exploratory factor analysis (EFA) (Büyüköztürk et al., 2020). In line with this criterion, based on the 5-20 times range recommended in the literature for sample size, the study was conducted with 134 athletes,

corresponding to 5 times the number of items. The distribution of participants' demographic characteristics is detailed in Table 1.

Table 1. Analysis of participants' demographic data

Variable	**Groups**	**n / X^{-}**	**% / SS**
Age	General average	**24,30**	**4.67**
Gender	Female	(64)	(%47,8)
	Male	(70)	(%52,2)
Sports Field	Modern Sports	(82)	(%61,2)
	e-sports	(52)	(%38,8)
Weekly Activity	1-5 hours	(68)	(%50,7)
	6-10 hours	(40)	(%29,9)
	11-15 hours	(11)	(%8,2)
	16 hours and above	(15)	(%11,2)
License Status	Amatour	(92)	(%68,7)
	Professional	(42)	(%31,3)
Year	Preparatory Year	(5)	(%3,7)
	1st Year	(19)	(%14,2)
	2nd Year	(23)	(%17,2)
	3rd Year	(16)	(%11,9)
	4th Year	(25)	(%18,7)
	Over 4th Year	(46)	(%34,3)
Total		**134**	**100**

Table 1 shows that the average age of the athletes participating in the study was 24.30±4.67, with 70 (52.2%) being male and 64 (47.8%) being female. According to the sports field variable, 52 participants (38.8%) were involved in e-sports, while 82 participants (62.2%) were involved in modern sports branches.

When the academic levels of the participants were examined, it was found that the percentage of preparatory class students was 3.7%, and the percentage of students in the 4th grade and above (including postgraduate) was 34.3%. Furthermore, 68.7% of the research sample played sports with an amateur license, while 31.3% played with a professional license. In terms of weekly activity duration, it was determined that the majority of participants (50.7%) played e-sports/exercised for 1-5 hours.

Data Collection Methods and Tools

The item pool of the "Motivation Scale for Modern Sports and E-Sports (MSE-MÖ)" used as a data collection tool in the study is being developed by researchers as an original tool. The scale development process consists of the following stages:

Literature Review and Theoretical Framework: In the first stage of the process, a comprehensive literature review on sports and e-sports motivation was conducted. This process included: Sports Motivation Scale (SMÖ) (Demir, 2022),the E-Sports Participation Motivation Scale (Üstün & Öz, 2019),the Sports Event Volunteer Motivation Scale (SEGMÖ) (Yıldız et al., 2016), the Physical Activity Participation Motivation Scale (PAPMS) (Tekkurşun Demir & Cicioğlu, 2018),the Recreational Exercise Motivation Scale (REMS) (Dinç & Yavaş, 2019),and the Exercise Participation Motivation Scale (EPMS) (Namlı & Tekkurşun Demir, 2024),were examined. In addition, tools developed for the digital gaming world, such as the Digital Game Playing Motivation Scale (DOOMÖ) (Hazar, 2018), and the Digital Sports Games Motivation Scale (DSOMÖ) (Kilci, 2020),were analyzed from a theoretical perspective.

Item Pool Creation: Considering the theoretical data obtained and the common motivational dynamics of both disciplines (modern sports and e-sports), a candidate item pool consisting of 28 items was created entirely by the researchers without directly transferring items from existing scales.

Expert Opinion and Content Validity: In order to test the content validity, linguistic appropriateness, and scientific adequacy of the draft form, the opinions of a total of five experts were sought. In this regard;

- 3 Subject Matter Experts: Assessed the extent to which the items represent motivation in sports and e-sports,
- 1 Language Expert: Assessed the clarity of the wording, spelling, and semantic appropriateness,

- 1 Statistics Expert: Assessed the suitability of the items for measurement technique and structural analysis.

Based on feedback from experts, items that had similar meanings or did not contribute to structural integrity were removed or revised, reducing the scale to 22 items.

Pilot Application: The draft form, shaped according to expert opinions, was piloted on a small group selected from the target audience prior to the main application. At this stage, the comprehensibility of the items and the response time were tested. As a result of the pilot application, it was observed that the statements were clear and that there were no technical problems, and the scale proceeded to the validity and reliability analysis stage.

Item pool for the Motivation Scale for Modern Sports and E-Sports (MSE-MÖ):

The study utilized a questionnaire consisting of two main sections as the data collection tool. The first section of the form contains a "Personal Information Form" designed to determine the demographic characteristics of the participants (age, gender, sport, etc.). The second section contains the "Motivation Scale for Modern Sports and E-Sports (MSE-MÖ)" developed by the researchers for this study.

This scale, developed to assess the motivation levels of modern athletes and e-sports players on the same conceptual basis, was created using a comprehensive literature review and expert opinions. The draft form, which was reduced to 22 items based on expert evaluations, was finalized with 18 items and a single-factor structure following validity and reliability analyses (Exploratory Factor Analysis). A 5-point Likert-type rating scale, scored from "1- Strongly Disagree" to "5- Strongly Agree," was used to determine participants' levels of agreement with the items.

Data Analysis

The management and statistical analysis of the data collected within the scope of the research were performed using the SPSS 27.0 and LISREL 8.7 software packages. First, descriptive statistical analyses were used to determine the socio-demographic characteristics of the participants. Descriptive statistics were used to examine whether the total scores obtained from the scale showed a normal distribution; it was determined that the kurtosis and skewness values were between -2 and +2, and it was accepted that the data showed a normal distribution (Demir, 2022; Yurt & Sunbul, 2011).To determine the psychometric properties and construct validity of the developed scale, Exploratory Factor Analysis (EFA) was first

applied, followed by Confirmatory Factor Analysis (CFA) to test the validity of the obtained structure and validate the theoretical framework.

RESULTS

Validity Tests

Content Validity

The pool of candidate items prepared was submitted for evaluation to five experts who were informed about the conceptual framework, content, and development purpose of the MSE-MÖ. Based on the data obtained from the expert opinions, six items were excluded from the scale. Calculations performed on the remaining items resulted in a Content Validity Index (CVI) of 0.91 for the scale. This result, which is above the values of 0.80 or 0.90 (Waltz & Bausell, 1981).predicted as the acceptable lower limit in the literature, proves that the MSE-MÖ has a high level of content validity and can represent the structure to be measured.

Structural Validity

To determine the construct validity of the scale, principal component analysis (PCA) was performed, and the Varimax rotation technique was used. Prior to the analysis, the Kaiser-Meyer-Olkin (KMO) test was performed to assess the suitability of the data for factorization, yielding a coefficient of 0.960. This value indicates that the sample size is "excellent" for factor analysis. Furthermore, the Bartlett Sphericity Test result was found to be significant [$\chi 2=2980.818$; $p<0.001$], confirming that the data came from a multivariate normal distribution. Following these preliminary analyses, the Exploratory Factor Analysis (EFA) stage was conducted to determine the factor structure of the scale (Table 2).

Table 2. Analysis of the motivation scale (AFA) in modern sports and e-sports

Article No	Factor Load	Common Variance (h2)	Item-Total Correlation
M14	,917	,840	,904
M12	,916	,839	,902
M21	,911	,829	,897
M3	,907	,823	,774
M5	,893	,798	,877
M6	,878	,772	,861
M4	,878	,771	,860

Article No	Factor Load	Common Variance (h2)	Item-Total Correlation
M8	,878	,771	,860
M2	,870	,757	,851
M9	,858	,737	,840
M15	,858	,736	,840
M22	,846	,717	,825
M10	,842	,709	,819
M7	,829	,687	,809
M1	,811	,658	,788
M13	,795	,632	,774
M16	,782	,612	,760
M11	,782	,612	,760
M17	,-413	,147	-,188
M18	-,341	,176	-,092
M19	-,320	,145	-,045
M20	-,305	,178	-,055
Self-worth	13,299		
Explained Variance (%)	73,882		

As a result of the analysis, the scree plot and eigenvalues were examined; a single-factor structure with an eigenvalue above 1.00 was identified. It was determined that the factor loadings (.-413,-341,-320, and.-305) and corrected item-total correlations (.188, .092, .045, and .055) of the reverse-coded items (M17, M18, M19, M20) were significantly below the acceptable threshold of 0.30. Initially consisting of 22 items, these four items were excluded from the analysis to preserve the construct validity and structural integrity of the final 18-item scale.

The final form, consisting of the remaining 18 items, was found to explain 73.881% of the total variance, with an eigenvalue of 13.299. All items in the scale were found to have

factor loadings above the 0.30 threshold. To test the validity of this single-factor structure identified by AFA, Confirmatory Factor Analysis (CFA) was performed using the LISREL 8.7 program on a different sample group. The structural model of the study is presented in Figure 1.

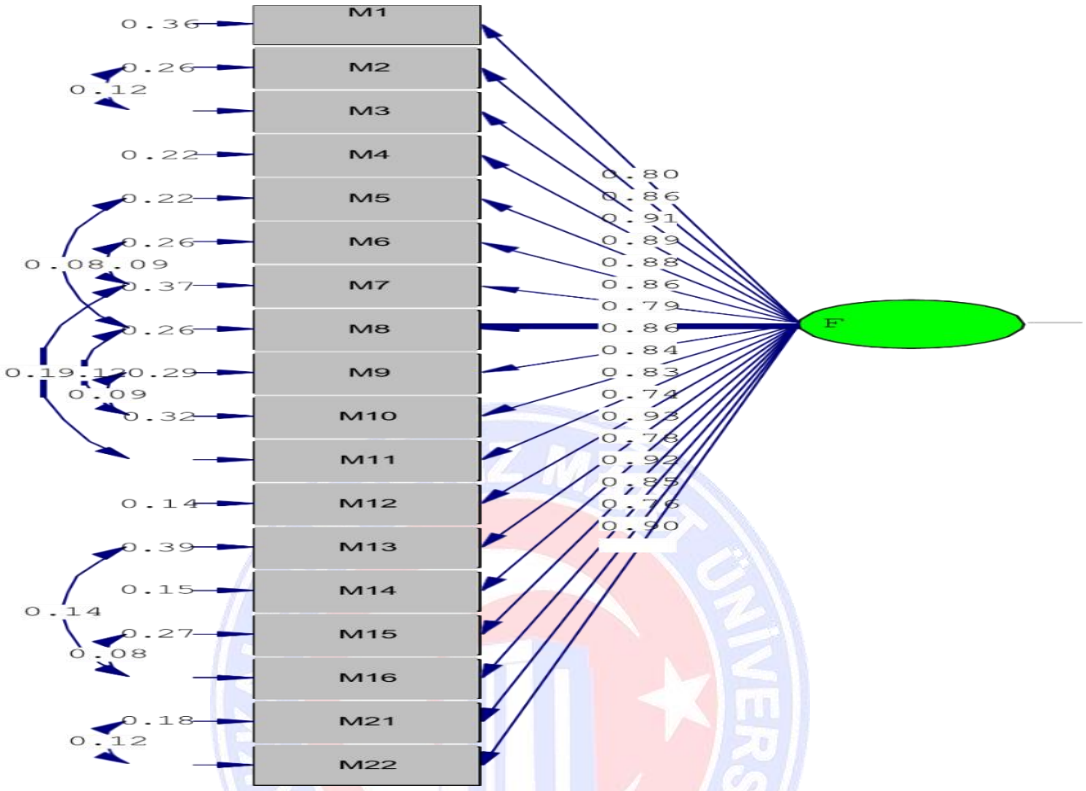

Figure 1. The acceptable fit values for the scale's single-factor structure applicable to athletes are shown in Table 3.

Tablo 3. Confirmatory factor analysis (CFA) model fit index results

Index	Observed Value	Good Fit Criterion	Acceptable Compliance
x^2/df	1,957	**<3**	**<5**
RMSEA	, 085	**≤,05**	**≤,08**
SRMR	,069	**≤,05**	**≤,10**
NFI	**,** 0.98	**≥,95**	**≥,90**
NNFI (TLI)	**,** 0.98	**≥,95**	**≥,90**
CFI	**,** 0.99	**≥,95**	**≥,90**
IFI	**,** 0.99	**≥,95**	**≥,90**

The results of the DFA conducted to test the validity of the MSE-MÖ, which consists of 18 items and a single-factor structure, revealed that the model possesses acceptable fit indices [$\chi 2(126, N=134)=246.65, p<0.001$]. The fact that the ratio of the chi-square value to the degrees of freedom ($\chi 2/df=1.957$) is below 2 indicates that the model fits the data quite well.

When examining the other goodness-of-fit indices obtained as a result of the analysis, it was determined that the RMSEA (0.085) and SRMR (0.069) values were within acceptable limits, while the NNFI (0.98), CFI (0.99), and IFI (0.99) values were at an excellent level of fit. These findings prove that the theoretical structure of the scale is highly consistent with the collected data and that its construct validity has been confirmed.

Reliability Analysis

Reliability analyses were conducted to determine the internal consistency of the items on the scale and the homogeneity of the responses within the scale. In this context, item-total correlation coefficients were examined and Cronbach Alpha (α) internal consistency coefficients were calculated. The literature emphasizes that for a scale to be considered reliable, the Cronbach Alpha coefficient must be 0.70 or above (Evci & Aylar, 2017).

Analyses conducted to test the internal consistency of the MSE-MÖ revealed that the scale's overall Cronbach Alpha value was 0.979. This value, which falls within the excellent range, demonstrates that the scale is a highly homogeneous, reliable, and stable measurement tool. Detailed reliability coefficients for the scale are presented in Table 4.

Tablo 4. Cronbach's alpha value analysis

Variable	Number of Items	Average	Standard Deviation	Cronbach's Alpha (α)
[MSE-MÖ]	18	68,09	19,31	0,979

DISCUSSION and CONCLUSION

The primary objective of this study is to develop the "Motivation Scale for Modern Sports and E-Sports (MSE-MÖ)" and establish its psychometric validity, enabling the measurement of motivation levels among athletes engaged in traditional (modern) sports and e-sports on a common basis.

The research process began with a pool of 28 candidate items developed within the framework of Self-Determination Theory. Expert opinion was sought to test the content validity of the scale and determine its conceptual boundaries. Based on expert feedback

analyzed using the Lawshe method, the Content Validity Index (CVI) was determined to be 0.91, and content validity was ensured by removing items deemed inappropriate at this stage.

Literature reveals well-established motivation scales such as SGMÖ (Yıldız et al., 2016), SMÖ (Demir, 2022), and FAKMÖ (Tekkurşun Demir & Cicioğlu, 2018) for traditional sports, alongside domain-specific tools like DOOMÖ (Hazar, 2018) and EPMS (Üstün & Öz, 2019) for e-sports. Unlike these instruments that fragment motivation into domain-specific sub-dimensions (e.g., health, social recognition), the MSE-MÖ adopts a unidimensional (single-factor) structure to bridge the gap between physical and digital sports. By capturing holistic motivational intensity rather than isolated factors, the MSE-MÖ provides a unified, standardized instrument for cross-domain comparisons. This fills a significant gap in the literature by offering a common ground to evaluate the motivational drives of both traditional and e-sport athletes simultaneously.

Data were collected from a sample group of 134 participants to determine construct validity. In the analyses, it was determined that the factor loadings of the items in the "demotivation" dimension of Self-Determination Theory were negative and disrupted structural integrity, and it was decided to exclude them from the scale. It was observed that the factor loadings of the remaining items were all above the threshold value of 0.30. In addition, the Bartlett test result determining the suitability of the data for factorization was found to be significant [$\chi2=2980.818$; $p<0.001$], and the KMO value was determined to be in the "excellent" range at 0.960.

To validate the unique structure of the developed scale, Confirmatory Factor Analysis (CFA) was conducted. The result showed that the chi-square value to degrees of freedom ratio ($\chi2/df=1.957$) was below 3, proving that the model fit the data well. When other goodness-of-fit indices were examined, it was observed that the RMSEA (0.085), SRMR (0.069), NNFI (0.98), CFI (0.99), and IFI (0.99) values were within acceptable and excellent threshold ranges. The fact that the factor loadings of the items ranged between 0.74 and 0.93 indicates that the items have a very high representational power of the scale structure.

As a result, this scientific process, which began with a literature review, has ultimately yielded an original measurement tool consisting of 18 items, whose validity and reliability have been proven. Based on Self-Determination Theory, this scale has the capacity to analyze motivational dynamics in both traditional sports and e-sports disciplines using a holistic approach. This study offers a unique contribution to the sports psychology literature in terms of both theory and methodology.

Suggestions

In future studies, it is recommended that this developed scale be applied in physical or digital sports disciplines across different cultures and various infrastructures to comparatively test motivation levels. Furthermore, it is believed that conducting longitudinal studies to determine changes in athletes' motivational orientations over time and their relationships with other psychological variables will provide a deep and comprehensive contribution to the sports science literature.

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