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Research Article

The Serious Leisure Perspective: Long Distance Runners Experience Scale (LDRES)

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Abstract: The recent increase in nature-based research demonstrates the potential additional benefits of participating in the event compared to urban areas in this context. However, there is a lack of quantitative measurement tools that explore the meanings of the lived experiences of those who participate in nature-based activities. The aim of the study at this point is to develop the Long-Distance Runners Experience Scale (LDRES), which is based on descriptions of long distance running as a serious leisure activity. Further research in this regard could strengthen the collective understanding of individual motivation for such activities. In the study, online/face-to-face survey method, which is one of the quantitative research techniques, was used. Since it is not possible to determine the boundaries of the main population exactly, the sample size was chosen as "random sample". In this context, a total of 650 athletes were reached in the data collection process carried out in two stages. An item selection analysis was applied to a pool of 45 items. Then, the steps relating to the development process of the 35-item measurement tool were followed, and all psychometric analyses were carried out in order. Considering the findings and results in question, it is possible to say that LDRES is a tool that can make valid and reliable measurements that can measure the experiences of long-distance runners.

Keywords: Canoe, warm- up, foam rolling, dynamic stretching, performance.

1. Introduction

Sports and leisure activities support health and improve quality of life. Therefore, understanding the experiences related to commitment to these roles is becoming increasingly important (Yair, 1990). Although the reasons why participants run or continue this habit are not fully clear or obvious, when the programs and participation records of running events held every year around the world are examined, it is seen that the number of participants is increasing (Shipway, 2010). Leisure, as a sphere of work, is often associated with rest, distraction from responsibilities and triviality. Such activities are defined as 'casual' leisure. On the other hand, serious leisure time is defined as meaningful and intrinsically satisfying pursuits in which individuals systematically participate in a specific amateur, hobby or voluntary activity, gain and demonstrate specialised knowledge, skills and experience, and even take these activities to the level of a career (Stebbins, 1982).

The concept of serious leisure was first introduced by Stebbins (1982) and has been developed further over the last thirty years (Gould et al., 2008; Stebbins, 1992). The term "serious leisure" describes a committed and meaningful relationship between an individual and a chosen leisure activity. This concept describes activities that are both meaningful and engaging, allowing participants to combine knowledge, special skills, and experiences. Individuals who participate in serious leisure activities such as long-distance running often develop a strong and deep bond with the subculture of their preferred activity. In this context, sports tourism can strengthen or shape participants' leisure identities, providing

them with the opportunity to interact with like-minded individuals, to demonstrate their social identity and to compare their leisure careers with others (Fairer-Wessels, 2013).

Serious leisure is often contrasted with casual leisure, which is defined as activities that provide immediate or short-term gratification, are intrinsically enjoyable and rewarding, and require little or no specialised training. Casual leisure includes all leisure activities that do not fall within the scope of serious leisure. Serious leisure is distinguished from casual leisure by six key characteristics defined by Stebbins (1982) and summarised by Fairer-Wessels (2013): the need for commitment; having a leisure career; significant personal effort based on special knowledge, education or skills; lasting and significant benefits; a unique philosophy of life (ethos); and a strong identification with the chosen activity.

Ogles and Masters (2003) suggested that participants are likely to be highly involved because long-distance running has particularly high potential costs (due to the commitment of months of training) compared to other leisure activities.

The concept of "loneliness" is a common expression in literature on long-distance runners. In this context, long-distance marathon running is often described as a "lonely" sport. Sillitoe (1959) wrote The Loneliness of the Long-Distance Runner which is considered one of the most important works of the 20th century and was adapted into a film in 1962; this work is considered a modern classic with themes of honesty, courage and defiance of authority. The book and film tell the story of Colin, a cross-country runner released from a reformatory who resists authority in his life. Young Colin from Nottingham turns to long-distance running to escape the negativity in his life. Long-distance running, or marathoning, is a discipline that requires serious commitment, constant training, preparation and repetition due to its challenging nature.

In this context, one way to escape from life is through the months of training and preparation that precede an actual race. It is therefore natural that long-distance or marathon runners develop a deep connection to these events, as the dedication and physical effort involved in such activities is considerable. This bond can also help them define themselves as individuals and reveal their social identity. Indeed, many marathon runners appear to have a high degree of bond with such activities and identify with the sport. This unique identity is what Stebbins (1982) describes as serious leisure. This definition refers to participants' systematic pursuit of a leisure activity (whether amateur, hobby-based or volunteer-driven) that is so important and engaging to them that it sometimes turns into a 'career' focused on acquiring and expressing specific skills, knowledge and experiences (Stebbins, 1992; Stebbins, 1997; Stebbins, 2007).

Long-distance running often requires personal dedication and physical effort and is a serious form of leisure that is seen as part of the social world for its participants. In this respect, many athletes voluntarily subject themselves to physical pain, putting themselves in a preparation phase with rigorous training, demanding programs and controlled diets, beyond health and fitness (Funk & Bruun, 2006).

A basic typology of long-distance runners has been developed. According to this typology, long distance runners are;

1. Elite athletes who practice running sport and training with the aim of potentially winning a race are included in this class.
2. Runners who aim to improve their physical fitness and consistently train in this direction but have a low chance of winning or succeeding in a real competition environment are classified as runners.
3. We can define them as people who are rarely motivated to run and usually do so depending on the weather conditions. And these people are called leisure runners who occasionally participate in competitions. When all three categories are considered, all of the participants in the study can be included in both the first and the second classification (Smith, 1998).

Sheehan (1978) defines running as "a relaxation resulting from the union of body, mind and soul", which offers a different perspective. The concept of subculture is also important for long-distance runners. Subculture is defined as "a structure that reflects the lifestyle of a community". Subcultures within communities are shaped by elements of interaction, continuity and difference. In this context, it is useful to evaluate subcultures in terms of the participants' perspectives, that is, their worldviews, the identities they gain through the activity, the activities they find important, the relationships and bonds between them. This subcultural definition is of great importance, especially in terms of understanding the unique social environment of long-distance runners (Hockey & Collinson, 2006).

Such serious leisure activities as long distance running require 'perseverance' and 'persistence' even in the face of serious injury or difficult conditions. This of course contrasts with other leisure activities where perseverance is rarely required. Another prominent characteristic of such participants is that they participate with the aim of career development. In this context, career for them means progression in terms of experiencing special situations or milestones, each stage of achievement or participation (Stebbins, 2001).

Another key feature of serious leisure is personal effort, and this is also true of the long-distance running community. Furthermore, another important element associated with serious leisure, the gains from participation, are often described by long distance runners as self-actualization, expression, a sense of accomplishment, positive self-image, high self-esteem, and social interaction. Another notable aspect of serious leisure, the specific ethos of the activity, is directly related to the social structure to which the long-distance runner belongs. This social world has its own norms, values, behaviors, and even language, and belongs only to that group. Non-participants find it difficult to enter this world and are unlikely to gain access. While Stebbins's serious leisure framework applies to long distance runners, certain characteristics are prominent depending on the individual runner and their running environment. These characteristics vary greatly depending on the runner, their running environment and the resulting activity (Green & Jones, 2005).

Running can be a source of both positive and negative emotions and experiences (Bale, 2004). These experiences may include the excitement of pushing one's limits and meeting new challenges, the excitement of a large group, or the energy of a scenic course (Shipway & Jones, 2008). Although long-distance running is considered a remarkable experience on its own, the emotions experienced by many participants during the run also contribute significantly to the overall impact of the experience (Nettleton & Hardey, 2006).

The research focusses on specific aspects of long-distance runners within a serious leisure perspective, where two sub-components are hypothesised: experience and connectedness to nature. The aim is to develop a new scale to measure experience in these multiple domains as a construct. In this context, the study aimed to develop a reliable and valid Long Distance Runners' Experience Scale (LDRES) based on the experiences of long-distance runners described in the literature.

2. Materials and Methods

2.1. Research Group

The study was conducted on long distance athletes who participated in many competitions and events in different provinces of Türkiye. The research was conducted on two groups. In line with the literature recommendations, exploratory factor analysis (EFA) was conducted with the first group. EFA was carried out with the data obtained from 350 long-distance athletes aged between 20 and 65 with an average age of 37.53. The data obtained from the second group were used to confirm the structure determined after EFA and for additional validity and reliability analyses. In this sense, first-order and second-order Confirmatory Factor Analysis (CFA) were conducted with 300 long-distance participants aged between 19 and 73 with an average age of 38.53 (Büyüköztürk, 2011; Cox et al., 2003).

2.2. Scale development process

2.2.1. Creating the first scale

It is possible to come across studies in the literature regarding the motivations and reasons why athletes run in a serious leisure activity long-distance running. However, no measurement tool has been found in natural environments that can reveal the deep meaning of such experiences, that is, their feelings and emotions in terms of both making sense of nature and making sense of the running experience with the environment they run in. In this respect, the aim of the study is to develop a measurement tool that will support qualitative studies on the meaning of nature and the experience of running as a description of the experience. An item pool was created to make sense of questions such as what kind of feelings athletes have in relation to the place they run, how they make sense of the place they run, or what they feel about the experience as a whole (physical, psychological, social) during the distance they run, and why they run. While creating the item pool for the Long Distance Runners Experience Scale (LDRES), various studies (Perrin & Benassi, 2009; Tigges, 2009; Gibbons & Buunk, 1999; Joshanloo, 2014; Ge et al., 2025; Arslan & Wong, 2024; Ryan & Caltabiano, 2009;

Connor & Davidson, 2003) were taken into consideration, and databases such as Google Scholar, Scopus, Web of Science, ProQuest and SpringerLink were searched. The item list, consisting of 45 items in total, was reduced to 35 through amending, combining and correcting items in line with the views of five experts in measurement and evaluation, as well as coaches and academics.

2.3. Data collection process

Permission to conduct the study was first obtained from the Scientific Research and Publication Ethics Committee of Mardin Artuklu University in the Republic of Türkiye. The study was initiated after receiving approval from the ethics committee. The survey applied to the athletes consisted of two parts. The first part of the survey aimed to collect information about the general profiles of the participants. In the second part of the survey, the measurement tool developed by utilizing the experiences of the participants and the literature was used. The sample size was determined during the development process of the scale by taking into consideration suggestions in the literature.

At this point, researchers based the number of items on the measurement tool (Cattell, 1978; Comrey & Lee, 1992), stating that five to ten times the number of items is sufficient for the sample. However, there are also researchers who emphasize that the sample size should be at least 100–250 for factor analysis, regardless of the number of items (Preacher & MacCallum, 2002). In the study, online/face-to-face survey method, which is one of the quantitative research techniques, was used. As it was not possible to determine the boundaries of the main mass within the scope of the study, the sample size was determined by taking support from the literature and was based on the number of items. A total of 650 people were randomly selected and volunteered to support the study. The draft form of this study consisted of 35 items. This sample size was deemed sufficient for EFA and CFA with 350 and 300 participants, respectively, because it was determined as ten times the number of items. In addition, considering the novelty of the measurement tool developed in the study, expert opinions were also consulted. However, all final decisions regarding the development of the scale were made by the researcher.

The scale is evaluated on a 5-point Likert-type scale as “Strongly Agree (5)” and “Strongly Disagree (1). In the scale, which has a total score and sub-dimension scores, each factor can be considered as a sub-scale and the total score of the scale can also be obtained. The total and each sub-scale score value are obtained by adding the value given to the items of that scale and dividing by the number of items. The data were delivered to the athletes via electronic survey forms (Google Forms), social media, online communication and face-to-face platforms. After the necessary review process of the surveys filled out by the runners, a total of 650 surveys were used in the scale development process.

2.4. Data Analysis

The collected data were transferred from Microsoft Office Excel to the SPSS program, and the necessary adjustments were made; outliers, normal distribution (skewness-kurtosis), and descriptive statistics analyses were performed, and the data were prepared for factor analysis. In the next step, the Kaiser-Meyer-Olkin and Bartlett's Test were used to determine the suitability of the data set for factor analysis. The Principal Axis Factoring (PAF) method was selected for exploratory factor analysis. Since the structure determined by Exploratory Factor Analysis (EFA) was not confirmed, First-Level and Second-Level Confirmatory Factor Analysis (CFA) analyses were performed in two stages. Furthermore, after the structure validation stage, the Explained Mean Variance (AVE), Root Mean Square of Explained Variance (√AVE), and Construct Reliability (CR) values were also calculated to determine the convergent and discriminant validity of the identified structure. All analyses were performed using SPSS 24, AMOS 23, and Excel software.

2.5. Ethical Approval

Ethical approval for this study was obtained from the University Human Research Ethics Committee, with the decision dated 31.03.2025 and numbered 190990. The study, titled “Serious Leisure Perspective: Long-Distance Runners’ Experience Scale”, was conducted in accordance with the principle of voluntary participation and strictly adhered to ethical standards. All procedures were carried out in line with the Directive on Scientific Research and Publication Ethics of Higher Education Institutions and the ethical principles of the Declaration of Helsinki. Prior to data collection, participants were fully informed about the purpose and procedures of the study and provided written informed consent.

3. Results

This section reports the evidence regarding the validity and reliability of the Long Distance Runners Experience Scale (LDRES) in terms of its psychometric properties.

3.1. Exploratory Studies

Hypothetical Studies-Data Suitability

The data were found to be suitable for factor analysis based on the sampling adequacy criteria of the Kaiser-Meyer-Olkin (KMO) (0.927) and Bartlett's test of sphericity (SD = 136, 4648.148, $p < 0.0001$). According to the KMO, the sample size was found to be in the 'excellent' category (0.92), indicating that it was sufficient for EFA (Field, 2009).

Hypothetical Studies - Parallelism Analysis

To determine the number of factors best revealing the relationships between items, Horn's (1965) Parallel Analysis, eigenvalues and Scree Plots were examined. Examination of the scree plot revealed a sharp decrease after two factors. Accordingly, the structure that best represents the relationship between the items is gathered under two factors/components. The scree plot is given in Figure 1.

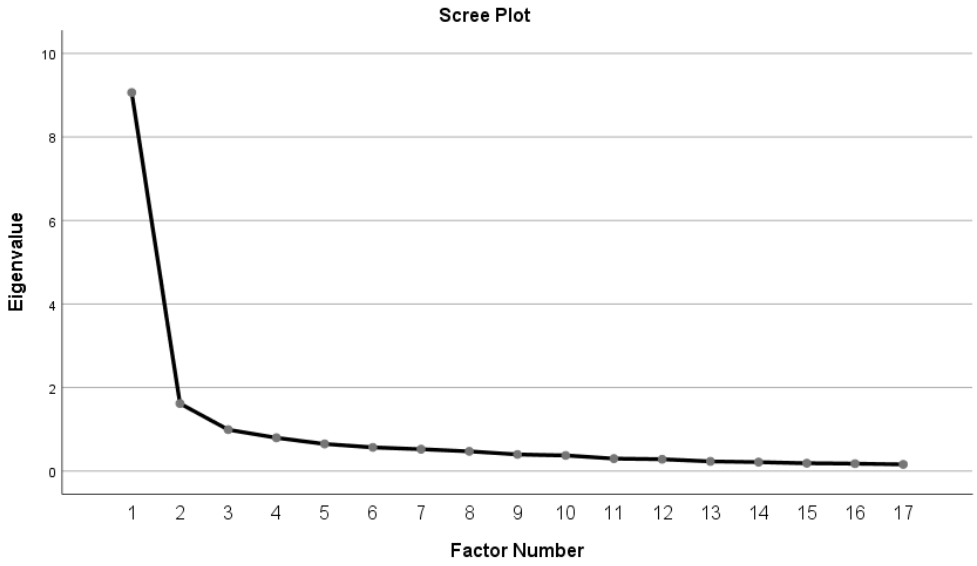

Figure 1. LDRES Accumulation Graph

Hypothetical Studies - Principal Axis Factoring (PAF)

Psychological variables are different from physical variables and have a multidimensional structure. Therefore, during the development of a measurement tool, factor analysis method is usually used to reveal its psychological structure. Although researchers often prefer factor analysis method, other techniques such as correlation, t-test and simple linear regression can also be used to determine the psychometric properties of a measurement tool (Büyüköztürk, 2011; Erkuş, 2003). The stage of examining the psychometric properties of the measurement tool can be started by using one of the item selection techniques such as correlation, factor analysis and lower and upper 27% group techniques. It is the responsibility of the researcher/researchers to use which of these techniques. In this context, factor analysis was used in the study and although Field (2009) determined a minimum value of 0.30 as the item elimination criterion in the literature, the 0.40 cut-off criterion was taken into account in this study. The Long Distance Runners Experience Scale (LDRES) factor structure (i.e. EFA) was examined for group 1 (n = 350) using the principal axis factoring (PAF) method. The number of components to be extracted was determined by examining the scatter plot and the traditional Kaiser criterion (i.e. all factors with eigenvalues greater than 1) (Büyüköztürk, 2011). The analysis results are presented below (see Table 1).

Table 1. Exploratory factor analysis results

Kaiser-Mayer-Olkin Sample Adequacy Measurement		0,927	
Bartlett Sphericity Test	Approximate Chi-square	4648,148	
	Degree of freedom	136	
	Meaningfulness	0,00	
Item Numbers	Factor Loadings		Total Variance
	F1	F2	
The Meaning of Nature 7	0,838		%50,94
The Meaning of Nature 8	0,835		
The Meaning of Nature 6	0,825		
The Meaning of Nature 5	0,793		
The Meaning of Nature 4	0,773		
The Meaning of Nature 2	0,765		
The Meaning of Nature 10	0,734		
The Meaning of Nature 3	0,691		
The Meaning of Nature 11	0,601		
The Meaning of Nature 17		0,928	
The Meaning of Nature 19		0,813	
The Meaning of Nature 18		0,767	
The Meaning of Nature 10		0,693	
The Meaning of Nature 21		0,608	
The Meaning of Nature 15		0,601	
The Meaning of Nature 5		0,576	
The Meaning of Nature 6		0,406	
Nature Sub-Dimension Cronbach's Alpha Value =0,933			
Experience Sub-Dimension Cronbach's Alpha Value =0,897			
Total Cronbach's Alpha Value of the Scale =0,943			

Examining the factor structure of the scale developed for long-distance running as a serious leisure activity reveals that it consists of two factors explaining 50.94% of the total variance. The factors are ordered according to their weights: first is 'meaning of nature', and second is 'meaning of experience'. This defines not only the factors in the scale, but also the priority relationship between them. Examining the factor loadings for the two sub-dimensions of the scale reveals that they vary between 0.601 and 0.838 for the 'nature' sub-dimension, and between 0.406 and 0.928 for the 'experience' sub-dimension. The Cronbach's alpha values were found to be 0.93 for the 'meaning of nature' sub-dimension, 0.89 for the 'meaning of experience' sub-dimension, and 0.94 for the overall scale. Field (2009) considers this value sufficient when it is above 0.50, and it is classified as 'excellent' when it is 0.90 and above. Accordingly, the factor relationships are correct. The results of the explanatory factor analysis regarding factor names, item codes and item descriptions are presented in Table 2.

The factors obtained with EFA and the items forming each factor are given in Table 2. Detailed explanations for each factor are as follows;

F1: The factor called "Meaning of Nature" is related to the feelings of being in nature during the running experience of long-distance runners in nature. It consists of the following items: "During the experience, I feel like I am one with the natural world." "During the experience, I feel like I am one with all living things." "During the experience, I feel like I am part of a tree or a forest." "During the experience, I feel like I am part of the web of life." "During the experience, I feel like I am part of the cyclical life process." "During the experience, I feel like I belong to nature." "During the experience, I feel like my actions affect the natural world." "During the experience, I feel like I can identify with nature." "During the experience, I feel that all living things share a common 'life force'."

F2: The factor called "Meaning of Experience" is related to the meaning that long-distance runners attribute to the experience during their running experience in nature. It consists of the following items: "Experience is a kind of self-

realization." "Experience is feeling that you exist." "Experience is struggling with yourself." "Experience is feeling that you are breathing." "Experience is fascinating." "Experience is a part of my soul." "Experience is meeting myself." "Experience is freedom."

Table 2. Factors, item codes and descriptions

Long Distance Runners Experience Scale (LDRES)		
Factor	Item Codes	Item Description
The Meaning of Nature	Meaning of Nature 7	During the experience, I feel one with the natural world.
	Meaning of Nature 8	During the experience, I feel unity with all living things.
	Meaning of Nature 6	During the experience, I feel like I am part of a tree or a forest.
	Meaning of Nature 5	During the experience, I feel like I am part of the web of life.
	Meaning of Nature 4	During the experience, I feel like I am part of the cyclical process of life.
	Meaning of Nature 2	During the experience, I feel like I belong to nature.
	Meaning of Nature 10	During the experience, I feel that my actions affect the natural world.
	Meaning of Nature 3	During the experience, I feel like I can identify with nature.
	Meaning of Nature 11	During the experience, I sense that all living things share a common 'life force'.
The Meaning of Experience	Meaning of Experience 17	Experience is a form of self-realization.
	Meaning of Experience 19	Experience is the feeling that you exist.
	Meaning of Experience 18	Experience is struggling with yourself.
	Meaning of Experience 10	Experience is to feel yourself breathing.
	Meaning of Experience 21	Experience is fascinating.
	Meaning of Experience 15	Experience is a part of my soul.
	Meaning of Experience 5	Experience is meeting myself.
	Meaning of Experience 6	Experience is freedom.

3.2. Confirmatory factor analysis (CFA)

The next step was to confirm the two-factor structure of the Long-Distance Runners' Experience Scale (LDRES) obtained from EFA. Accordingly, first- and second-order CFA were conducted on Sample 2 (n = 300) using the maximum likelihood method with robust standard error estimation. Within the framework of the stated assumptions, CFAs were conducted to confirm the two-factor and 17-item structure of the scale. The fit indicators related to confirmatory factor analyses are given in Table 3. As seen in the table, the chi-square/degree of freedom ratio (3036.36/857 = 3.5430) shows a 'moderate fit' and this ratio being below 5 is generally considered as 'good fit'. RMSEA value of 0.079 is also considered as 'good fit'. In the literature, RMSEA values of 0.08 and below fulfil the 'good fit' criterion (Brown, 2014).

Table 3. Fit Indices for First and Second Order Confirmatory Factor Analysis

Variable	X2	sd	X2/sd	NFI	GFI	CFI	TLI	NFI	RMSEA
Criteria			≤5	≥.90	≥.90	≥.90	≥.90	≥.95	≤.08
Scale (First Order)	306,815	106	2,894	,935	,916	,956	,944	,935	,071
Scale (Second Order)	402,968	110	3,663	,915	,894	,936	,921	,915	,084

The analysis results show that both the first- and second-order models provide an optimal fit. More specifically, the fit index values for the structure are as follows:

The index values for the first-order model are: $\chi^2/df = 2.894$, RMSEA = 0.71 and GFI = 0. The index values for the second-order model are: $\chi^2/df = 402.968$, RMSEA = 0.84, GFI = 0.89, NFI = 0.91, TLI = 0.92, and CFI = 0.93. Examining the fit indices of both models shows that they both demonstrate a 'perfect fit' (Thompson, 2004). Accordingly, the two-factor, 17-item structure of the Long-Distance Runners Experience Scale (LDRES) is confirmed as valid. Figure 1 shows the path diagrams resulting from first- and second-order confirmatory factor analyses (CFA) of the two-factor structure of the LDRES. Figure 2 shows the structural equation model, which includes the standardised parameter estimates for the scale's factors and items.

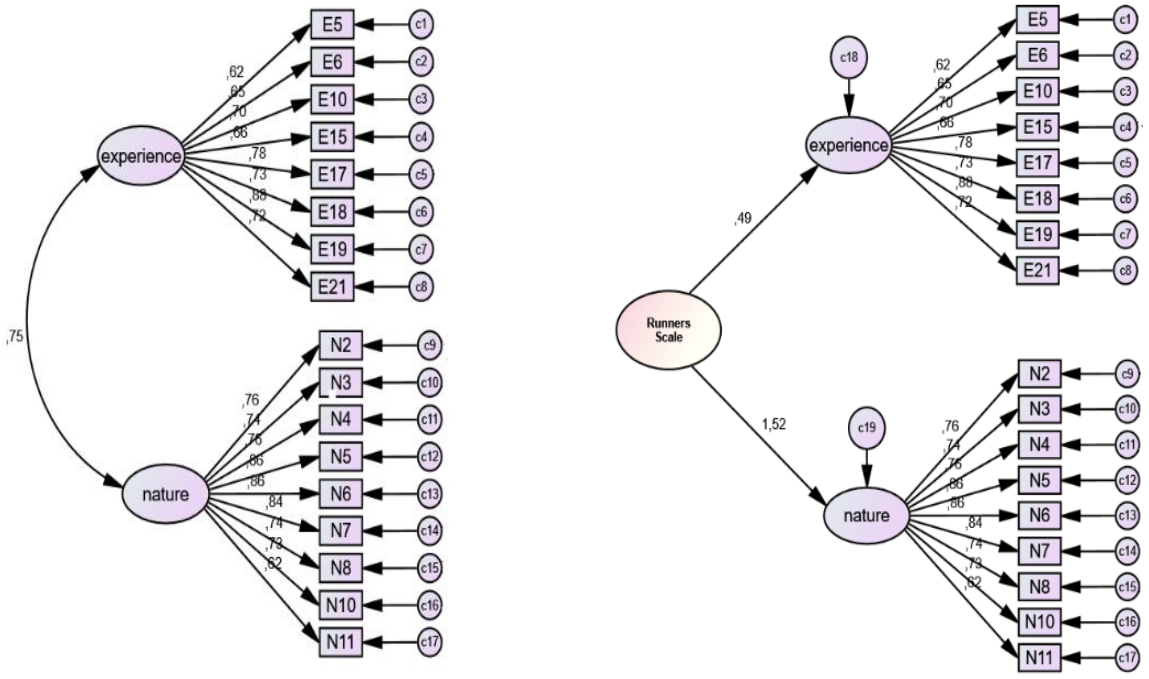

Figure 2. First and Second Order Confirmatory Factor Analysis Path Diagrams

3.3. Convergent and discriminant validity

The aim of this study was to further investigate the validity of the Long-Distance Runners Experience Scale (LDRES). To this end, the convergent and discriminant validity of the measurement tool were assessed using Average Variance Extracted (AVE), Square Root of Average Variance Extracted and Construct Reliability (CR) values (see Table 4).

Table 4 presents the AVE, √AVE, and CR values calculated for the Long-Distance Runners' Experience Scale (LDRES) in terms of convergent and discriminant validity. For the "meaning of experience" sub-dimension, the AVE value was calculated as 0.52, the square root of the AVE was 0.72, and the CR value was 0.89. For the "meaning of nature" sub-dimension, these values were 0.59, 0.77, and 0.92, respectively. It is stated in the literature that the AVE value should be above 0.50 and the CR value should be above 0.70 (Hair et al., 2009). The findings obtained in this context show that the measurement model has sufficient convergent and discriminant validity.

Table 4. Results Regarding Convergent and Discriminant Validity

Sub Dimension	Convergent and Discriminant Validity	Coefficients
The meaning of experience	AVE	.52
	CR	.89
	√AVE	.72
The meaning of nature	AVE	.59
	CR	.92
	√AVE	.77

Note. AVE = Average Variance Explained; CR = Construct Reliability, √AVE = Square Root of Average Variance Explained

4. Discussion

This study developed a domain-specific measurement tool that can provide reliable and valid measurements based on the description of emotions in two subcategories: 'meaning of experience' and 'meaning of nature' of long-distance runners, from a serious leisure perspective. Analyses were conducted to provide psychometric evidence of the scale's validity and reliability. Using the data from the first study group, the two-dimensional structure revealed by Horn's

parallelism analysis, the scree plot and factor analysis was confirmed. The data from the second study group were used to conduct first- and second-order confirmatory factor analyses, as well as analyses of convergent and discriminant validity and reliability. When the findings were evaluated as a whole, the psychometric analyses regarding the measurement tool developed to make sense of nature and experience during the run of long-distance runners within a serious leisure perspective provided valid evidence.

EFA was performed for the Long-Distance Runners Experience Scale (LDRES) using the principal axis factorization (PAF) method. As a result of the analysis, a two-factor structure with 17 items, with an eigenvalue of 1 and above, explaining 50.94% of the total variance, was obtained. The results obtained show that LDRES reflects a two-factor structure with its 17 items. In order to evaluate the validity of this structure, both first and second-level CFA were conducted. The structure that emerged as a result of EFA was confirmed through CFA with the fit indices related to the proposed two-factor model, and it was determined that this model provided the best fit with the data. The seventeen items in the scale showed high levels of consistency both among themselves and with the two-factor structure. In order to examine the convergent and discriminant validity of the Long-Distance Runners Experience Scale (LDRES), AVE, CR and AVE value were calculated for each factor. The results obtained showed that each dimension in the model represented a unique structure and had sufficient discriminant validity. The reliability of the scale was assessed with Cronbach's alpha coefficient. The calculated alpha values reveal the reliability of both the sub-dimensions and the general scale structure. Based on these findings, it was concluded that LDRES is a valid and reliable measurement tool. This measurement tool comprises 17 items and two sub-dimensions representing the experiences of long-distance runners as participants in serious leisure activities. Separate scores can be obtained for the general score and the sub-dimensions, since the validation study was conducted for both the first- and second-order structures. In this context, the lowest possible general score is 17 and the highest is 85. The lowest possible score for the 'Nature' sub-dimension is 9 and the highest is 45. The lowest possible score for the 'experience' sub-dimension is 8 and the highest is 40. The Long-Distance Runners Experience Scale (LDRES) is a 17-item, five-category, Likert-type scale with two sub-dimensions.

The scale is rated on a five-point Likert scale, with the following categories: strongly disagree (1), slightly disagree (2), neither agree nor disagree (3), slightly agree (4) and strongly agree (5). As the first- and second-order structures were verified in the construct validity analyses, the total and sub-dimension scores can be calculated. Total and sub-scale score values are obtained by adding the values given to the items in a sub-scale and dividing this sum by the number of items in that sub-scale. The literature on long-distance runners' participation in serious leisure activities is quite limited. Therefore, this study contributes to the body of knowledge in this field by providing valid and reliable, as well as unique psychometric measures to understand long-distance runners' experiences of participation in serious leisure activities. Future research in this area should utilise this instrument to examine possible differences between different populations. However, the study also has some notable limitations. The participant population is not fully representative of all long-distance runners. Therefore, it is recommended that future studies should replicate similar research with more representative samples to increase the generalisability of the present results. Since the items in the scale address the connection between human, nature and experience, it is seen that there is a strong, reciprocal and deep relationship between human and nature. Ignoring this relationship can have devastating consequences for both the natural environment and the human psyche. Therefore, recognising this connection can support healing for both parties (Davis, 1998).

Fisher (2002) expression is defined as ‘activities aimed at rediscovering how the human spirit is included in and nourished by the comprehensive spirit of nature; to regain the ability to respect, contribute to, and establish mutual relationships with living nature’ and explains the connection between human beings and nature in depth.

There are significant studies on leisure time and running in national and international literature.

For example, Pišot (2015) conducted a study to analyze marathon and half marathon runners in Slovenia and how running affects runners' leisure time and concluded that running as such a serious leisure activity is very important and satisfying for runners, that runners are very knowledgeable about sports nutrition, and that they are willing to spend more than 600 euros per year on sports equipment, fees and other things.

Qiu et al. (2020) emphasized that marathon events have been developing in China in recent years and especially marathon events have become a unique serious leisure activity. In the 2017 Nanjing Marathon Event and Hangzhou

Marathon events, the relationship between marathon runners and their behaviors was examined, and as a result, it was reported that there was a positive relationship in terms of variables such as the number of years of runners, weekly running frequency, and the longest marathon event.

In their study in Israel, Lev and Zach (2020) reported that long-distance running as a serious leisure time activity has an impact on family relationships and in this respect, it creates a positive relationship environment on children and improves family relationships and communication; while both of the couples in the family are runners reveal more balanced relationships, while the fact that only one person in the family is a runner will create sensitivity in terms of the foundation of marital life.

It is also seen that measurement tools related to running have been developed from past to present. For example, Chapman & De Castro (1990) developed the running addiction scale (RAS) to obtain information about an individual's running habits and the degree of addiction and to investigate the psychological relationships of running addiction. The short form of this scale was developed by Szabo (2010) as the Running Addiction Scale (RAS-8). This scale is particularly suitable for assessing addiction in high distance and duration events such as marathons and ultra-marathons. Tenenbaum et al. (1999) developed the Running Discomfort Scale (RDS) to reveal the feelings and thoughts of people participating in a long-distance running activity that completes a challenging course such as a 9 km run in terms of pain and discomfort. Goode & Roth (1993) developed the Thoughts During Running Scale (TDRS) to assess the prevalence of certain thoughts during running. The Rating of Perceived Exertion (RPE) Scale, developed by Borg (1998) to assess an individual's subjective perception of effort during exercise, is widely used to assess runners' "running intensity" and "fatigue levels". Stevinson and Biddle (1998) developed the Running Discomfort Scale to multidimensionally assess the physical and cognitive discomfort experienced by long-distance runners during running. De Bosscher et al. (2021) developed the DISQ-Sport Scale specifically to measure runners' perceived demands, available resources, and recovery levels during running. Waśkiewicz et al. (2020) developed the Motivations of Marathoners Scales (MOMS) to assess individuals' motivations, perceptions, and behavioral commitment to running.

5. Conclusions

Few studies in the reviewed literature have addressed the emotions and experiences of long-distance runners in relation to nature. In this context, the developed Long-Distance Runners Experience Scale (LDRES) is considered to provide a significant contribution to field-specific measurement tools and is thought to serve as a valuable reference for literature.

Implications for future research

Viewing physical activity as a serious leisure pursuit offers significant opportunities to enhance individual well-being and promote a culture of active living in society. Future initiatives could focus on raising awareness through social media campaigns and public advertisements, particularly targeting families, to highlight the benefits of physical activity within the serious leisure context. Integrating structured, high-engagement activities, such as long-distance running, into early "leisure education" programs may help establish lifelong habits. From the preschool years onward, children should be taught leisure awareness and activity-planning skills. Embedding leisure education within school curricula can foster positive attitudes toward physical activity (Caldwell, 2005). Additionally, organizing, promoting, and supporting community-based events—such as running, cycling, or walking—can enhance motivation and participation (Misener & Doherty, 2012). Developing specialized programs to deepen participants' knowledge and experience, including mentorship, certification, and leadership training, could further strengthen engagement and long-term commitment to serious leisure activities (Green & Jones, 2005).

Limitations

Studies addressing long-distance running within the serious leisure framework and from a recreation science perspective remain limited. Consequently, the underlying reasons for engaging in such activities—beyond the inherent motivations—require further investigation. Specifically, variables such as why individuals begin and continue long-distance running, how they position these activities within their lives, and what personal benefits they derive from participation should be examined independently. Although this study developed a novel measurement tool that captures factors related to the natural environment, course characteristics, difficulty level, and distance from a serious

leisure perspective, future research should validate and refine this instrument across diverse populations and contexts to enhance its generalizability.

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