

## Investigation of 30 Meter Sprint Performances with and without Finish Line in Athletes in Terms of Personality Traits

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### Abstract

The aim of this study was to investigate 30-metre sprint performances of athletes with and without finish line in terms of personality traits. A total of 61 male athletes with an age, height and body weight mean of 19.98±1.52 years, 173.16±0.07 cm and 65.49±10.06 kg, respectively, voluntarily participated in the study. In order to achieve this aim, personality traits of athletes in different branches and 30-metre sprint values were measured twice. The first 30-metre sprint values were taken by suggesting "Think that the finish line is further ahead and do not decrease your speed when you approach the finish line". In the second 30-metre sprint, no suggestion was made to the athletes and the participants were asked to perform. After the measurements, running performances with and without a clear finish line were compared according to personality traits. Therefore, the effect of personality traits on compliance with suggestions and result-orientated behaviour in athletes was revealed. The "Ten-Item Personality Scale" developed by Gosling, et al. (2003) and adapted into Turkish by Atak (2013) was used to determine the personality characteristics of the participants. The 30-metre sprint values with and without the finish line were measured using a photocell. Statistical data were analysed with STATA 13 version. Structural Equation Modelling and Poisson Logistic Regression Analysis were applied to determine the relationship between the groups. As a result of the analyses, it was determined that the athletes with higher "agreeableness" sub-dimension had better 30-metre sprint values with the finish line and the athletes with higher "responsibility" sub-dimension had better 30-metre sprint values without the finish line. As a result, it can be stated that the participants with high agreeableness sub-dimension had a higher tendency to comply with the suggestions, while the participants with high responsibility sub-dimension had a lower tendency to comply with the suggestions.

**Keywords:** Athlete, Personality, Performance, Sprint.

## Sporcularda Bitiş Çizgisi Olan ve Olmayan 30 Metre Sprint Performanslarının Kişilik Özelliklerine Göre İncelenmesi

### Öz

Bu çalışmanın amacı sporcularda bitiş çizgisi olan ve olmayan 30 metre sprint performanslarının kişilik özelliklerine göre incelenmesidir. Çalışmaya yaş, boy uzunluğu ve vücut ağırlığı ortalamaları sırasıyla 19.98±1.52 yıl, 173.16±0.07 cm ve 65.49±10.06 kg olan toplam 61 erkek sporcu gönüllü olarak katıldı. Bu amaca ulaşmak için sporcuların kişilik özellikleri ve 30 metre sprint değerleri iki kez ölçüldü. İlk 30 metre sprint değerleri "Bitiş çizgisinin daha ileride olduğunu düşünün ve bitiş çizgisine yaklaştığımızda hızınızı düşürmeyin." telkininde bulunularak alındı. İkinci 30 metre sprint değerleri alınırken ise, sporculara hiçbir telkinde bulunulmadı. Ölçümler sonrasında bitiş çizgisi belli olan ve olmayan koşu performansları kişilik özelliklerine göre karşılaştırıldı. Dolayısıyla sporcularda kişilik özelliklerinin telkinlere uymada ve sonuca yönelik hareket etmedeki etkisi ortaya kondu. Katılımcıların kişilik özelliklerini belirlemek için Gosling, vd. (2003) tarafından geliştirilen ve Atak (2013) tarafından Türkçe'ye uyarlanan "On-Madde Kişilik Ölçeği" kullanıldı. Bitiş çizgisi olan ve olmayan 30 metre sprint değerleri ise, fotosel kullanılarak ölçüldü. İstatistiksel veriler STATA 13 versiyon ile analiz edildi. Gruplar arasındaki ilişkiyi belirlemek için Yapısal Eşitlik Modeli (Structural Equation Modeling) ve Poisson Lojistik Regresyon Analizi uygulandı. Analizler sonucunda "yumuşak başlılık" alt boyutu yüksek olan sporcuların bitiş çizgisinin olduğu 30 metre sprint değerlerinin; "sorumluluk" alt boyutu yüksek olan sporcuların ise, bitiş çizgisinin olmadığı 30 metre sprint değerlerinin daha iyi olduğu tespit edildi. Sonuç olarak, yumuşak başlılık alt boyutu yüksek olan katılımcıların telkinlere uyma eğilimlerinin daha fazla olduğu, sorumluluk alt boyutu yüksek olan katılımcıların ise, telkinlere uyma eğilimlerinin düşük olduğu ifade edilebilir.

**Anahtar Kelimeler:** Sporcu, Kişilik, Performans, Sprint.

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## INTRODUCTION

Athletes train regularly to improve their performances and they implement various methods during trainings. In addition to trainings, they resort to other methods such as nutrition, sleeping pattern, psychological support, acupuncture, cupping and taking supplements to enhance their performances (Close et al., 2019; Devrim-Lanpir et al., 2021; Ekrami et al., 2021; Karasimav and Yıldız, 2015; Karavelioğlu et al., 2019; Lipert et al., 2021; Sánchez et al., 2021). As it is thought that better performance will increase success, the search for different methods continues (Bayraktar and Kurtoğlu, 2009).

While the pursuit of increasing performance for success continues, the physical determinants for success in sports are well-known. In addition to guiding the athlete to a branch by taking genetic factors or somatic predisposition into account, developing motoric and technical tactical skills also increases sportive performance. However, despite physical predispositions and conditions, most athletes cannot achieve the success they desire (Piepiora, 2021a). The fact that the performances of athletes with similar characteristics and conditions are not the same (Park et al., 2020) suggests that psychological factors such as personality, anger management, self-confidence and concentration have a differentiating effect on success; however, the most important factor is believed to be the personality factor (Allen et al., 2013; Allen and Laborde, 2014; Kang et al., 2016; Piepiora, 2020).

Therefore, personality is assumed to be behind the success of a well-prepared athlete (Allen et al., 2013). Also, in terms of the coach-athlete relationship, it is known that each athlete is affected by the discourse of the coach on different levels (Kılınç et al., 2011). Different physical responses to the same discourse of the coach may be attributed to the individual differences of the athletes. However, performances of the athletes of similar physical characteristics can be related to the personality traits of the athletes (Marchese et al., 2022)

Personality traits are divided into five categories as extroverted, agreeable, responsible, open to experience and emotionally unstable and each personality trait is defined within itself. Extroverted individuals are sociable, assertive, honest, and very energetic. They are success-oriented, and they love excitement. Agreeable individuals are kind, cooperative, helpful, trustworthy and respect the values of the society. Responsible individuals are dependable, conscientious, hard-working, and highly motivated. They like success and are punctual. Individuals who are open to experience are independent, creative, imaginative and curious with a wide range of interests. Emotionally unstable individuals are uneasy, moody, depressed, and distrustful. They avoid effort, are intolerant and resentful (Acar and Karavelioğlu, 2022; Bojanić et al., 2019; Costa and McCrae, 1988; Haslam et al., 2009; John et al., 2008; Laurin, 2009; Roberts et al., 2004; Roccas et al., 2002).

Since 1980s, the personality of athletes has been studied extensively (Eysenck, 1981; Eysenck, 1963; Eysenck et al., 1982) and studies show that personality is effective in becoming a professional athlete, selecting a branch, individual choice of branch and in the status of training (Clingman and Hiliard, 1987; Eysenck et al., 1982; Garland and Barry, 1990; Piepiora, 2021b; Vealey, 1989)

Studies on personality in sports are highly popular as they are useful in identifying psychological traits of athletes. Thus, the good sides, strengths and weaknesses of an athlete can be determined (Piepiora, 2020). Research on the personality traits of the athletes is highly popular as it is useful for identifying the psychological characteristics of the athletes. Thus, problems, strengths and weaknesses of an athlete can be diagnosed (Piepiora, 2020). The number of such studies is limited in our country. Personality traits of an athlete and how he/she responds to the suggestions, guidance and demands of a coach are thought to be closely related. Therefore, such information which can enable the coaches to communicate better with the athlete is crucially important for them as it will be effective in understanding and guiding the athlete in the most beneficial way. It is believed that the coaches who know about the personalities and personality traits of their athletes are more likely to make the right decisions while determining the most appropriate coaching style to motivate them. In the light of all this information, the aim of this study is to determine the difference between personality traits of the athletes who perform better by following the suggestions of the coach in 30 meters sprint and those who perform better where the finish line is not clear.

## **METHODS**

### **Study Design**

A pilot study was conducted before the main study to receive participants' feedback and to analyse the efficiency of Turkish translations of the scales. In this study, cronbach alpha value of the personality traits scale was .7790; inter-item covariance mean value was .5851852; and the scale reliability coefficient was 0.7790. To avoid the possibility of distorting the accuracy of the results, a special effort was made to ensure the confidentiality of the participants during both the pilot survey and application periods. Meetings were held with the participants explaining the methodology of the study and a cover letter was included in the survey to guarantee the confidentiality of the participants.

### **Participants**

This study was carried out at Kütahya Dumlupınar University, Faculty of Sports Sciences. A total of 61 male athletes who have ongoing sports careers with an age, height, and body weight mean of respectively  $19.98 \pm 1.52$  years,  $173.16 \pm .007$  cm and  $65.49 \pm 10.06$  kg participated in the study voluntarily. The participants were informed about the purpose of the study and potential risks. Then, written consent was obtained and experimental tests were performed according to the Declaration of Helsinki.

### ***Inclusion Criteria;***

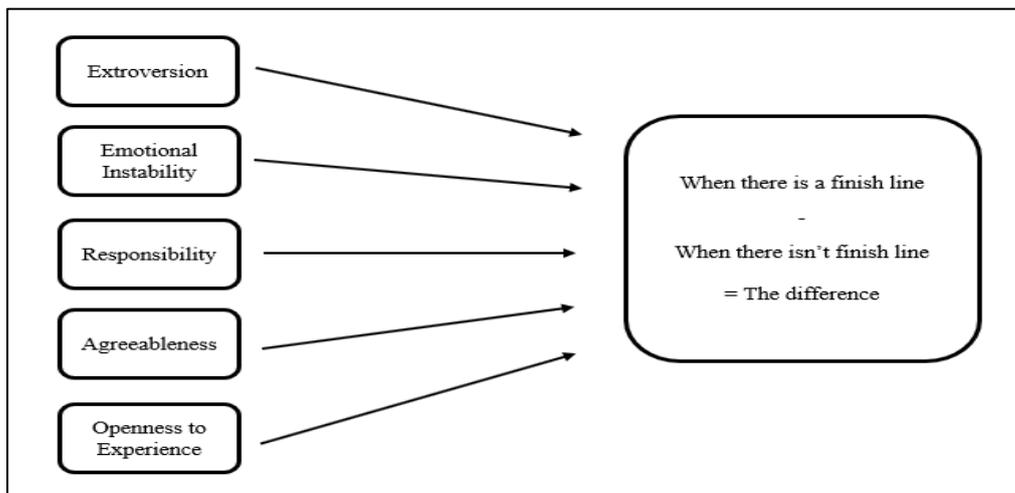
1. Older than 18 years of age
2. Willing to take part in the study, and accepting
3. Having an ongoing sports career

**Exclusion Criteria;**

1. Having a health issue
2. Taking stimulants before training
3. Doing exhausting physical activity before training

**Experimental Design:** This study aims to determine the relationship between running performance and personal traits including the finish line tool in the process. The conceptual framework of the study is about how the relationship between personality traits scale and performance levels is affected in circumstances when there is a finish line compared to when there is not.

The model with the independent variable (with five personality sub-dimensions) and the dependent variable is shown in Figure 1. A research structure was designed to try to demonstrate its relationship with other structures. There is a researcher’s influence and intervention (the manipulation effect) on the model, but the research model gains a quasi-experimental (self-experiment) nature due to the fact that there is no control group unlike the experimental group (Karasar, 2015). Moreover, the focus is on the changing process of the structures investigated in the model. In other words, focusing on the current situation and the relationship between the structures and the fact that the data was obtained in two stages (with and without line) enable us to find out the difference between two different situations.



**Figure 1.** Research Model

This study is based on 5 independent variables (extroverted, emotionally unstable, responsible, agreeable, and open to experience) and 1 dependent variable (When There is a Finish Line – When There isn’t a Finish Line = The difference). The measurement tools of this quantitative, quasi-experimental study are the scales developed for each variable. Data were collected and hypotheses were tested by using these scales. Athletes whose performances improved when there was a finish line and those whose performances improved when there was not a finish line were divided into two separate groups.

The relationship between the personality traits of these two groups and their performances was analysed. The survey, consisting of demographic information (age, gender,

height, and body weight) and a scale with 5 different sub-dimensions, was sent to the participants as an online link via e-mail. As a requirement of ethical rules, each participant who accepted to answer the survey was informed about the subject of the study and it was stated that the data obtained would be used for scientific purposes in accordance with ethical rules.

### **Data Collection Tools**

**Height and Body Weight:** The height of the participants was measured in cm with a Holtain brand height meter and their body weight in kg with an Angel brand electronic scale.

**Personal Traits Scale:** “Ten-Item Personality Scale” by Gosling et al. (2003), which was adapted into Turkish by Atak (2013), was used to determine personal traits. This scale measures five important personal traits such as “openness to experience (1-6)”, “responsibility (2-7)”, “extroversion (3-8)”, “agreeableness (4-9)” and “emotional instability (5-10)”.

**30 Meter Sprint:** The participants were informed that 30 meter and 100 meters running values were to be recorded. The gates of the automatic time analyser (Newtest Powertimer, Finland) were located at the beginning, 30-meter, and 100-meter of the tartan track. At first, the participant ran for 30 meters. Then, after full rest, ran for 100 meters. In the first run, speed values of 30 meters with a finish line and in the second run speed values of 30 meters without a finish line were detected.

### **Ethical Approval**

Ethics committee approval of the study was obtained from Kütahya Dumlupınar University, Social and Human Sciences Scientific Research and Publication Ethics Committee. (03/02/2023-197 numbered article).

### **Statistical Analysis**

Statistical data were analysed by STATA 13 version. Firstly, Structural Equation Modelling Analysis was made to determine the relationship between groups. In addition, the same analyses were remade by using Poisson Regression Analysis. Thus, the same coefficient values were retrieved which minimizes the risk of error. The level of significance is determined as  $p < 0.05$ .

## FINDINGS

While examining the results of the main study, the missing data were cleared and then analyses were made. Descriptive statistics of the data are shown in Table 1. It is observed that athletes perform better when there is no finish line.

**Table 1.** Demographic information and 30 m sprint values of the participants

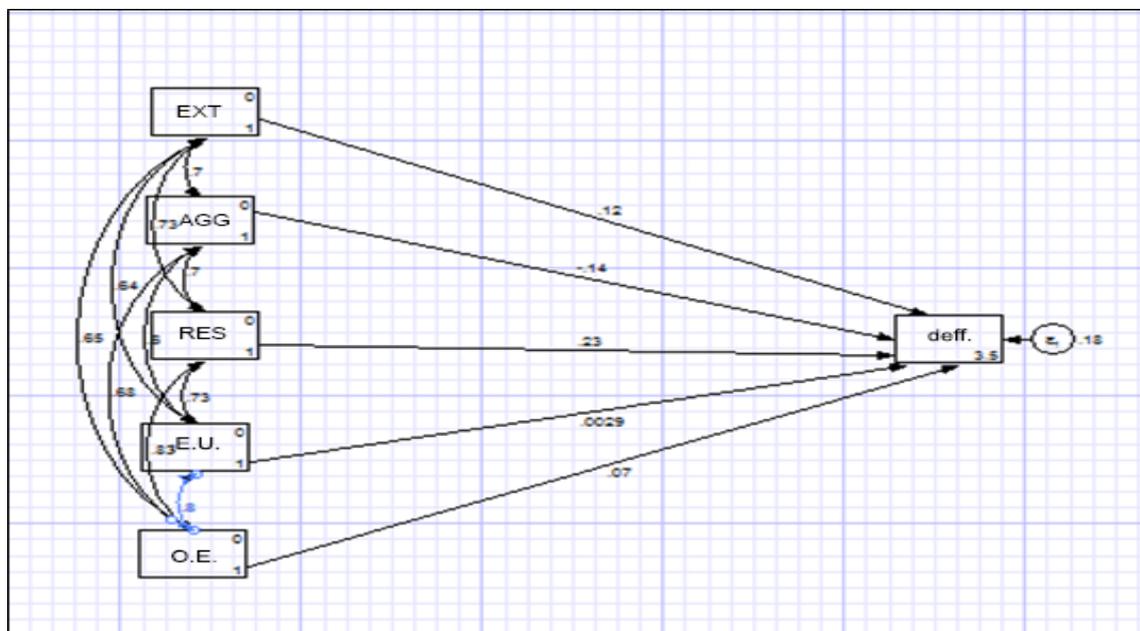
Variables	N	Mean ± ss
Age (year)		19.98 ± 1.52
Height (cm)		173.16 ± .007
Body Mass (kg)		65.49 ± 10.06
30 m Sprint (sec) (With Line)	61	4.71 ± .50
30 m Sprint (sec) (Without Line)		4.67 ± .47

## Hypothesis Test Results

The aim of this study is to show the difference of the relationship between personal traits and performance with and without a finish line. First, the personal traits of athletes with improved performances when there is a finish line (1st group), and then of the athletes who perform better without a finish line (2nd group) were examined.

### *1st Group: Improved Performances with a Finish Line*

**Hypothesis 1 (H1)** – Athletes with higher agreeableness sub-dimension performed worse when there wasn't a finish line.



**Figure 2.** Results of structural equation analysis of the group

Before testing hypothesis 1 (H1), 2 items were identified by pairwise correlation. After coding, Structural Equation Modelling was first performed on the STATA 13 program to examine the relationships suggested in the hypothesis (Figure 2), and in addition, the same analyses were repeated with Poisson Regression Analysis. Thus, the same coefficient values

were obtained by using two different methods which minimizes the risk of error. As a result of the analysis in which all control variables were included, a significant and positive relation was observed between agreeableness, which is a sub-dimension of personality traits, and performance (when there is a finish line). When there is not a finish line, each increase in the value of agreeableness leads to an increase of .138597 on running time which is a significant decrease in performance ( $p < 0.095$ ). Therefore, Hypothesis 1 (H1) was proven. The results of the analysis are shown in Table 2.

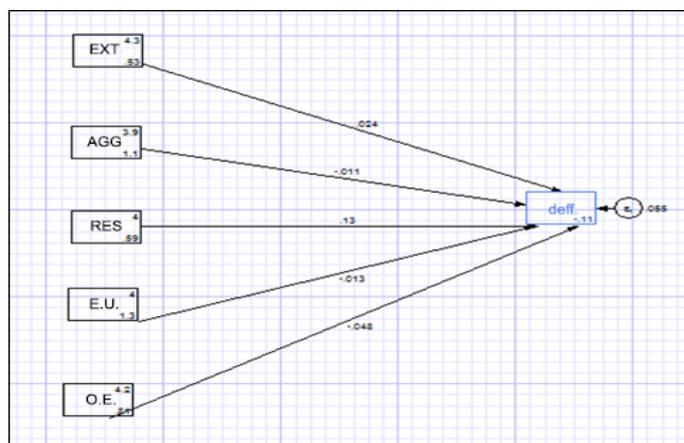
**Table 2.** Factor analysis results on personality sub-dimensions of athletes

Sub-dimensions	Coef.	Std. Err.	Z	p >  z	[%95 Conf. Interval]	
Extroversion	.1182061	.1319618	0.90	0.370	-.1404343	.3768464
Agreeableness	-.138597	.0830238	-1.67	0.095	-.3013206	.0241266
Responsibility	.2284492	.171348	1.33	0.182	-.1073866	.5642851
Emotional Instability	.0028768	.0973757	0.03	0.976	-.1879759	.1937296
Openness to Experience	.0701843	.174253	0.40	0.687	-.2713452	.4117138
_cons	3.546752	.8060196	4.40	0.000	1.966983	5.126522

In this study, the relationship between the finish line and the performance of the athletes was analysed according to coefficient (factor) analysis in terms of 5 personality sub-dimensions and it was observed that the athletes who were negatively affected in the absence of the finish line were individuals with the agreeableness personality sub-dimension. In this context, decrease of performance of agreeable individuals occurs at the level of  $-.138597$  when there is no finish line (Table 2). In addition, the standard deviation value of less than 1% (.0830238) also supports the validity and reliability of the study (Table 2).

**2nd Group: Improved Performances When There is Not a Finish Line**

**Hypothesis(H2)** Athletes with a high sub-dimension of responsibility perform worse when there is a finish line.



**Figure 3.** Results of structural analysis of the group

Structural Equation Modelling and Poisson Logistic Regression Analysis were performed while testing Hypothesis 2 (H2). The results of the analysis are shown in Figure 3. Results show that each increase in the value of responsibility sub-dimension, which is one of the personal traits, leads to .1260921 increase in performance value (without a finish line) ( $p < 0.071$ ) (Table 3). Statistically, a significant and positive relation was found, and Hypothesis 2 (H2) was supported.

**Table 3.** Factor analysis results on personality sub-dimensions of athletes

Sub-dimensions	Coef.	Std. Err.	Z	P >  z	[%95 Conf. Interval]	
<b>Extroversion</b>	.0243933	.0570365	0.43	0.669	-.0873962	.1361828
<b>Agreeableness</b>	-.0105773	.0419445	-0.25	0.801	-.0927869	.0716324
<b>Responsibility</b>	.1260921	.0698017	1.81	0.071	-.0107167	.2629009
<b>Emotional Instability</b>	-.0133931	.0463821	-0.29	0.773	-.1043004	.0775142
<b>Openness to Experience</b>	-.0482014	.0502385	-0.96	0.337	-.1466669	.0502642
<b>_cons</b>	-.1134489	.3580853	-0.32	0.751	-.8152832	.5883853

The relationship between the finish line and the performance of the athletes was analysed according to coefficient (factor) analysis in terms of 5 personality sub-dimensions and it was observed that the athletes who were negatively affected in the absence of the finish line were individuals with the responsible personality sub-dimension. In this context, decrease of performance of responsible individuals occurs at the level of .1260921 when there is a finish line. In addition, the standard deviation value of less than 1% (.0698017) also supports the validity and reliability of the study (Table 3).

## DISCUSSION AND CONCLUSION

In this study, the first 30-metre sprint values were taken by suggesting: "Think that the finish line is further ahead and do not decrease your speed when you approach the finish line". In the second 30-metre sprint, no suggestion was made to the athletes and the participants performed as if they were running 100 metres. At the end of the study, the 30-meter sprint values of the athletes with a high sub-dimension of agreeableness were found to be better, while 30-meter sprint values of the athletes with a responsibility sub-dimension were better when there was no finish line. In the light of these results, it can be inferred that participants with high agreeableness sub-dimension have a high tendency to comply with suggestions whereas the athletes with high responsibility sub-dimension have a low tendency to comply with suggestions. Also, there has not been any studies in the literature revealing the effects of personal traits on athletes in complying with suggestions and acting towards results.

Literature review on personality traits of the athletes shows that the idea of whether sports shapes personality or personality determines the success of an athlete is an issue which is open to discussion. According to the studies, sports have a very important effect on the personal traits of the athletes (Chirivella and Martinez, 1994; Kang et al., 2016; Kajtna et al., 2004; McEwan et al., 2019; Piepiora et al., 2021; Tok, 2013). It is stated in many studies that

successful athletes have a low level of emotional instability and high levels of extroversion, agreeableness, responsibility and openness to experience. It is also observed that the athletes with a high level of athleticism also have high levels of openness to experience (Fuller, 2011; Piepiora, 2021a; Piepiora et al., 2021; Piepiora and Witkowski, 2020). While many studies in the literature have focused on this point, determining the personal traits of the athletes who comply with the important suggestions of the coach, which is one of the most important factors affecting the performance in terms of extrinsic motivation, is thought to bring a new perspective to such studies. McCrae and Costa (2003) point out in their study that athletes who are open to experience tend to challenge the authority and are independent individuals.

Gould (1985) found out that athletes with high levels of performance have high levels of extrinsic motivation. It is known that athletes with high levels of responsibility also have high levels of inner motivation (Acar and Karavelioğlu, 2022; Bojanić et al., 2019; Haslam et al., 2009; Laurin, 2009). It may well be said that athletes with this personality trait question the discourse of the coach and resisting to comply with the suggestions they do not agree with. Piepiora et al. (2021) state that in individual sports, personal traits such as emotional instability, extroversion, openness to experience are common and according to Allen et al., (2011) extroversion is the most important differentiating trait for champion athletes whereas for Piepiora and Witkowski (2020) they are the athletes with the lowest of emotional instability. Piepiora (2021a) emphasizes the importance of the intensity levels of personal traits and suggests them to be influential in determining success in individual sports.

On the other hand, in our study, it was observed that whether there is a finish line or not or the suggestions of the trainer did not have an effect in the 30-meter sprint performance of the athletes in terms of personal traits such as extroversion, openness to experience and emotional instability. According to Piepiora (2021b), the effects of the past experiences and successes of the athletes in their careers and the effects of long years of sports education on the personality traits of the athletes should be considered and the relationship between the athletes is affected by social and cultural factors. Therefore, the reason behind the fact that the existence of a finish line or the suggestions of the coach did not have an effect on the athletes with personal traits such as extroversion, openness to experience and emotional instability is thought to be one of the factors mentioned by Piepiora (2021b).

There have been numerous studies on athletes and a majority of them focus on improving the performances of the athletes in order to achieve success. In this regard, it is considered to be extremely important to examine the role of personality and individual differences in improving the athletic performance of an athlete. Technical problems or the weakness of the coach may be the reasons why an athlete performs well in training but performs poorly in competitions. Stress or environmental factors may also affect the mental state of the athlete. Therefore, it is of utmost importance to identify the level of coping with stress and environmental factors of individuals with different personality traits for the success of the athlete.

In conclusion, based on the findings of this study it can be stated that the athletes with the sub-dimension of agreeableness were more likely to follow the suggestions of the coach and the athletes with a high responsibility sub-dimension resisted the suggestions of the coach.

On the other hand, it can be said that the performance values of the athletes with high sub-dimensions such as extraversion, openness to experience and emotional instability were not affected by whether there was a finish line or not and the suggestions of the coach. Coaches can take these results into consideration while selecting athletes for their teams. In addition, adapting their coaching strategy approaches into the personality traits of the athletes will result in a healthier relationship between the coaches and the athletes.

**Conflict of Interest:** There is no personal or financial conflict of interest within the scope of the study.

**Statement of Contribution Rate of the Researchers:** Study Design: MBK; Data Collection: MBK, SA; Statistical Analysis: MBK; Manuscript Preparation: MBK, GB

**Information on Ethics Committee Permission**

**Board Name:** Kütahya Dumlupınar University, Social and Human Sciences Scientific Research and Publication Ethics Committee

**Date:** 17.03.2023

**Issue/Decision Number:** 171849

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