The indispensable phenomenon of the modern age: innovation (from the perspective of personality traits of sports sciences students)

El fenómeno indispensable de la era moderna: la innovación (desde la perspectiva de los rasgos de personalidad de los estudiantes de ciencias del deporte)

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How to cite in APA

Siyahtaş, A., Güler, C., & Tükenmez, A. (2025). The Indispensable Phenomenon of the Modern Age: Innovation (From the Perspective of Personality Traits of Sports Sciences Students). *Retos*, *69*, 225–239. https://doi.org/10.47197/retos.v69.112996

Abstract

Introduction: Innovation is a concept that organizations and individuals should embrace in today's world. The innovation skills of students who will work in the sports industry according to their personality traits are curious.
Objective: The study aimed to examine the relationship between personality traits and innovation perceptions of students studying at the faculty of sport sciences.
Methodology: The research, which was designed in accordance with the relationship screening model, one of the quantitative methods, was conducted between September-October 2024. The study group consisted of 241 students (n=241) studying at Istanbul University-Cerrahpaşa Faculty of Sport Sciences. The research data were collected with the Individual Innovativeness Scale (IIS) and the Ten-Item Personality Inventory (TIPI). Mann Whitney U and Kruskall Wallis tests were used to analyze the data that did not meet the normality assumption. The relationship analysis was tested with Spearman correlation analysis.
Results: The mean age of the students was 24.01(±1.99) and 51.9% were female. Among the personality traits of the students, "conscientiousness" trait came to the fore. Students with a low level of innovation perception were included in the "Late Majority" category. Students' independent variables, except for age, were found to be effective on innovation perceptions and personality traits.
Conclusions: As a result of the research, it is understood that personality traits play an effective role on innovation perception. It is recommended that the innovation perceptions of the students studying at the Faculties of Sport Sciences should definitely be improved and their personality traits should be taken into consideration in this regard.

Keywords

Innovation; individual innovation; personality traits; sports sciences students.

Resumen

Introducción: La innovación es un concepto que las organizaciones y los individuos deben adoptar en el mundo actual. Son curiosas las habilidades de innovación de los estudiantes que trabajarán en la industria del deporte según sus rasgos de personalidad.
Objetivo: El objetivo del estudio era examinar la relación entre los rasgos de personalidad y las percepciones de innovación de los estudiantes de la Facultad de Ciencias del Deporte.
Metodología: La investigación, que se diseñó de acuerdo con el modelo de detección de relaciones, uno de los métodos cuantitativos, se llevó a cabo entre septiembre y octubre de 2024. El grupo de estudio estaba formado por 241 estudiantes (n=241) que estudiaban en la Facultad de Ciencias del Deporte de la Universidad de Estambul-Cerrahpaşa. Los datos de la investigación se recopilaron con la Escala de innovación individual (IIS) y el Inventario de personalidad de diez ítems (TIPI). Se utilizaron las pruebas U de Mann Whitney y Kruskall Wallis para analizar los datos que no cumplían el supuesto de normalidad. El análisis de las relaciones se comprobó con el análisis de correlación de Spearman.
Resultados: La edad media de los estudiantes era de 24,01(±1,99) y el 51,9% eran mujeres. Entre los rasgos de personalidad de los estudiantes, destacaba el rasgo de «concienciación». Los estudiantes con un bajo nivel de percepción de la innovación se incluían en la categoría «Mayoría tardía». Las variables independientes de los estudiantes, excepto la edad, resultaron ser eficaces sobre la percepción de la innovación y los rasgos de personalidad.
Conclusiones: Como resultado de la investigación, se entiende que los rasgos de personalidad desempeñan un papel eficaz en la percepción de la innovación. Se recomienda mejorar definitivamente la percepción de la innovación de los estudiantes de las facultades de Ciencias del Deporte y tener en cuenta sus rasgos de personalidad a este respecto.

Palabras clave

Innovación; innovación individual; rasgos de personalidad; estudiantes de ciencias del deporte.

Introduction

One of the key terms within the field of psychology, personality, is described as an explanation of individuals' character in their daily lives (Noviana & Oktaviani, 2022). While personality differs from person to person, it is defined as the total of distinguishing traits that separate and make an individual unique from others (Horzum et al., 2017; Nopiana et al., 2022). Cüceloğlu (1994) defines personality as "a unique, stable, and organized way in which an individual interacts with both their internal and external surroundings, setting them apart from others." Experts have conducted research on how a person differs or resembles others in terms of personality traits (Atak, 2013). Various classifications and theories have been developed to assess human personality (Stachl et al., 2020). Among these, the most widely accepted is the Five-Factor Personality Model (Costa & McCrae, 1992). The dimensions that make up this model, also referred to as the "Big Five," are as follows: Openness to Experience, Agreeableness, Neuroticism, Conscientiousness, and Extraversion (Soto & Jackson, 2013). Each person's personality structure places them at a unique point on the spectrum, which in turn influences interpersonal differences (Cohen & Baruth, 2017). Openness to experience describes a person's willingness to explore new experiences or ideas; agreeableness refers to how individuals interact with others and their environment; neuroticism reflects the level of emotional stability; conscientiousness is the capacity to regulate impulses, stay organized, and maintain motivation; and extraversion involves qualities like social engagement, positive emotions, and energy (Baruth & Cohen, 2023). In short, the Five-Factor Personality Model has become an important mechanism for understanding the structure of personality (Patterson et al., 2009). In the literature, as a result of studies conducted with different sample groups, various inferences have been made regarding the personality characteristics of these groups (Kuśnierz et al., 2020). One of these groups is university students. Many studies have been conducted especially on the personality traits of students studying in various faculties (Müller, 2023). In this context, students of the faculty of sport sciences are also among the frequently examined groups. Various studies have been conducted on the personality traits of this student group and the areas affected by these traits. For example, in a study conducted by Yüksel et al. (2024), it was reported that there was a significant relationship between students' personality types and their career decisions. Similarly, Mitrache et al. (2023) stated that personality traits affect individuals' thinking styles. In general, personality traits play an important role in understanding human behavior and greatly affect individuals' attitudes and behaviors. However, it is noteworthy that the literature on the effect of personality traits on innovation behavior, which is one of the important phenomena of today, is limited. Although there are findings that personality traits affect innovation behavior in studies conducted with different sample groups (Yesil & Sozbilir, 2013; Fırın & Sevim, 2022), it is understood that these findings have not been sufficiently examined in the case of sport sciences faculty students.

Innovation is one of the leading features that distinguishes our era from previous ones (Işık et al., 2016). Especially for modern societies, innovation, which is seen as the key to development in all areas (Kılıçer & Odabaşı, 2010), is defined as the development, acceptance, and implementation of a new idea, behavior, technology, or service (Damanpour & Aravind, 2011). In other words, it can be explained as "the willingness to discard old ideas and find new options" (Perry et al., 2016; Tarhan & Şar, 2021). Innovation is seen as a process in which new ideas emerge, develop, and are put into practice (Thurlings et al., 2015). At the end of this process, which is considered a renewal, a result (innovation) is achieved (Keleş et al., 2020). The innovations that emerge bring many benefits in economic and social terms (Yüksel, 2024). Therefore, in the globalizing world, organizations or institutions need innovative individuals to be sustainable and adapt to change (Mutlu & Aydın, 2023). However, it is known that individuals must possess certain characteristics related to innovation (Işık & Türkmendağ, 2016). In terms of these characteristics, individuals have been classified by Rogers (2003) into five different categories. Innovators are those with a positive attitude toward technology, interested in technology, and early adopters. Early adopters are individuals interested in digitalization and willing to take risks. The early majority are process-oriented and hesitant to take risks, while the late majority, or skeptics, have a negative attitude toward technology and are skeptical of innovations. Finally, laggards, or traditionalists, have a highly negative attitude toward technology and are resistant to accepting any form of innovation (Mattila et al., 2003).

Individuals with various characteristics in terms of innovation perception are expected to adapt to the changes brought by technology and digitalization. It is believed that individuals differ from one another in terms of their innovation perception based on their traits (Işık & Türkmendağ, 2016). One of the most important reasons for this is personality (Steel et al., 2012; Fırın & Sevim, 2022), as it is suggested that innovation perception is a behavior underlying an individual's personality structure (Hurt et al., 1977). Research has shown that personality traits influence the perception of innovation (Yesil & Sozbilir, 2013; Kong & Li, 2018; Liu et al., 2019; Metin & Öcal, 2023; Rahman et al., 2023). While studies in various disciplines have determined that personality traits can be used to identify innovative individuals (Ali, 2019), some studies have indicated that personality traits could be a significant factor in explaining innovative behavior (Eastman et al., 2001).

As in every field and sector, the sports industry is also undergoing development and change. Those who typically drive progress in the sports sector are individuals who have been educated in the field of sports. These individuals need to adapt to the changes occurring in the sports world. It is crucial for them to follow innovations in the sector and to have a positive attitude toward technology and information systems. At this point, the importance of innovation, which is an indispensable concept of the modern age, becomes evident. The presence of innovative individuals is thought to play a significant role in the development of the sports world. It has been observed that there are limited studies examining the relationship between personality traits and innovation perception of students of sports sciences faculty. Therefore, it is planned to fill a gap in the literature with the current research. Based on the aforementioned explanations, the purpose of this study is to examine the relationship between the personality traits and innovation perception of university students studying at faculties of sports sciences. The research seeks to answer the following questions:

I. What are the prominent personality traits of students studying at faculties of sports sciences?

II. What are the levels and categories of innovation perception among students studying at faculties of sports sciences?

III. Which personality traits are related to the innovation perception of students studying at faculties of sports sciences?

IV. Do independent variables affect the personality traits and innovation perception of students studying at faculties of sports sciences?

Determining the prominent personality traits of students studying in sport sciences faculties (I), revealing the level of innovation perception of these students and the categories in which this perception is categorized (II), and analyzing the relationship between personality traits and innovation perception (III) can fill an important academic gap in the literature because there is a limited number of studies on how individual differences intersect with innovative thinking in the field of sport sciences. In this context, examining the relationship between students' personality profiles and their innovativeness levels may provide theoretical and practical contributions in terms of shaping education programs individually, planning entrepreneurship supports, and bringing creative individuals to the sport industry. Furthermore (IV), analyzing the effects of independent variables on personality traits and perception of innovation contributes to understanding the transformative effect of sport sciences education on the individual and developing more effective educational strategies. This holistic approach has the potential to fill the gaps in the literature in terms of both individual development and the progress of the field.

Method

Research Design

This study, which examines the relationship between personality traits and innovation perceptions of students studying at the Faculty of Sport Sciences, was designed as a relationship-seeking and descriptive type of quantitative research methods.

Participants

The population of the study consists of individuals receiving sports education in Istanbul, while the sample is composed of those who met the inclusion criteria between September and October 2024. Based on an unknown population sample calculation, 384 participants were required with a 95% confidence interval and a 5% margin of error. Data were collected using face-to-face survey methods, reaching 400 participants. However, after identifying that 159 of the surveys were incomplete or incorrectly filled out, the study was completed with 241 participants (n=241). The criteria for inclusion in the study are as follows:

- Being an active student in the 2024-2025 academic year,
- being a Turkish citizen,
- being 18 years of age or older,
- volunteering to participate in the research.

Data Collection Instruments

In this study, data were collected using the Demographic Information Form, the Individual Innovation Scale (IIS), and the Ten-Item Personality Inventory (TIPI).

The Demographic Information Form consists of sociodemographic questions and other questions deemed necessary for the research related to the participants.

The Ten-Item Personality Inventory (TIPI)

The TIPI was developed to measure five personality traits of individuals and was adapted into Turkish by Atak (2013). Personality Traits are as follows: "Openness to Experiences, Agreeableness, Neuroticism, Conscientiousness and Extraversion." The scale consists of a total of 10 items. Whichever subdimension has the highest score is considered to be the most dominant personality trait of the individual. The internal consistency coefficient of the scale varied between .81-.86 (Atak, 2013). In the current study, the internal consistency coefficient was calculated between .71-.80.

The Individual Innovation Scale (IIS)

The ISS is a measurement tool that measures individual innovativeness behavior (Hurt et al., 1977). It was translated into Turkish in 2010 (Kılıçer & Odabaşı, 2010). The 5-point Likert-type scale consists of four subscales ("esistance to change", "opinion leadership", "openness to experience", and "risk-taking"). The overall internal consistency of the scale was calculated as .87, while the internal consistency for the sub-dimensions ranged between .62-.81. Individuals are categorized according to their innovativeness according to their scores. Those scoring 80 points and above are classified as "Innovators", those scoring between 69-80 as "Early Adopters", between 57-68 as "Early Majority", between 46-56 as "Late Majority", and those scoring below 46 as "Laggards". Innovation levels are further classified as "Low" (<64), "Medium" (65-67), and "High" (>68) (Kılıçer & Odabaşı, 2010). In the present study, internal consistency was calculated between .85 for the overall scale and between .61-.74 for the sub-scales.

Research Ethics

This research was found ethically appropriate by the Istanbul University-Cerrahpaşa Social and Human Sciences Research Ethics Committee with the decision numbered 374 dated 13.09.2024.

Data analysis

The analyses using descriptive statistics were carried out using the IBM SPSS 29 software program. The tests to be used in the analysis of the current research were decided according to the normality assumption. Skewness and kurtosis values were examined for the normality assumption. Accordingly, it was accepted that the data were not between ±1.5 and therefore did not show a normal distribution (Table 2). In the study, the reliability of the scales was evaluated according to Cronbach Alpha values. Hair et al. (2010) stated that a value of 0.70 is generally accepted as an acceptable threshold and values up to 0.60 may be acceptable for exploratory research. Therefore, the data were analyzed with Mann Whitney U, Kruskall Wallis and Spearman correlation tests. Data below 0.05 and 0.01 were considered significant.

Results

Table 1 presents the distribution of demographic characteristics of students in the Faculty of Sports Sciences. The students' average age is 24.01 (±1.99), with 51.9% of them being female. It was found that 51.9% of the students are enrolled in the Sports Management department, and 61.0% of them are in their third year. Furthermore, 86.6% of the students reported that they do not have any ideas for developing or designing an innovative product.

Table 1. Distribution of demographic Information

Variables		n	%	x̄±Ss (min-max)
Age				24.01±1.99 (18-28)
Gender	Male	116	48.1	
	Female	125	51.9	
Department	Physical Education and Sports Teaching	23	9.5	
	Coaching Education	93	38.6	
	Sports Management	125	51.9	
Class	1st Class	32	13.3	
	2nd Class	36	14.9	
	3rd Class	147	61.0	
	4th Class	26	10.8	
Do You Have an Innovative Product Development/Design Idea of Your Own That You Haven't Shared with Anyone?	Yes	42	17.4	
	No	199	86.6	
Total		241	100	

The score distributions of the scales are presented in Table 2. It was found that participants had the highest average score in the "Agreeableness" subdimension of the TIPI (4.38±.90) and the lowest average score in the "Openness to Experience" subdimension (4.00±.93). The total average score for the IIS was determined as 56.98±8.72, with the highest score observed in the "Resistance to Change" subdimension (20.48±5.28) and the lowest in the "Risk Taking" subdimension (4.63±2.33).

Table 2. Distrscibutions of Scale Scores (n=241)

	Openness to Experience			Agreeableness			Neuroticism			Conscientiousness			Extraversion		
Variables	Rank Average	DF.	Z/X² p	Rank Average	DF.	Z/X² p	Rank Average	DF.	Z/X² p	Rank Average	DF.	Z/X² p	Rank Average	DF.	Z/X² p
							Gender								
Male	120.47		Z=-0.115	97.22		Z=-5.261	139.47		Z=-4.036	113.49		Z=-1.654	120.81		Z=-0.040
Female	121.49		p>.05	143.07		p<.05	103.86		p<.05	127.97		p>.05	121.17		p>.05
							Department								
Physical Education and Sports Teaching	124.30	2		115.43	2		133.33	2		126.96	2		124.98	2	
Coaching Education	112.25	2	X²=2.490 p>.05	108.75	2	X²=6.023 p<.05	134.54	2	X²=8.451 p<.05	127.90	2	X²=2.189 p>.05	135.78	2	X²=7.963 p<.05
Sports Management	126.90	2		131.14	2		108.66	2		114.77	2		109.27	2	
							Class								
1st Class	70.34	3		93.09	3		133.31	3		98.84	3		85.63	3	
2nd Class	125.10	3	X²=24.308	103.60	3	X²=17.767	148.64	3	X²=15.267	122.71	3	X²=35.960	150.13	3	X²=43.613
3rd Class	125.10	3	p<.05	124.06	3	p<.05	107.62	3	p<.05	112.46	3	p<.05	109.65	3	p<.05
4th Class	154.52	3		162.13	3		143.21	3		194.17	3		188.38	3	
	Do You Have an Innovative Product Development/Design Idea of Your Own That You Haven't Shared with Anyone?														
Yes	133.35		Z=-1.283	130.83		Z=-1.037	134.14		Z=-1.370	143.45		Z=-2.359	158.58		Z=-3.885
No	118.39		p>.05	118.92		p>.05	118.23		p>.05	116.26		p<.05	p>.05		p<.05

Table 3. Analysis Results Between Participants' Variables and the TIPI

Scales	Min.	Max.	x̄	Skew.	Kur.	Cronbach Alpha
Openness to Experience	2.00	6.00	4.00±.93	.134	-.678	.79
Agreeableness	1.00	7.00	4.38±.90	.730	1.677	.75
Neuroticism	1.00	7.00	4.28±.94	.188	1.205	.75
Conscientiousness	2.00	7.00	4.37±1.18	.875	-.007	.71
Extraversion	1.00	7.00	4.04±1.35	.563	-.189	.80
Individual Innovativeness Scale (IIS)	34.00	87.00	56.98±8.72	1.218	1.497	.85
Resistance to Change	8.00	40.00	20.48±5.28	1.027	1.335	.62
Opinion Leadership	5.00	25.00	15.42±4.10	.432	-.434	.63
Openness to Experience	5.00	25.00	15.40±4.81	.043	-.756	.74

Risk Taking	2.00	10.00	4.63±2.33	.734	-.609	.61

Z: Mann Whitney U Test ; X2: Kruskall Wallis Test ; DF: Degrees of Freedom ; p<0,05; statistical significance value

The analysis results examining the differences in personality traits based on various independent variables of the students in the faculty of sport sciences are presented in Table 3. According to the findings, a significant difference was found between students' gender and the personality traits of "Agreeableness" (Z=-5.261; p<.05) and "Emotional Stability" (Z=-4.036; p<.05). It was observed that female students had higher mean scores (x̄=143.07) in the "Agreeableness" dimension compared to male students (x̄=139.47). In the "Emotional Stability" dimension, male students' mean scores (x̄=139.47) were found to be higher than those of female students (x̄=103.86).

A significant difference was found between the department variable and the personality traits of "Agreeableness" (X^2=6.023; p<.05), "Neuroticism" (X^2=8.451; p<.05), and "Extraversion" (X^2=7.963; p<.05). The significant differences in personality traits were observed between students of the Sport Management and Coaching Education departments. Students in the Sport Management department had a higher mean score in the "Agreeableness" personality trait (x̄=131.14) compared to others, while students in the Coaching Education department had higher mean scores in the "Neuroticism" (x̄=134.54) and "Extraversion" (x̄=135.78) personality traits.

A significant difference was found between students' grade levels and all personality traits (Openness to Experience, Agreeableness, Neuroticism, Conscientiousness, and Extraversion) (p<.05). The difference occurred between first-year students and other grade levels, with first-year students having the lowest mean scores across all personality traits.

Additionally, Sport Sciences students were asked whether they had an idea for developing or designing an innovative product. Significant differences were observed in the personality traits of "Conscientiousness" and "Extraversion." Students who answered "Yes" had higher mean scores (x̄=143.45; x̄=158.58) compared to those who answered "No" (x̄=116.26; x̄=113.07).

Table 4. Analysis Results of Participants' Variables and the Individual Innovativeness Scale (IIS)

	Innovation Perception			IIS_Resistance to Change			IIS_Opinion Leadership			IIS_Openness to Experience			IIS_Risk Taking		
Variables	Rank Average	DF.	Z/X^2 p	Rank Average	DF.	Z/X^2 p	Rank Average	DF.	Z/X^2 p	Rank Average	DF.	Z/X^2 p	Rank Average	DF.	Z/X^2 p
Gender															
Male	120.81		Z=-0.042	132.69		Z=-2.514	124.49		Z=-0.752	125.56		Z=-0.981	130.61		Z=-2.111
Female	121.18		p>.05	110.16		p<.05	117.76		p>.05	116.77		p>.05	112.08		p<.05
Department															
Physical Education and Sports Teaching	135.87	2	X^2=1.579	94.04	2	X^2=5.793	126.85	2	X^2= 0.899	118.39	2	X^2=2.110	128.93	2	X^2=1.703
Coaching Education	122.96	2	p>.05	131.50	2	p>.05	125.01	2	p>.05	129.13	2	p>.05	126.39	2	p>.05
Sports Management	116.80	2		118.15	2		116.94	2		115.43	2		115.53	2	
Class															
1st Class	98.80	3		95.91	3		100.33	3		89.84	3		93.28	3	
2nd Class	141.24	3	X^2=34.025	144.92	3	X^2=10.105	130.47	3	X^2=28.593	151.92	3	X^2=51.066	135.58	3	X^2=29.557
3rd Class	109.18	3	p<.05	117.80	3	p<.05	111.76	3	p<.05	106.72	3	p<.05	112.78	3	p<.05
4th Class	187.12	3		136.88	3		185.56	3		197.25	3		181.40	3	
Do You Have an Innovative Product Development/Design Idea of Your Own That You Haven't Shared with Anyone?															
Yes	154.55		Z= -3.439	130.70		Z=-0.996	151.54		Z=-3.137	157.01		Z=-3.696	161.25		Z=-4.216
No	113.92		p<.05	118.95		p>.05	114.56		p<.05	113.40		p<.05	112.51		p<.05

IIS: Individual Innovativeness Scale; Z: Mann Whitney U Test ; X2: Kruskall Wallis Test; DF: Degrees of Freedom; p<0,05; statistical significance value

The results regarding the differences in students' innovation perception levels based on their demographic characteristics are presented in Table 4. Significant differences were found between students' gender and the "Resistance to Change" (Z=-2.514; p<.05) and "Risk-Taking" (Z=-2.111; p<.05) sub-dimensions. In both sub-dimensions, male students' average scores (x̄=132.69; x̄=130.61) were found to be higher compared to female students (x̄=110.16; x̄=112.08).

No significant differences were found between students' academic departments and their overall innovation perception (X^2=1.579; p>.05), "Resistance to Change" (X^2=5.793; p>.05), "Opinion Leadership"

(X^2=0.899; p>.05), "Openness to Experience" (X2=2.110; p>.05), and "Risk-Taking" sub-dimensions (X^2=1.703; p>.05).

Significant differences were identified between the class level variable and innovation perception (X2=34.025; p<.05), "Resistance to Change" (X2=10.105; p<.05), "Opinion Leadership" (X2=28.593; p<.05), "Openness to Experience" (X2=51.066; p<.05), and "Risk-Taking" sub-dimensions (X2=29.557; p<.05). It was determined that students in their fourth year of study had higher average scores across all dimensions compared to students in other class levels.

Finally, a significant difference was identified between the responses given by students regarding whether they have an idea for developing/designing an innovative product and their innovation perception (Z=-3.439; p<.05), as well as in the sub-dimensions of "Opinion Leadership" (Z=-3.137; p<.05), "Openness to Experience" (Z=-3.696; p<.05), and "Risk-Taking" (Z=-4.216; p<.05). However, no significant difference was observed in the sub-dimension of "Resistance to Change" (Z=-0.996; p>.05). In the sub-dimensions where significant differences were found, students who had an idea for developing/designing an innovative product exhibited higher average scores compared to those who did not.

Table 5. Correlation Results Between Age, Personality Traits, and Innovation Perception

			Age	Innovation Perception	IIS_Resistance to Change	IIS_Opinion Leadership	IIS_Openness to Experience	IIS_Risk Taking
	Age	r	-	.042	-.105	-.012	-.012	-.035
		p	-	.518	.105	.851	.857	.587
Personality Traits	Openness to Experience	r	.061	.458**	.054	.288**	.436**	.427**
		p	.342	.000	.402	.000	.000	.000
	Agreeableness	r	-.052	.426**	.041	.387**	.341**	.299**
		p	.425	.000	.525	.000	.000	.000
	Neuroticism	r	.081	.238**	.159*	.320**	.225**	.223**
		p	.211	.000	.014	.000	.000	.000
	Conscientiousness	r	-.065	.610**	.218**	.625**	.536**	.567**
		p	.314	.000	.001	.000	.000	.000
	Extraversion	r	-.028	.582**	.095	.541**	.435**	.541**
		p	.665	.000	.142	.000	.000	.000

Table 5 presents the correlation results between students' age, personality traits, and innovation perception. No significant relationship was found between students' ages and their personality traits (p>.05) or innovation perception (p>.05).

A significant relationship was found between innovation perception and the personality traits of openness to experience (r=.46; p<.05), agreeableness (r=.43; p<.05), neuroticism (r=.24; p<.05), conscientiousness (r=.61; p<.05), and extraversion (r=.58; p<.05) at varying levels. Detailed relationships between students' personality traits and the subdimensions of the Individual Innovation Scale (IIS) are presented in Table 5.

Discussion

Innovation is a concept that exists in all areas of life. The area covered by sports in social life is indisputably large. Attempts to achieve beneficial outcomes in sport explain the phenomenon of innovation in sport. Many countries are talking about the concept of innovation in sport. This situation necessitates a new reform and renewal in sports (Gündoğdu & Sunay, 2012). In recent years, there has been more emphasis on innovation in sports, and organizations are looking for ways to seize opportunities with competitive advantage (Özdemir, 2023). The topic of innovation in sports has been explored in research focusing on the personal characteristics of students enrolled in sports sciences faculties, where future contributors to the development of sports are trained. This study aims to investigate the connection between personality traits and the perception of innovation among university students in sports sciences faculties. In this context, a total of 241 sport sciences faculty students, 48.1% male and 51.9% female, participated in the study. According to the findings, sports sciences faculty students stand out with their agreeableness characteristics. It is seen that different features come to the fore in the studies. For example, in the study conducted by Bulut (2023), it was determined that students stood out with

openness to experience. In another study, the trait of emotional stability came to the fore (Uysal, 2022). It is an expected finding in research that individuals have different personality traits. One reason for the different results in the studies may be the effect of time period and environmental factors. Especially when examining the personality traits of sport science students, the social, cultural and educational environment in which they live plays an important role. For example, external factors such as the difficulties of educational life, psychological stress and social changes in one period may shape students' traits such as emotional stability or responsibility. It has been determined that the students of the Faculty of Sport Sciences have a low level of innovation perception and are in the "Late Majority" category. In other words, it can be said that students are skeptical about innovations. This finding is not supported by the literature. In the studies conducted, it is seen that students are generally in the "Early Majority" group (Mülhim, 2018; Güngör & Kurtipek, 2020; Göksel & Yıldız, 2021). However, no matter what, while students are expected to be people who follow, adopt and implement innovations, it is recommended that efforts to improve this situation be increased. The results of the research revealed a significant difference in the sub-dimensions of agreeableness and neuroticism based on the participants' gender, as measured by the ten-item personality scale. This result is similar to and different from the results of similar studies in the literature (Eraslan, 2015; Karadağ & Kaya, 2019; Cifci et al., 2023). The reason for this difference can be traced to the existence of many theories explaining the effects of gender on psychological traits. Men and women may express their emotional experiences and psychological traits differently due to social and biological factors. Furthermore, societal expectations and upbringing may also play a role in the emergence of these differences. In the analysis conducted according to the departments of the participants in the study, a significant difference was found in the sub-dimensions of agreeableness, neuroticism and extraversion. There are also parallel and different studies that analyzed the results according to the department variable (Nalbant et al. 2023; Yazıcı et al. 2023). Students' chosen major is usually in line with their interests, personal values and skills. Therefore, the personality traits of students studying in different departments may also differ depending on these preferences. According to the results of the analysis between the sub-dimensions of the ten-item personality scale and the participants according to the class variable, a significant difference was found between the sub-dimensions of openness to experience, agreeableness, neuroticism, conscientiousness, extraversion. The results of different studies in the literature were compared and similarities and differences were determined (Üçan, 2019). The academic process that students go through during their university life can contribute to their personality development. Students in the lower grades are in a more exploratory stage, while students in the upper grades may develop a more mature, responsible and professional attitude towards their academic and career goals. In the study, the participants were asked whether they had an idea to develop/design an innovative product and as a result of the analysis conducted to determine whether there was a significant difference between the sub-dimensions, a significant difference was found in the conscientiousness and extraversion sub-dimensions. Since there are no studies on this subject in the literature, no comparison could be made in the literature. However, it can be interpreted that the higher level of responsibility of individuals who develop innovative ideas on the subject may indicate that these individuals have developed planning, task awareness and problem solving skills. Extroversion can also be seen as a trait that supports creativity and innovative thinking, as these individuals are often more open to new experiences.

According to the results of the analysis between the sub-dimensions of the individual innovativeness scale according to the gender of the participants in Table 4, a significant difference was found in the sub-dimensions of "Resistance to Change" and "Risk Taking". When the studies on the subject in the literature were examined, similar results were found (Çuhadar et al., 2013; Kılıç, 2015; Korucu & Olpak, 2015). Factors such as gender roles, educational opportunities or different social experiences of individuals can be considered as factors in the formation of this difference. In addition, it can be said that gender roles shape individuals' innovativeness behaviors through social norms. No significant difference was found between the sub-dimensions of the innovativeness scale according to the department variable of the participants. Similar studies in the literature on the research topic were examined and a significant difference was found. It was found that the results of the research differed from the results of the study (Öztürk Yurtseven & Aldan Karademir, 2017; Mülhim, 2019; Biricik et al., 2022). Based on this result, it suggests that the education offered by each department in the faculty of sport sciences may affect students' innovative thinking and behaviors in different ways. Because the career expectations that each department offers to students and the skills developed in this direction can also have an impact on innovation. Some departments may be more theory-oriented, while other departments may be more

practical and field-oriented. This may affect whether students are open to innovative approaches. According to the results of the analysis specific to the individual innovativeness levels of the participants regarding their grade level, a significant difference was found between the sub-dimensions of "Innovation perception", "Resistance to Change", "Opinion Leadership", "Openness to Experience" and "Risk Taking". Similar studies in the literature have similarities and differences with this result (Örün et al., 2015; Ertuğ & Kaya, 2017; Yeğin, 2017;). This result suggests that upperclassmen may have more developed innovative thinking skills because they have more academic knowledge and experience. In addition, it can be thought that the career goals of upperclass students become clearer as they approach graduation and therefore they have higher motivation for innovation. It was determined that there was a significant difference in the sub-dimensions of "Innovation perception", "Opinion Leadership", "Openness to Experience" and "Risk Taking" according to the individuals' having an idea of developing/designing an innovative product. Having an innovative product idea for this result shows students' creative thinking and problem solving skills. Such students are often more open to developing new ideas and finding solutions to existing problems. Students who have the idea of developing an innovative product may be more motivated to think innovatively. It can often be an important clue to students' future career aspirations. At the same time, these students may often be more enthusiastic about entrepreneurship, product development or innovative solutions.

According to the correlation analysis between students' age, personality traits and innovation perceptions in Table 5, there is no relationship between students' age, personality traits and innovation perceptions. This can be interpreted as that students' age does not always play a decisive role on their personality traits and perceptions of innovation. Especially in the case of young individuals, such as university students, the impact of age on these variables may be limited, as age ranges are usually narrow. Since the majority of university students are in the same life stage (e.g. young adulthood), the impact of age differences may be minimal. Personality traits may change over time, but these changes are generally thought to be more pronounced later in life. Considering the age group of university students, the effect of age on personality may not yet be sufficiently evident. There was a relationship between the personality traits of the students and the sub-dimensions of the individual innovativeness scale. Significant relationships were also found in similar studies in the literature (Çetin & Şahin, 2018; Çetin, 2018). There is a similarity between the research results and the study results. Research findings show that there is a relationship between personality traits and individual innovativeness. Individuals with high levels of openness may be more successful in innovative thinking and creative solutions as they are more open to new ideas and experiences. In addition, individuals with extraversion personality traits may be more advantageous in generating innovative ideas because they are more active in social interactions and play a more active role in group work.

Conclusions

According to the results of the research; it was seen that the "agreeableness" personality trait of the students studying at the faculty of sport sciences was dominant. Students with low level of innovation perception are classified in the "Late Majority" category. It was determined that various independent variables of the students affect their personality traits and innovation perception levels. In addition, it was concluded that there is a relationship between the personality traits and innovation perceptions of sport sciences faculty students. According to the results of the study, in addition to demographic factors affecting individual innovativeness levels, personality traits also play an important role in shaping innovative behaviors. In particular, when developing strategies to increase students' innovation levels, students' personality traits should be taken into account and educational programs and experiential opportunities should be offered to encourage innovative thinking. Future studies could include students from different disciplines or a wider age range. By adding new variables to the study, different factors that may have an impact on individual innovativeness can be examined. For example, factors such as social media use, motivation, leadership abilities or technological competence can be investigated in relation to innovation. The impact of education and innovation-oriented interventions on individual innovativeness and personality development can be examined. Qualitative research methods can be used to support your quantitative findings or to understand the reasons for these findings in more depth. Further research in different countries or cultural groups may be recommended to understand how the

results of the study vary in different cultural and social contexts. This may reveal cross-cultural differences in personality traits and perception of innovativeness.

Acknowledgements

The authors sincerely thank all students who participated in the study.

Conflict of interest

There is no conflict of interest between the authors.

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