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Development of a Scale for Determining Narcissistic Personality Levels in Athletes

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Abstract

This study aimed to develop a valid and reliable measurement tool to assess narcissistic personality levels among athletes. Narcissism is characterized by an individual's admiration and attachment to their own physical or mental attributes, and individuals with high levels of these traits may demonstrate distinct patterns of behavior in sports contexts. The scale development process began with a comprehensive literature review and an examination of narcissistic tendencies observed in athletes. An initial pool of 28 items was generated, which was later refined through expert evaluations involving two sports psychology academicians and one linguistics specialist. As a result, one item was revised, and two items were removed due to content similarity. A pilot study conducted with 12 athletes confirmed the clarity and comprehensibility of the remaining items, allowing the process to continue with 26 items. Data was collected from amateur athletes in Beykoz, Istanbul, using a purposive sampling method. Exploratory and Confirmatory Factor Analyses demonstrated a three-factor structure—physical, cognitive, and behavioral—comprising 22 final items. Reliability analyses indicated acceptable Cronbach's alpha values for each subdimension and for the overall scale. The findings show that the developed scale is a valid and reliable instrument for evaluating narcissistic characteristics in athletes.

Keywords: Athletes, narcissism, narcissistic personality, scale development, sport

Introduction

The concept of narcissism dates back to Narcissus in Greek mythology, who was renowned for his unique handsomeness. According to legend, Narcissus, who could not love or accept anyone else, saw his image reflected in the water of a lake and fell in love with himself. For days, he followed his reflection, with which he was in love; eventually, he melted away and disappeared (Twenge & Campbell, 2010). However, according to Wilde, the legend did not end there; rather, the lake cried out for Narcissus. When the lake was asked why, it replied as follows: "I weep for Narcissus, because when he leaned over my waters, I could see the reflection of my own beauty in the depths of his eyes" (Coelho, 2018). As in the mythological story, narcissism refers to the state of being in love with oneself; accordingly, it extends beyond prioritizing oneself to encompass situations in which one uses others to fulfill one's own desires (Karadağ et al., 2024; Özkan et al., 2024). Narcissism, which can otherwise be equated with self-love, involves admiration and attachment to one's physical and/or mental self. Two types of narcissism have been defined in the literature: normal narcissism and pathological narcissism.

Normal narcissism refers to the feeling that an individual can meet the expectations of their environment and adapt to other individuals (Rozenblatt, 2002); accordingly, it is a state in which a person's self-worth and self-confidence are as high as possible, and criticism from and positive or negative interactions with others do not negatively affect the individual's self-confidence. Instead of feeding on the attention of other individuals around them, the person in question contemplates their own thoughts about themselves and maintains their self-confidence in this way (Akhtar, 1989). Like everyone else, the individual in question is happy to receive feedback from others, such as appreciation, admiration, or love. These

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expectations or needs are narcissistic needs. All people have these needs. However, these needs can give rise to a negative emotional state. Although this point is not explicitly stated, the aim of this process is for the individual to receive and be accepted by the environment, thus offering them the value that they believe they deserve. A person spends a considerable amount of time meeting such needs and is open to engaging in any behaviors that are necessary to satisfy them. A person who, following such efforts, fails to experience the value or acceptance that they desire can become narcissistically depleted. This depletion can occur in daily life (Özmen, 2006).

Although individuals with pathological narcissism behave as though they are indifferent to others' opinions, such individuals are deeply reliant on external validation and subconsciously preoccupied with the perceptions of others. This paradox reveals an underlying insecurity that is masked by an external display of exaggerated confidence and self-assuredness, particularly with respect to the physical appearance of these individuals. A core characteristic of pathological narcissism, which distinguishes it from normal narcissism, lies in the fact that this profound need is fueled by external feedback. Individuals who struggle with pathological narcissism often project their feelings of worthlessness and self-criticism onto their social environments as a coping mechanism. Consequently, they react increased heightened sensitivity (as indicated by aggression, excessive anger, etc.) to negative emotions, criticism, and perceived slights that are directed toward them (Kernberg, 1985). Pathologically narcissistic people seem to have developed a kind of defense mechanism to protect themselves from situations that they believe threaten them and have thus formed a personality structure on this basis.

According to Kernberg (1985), normal narcissism involves libidinal investment in the self, which is accompanied by integrated representations of both good and bad self-images. While Kohut (1971) proposed a continuum between pathological and normal narcissism, Kernberg posited numerous distinctions in this context. A key differentiator is the presence of a specific form of narcissistic resistance in pathological narcissism, which distinguishes this form of narcissism from its normal counterpart. This resistance is the result of pathological object relations. Other divergences include a pathological split and a lack of integration within the ego and superego, as understood in the field of educational psychology. In normal narcissism, object representations that are invested with libidinal and aggressive drives are integrated, whereas pathological narcissism involves the pathological development of these internal object representations. In addition, pathological narcissism involves excessive reactions to criticism, blame, and failure, alongside distinct manifestations of interest in, trust in, and dependence on objects. Whereas in the case of normal narcissism, a child's demands are correlated with their needs, in the case of pathological narcissism, these demands are excessive and insatiable. The coldness, distance, contempt, and humiliation that are exhibited by narcissistic patients toward others differ significantly from the self-centeredness that is observed in young children (Karaaziz & Atak, 2013).

Individuals who exhibit narcissistic traits exploit others for personal gain, possess an inflated sense of self-worth, and expect to receive similar deferences from their social circles. Despite these expectations, they lack empathy with respect to others around them. Such behaviors are often observed among individuals who occupy high-status positions, such as leaders and business executives (Sayar, 2003). Notably, the prevalence of narcissistic personality disorder is significantly higher in consumer societies than in cooperative societies (Doğaner, 1996). Narcissistic personality disorders can be identified by reference to the following criteria:

Feeling very important, exaggerating one's achievements and abilities, expecting to be recognized as a superior person without having made sufficient achievements. Being preoccupied with power, unlimited success, intelligence, perfect love or beauty. Believing that one is unique and that only superior people can understand one. Desiring to be highly admired. Believing that one is entitled to everything. Using social relationships for one’s own benefit. Using the weaknesses of others to satisfy one’s own wants and demands. Being unable to empathize. Exhibiting a jealous personality and believing that others are jealous of one. Engaging in arrogant, self-righteous behavior. Feeling anger, shame or humiliation in response to criticism (American Psychiatric Association, 1994).

In the sport psychology literature, narcissistic tendencies have increasingly been examined in relation to athletes’ motivational orientations and self-evaluative processes. Narcissism is closely associated

with self-enhancement motives, which refer to individuals' tendency to maintain and promote a positive self-image (Sedikides & Gregg, 2008). In competitive sport environments, where performance evaluation and social comparison are highly salient, athletes may develop self-enhancement strategies that reinforce narcissistic tendencies. These tendencies may manifest in exaggerated perceptions of personal ability, a strong desire for admiration, and heightened sensitivity to feedback.

Within achievement goal theory, athletes' psychological orientations toward success are often conceptualized through ego orientation and task orientation (Nicholls, 1989; Roberts et al., 2007). Ego-oriented athletes define success primarily through outperforming others and demonstrating superior ability, whereas task-oriented athletes focus on personal improvement and mastery. Previous research suggests that ego-oriented motivational climates may be associated with stronger self-evaluative concerns and narcissistic characteristics, particularly in highly competitive sport contexts.

Furthermore, studies examining narcissism and performance indicate that narcissistic individuals may initially demonstrate high confidence and strong self-presentation motives, which can sometimes enhance performance in evaluative situations (Wallace & Baumeister, 2002). However, excessive narcissistic tendencies may also lead to interpersonal conflicts, difficulties in team cohesion, and maladaptive reactions to criticism. Therefore, examining narcissistic personality traits in athletes is important for understanding how self-perception, motivation, and competitive dynamics interact in sport settings.

Since sports environments offer a multidimensional structure that encompasses not only individual performance but also intra-team interactions, athletes' personality traits hold particular significance in this context. In particular, narcissistic traits have the potential to influence both athletes' individual performance and their social adaptation within the team. However, a review of the national and international literature reveals that while various measurement tools exist for assessing narcissism, these tools were largely developed for general populations and do not sufficiently capture the behavioral, cognitive, and physical manifestations specific to the sports context.

The unique dynamics of athletes—such as their performance-oriented mindset, level of competition, body image, and social visibility—can lead to the manifestation of narcissistic tendencies in various forms. This situation limits the ability of general narcissism scales to assess the specific patterns observed in athletes. Consequently, there is a clear need for a valid and reliable measurement tool that takes into account context-specific factors unique to athletes.

Developed in this context, this scale offers a unique contribution to the literature by addressing narcissistic personality traits specifically within a sports context and evaluating their physical, cognitive, and behavioral dimensions within a holistic framework. The scale was developed solely for research purposes and is not a clinical diagnostic tool. However, identifying narcissistic traits in athletes will provide significant contributions to the development of intervention programs that support athletes' psychological well-being and optimize their performance, from the perspective of sports psychologists and practitioners. In this regard, the study aims to fill an important gap in the field and introduce a unique measurement tool to the sports psychology literature.

Method

The development of the scale was carried out in four sequential stages. Initially, an item pool was generated based on an extensive literature review and expert input, followed by content validity evaluation by three subject-matter experts, which led to minor revisions. Subsequently, a pilot study with 12 athletes was conducted to assess item clarity and comprehensibility. In the third stage, exploratory factor analysis (EFA) was employed to examine the underlying factor structure, reducing the number of items from 26 to 23. Finally, confirmatory factor analysis (CFA) was performed to validate the 22-item structure, and internal consistency was assessed using Cronbach's alpha coefficients for each subdimension and the overall scale.

Research Model

This study adopts a quantitative scale development design to assess narcissistic personality levels among athletes. The psychometric properties of the instrument were evaluated through comprehensive validity and reliability analyses. The overall procedure was guided by established scale development frameworks, incorporating systematic item generation, construct validation, and reliability assessment processes (Boateng et al., 2018; DeVellis, 2017).

Ethics Approval

This study was approved by the Scientific Research and Publication Ethics Committee of Social and Human Sciences at Karamanoğlu Mehmetbey University on 23 October 2024 (Decision No. 13-2024/282). All procedures were conducted in accordance with ethical principles, and the intellectual, legal, and copyright responsibilities belong to the responsible researcher.

Population and Sample

The population on which this study focuses consists of amateur athletes in the Beykoz district of Istanbul. Participants were recruited via the purposive (monographic) and theoretical sample selection technique", which is a nonprobability-based (judgmental) sampling technique; this process was used to select athletes from the Beykoz 1908 A.Ş., Kavacıkspor, and Beykoz İdman Yurdu clubs. The researcher, based on their knowledge and predictions about the population, conducts the study on a group or several participants whom they believe can represent the population (Ural & Kılıç, 2011).

The study group consisted of 191 athletes who were recruited from the U16/B, U17/B, U18/B, and senior category teams of Beykoz 1908 A.Ş., 68 athletes from the football branch; 73 athletes from the U16/A, U17/A, U18/A, and senior category teams of Kavacıkspor; and 50 athletes from the U17/B, U18/B, and senior category teams of Beykoz İdman Yurdu. In scale development studies, sample size adequacy is commonly evaluated based on item-to-participant ratios and factor analysis requirements.

Sample size adequacy was evaluated using complementary criteria. The sample size should be at least 5–10 times the number of items (DeVellis, 2017; Worthington & Whittaker, 2006), while a sample of 150–200 participants is generally considered sufficient for factor analysis (Hair et al., 2010; MacCallum et al., 1999). In addition, a retrospective RMSEA-based power analysis for the final three-factor, 22-item CFA model ($df = 206$, $\alpha = .05$, $RMSEA_0 = .08$, $RMSEA_1 = .05$, and 95% power) indicated a minimum required sample size of 119 participants. Accordingly, the sample of 191 athletes was considered adequate.

The surveys were administered to athletes recruited from three sports clubs between September 27, 2024, and October 6, 2024. Data collection was conducted before training sessions in the presence of two coaches, ensuring that participants had sufficient time to complete the surveys. This procedure was preferred because scale development studies require participants who possess characteristics relevant to the construct being measured. Additionally, Istanbul was selected as the research setting due to its diverse cultural structure, allowing the inclusion of athletes from different social and cultural backgrounds. Due to time constraints, the study sample was restricted to selected athletes from Beykoz 1908 A.Ş., Kavacıkspor, and Beykoz İdman Yurdu.

In the phase that focused on content and appearance validity, the opinions of 3 experts, i.e., 2 academics working in the psychosocial field of sports research and 1 linguistics teacher, were obtained. Interviews were conducted with these experts on the basis of a specification table. Table 1 presents an example of the specification table used in this context. The tables completed by the experts indicated that 1 question should be changed and that 2 questions should be removed from the scale given their similarity to other items. The questions were revised in line with this guidance and resubmitted to the experts to obtain their approval. In the pilot study phase, a total of 12 athletes were surveyed. Although the sample size was relatively small, it was considered sufficient to evaluate the clarity, comprehensibility, and appearance of the items prior to the main data collection. The pilot participants reported that all items were clear and understandable. Thus, the scale successfully passed the content and appearance validity phase, and 26 items remained in the scale after 2 items were removed from the initial 28-item pool.

Table 1. Sample Symptom Table Used to Assess Content and Appearance Validity

Scale Items	Degree of Item Suitability			Description
	Not Suitable at All	Partially Suitable	Suitable	
Item 1				
Item 2				
Item 3				

Within the scope of content and appearance validity, the "not suitable at all" option indicates that "the item should be removed from the scale". The "partially suitable" option indicates that "the item can be used after the suggested corrections are made". The "suitable" option indicates that "the item can be included in the scale as it is". One of the academic experts reported that 2 items in the 28-item question pool featured similar meanings. The linguistics expert used the specification table to inform us that one question should be changed. After corrections were made in line with their suggestions, the item pool was resubmitted to the experts to obtain their approval. The experts approved the content and appearance validity of all the items included in the revised item pool.

Limitations of the Study

The data collection process in this study was conducted within certain temporal constraints; therefore, the sample was limited to three sports clubs. In this context, a purposive (monographic) sampling method was employed. In purposive sampling, the researcher includes individuals who are considered to have the potential to represent the population (Ural & Kılıç, 2011). Furthermore, considering that Istanbul hosts individuals from diverse sociocultural backgrounds, selecting the sample from this city was deemed to provide an appropriate level of diversity for the purposes of the study.

Data Analysis

SPSS and AMOS software were used to analyze the data thus obtained. In the Findings section, the results of the exploratory factor analysis (EFA) are presented first. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were used to determine the existence of relationships among the variables included in this research, which represented a prerequisite for the EFA (Tabachnick & Fidell, 2014). Because the scale could contain more than one factor, varimax vertical rotation was performed. When the items included in the scale were removed, a minimum difference of .10 was sought for overlapping items, namely, those that loaded on two or more factors. The factor structure of the scale was established after items M8, M16, and M18, which did not meet this condition, were removed. Thus, 3 items were excluded from the scale, and the EFA was subsequently conducted. The KMO value of the scale was .674, and the P value was .000. In line with the results of the EFA, 23 items were retained from the 26-item question pool. Thus, an assessment of the values of the scale used to measure narcissistic personality among athletes revealed that the scale should consist of 23 items and 3 factors.

A confirmatory factor analysis (CFA) was then conducted to confirm the factor structure of the scale described here. To determine whether an item should be removed from the scale, the criterion that the factor loading value must be greater than 0.45 was used (Büyüköztürk, 2009). In the analysis, item M13 was removed from the scale, and appropriate goodness-of-fit values were obtained. As a result of the CFA, the scale used to measure narcissistic personality among athletes, which consists of 3 factors and 22 items, was confirmed.

Finally, a reliability test was performed. With respect to the factors included in the 3-factor structure, the Cronbach's alpha coefficients were 0.866 for the physical subdimension, 0.622 for the cognitive subdimension and 0.933 for the behavioral subdimension. The Cronbach's alpha coefficient for the overall scale was 0.714. Cronbach's alpha reliability coefficients higher than 0.60 are interpreted as indicating high levels of reliability (Kalaycı, 2018). The results of the study thus confirmed H1. Acceptable and excellent validity and reliability values were observed with respect to the scale used to measure narcissistic personality among athletes.

Results

According to Table 2, the KMO value of the scale used to measure narcissistic personality among athletes was 0.674 (0.674>0.60). The KMO value was therefore greater than .60, and Bartlett's test of sphericity was statistically significant at the 99% confidence level (p<0.01). Hence, the sample size was adequate to support the factor analysis.

Table 2. KMO and Barlett's test

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		.674
Bartlett's Test of Sphericity	Approx. Chi-Square	9053.367
	df	253
	Sig.	.000

According to the reliability levels exhibited by the factors included in the EFA, which are presented in Table 3, the items associated with the first factor explained 19.869% of the scale, with an eigenvalue of 4.570.

Table 3. Eigenvalues pertaining to the exploratory factor analysis

Factors	Total	% of Variance	Cumulative %
1. Factor	4.570	19.869	19.869
2. Factor	3.797	16.507	36.376
3. Factor	3.497	15.205	51.581

The items associated with the second factor explained 16.507% of the scale, with an eigenvalue of 3.797. The items associated with the third factor explained 15.205% of the scale, with an eigenvalue of 3.497. In line with Table 4, on the basis of an examination of the items associated with the various factors, the first subdimension was labelled "physical", the second subdimension was labelled "cognitive", and the third subdimension was labelled "behavioral". The names assigned to the scale were developed depending on the subject and meaning of the questions. According to the EFA conducted to investigate the scale used to measure narcissistic personality among athletes, the factor loadings of the items ranged between 0.45 and 0.90. These values were within the acceptable range for factor loadings.

Table 4. Factor loadings of the items included in the exploratory factor analysis

Factor	Item	Question	Load Value
1. Factor (Physical)	M20	The physical features of some people are pitifully bad.	.727
	M4	With my muscle coordination, there is no skill that I cannot acquire.	.723
	M6	As a result of my physical characteristics, I have no opponents.	.693
	M22	I am generally very well-liked by people.	.687
	M10	I think that I am more talented than many athletes.	.679
	M24	I think that I have a physical advantage over most athletes.	.651
	M3	I learn movements that require skill more easily than other athletes can.	.669
	M17	It makes me very happy to be praised for my physical features.	.666
	M7	I am always happy to hear that I am very talented.	.590
2. Factor (Cognitive)	M11	I think that I am mentally superior to others.	.650
	M25	I have the advantage of learning quickly.	.645
	M19	People always appreciate my decisions.	.637
	M21	I have a character that enables me to solve all problems in the environments in which I am embedded.	.610
	M5	I am more tolerant and respectful of others than most people are.	.608
	M15	I respect my ability to think highly.	.594
	M2	I can communicate effectively as a result of my language skills.	.587
	M9	I would like to lecture to most athletes about honesty.	-.563
	M23	I have a positive mood that inspires people.	-.531
	M13	My sense of feeling is very good.	.457
3. Factor (Behavioral)	M1	I do not see the subtlety of my behavior in most people.	.839
	M14	I deserve praise for my behavioral qualities.	.835
	M12	My attitude towards all events and phenomena is admirable.	.833
	M26	Few people are as generous as I am.	.812

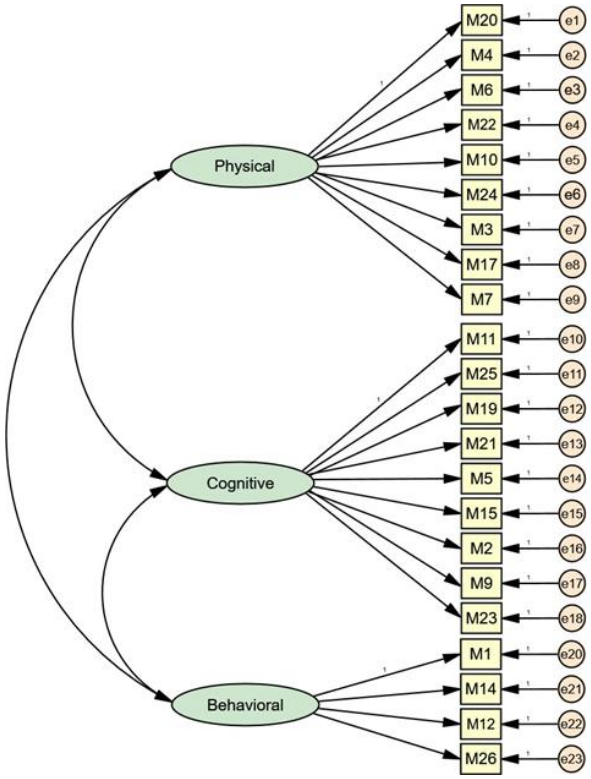

Figure 1. Path diagram for the confirmatory factor analysis

Figure 1 illustrates the CFA that was performed to confirm the factor structure defined in the EFA that was conducted to investigate the scale used to measure narcissistic personality among athletes. The factor loading of item M13 indicated that this item was not suitable for the scale and disrupted the corresponding fit values; it was therefore removed from the scale, and the path diagram for the CFA presented in Figure 1 was thus obtained. Accordingly, following the CFA, the scale used to measure narcissistic personality among athletes, which consisted of 3 factors and 22 items, was confirmed, and appropriate goodness-of-fit values were obtained. The goodness-of-fit values are presented in Table 5.

Table 5. Goodness-of-Fit values according to the confirmatory factor analysis

X2/sd	p	RMSEA	CFI	GFI	NFI
1.352	0.000	0.043	0.992	0.882	0.971

The fit criteria obtained from the CFA presented in Table 5 reveal that the ratio of the X2 value to the sd value is 1.352, and the root mean square error of approximation (RMSEA) value is 0.043. Other fit values correspond to acceptable and excellent fit values.

Table 6. Cronbach's Alpha reliability values

Sub-Dimensions	Physical	Cognitive	Behavioral	General
Values	0.866	0.622	0.933	0.714

Table 6 indicates that none of the correlations among the items included in the scale took a value below the expected threshold of 0.30. The overall reliability of the scale was 0.714, which was acceptable.

Thus, the validity and reliability of the final structure of the scale used to measure narcissistic personality among athletes were verified, and the scale is presented in Table 7. The items included in this instrument are scored a 5-point Likert-type scale. The scale does not include any reverse-scored items. The degree to which the participants agreed with these questions indicates that the higher these scores are, the stronger the narcissistic personality structure in question.

Table 7. Scale used to measure narcissistic personality among athletes

Factor	Queue	Questions	1	2	3	4	5
Physical	1	The physical features of some people are pitifully bad.					
Physical	2	With my muscle coordination, there is no skill that I cannot acquire.					
Physical	3	As a result of my physical characteristics, I have no opponents.					
Physical	4	I am generally very well-liked by people.					
Physical	5	I think that I am more talented than many athletes.					
Physical	6	Physically, I think that I have more advantages than most athletes.					
Physical	7	I learn movements that require skill more easily than other athletes can.					
Physical	8	It makes me very happy to be praised for my physical features.					
Physical	9	I am always happy to hear that I am very talented.					
Cognitive	10	I think that I am mentally superior to others.					
Cognitive	11	I have the advantage of learning quickly.					
Cognitive	12	People always appreciate my decisions.					
Cognitive	13	I have a character that enables me to solve all problems in the environments in which I am embedded.					
Cognitive	14	I am more tolerant and respectful of others than most people are.					
Cognitive	15	I respect my ability to think very highly.					
Cognitive	16	I can communicate effectively as a result of my language skills.					
Cognitive	17	I would like to lecture to most athletes about honesty.					
Cognitive	18	I exhibit a positive mood that inspires people.					
Behavioral	19	I do not see the subtlety that characterizes my behavior in most people.					
Behavioral	20	I deserve praise for my behavioral qualities.					
Behavioral	21	My behavior toward all events and phenomena is admirable.					
Behavioral	22	Few people are as generous as I am.					

Discussion

The process of scale development involves scientific and systematic steps that are taken to measure a specific concept or construct. One of the first steps in this process involves conducting a comprehensive literature review (DeVellis, 2017). During the scale development phase reported in this research, first, a review of the literature on narcissistic personality was conducted. Narcissistic personality behaviors among athletes were examined in the context of this literature review. On this basis, a question pool featuring a total of 28 items was developed.

Content validity is a critical type of validity that determines how accurately and representatively a measurement tool measures the targeted construct (Zamanzadeh et al., 2015). In this process, obtaining expert opinions is vital for determining whether the items included in the measurement tool in question adequately cover the relevant concept (Rubio et al., 2003). These expert judgments also ensure that the items included in the measurement tool cover only the targeted phenomenon and that irrelevant elements are excluded (Zamanzadeh et al., 2015). During the content validity stage, the opinions of a total of 3 experts, i.e., 2 academicians working in the psychosocial field of sports research and 1 linguistics teacher, were obtained. Interviews were conducted with these experts on the basis of a specification table. Through this form, these 3 different experts informed us that 1 question should be changed and that 2 questions should be removed given their excessive similarity to other items. The questions were corrected in line with this guidance and resubmitted to the experts to obtain their approval. The experts viewed the new question pool as appropriate. In the pilot study, a total of 12 different athletes were surveyed. The athletes indicated that the scale was not characterized by a pattern of broken questions. Thus, the scale successfully passed the content and appearance validity stage with 26 items after 2 items were removed.

In final version of the item pool, the questions were scored on a 5-point Likert scale; this process focused on athletes who were included in the sample and recruited from Beykoz 1908 A.Ş., Kavacıkspor and Beykoz İdman Yurdu. After the data were obtained, a CFA and an EFA were conducted to determine the construct validity, and Cronbach's alpha coefficients were used to determine the internal reliability.

First, the KMO value of the scale used to measure narcissistic personality among athletes was observed to be 0.674 (0.674>0.60). In general, the KMO value should be at least 0.60 (Field, 2018). According to the literature, KMO values of 0.90 are considered excellent, 0.80 good, 0.70 acceptable, and 0.60 weak (Hutcheson & Sofroniou, 1999; Kaiser, 1974). Therefore, the sample is borderline sufficient for factor analysis, and caution is warranted when interpreting the results. Replication with larger samples in future research is recommendedThe KMO value was greater than .60, and Bartlett's test of sphericity was statistically significant at the 99% confidence level ($p<0.01$). The sample size was thus adequate to support the factor analysis.

An EFA was then conducted. Researchers use EFA to determine how many interrelated variables can be organized under a smaller number of latent factors (Fabrigar & Wegener, 2012). Such an analysis increases the validity of scales by testing the fit of items to the factor structure (Costello & Osborne, 2005). EFA is used to identify the factors onto which the variables in the data load. This analysis enables researchers to determine whether the variables fit the theoretically expected factor structure (Field, 2018). In the findings of the EFA conducted for this research, an analysis of the reliability levels of the factors reveals that the items associated with the first factor explain 19.869% of the scale, with an eigenvalue of 4.570. This analysis also reveals that the items associated with the second factor explain 16.507% of the scale, with an eigenvalue of 3.797. Finally, the analysis reveals that the items associated with the third factor explain 15.205% of the scale, with an eigenvalue of 3.497. An analysis of the data obtained from the EFA conducted to investigate the scale used to measure narcissistic personality among athletes revealed that the factor loadings of the items ranged between 0.45 and 0.90. These values are within the acceptable limits for factor loadings. Stevens (2002) claimed that in factor analysis, loadings should generally be above 0.40 or 0.45, and loadings above 0.70 indicate strong factor structures.

On the basis of an examination of the meaning and subject matter of the items associated with these factors, the first subdimension was labelled “physical”, the second subdimension was labelled “cognitive”, and the third subdimension was labelled “behavioral”.

In the next stage, a CFA was conducted. Such a CFA is used to test the theoretical model developed by the researcher and to determine whether the relationships among the relevant variables are in line with the researcher’s predictions (Brown, 2015). This approach is used to determine whether scales actually represent the concepts that they aim to measure (Byrne, 2016). It is also used to determine whether the factor structure identified during the scale development process is compatible with the data (Kline, 2016). Cronbach's alpha coefficient is employed to determine the extent to which the items included in a scale are consistent with each other. This determination helps researchers understand whether the scale is reliable (Tavakol & Dennick, 2011). In the CFA conducted to determine whether the factor structure described in the EFA that was performed to investigate the scale used to measure narcissistic personality among athletes could be confirmed, the factor loading value of item M13 was not suitable for the scale and disrupted the scale fit values. The corresponding items were removed from the scale, and the final path diagram for the CFA is presented in Table 4. A path diagram is a type of diagram that is used to visualize both direct and indirect relationships among variables (Bollen, 1989; Schumacker & Lomax, 2016). Such a diagram-is especially useful in the context of analyses such as CFA and structural equation modeling (SEM). These diagrams explain causal and correlational connections by illustrating the relationships among variables with arrows (Kline, 2016). Thus, a scale that can be used to measure narcissistic personality among athletes emerged from the CFA; this scale consisted of 3 factors and 22 items. Appropriate goodness-of-fit values were reached with respect to this version of the scale.

In the EFA results, items M9 and M23 exhibited negative factor loadings. This is not due to reverse wording, as the content of the items aligns directly with the measured construct. Negative loadings can arise from sample distribution and the natural variance within the factor structure (Fabrigar & Wegener, 2012). Therefore, the items were not reverse-scored, but the presence of negative loadings is addressed in the discussion.

In the context of CFAs, the ratio of the X^2 (chi-square) value to the degree of freedom (df/sd) should be ≤ 2 (Tabachnick & Fidell, 2014). The values pertaining to the fit criteria obtained from the CFA revealed that the ratio of the X2 value to the sd value was 1.352. The chi-square test can be used to measure how

well the model fits the data but is sensitive to the sample size. Therefore, this approach involves dividing the chi-square result by the degrees of freedom. This ratio also takes the complexity of the model into account (Kline, 2016). RMSEA measures the approximate fit of the model at the population level. This measure thus evaluates the approximate error of the model, not the degree to which it fits the observed data. This approach is often preferred because it is relatively independent of sample size (Browne & Cudeck, 1993). The RMSEA value in this context was 0.043. This value indicates an excellent fit (Browne & Cudeck, 1993). The comparative fit index (CFI) compares the fit of the observed model to that of the independent model. This approach is particularly robust to sample size. High CFI values indicate that the model fits the data very well (Hu & Bentler, 1999). The CFI value in this research was 0.992. This value indicates an excellent fit (Hu & Bentler, 1999). The goodness-of-fit index (GFI) represents the proportion of variance that the model can explain. As this value approaches 1, the fit of the model increases (Jöreskog & Sörbom, 1993). The GFI value in this research was 0.902. This value indicates a good fit (Schermelleh-Engel et al., 2003). The normed fit index (NFI) compares the fit of the observed model to that of the independent model (Bentler & Bonett, 1980). The NFI value in this research was 0.971. This value indicates an excellent fit (Hu & Bentler, 1999).

Finally, a Cronbach's alpha reliability coefficient was used in this context. Table 6 indicates that none of the items included the scale took a value that was below the expected threshold of 0.30 in terms of their correlations with other items. With respect to the Cronbach's alpha reliability coefficients pertaining to the scale, the physical subdimension took a value of .866, the cognitive subdimension took a value of .622, and the behavioral subdimension took a value of .933; furthermore, the overall Cronbach's alpha coefficient for the scale was 0.714. George and Mallery (2019) claimed that Cronbach's alpha coefficient should be .70 or higher. However, according to another source, a Cronbach's alpha reliability coefficient that is higher than 0.60 is quite reliable (Kalaycı, 2018). Devellis (2017) claimed that especially in the context of newly developed scales, a value of approximately 0.60 is also acceptable and tolerable at the medium/borderline level. When such a scale is used to support scientific studies, the reliability score pertaining to the cognitive subdimension, i.e., .622, will increase as a result of the newly applied validity and reliability studies. On the basis of these results, the factor structure and overall reliability level of the scale were determined.

This study, which is titled "Development of a narcissistic personality scale for athletes" makes important contributions to both the sport psychology literature and to theories of personality. First, measuring the traces of narcissism among athletes on the basis of a unique scale offers a robust measurement tool that can support qualified research in this field. Although narcissism scales that have been developed for the general population are common in the literature on this topic, the lack of a measurement tool that accounts for contextual factors specific to athletes, including their competitive structures, achievement orientation and self-evaluation processes, has drawn the attention of scholars. The scale developed in this context provides a more reliable and valid assessment of the narcissistic traits exhibited by athletes.

In addition, the methodological contributions of the study are very valuable. The meticulous application of psychometric processes such as content validity, construct validity (EFA and CFA), and reliability analyses (e.g., Cronbach's alpha coefficient) in the process of developing this scale represents a model for other researchers. In this respect, this research provides a methodological roadmap that can be followed not only in efforts to measure narcissism but also in efforts to measure various other psychological constructs among athletes.

Another important contribution of this study is that the findings obtained in this context can be transferred to applied fields. By understanding the narcissistic tendencies of athletes, coaches, sport psychologists and sport managers can communicate more effectively, develop appropriate leadership approaches and manage team dynamics in a healthier way that takes into account individual differences. Narcissistic traits contribute positively to performance in some cases, but when they reach an excessive level, they can lead to both individual and team-based problems. Therefore, the scale developed in this context can be used as an important diagnostic tool in both psychological evaluations of athletes and talent selection, rehabilitation and support programs.

Conclusion

As a result, this study not only makes an original contribution to personality research in the sports context but also offers significant value to the scientific literature in both theoretical and applied terms by providing a reliable measurement tool that can be used to support psychological assessment processes.

The results of this study confirmed the validity and reliability of the scale used to measure narcissistic personality among athletes, and the final structure of this scale is presented in Table 7. The items included in this instrument are scored on a 5-point Likert-type scale; in total, this measure features 3 factors and 22 items. The scale does not include any reverse-scored items. The more the participants agree with the questions and the higher their scores are, the higher the level of narcissistic personality structure in question. Researchers who want to use this scale can do so by citing it without permission.

In future research, it is recommended that the developed scale be tested on samples from different sports disciplines (including both individual and team sports) and across wider age ranges. Additionally, studies involving more heterogeneous samples that include different performance levels (amateur, semi-professional, and professional athletes) are expected to strengthen the external validity of the scale's psychometric properties. Furthermore, reapplying the scale in different cultural contexts and re-evaluating it through confirmatory factor analyses would contribute significantly to the generalizability and theoretical robustness of the measurement instrument.

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Author Contributions

The author (YEB) was solely responsible for the conceptualization, methodology, investigation, data curation, formal analysis, software development and coding, preparation of the original draft, review and editing, and overall supervision of the study.

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Conflict of Interest

There are no conflicts of interest in this research

Ethics Committee Approval

This study was approved by the Scientific Research and Publication Ethics Committee of Social and Human Sciences at Karamanoğlu Mehmetbey University on 23 October 2024 (Decision No. 13-2024/282). All procedures were conducted in accordance with ethical principles, and the intellectual, legal, and copyright responsibilities belong to the responsible researcher.

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Appendix A. Final Turkish Form of the Scale

Table 1.Sporcularda narsist kişilik düzeyini belirleme ölçeği türkçe formu

Faktör	Sıra	Sorular	1	2	3	4	5
Fiziksel	1	Bazı insanların fiziksel özellikleri içler acısı derecede kötü.					
Fiziksel	2	Kas koordinasyonum sayesinde, öğrenemeyeceğim hiçbir beceri yoktur.					
Fiziksel	3	Fiziksel özelliklerim nedeniyle, rakibim yok.					
Fiziksel	4	İnsanlar tarafından genellikle çok sevilirim.					
Fiziksel	5	Çoğu sporcudan daha yetenekli olduğumu düşünüyorum.					
Fiziksel	6	Fiziksel olarak çoğu sporcudan daha avantajlı olduğumu düşünüyorum.					
Fiziksel	7	Beceri gerektiren hareketleri diğer sporculara göre daha kolay öğreniyorum.					
Fiziksel	8	Fiziksel özelliklerimden övgüyle bahsedilmesi beni çok mutlu eder.					
Fiziksel	9	Sürekli olarak çok yetenekli olduğumu duymak bana mutluluk verir.					
Bilişsel	10	Kendimi zihinsel olarak diğerlerinden üstün görüyorum.					
Bilişsel	11	Çabuk öğrenme konusunda oldukça avantajlıyım.					
Bilişsel	12	İnsanlar kararlarımı her zaman takdir ediyor.					
Bilişsel	13	İçinde bulunduğum ortamlardaki tüm sorunları çözmemi sağlayan bir karakterim var.					
Bilişsel	14	Çoğu insandan daha hoşgörülü ve başkalarına karşı daha saygılıyım.					
Bilişsel	15	Düşünme yeteneğime büyük saygı duyuyorum.					
Bilişsel	16	Dil becerilerim sayesinde etkili bir şekilde iletişim kurabiliyorum.					
Bilişsel	17	Çoğu sporcuya dürüstlük konusunda ders anlatmak isterdim.					
Bilişsel	18	İnsanlara ilham veren olumlu bir ruh hali sergiliyorum.					
Davranışsal	19	Davranışlarımda gördüğüm inceliği çoğu insanda göremiyorum.					
Davranışsal	20	Davranışsal özelliklerim sayesinde övgüyü hak ediyorum.					
Davranışsal	21	Her türlü olay ve olguya karşı sergilediğim tavır takdire değer.					
Davranışsal	22	Benim kadar cömert olan çok az insan vardır.					

Note. The scale was developed, administered, and psychometrically validated in Turkish; therefore, its final validated form is presented in the original language.