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Engagement in Sports Training Among Track and Field Athletes in Algeria – An Analytical Study Using the EATS Scale in Light of Certain Variables

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Abstract

The study aimed to assess the level of engagement in sports training among track and field athletes in Algeria in light of certain variables, using the EATS scale. The research adopted a descriptive-analytical approach and was conducted on a sample of 162 Algerian track and field athletes. The study yielded the following results:

1- There are statistically significant differences in training engagement among Algerian track and field athletes based on gender (male–female).

2- There are statistically significant differences in training engagement among Algerian track and field athletes based on the nature of specialization (short-distance events – middle- and long-distance events – jumping events).

Keywords: Track and field, engagement, sports training.

Article info

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1. Introduction and Problem Statement:

Engagement in sports training is considered one of the most critical factors contributing to the development of high athletic performance, particularly in disciplines that demand strict commitment and complete mental and physical dedication. This concept goes beyond mere physical attendance at training sessions; it encompasses psychological readiness, adherence to the training plan, and positive interaction with the coach's instructions. In this sense, engagement reflects the relationship between the athlete and the training process. In the daily reality of athletes, a noticeable disparity can be observed in the level of engagement among track and field athletes during training sessions. Specifically in the Algerian context, there is a decline in seriousness during sessions, frequent unjustified absences, and even a lack of focus during certain exercises by some athletes. Despite their talent, they display inconsistency in attendance and a lack of commitment, which raises concerns for coaches and negatively impacts the effectiveness of the training plan. This behavior cannot be separated from the surrounding social and cultural environment, which may not grant sports training the value it deserves. On the other hand, modern technology has imposed itself on athletes' behaviors and affected the nature of their relationship with training. The mobile phone has become a constant companion during training sessions, and recovery periods are often used to browse social media or respond to messages, which distracts attention and weakens concentration.

We have also observed the phenomenon of "running with headphones," where an increasing number of runners choose to listen to music or podcasts during training. This creates an atmosphere entirely different from that of competition day, which directly affects their performance. Such behavior may be an attempt to escape routine or anxiety, yet it can diminish their motor awareness and real-time interaction with the coach. Although this behavior may appear personal, it reflects a broader pattern of "disconnection" from the training environment. These practices prompt us to ask: Do today's athletes still view training as a responsibility? Or has it become a secondary obligation—something that can be postponed or taken lightly? Has training, in the eyes of athletes, lost its appeal due to the allure and immediacy of digital alternatives?

In this context, studying engagement in sports training is no longer a purely theoretical concern, it has become a practical necessity for understanding athletes' behavior within the training environment and identifying the variables that influence their commitment and responsiveness to structured programs. Track and field is a particularly suitable field for such studies due to its individual nature and the specificity of its disciplines and workload distribution.

Many researchers have examined athletic engagement from various perspectives, considering it an indicator of psychological well-being and strong performance, often linked to an athlete's sense of enjoyment and belonging factors that motivate continued training even under pressure. Some scholars distinguish between different types of motivation that influence engagement, such as intrinsic and extrinsic motivation, arguing that intrinsic motivation is more effective in sustaining long-term engagement (Vallerand & Losier, 1999, p. 145). Badran Sharif (2004) noted that weak social support and limited societal appreciation for sports in some Arab communities may lead to a decline in athletes' commitment (Sharif, 2004, p. 73). Hamada Hussein (2010) emphasized that the sense of achievement and self-worth are among the key psychological motivators that drive athletes to persist in training, especially in individual sports, where the athlete bears full responsibility for their performance (Hussein, 2010, p. 176).

Despite the abundance of studies on engagement in sports training, research specifically focused on track and field athletes, particularly in Algeria, remains limited. Most studies have addressed general aspects without delving into the influence of local cultural and environmental variables. Moreover, modern measurement tools such as the EATS scale have not been sufficiently utilized in Arab studies and, to the best of the researcher's knowledge, have never been applied in the Algerian context. Therefore, this study aims to offer a meaningful contribution to the scientific understanding of track and field athletes' behavior in Algeria and to support the improvement of training practices and psychological support in this vital field.

This leads us to pose the following research questions:

2. General Research Question:

Are there statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on gender and type of athletic specialization?

2.1. Sub-questions:

- Are there statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on gender (male–female)?
- Are there statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on the type of athletic specialization?

3. General Hypothesis:

There are statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on gender and type of athletic specialization.

3.1. Sub-hypotheses:

- There are statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on gender (male–female).
- There are statistically significant differences in sports training engagement among Algerian track and field athletes, as measured by the EATS scale, based on the type of athletic specialization.

4. Definition of Terms

4.1. Track and Field

Conceptual Definition: In its modern sense, track and field includes walking, running over various distances, and different types of jumping events (long jump, high jump, triple jump, pole vault), as well as throwing events (shot put, hammer throw, discus, javelin), in addition to combined events such as the decathlon for men and the heptathlon for women. (Kamal Jamil, 2005, p. 13)

Operational Definition: Track and field is considered one of the oldest and most widespread sports. It encompasses a variety of events such as short-, middle-, and long-distance races, high jump, long jump, pole vault, shot put, javelin throw, and others. Its aim is to develop athletes' physical, technical, tactical, and psychological abilities by applying scientific principles of sports training tailored to each athlete's needs, in order to foster adaptation, commitment, and perseverance. Track and field embodies athletic engagement by uniting mental and psychological motivation with physical and technical capabilities.

4.2. Athletic Engagement

Conceptual Definition: Engagement is the opposite of burnout and is characterized by a sense of immersion in an activity such as sports practice. The individual forms a bond with the activity, which is reflected in greater dedication and involvement in the task. Engagement is thus defined as a positive mental state of awareness, marked by vigor, dedication, and absorption. (Schaufeli et al., 2002, p. 703)

Operational Definition: Engagement refers to the interaction between the athlete and the activity practiced, which drives them to commit to training, show dedication to the task, and experience inspiration, enthusiasm, and a sense of challenge in giving their best to overcome difficulties. This, in turn, enhances long-term performance. Engagement in sports training involves cognitive interest and the athlete's ongoing mental focus on the sport, behavioral investment reflected in the time and effort devoted to practice, and emotional attachment through the feelings and emotions evoked by athletic activity in general and track and field in particular. 4.3. Sports Training

Conceptual Definition: According to Bompa & Haff (2009), "Sports training is a developmental process aimed at enhancing athletic performance by integrating physical training with mental and psychological development, thereby contributing to the formation of a well-rounded athletic personality."

Operational Definition: Sports training is an organized and structured educational process based on scientific knowledge and methodological principles, designed to help individuals reach the highest possible level in their chosen sport. This is achieved by developing physical abilities such as strength, flexibility, and endurance, as well as sport-specific motor and technical skills. It also involves cultivating mental capacities related to strategic decision-making. Sports training includes enhancing planning and organizational skills by strengthening internal psychological motivation and developing personal and volitional traits through consistent engagement and commitment to training.

5. Research Objectives

- To analyze the level of engagement in sports training among Algerian track and field athletes using the EATS scale, and to identify the factors influencing it.

- To examine differences in athletic engagement among Algerian track and field athletes based on gender (male and female), using the EATS scale.

- To examine differences in athletic engagement among Algerian track and field athletes based on the type of athletic specialization (sprint events, middle- and long-distance events, long jump), using the EATS scale.

- To explore the relationship between intrinsic motivation and athletic engagement, and how this affects athletes' continuity in training.

- To analyze the impact of modern technology such as the use of social media during training on athletes' focus and performance. Here is the English translation of sections 6 and 7 of your research paper, rendered in a formal academic tone:

6. Significance of the Study

In the context of athletic engagement in sports training among track and field athletes in Algeria, the significance of this study lies in its analysis of the factors influencing athletes' commitment, self-regulation during training sessions, and overall discipline. Given the scarcity of studies addressing the impact of cultural and social environments on athletes' behavior, particularly in the Algerian context, this research is especially valuable. It focuses on mental, psychological, and physical engagement during training, which has become a growing concern in the sports sector due to shifting priorities and expectations among athletes and their families regarding future prospects. This gives the study considerable scientific relevance.

Moreover, the use of the EATS scale as a contemporary tool to measure athletic engagement and assess the influence of intrinsic motivation and modern technology on athletic performance represents another important dimension of this research. Exploring the relationship between engagement and technology is a crucial step toward understanding the challenges athletes face in the digital age and proposing practical solutions to improve training discipline and achieve high performance.

7. Review of Previous Studies

Study by Lonsdale, Hodge, and Raedeke (2007) Title: "The Development and Initial Validation of the Athlete Engagement Questionnaire (AEQ)"

This study aimed to develop a scale to measure the core dimensions of athletic engagement (confidence, dedication, and vigor), and to examine whether enjoyment could also be considered a fundamental dimension of engagement. The researchers sought to validate the scale by examining its correlations with athlete burnout scores. The study was conducted with elite athletes from New Zealand and Canada. Results indicated that enjoyment was strongly associated with athletic engagement, but the enjoyment items did not load onto the vigor factor. Instead, they formed a separate factor labeled "enthusiasm." The four-factor AEQ, with subscales measuring confidence, dedication, vigor, and enthusiasm, was found to be the most appropriate structure. The factorial validity of the AEQ scores was supported, and the negative correlations between athlete burnout and engagement provided evidence of the scale's construct validity.

Study by Félix Guillén and Julio Román (2014) Title: "The Sport Engagement Scale: Adaptation of the Utrecht Work Engagement Scale (UWES) to the Sports Context"

This study aimed to adapt the Utrecht Work Engagement Scale (UWES), originally developed by Schaufeli and Bakker (2003) to measure engagement in the workplace to the sports context. The sample consisted of 240 Spanish third-division football players aged between 15 and 38. The factor structure of the UWES was analyzed using both exploratory and confirmatory factor analyses. The results revealed a three-factor structure (vigor, absorption, and dedication) and demonstrated sufficient internal consistency across all dimensions. Furthermore, the findings provided initial support for construct validity, as athletic burnout was negatively correlated with the three engagement dimensions. These results offer preliminary evidence of the usefulness of the UWES in the sports context.

Study by Jingdong Liu et al. (2024) titled "Development and Preliminary Validation of the Engagement in Athletic Training Scale"

The study aimed to develop and preliminarily validate the Engagement in Athletic Training Scale (EATS), which was designed to assess athletes' engagement in athletic training. This was done through three empirical studies. In the first study, the items were generated and the initial content validity of the EATS scale was established. In the second study, the factor structure of EATS was examined using Exploratory Factor Analysis (EFA) and Exploratory Structural Equation Modeling (ESEM). The internal consistency reliability of the subscales was also assessed. In the third study, the factor structure, discriminant validity, internal consistency reliability, and face validity of the EATS were further examined in an independent sample (N = 513). At the same time, measurement invariance of the EATS was assessed across samples (Study 2 and Study 3) and gender. Overall, the results of the three studies provided preliminary psychometric evidence for the 19-item EATS, indicating that it can be used as a valid and reliable scale to assess athletes' engagement in athletic training.

Research Methodology and Procedures:

Method Used: The study of methodology is of great importance. Regardless of the research topic, the results depend on the value of the methods used. A method is defined as "a set of rules used by the researcher to interpret a specific phenomenon in order to reach scientific truth" (Bouhouch Ammar, 2019, p.14). Based on this, the researcher used the descriptive-analytical method, as it suits the nature of the topic and serves its objectives and answers its questions. This method describes the phenomenon under study, analyzes the data, identifies the relationships between its components, the opinions expressed about it, the processes it involves, and the effects it produces.

Research Population: "One of the important aspects in conducting research and addressing a problem is to accurately define the original research population and study it thoroughly. Some researchers refer to it as the target population, which is the population to which the research results will be generalized" (Haider Abdul Razzaq Kazem Al-Abadi, 2015, p.96). The research population consisted of athletes in the U18 age group from athletics clubs in various regions of Algeria, including clubs from the wilayas of Tipaza, Chlef, Aïn Defla, Oran, Tiaret, Bordj Bou Arréridj, and Sétif. The total number of the research population was approximately 398 athletes.

Research Sample: Determining the appropriate sample size "must be proportional to the population size not too small to compromise the accuracy of the results, nor too large to require excessive effort" (Naglaa Mohamed Ibrahim Bakr, 2018, p.159). Accordingly, the distribution of the instrument was limited by the researcher's available resources to a sample of 162 athletes, distributed as follows:

Table No. (01) shows: Distribution of the main sample according to gender and the nature of the event.

Province	Club	Nature			Sex		Total
		Short distances	Middle and long distances	Jumping	Male	Female	
Tipaza	CAK	08	12	03	13	10	23
Chlef	ASCH	13	11	09	21	12	33
Aïn Defla	NKA	04	08	03	06	09	15
Oran	AOC/OLC	08	06	04	10	08	18
Tiaret	CAAT	12	11	08	13	18	31
Bordj Bou Arréridj	Amel Reo	04	06	05	08	07	15
Sétif	CSAF	13	10	04	12	15	27
Total		**62**	**64**	**36**	**83**	**79**	**162**

Table (01) illustrates the size of the primary study sample according to the variables of gender (male and female) and the nature of the athletic activity (short-distance, middle and long-distance running, and jumping events).

Data Collection Tools:

Engagement in Athletic Training Scale (EATS): The Engagement in Athletic Training Scale (EATS) was used to assess the extent of athletes' participation in athletic training. This scale was developed and refined by Jing-Dong Liu and colleagues (2024). It consists of 19 items distributed across four sub-dimensions that help interpret differences in athletes' levels of engagement in training. These sub-dimensions are:

(1) Behavioral Engagement, (2) Cognitive Engagement, (3) Negative Emotional Engagement, (4) Positive Emotional Engagement (Jing-Dong Liu, 2024).

A 5-point Likert scale was used, ranging from (1 – Strongly Disagree) to (5 – Strongly Agree). The cognitive engagement subscale included six items, the behavioral engagement subscale included five items, the positive emotional engagement subscale included four items, and the negative emotional engagement subscale also included four items.

The validity, reliability, and development of the scale were confirmed by the researchers through three empirical studies.

In the first study, item generation and initial content validity of EATS were established.

In the second study, the factor structure of EATS was examined using Exploratory Factor Analysis (EFA) and Exploratory Structural Equation Modeling (ESEM), and the internal consistency reliability of the subscales was assessed.

In the third study, the factor structure, discriminant validity, internal consistency reliability, and face validity of EATS were further examined using a sample of 513 athletes. At the same time, measurement invariance of EATS was evaluated.

The results of the three studies provided strong evidence supporting the 19-item EATS as a valid and reliable tool for assessing athletes' engagement in athletic training.

To apply this scale in the current study, the researcher adapted it to the Algerian context. This process began with translating the scale into Arabic by professors whose native language is Arabic and who are proficient in English. A back-translation into English was then conducted to identify any linguistic discrepancies or conceptual inconsistencies. The revised and refined version was subsequently adopted.

Before administering the scale to the main study sample, the researcher verified its validity and reliability by applying it to a pilot sample of 42 athletes. The results were as follows:

Psychometric Properties of the Scale (Validity and Reliability)

Validity: The validity of the scale was confirmed using both internal consistency validity and discriminant validity, as follows:

Internal Consistency Validity: The researcher administered the scale to a randomly selected sample of 42 athletes from the clubs of Tipaza, Sétif, and Aïn Defla. The correlation coefficient was calculated between each item and the subscale to which it belongs, as well as between each subscale and the total score of the scale. The results were as follows:

Table (02): This table presents the correlation between each item and the subscale to which it belongs.

First axis		Second axis		Third axis		Forth axis	
Item number	Correlation	Item number	Correlation	Item number	Correlation	Item number	Correlation
3	0.789	2	0.749	12	0.881	1	0.679
4	0.898	7	0.893	13	0.911	6	0.783
5	0.789	8	0.733	17	0.689	14	0.770
9	0.765	10	0.781	19	0.754	15	0.863
11	0.698	16	0.820	//	//	//	//
18	0.910	//	//	//	//	//	//

It is evident from the table above that there is a correlational relationship between all items and the subscales to which they belong, indicating the validity of the items.

Table (03): This table presents the correlation between each subscale and the total score of the scale.

Axis	Correlation	Significance at 0.05
Cognitive Engagement	0.825	Significant
Behavioral Engagement	0.789	Significant
Positive Emotional Engagement	0.913	Significant
Negative Emotional Engagement	0.842	Significant

It is evident from Table (03) that there is a statistically significant correlation between all subscales and the total score of the scale, indicating the validity of the subscales and, consequently, the overall validity of the scale.

Discriminant Validity: This type of validity was used to estimate the scale's validity coefficient through the extreme group comparison method, also known as discriminant validity. The differences between the means of the two groups (those who scored the highest and those who scored the lowest on the scale) were calculated using a T-test. The results were as follows:

Table (04): This table presents the T-value indicating the significance of the differences between the upper and lower groups on the EATS scale.

Comparison groups	Sample	Arithmetic mean	Standard deviation	Degrees of freedom	Calculated t-value	P-value	Significance level
Top third 27%	11	73.72	7.11	20	9.42	0.000	0.05
Bottom third 27%	11	38.54	10.13				

It is evident from the table above that the T-test value ($t = 9.42$) with a significance level of ($p = 0.000$) and degrees of freedom ($df = 20$) is less than the significance threshold of 0.05. This result is statistically significant, indicating that there are differences between the two groups. Therefore, the scale demonstrates the ability to distinguish between its extremes, confirming its validity and suitability for use in the study.

10.2. Reliability

Reliability refers to the consistency of the test results when administered multiple times to the same individuals under the same conditions. A reliable test yields stable results across repeated applications.

10.2.1 Calculating Reliability Using Internal Consistency (Cronbach's Alpha)

Cronbach's Alpha is used when the test is administered once, to assess the internal homogeneity of the items within the scale.

Table (05): This table presents the reliability coefficient of the EATS scale calculated using Cronbach's Alpha.

Sample	Number of items	Factor value Cronbach's alpha
42	19	0.879

It is evident from Table (05) that the EATS scale demonstrates a high reliability coefficient, indicating that it is a trustworthy and dependable instrument.

10.2.2. Calculating Reliability Using the Test-Retest Method

In this method, reliability is assessed by re-administering the test after a time interval of 15 days between the first and second applications. The Pearson correlation coefficient is then calculated between the scores obtained in the first and second administrations of the scale.

Table (06): This table presents the reliability coefficient of the EATS scale using the test-retest method.

	Sample	Correlation	p-value	Significance
First application	42	0.932	0.000	Significant at 0.01
Second application	42			

The table shows that the correlation coefficient between the first and second administrations of the scale is (0.932), which is statistically significant. Therefore, it can be concluded that the EATS scale demonstrates a very high level of reliability.

Final Version of the Scale: The final version of the scale consists of 19 items distributed across four dimensions, as shown in the following table:

Table (07): This table presents the items and corresponding subscales of the EATS scale.

No.	Dimension	Number of Items	Item Numbers
01	Behavioral engagement	06	18/11/09/05/04/03
02	Cognitive engagement	05	16/10/08/07/02
03	Positive emotional engagement	04	19/17/13/12
04	Negative emotional engagement	04	15/14/06/1
Total		19	

It is evident from Table (07) that the scale consists of four dimensions: Behavioral Engagement, Cognitive Engagement, Positive Emotional Engagement, and Negative Emotional Engagement. The total number of items in the scale is 19.

Research Implementation Procedures

The researcher coordinated with colleagues and coaches who had connections with various athletic clubs to obtain permission to conduct the study and distribute the research instrument to the athletes. After receiving approval, the researcher contacted supervisors and coaches to distribute the scale to the athletes.

Athletes practicing track and field disciplines including short-distance runners, middle and long-distance runners, and jumpers were invited to participate in the study. The sample was selected based on availability and the feasibility of achieving the research objectives.

To facilitate participation, the scale was prepared in an electronic format, allowing athletes to complete it at their convenience, either at the club or elsewhere, using their mobile phones. The researcher administered the scale with a clear explanation of the study's purpose provided in the introduction. Participants were assured of the confidentiality of their responses and that their participation was voluntary and solely for scientific research purposes. Data collection was conducted during January and February 2025.

After data collection, the researcher reviewed and scored the completed questionnaires according to the designated scoring criteria. Incomplete or invalid responses that did not meet the scale's requirements were excluded. The scoring was carried out as follows:

Table (08): This table presents the evaluation criteria for interpreting the responses of the research sample for each subscale and for the overall scale.

Dimensions of the scale	Level of agreement				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Behavioral	6-10.7	10.8-15.63	15.64-20.43	20.44-25.23	24.25-30
Cognitive	5-8	9-12	13-16	17-20	21-25
Positive emotional	5-7	8-10	11-13	14-16	17-20
Negative emotional	5-7	8-10	11-13	14-16	17-20
Scale as a whole	19-34.1	34.2-49.3	49.4-64.5	64.6-79.7	79.8-95

Table (08) presents the evaluation criteria for interpreting the responses of the study sample across each subscale. The overall score range for the EATS scale lies between 19 and 95, based on an average indicator score of 15.2 for each response option. After completing the scoring process, the researcher recorded and categorized the scores in preparation for statistical analysis.

The data were analyzed using appropriate statistical methods suited to the nature of the study, with the aid of the SPSS software, version 28. The statistical techniques used included: Arithmetic Mean, Standard Deviation, Pearson Correlation Coefficient, Cronbach's Alpha, T-Test, One-Way ANOVA, Tukey's Post Hoc Test

Analysis and Discussion of the First Hypothesis:

Hypothesis Statement: There are statistically significant differences in athletic training engagement among Algerian track and field athletes based on gender (male–female), as measured by the EATS scale.

To test this hypothesis, means, standard deviations, and T-test values were calculated to determine the significance of the differences between male and female athletes, as shown in the following table:

Table (09): This table presents the T-test value indicating the significance of gender-based differences in EATS scores.

Variable / Scale	Gender	Sample	Arithmetic mean	Standard deviation	Degree of freedom	T-value	Probability value	Significance level
Scale EATS	Male	83	72.69	15.58	160	13.46	.000	0.05
	Female	79	45.96	8.47				

Interpretation and Analysis of Results

It is evident from Table (09) that there are statistically significant differences at the 0.05 significance level between the mean scores for overall engagement in athletic training among track and field athletes, attributed to the gender variable. The T-test value was (13.46), which is statistically significant since the p-value (0.000) is less than the significance threshold (0.05). The differences were in favor of male athletes, whose mean score (72.69) was higher than that of female athletes (45.96). This indicates that there are statistically significant differences in the level of engagement in athletic training between male and female Algerian athletes, with males showing higher levels of engagement. This includes cognitive, behavioral, and emotional aspects of training participation.

13.1.1. Discussion of the First Hypothesis Results

The first hypothesis stated that there are statistically significant differences between males and females in the level of training engagement. As shown in Table (09), the results confirmed the presence of statistically significant differences between male and female track and field athletes in their level of engagement in athletic training, as measured by the EATS scale. These findings reflect a higher level of engagement and participation among male athletes compared to females, with a mean score of (72.69) for males and (45.96) for females.

This difference cannot be considered a random variation; rather, it indicates a behavioral, cognitive, and emotional pattern linked to gender in terms of commitment and participation in training programs. These results are consistent with several studies that have highlighted gender-based differences in sports engagement. For example, Scanlan et al. (1993, p 17) found that males tend to exhibit higher intrinsic motivation and self-discipline, often due to prevailing sports culture and stronger societal support for males in competitive sports. Similarly, Weiss & Ferrer-Caja (2002, p 103) noted that females often face social and cultural barriers that limit their full engagement in sports activities, including lack of encouragement and family support, as well as stereotypical perceptions of women's roles in society**.**

In addition, these differences can be attributed to several psychological and behavioral factors. Vallerand & Losier (1999, p 145) noted that intrinsic motivation among males in the sports domain tends to surpass that of females, contributing to greater commitment to training and competition. Cognitive factors such as personal goals and self-perceptions of competence also play a significant role in enhancing engagement levels among male athletes.

From another perspective, these results can be interpreted through the lens of Social Identity Theory, which posits that individuals are drawn to groups that offer them higher social status and recognition. Since sports are often perceived as a domain that grants males such status in many societies, this may lead to higher levels of commitment and participation among males compared to females (Tajfel & Turner, 1986, p 13).

In conclusion, these findings highlight a clear disparity in the level of engagement and participation in athletic training between male and female track and field athletes. This calls for greater attention from those responsible for developing training programs to address the factors that may enhance female athletes' engagement—whether by creating a more motivating training environment or by providing psychosocial support that fosters their involvement in the training process.

13.2. Presentation and Discussion of the Second Hypothesis Results

Hypothesis Statement: There are statistically significant differences in athletic training engagement among Algerian track and field athletes, as measured by the EATS scale, based on the nature of the athletic activity (short-distance running, middle- and long-distance running, and jumping).

To test this hypothesis, the researcher calculated the means and standard deviations of the total EATS scores according to the type of athletic activity practiced by the athletes, as shown in the following table:

Table (10): This table presents the means and standard deviations of the total EATS scores according to the nature of the athletic activity.

Nature of activity	Sample individuals	Arithmetic means	Standard deviations
Short distances	62	79.2903	11.10514
Medium and long distances	64	52.7656	6.10943
Jumping	36	38.1111	5.16459
Total	162	//	//

Interpretation and Analysis of Results

Table (10) reveals apparent differences in the mean scores of overall engagement in athletic training among track and field athletes, attributed to the nature of the athletic activity. Specifically, the mean EATS score for short-distance runners was (79.29) with a standard deviation of (11.10). For middle- and long-distance runners, the mean score was (52.76) with a standard deviation of (6.10). Meanwhile, jumpers had a mean score of (38.11) and a standard deviation of (5.16). These mean scores clearly indicate observable differences in engagement levels across the different athletic disciplines. To determine whether these apparent differences are statistically significant, a one-way analysis of variance (ANOVA) was conducted to examine the differences in total EATS scores among Algerian track and field athletes based on the nature of the activity. The results are presented in the following table:

Table (11): This table presents the results of the one-way ANOVA for the EATS scale according to the nature of the athletic activity.

Dimensions	Source of variation	Sum of squares	Df	Mean squares	F value	Significance level	Sig
EATS scale	Between groups	43650.513	2	21825.257	321.084	0.05	0.000
	Within groups	10807.814	159	67.974			
	Total	54458.327	161				

Based on Table (11), the application of the ANOVA test revealed that the F-value reached (321.08), with a significance level of (p = 0.000), which is less than the predetermined threshold of 0.05. This indicates the presence of statistically significant differences in the athletes' assessments of their engagement in athletic training, depending on the nature of the activity they practice.

To identify the source of these differences and determine which activity type the differences favored, Tukey's post hoc test was used for pairwise comparisons. The results are presented in the following table:

Table (12): This table presents the post hoc comparisons (Tukey test) to analyze the source of variance in EATS scores among the study sample according to the nature of the athletic activity.

Nature of competition	Sample	Level of significance 0.05		
		1	2	3
Jumping	38	38.1111	//	//
Middle and long distances	64	//	52.7666	//
Short distances	62	//	//	79.2903

Table (12) presents the results of the post hoc comparisons using Tukey's test to analyze the source of variance in EATS scores among the study participants, based on the variable "nature of athletic activity." The results indicate that there are statistically significant differences at the 0.05 level among all groups representing different activity types. This suggests that the nature of the athletic activity has a substantial impact on the level of engagement in athletic training.

Upon analyzing the differences among the three groups (jumping, short-distance running, and middle- and long-distance running), it becomes clear that athletes in the "jumping" category recorded the lowest scores. Statistically significant differences were found between jumpers and short-distance runners, the latter having the highest mean score on the scale. Additionally, significant differences were observed between jumpers and middle-/long-distance runners, with the advantage favoring the latter group.

Furthermore, the differences between short-distance runners and middle-/long-distance runners were also statistically significant, with short-distance runners showing higher levels of engagement. These findings reinforce the hypothesis that the nature of the athletic activity plays an important role in determining athletes' engagement in training.

Discussion of the Second Hypothesis Results

The results of the one-way ANOVA analysis presented in Table (11) indicate that there are statistically significant differences in the level of engagement in athletic training among athletes, depending on the nature of the activity practiced. To identify the source of these differences, Tukey's post hoc test was applied, as shown in Table (12). The test revealed that short-distance runners recorded the highest mean engagement score (79.29), compared to middle- and long-distance runners (52.77), and jumpers, who recorded the lowest mean score (38.11). These findings confirm that the nature of the athletic activity has a clear influence on athletes' commitment to and engagement in training programs.

These results can be interpreted by considering that short-distance running events require explosive power, high levels of concentration, and direct competition—all of which enhance athletes' sense of control and competence, thereby fostering greater engagement in training. This interpretation aligns with the findings of Burton & Raedeke (2008, p 45), who noted that athletes in individual sports that demand high performance and yield immediate results tend to show greater training commitment.

In contrast, other disciplines such as jumping, which rely heavily on technical and precise execution, often suffer from a lack of frequent competitions and limited media coverage. These factors may result in weaker external incentives, which can negatively affect athletes' motivation and engagement in training.

Additionally, the findings of Côté et al. (2003,p 93) support the idea that the type and nature of the sport are closely linked to the training environment, as well as the quality of relationships with coaches, teammates, and program supervisors. These elements significantly influence the quality of participation and athletic engagement, and are reflected in athletes' behavioral commitment.

The researcher believes it is important to consider that these differences may also stem from the level of support and attention provided by officials and administrators, which some disciplines receive more than others. In Algeria, for instance, short- and middle-distance running events often benefit from more advanced training resources and facilities due to their popularity, compared to disciplines such as jumping. This disparity contributes to enhanced motivation and a stronger commitment to athletic training in the more supported disciplines.

In light of the findings presented, the results of this hypothesis are clearly consistent with the existing literature and previous international studies, which have established a link between the nature of the sport and the level of engagement or participation in athletic training. These findings underscore the importance of adapting motivational training programs to suit the specific characteristics of each track and field discipline. Such tailored approaches aim to enhance athletes' participation and engagement, ultimately improving their performance and capabilities over the long term.

General Conclusion:

Based on the findings of this study, which employed the EATS scale to measure the level of engagement in athletic training among track and field athletes, precise scientific data were obtained confirming the existence of statistically significant differences that reflect the influence of both gender and the nature of the athletic activity on athletes' engagement in training.

The results of the first hypothesis revealed that male athletes outperformed female athletes across all dimensions of engagement cognitive commitment, behavioral participation, and emotional involvement. This reflects the complex interplay of psychological, social, and cultural factors associated with gender.

As for the second hypothesis, the findings showed that engagement in training varies according to the nature of the athletic activity. Short-distance runners recorded the highest levels of engagement, followed by middle- and long-distance runners, while jumpers ranked lowest. This suggests that the structural and competitive characteristics of the sport, along with the level of support and infrastructure available, play a decisive role in shaping athletes' motivation and training behavior. These conclusions are consistent with the findings of Fatah Abdelli (2012, p 203), which emphasized the importance of these factors in influencing athletic engagement.

Conclusion:

This study has provided a precise scientific perspective on the determinants of engagement in athletic training among track and field athletes in Algeria, relying on modern, reliable tools and grounded theoretical frameworks. The findings confirm that engagement in training is not a uniform or spontaneous phenomenon, but rather the result of a complex interaction between athletes' psychological makeup, gender-based cultural representations, the nature of the sport, and the level of support and resources available.

Achieving high levels of athletic engagement requires adopting multidimensional approaches that go beyond physical and technical aspects to include psychological, social, and institutional factors surrounding the athlete. This calls on coaches, policymakers, and sports administrators in Algeria and beyond to adopt more holistic strategies in designing and developing training programs, through the following recommendations:

- Enhance psychological readiness and raise awareness of the importance of athletic engagement by implementing specialized training programs aimed at improving focus and self-motivation.
- Strategically leverage technology by using modern digital tools and sports applications to improve athletes' concentration and engagement.
- Establish a motivational system and supportive training environment based on both moral and material incentives that encourage athletes to commit to training and continuously develop their skills.
- Strengthen the social role of sport within the local community by inspiring families and society to support athletes and recognize the value of sports participation.
- Adopt modern assessment tools such as the EATS scale to evaluate and enhance athletic engagement, and to refine training strategies that address the holistic needs of each athlete in alignment with Algerian cultural and environmental contexts.

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