

The relationship between mindfulness and optimism-pessimism levels in athletes La relación entre la atención plena y los niveles de optimismo-pesimismo en los atletas

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Abstract. This study investigates the interplay between psychological traits—Optimism, Pessimism, and Mindfulness—and their collective impact on athletes' performance and well-being. Employing a correlational survey design, this study engages a carefully selected convenience sample comprising 236 athletes from various sporting disciplines, encompassing various educational backgrounds. The sample included 33.1% women and 66.9% men, with a significant portion holding bachelor's degrees. The Athlete Optimism And Pessimism Scale (AOPS) and the Mindfulness Inventory for Sport (MIS) were administered to assess the psychological constructs. Analytical methods included t-tests, ANOVA, and Pearson's correlations. Results indicate no gender differences in overall Optimism, Pessimism, and Mindfulness. However, males displayed higher Refocusing abilities. No significant impact of sport type or education level was observed on these psychological traits. Age showed no correlation with the variables. A positive association between Optimism and the Mindfulness subcomponents of Awareness and Refocusing emerged, highlighting Optimism's beneficial role.

In contrast, Pessimism showed negative correlations, suggesting its detrimental effect. The findings underscore the need for tailored psychological interventions that enhance Optimism and Mindfulness while reducing Pessimism. This study contributes to sports psychology by suggesting that individualized interventions are crucial for fostering an athlete's psychological resilience and performance, with the potential for growth and adaptation extending across the lifespan.

Keywords: Athletic Performance, Psychological Resilience, Mindfulness, Optimism, Pessimism

Resumen. Este estudio investiga la interacción entre rasgos psicológicos —Optimismo, pesimismo y atención plena— y su impacto colectivo en el rendimiento y bienestar de los atletas. Utilizando un modelo de encuesta correlacional, la investigación incluye una muestra de conveniencia de 236 atletas de diversas disciplinas deportivas, con una representación diversa a través de niveles educativos. La muestra incluyó un 33.1% de mujeres y un 66.9% de hombres, con una parte significativa con títulos de licenciatura. Se administraron la Escala de Optimismo y Pesimismo en Atletas (AOPS) y el Inventario de Atención Plena en el Deporte (MIS) para evaluar los constructos psicológicos. Los métodos analíticos incluyeron pruebas t, ANOVA y correlaciones de Pearson. Los resultados indican que no hay diferencias de género en Optimismo, pesimismo y atención plena en general. Sin embargo, los hombres mostraron mayores habilidades de reenfoque. No se observó un impacto significativo del tipo de deporte o nivel educativo en estos rasgos psicológicos. La edad no mostró correlación con las variables. Se destacó una asociación positiva entre el Optimismo y los subcomponentes de conciencia y reenfoque de la atención plena, resaltando el papel beneficioso del Optimismo. En contraste, el pesimismo mostró correlaciones negativas, sugiriendo su efecto perjudicial. Los hallazgos subrayan la necesidad de intervenciones psicológicas personalizadas que mejoren el Optimismo y la atención plena mientras reducen el pesimismo. Este estudio contribuye al campo de la psicología deportiva al sugerir que las intervenciones individualizadas son cruciales para fomentar la resiliencia psicológica y el rendimiento del atleta, con el potencial de crecimiento y adaptación que se extiende a lo largo de la vida.

Palabras clave: Rendimiento Deportivo, Resiliencia Psicológica, Mindfulness, Optimismo, Pesimismo

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Introduction

In the highly competitive and demanding world of sports, athletes constantly seek ways to enhance their performance, manage stress, and maintain optimal mental and physical health. The pressure to excel, coupled with the physical and psychological demands of training and competition, requires physical prowess and strong mental resilience. Psychological traits such as mindfulness, optimism, and pessimism are key factors influencing an athlete's mental state, coping mechanisms, and, ultimately, performance outcomes (Chang et al., 2020; Dagnall et al., 2021; Soundara Pandian et al., 2022). Understanding how these traits interact is essential for developing effective strategies that support athletes' well-being and enhance their competitive edge.

Mindfulness refers to maintaining a moment-by-moment

awareness of one's thoughts, feelings, bodily sensations, and surrounding environment (Kabat-Zinn, 2003; Valipoor & Bosch, 2021; Meaden, 2024). It involves accepting these experiences without judgment, which can help individuals respond to situations more effectively. In athletics, mindfulness has been linked to various positive outcomes, including improved focus, emotional regulation, reduced anxiety, and enhanced performance (Jones et al., 2020; Hut et al., 2021; Wang et al., 2023). Athletes who cultivate mindfulness are often better equipped to handle the pressures of competition, recover from setbacks, and maintain consistent performance levels (Augustus et al., 2022; Sparks & Ring, 2022; Ragab, 2024). Optimism and pessimism are dispositional traits reflecting an individual's general expectations about the future (Scheier & Carver, 2018; Pienkowski et al., 2022; Chang, 2024). Optimistic athletes

anticipate positive outcomes and view challenges as opportunities for growth, which can enhance motivation, persistence, and resilience (Loftus et al., 2020; Lai et al., 2020; Hussain et al., 2023). They are more likely to employ adaptive coping strategies when faced with adversity, contributing to sustained engagement and success in their sport (Bryan et al., 2017; Fasey et al., 2022). Pessimistic athletes, conversely, may focus on potential failures and adverse outcomes, leading to increased stress, decreased motivation, and a higher risk of burnout (Gustafsson et al., 2018; Wu et al., 2024). This negative outlook can hinder performance and diminish overall well-being.

The relationship between mindfulness and optimism is an area of growing interest in psychological research. Mindfulness practices promote a more accepting and less judgmental attitude toward experiences, which leads to a more optimistic perspective (Hatton-Bowers et al., 2019; Thiermann & Sheate, 2020; Levit-Binnun et al., 2021). By fostering greater awareness and acceptance, mindfulness may help athletes reframe stressful situations, reduce negative thought patterns, and enhance positive outlooks (Röthlin et al., 2020; Sullivan et al., 2021). For example, a mindful athlete might interpret a challenging competition as an opportunity to demonstrate their skills and learn rather than as a threat to their success. Despite the theoretical connections among mindfulness, optimism, and pessimism, empirical studies examining their interplay in athletic populations are limited (Whitton et al., 2020; Angosto et al., 2021; Hwang & Choi, 2021). Most existing research has explored these traits independently, without considering how they collectively impact athletes' performance and well-being. This gap in the literature underscores the need for comprehensive studies that investigate the relationships among these psychological constructs within the context of sports.

Understanding this interplay is crucial for several reasons. It can inform the development of targeted psychological interventions to enhance athletic performance and mental health. For instance, integrating mindfulness training into athletic programs could increase optimism levels and reduce pessimism, improving athletes' motivation, resilience, and overall well-being (Oguntuase & Sun, 2022; Soundara Pandian et al., 2022; Augustus et al., 2024). Additionally, exploring these relationships can contribute to the theoretical understanding of how psychological traits interact to influence behavior and outcomes in sports settings, paving the way for future research in this domain.

Therefore, this study investigates the interplay between psychological traits—optimism, pessimism, and mindfulness—and their collective impact on athletes' performance and well-being. By examining these relationships, we aim to contribute to the theoretical understanding of psychological factors in sports and provide

evidence-based recommendations for interventions that support athletes' mental health and performance.

Method

Model

This study, which aims to examine the relationship between athletes' levels of Mindfulness and their Optimism and Pessimism, along with certain demographic variables, is descriptive research conducted in the correlational survey model. Although correlational studies do not prove causality in a true sense, using specific advanced statistical techniques allows inferences related to cause-and-effect relationships to be made in correlational research (Fraenkel & Wallen, 2009).

Study Group

The study group for the research was established using a convenience sampling method. Convenience sampling, based on the principles of accessibility and suitability, is a method often preferred for rapidly collecting information on some research topics (Büyükoztürk, 2010). Of the 236 individuals selected via convenience sampling, 33.1% (n=78) are women, and 66.9% (n=158) are men. Of the participants, 34.7% (n=82) have a high school diploma, 56.8% (n=134) hold a bachelor's degree, and 8.5% (n=20) have a graduate degree. Among the athletes who participated in the study, 28% (n=66) were involved in individual sports, and 72% (n=170) were engaged in team sports. The average age of the participating athletes is 22.54 years. The measuring instrument was administered to the female participants through an online form. This study was conducted with approval from the Istanbul Aydın University Social Sciences Ethics Committee.

Table 1.
Distribution of Women in the Research Sample by Some Variables

Variable	Category	n	%
Gender	Female	78	33.1
	Male	158	66.9
	Total	236	100.0
Sport Type	Individual	66	28.0
	Team	170	72.0
	Total	236	100.0
Education Level	High School	82	34.7
	Bachelor's	134	56.8
	Master's	20	8.5
	Total	236	100.0

Data Collection Tools

In the study, "The Athlete Optimism And Pessimism Scale (AOPS)" developed by Tekkurşun Demir, G. (2022) and the Turkish adaptation of "Mindfulness Inventory for Sport (MIS)" by Tingaz, E. O. (2020) were used. A personal information form was created to determine individuals' age, marital status, education level, and whether they have an athlete's license.

The Athlete Optimism And Pessimism Scale (AOPS)

The Athlete Optimism and Pessimism Scale (AOPS), developed by Tekkurşun Demir, G. (2022), was used to measure athletes' levels of Optimism and Pessimism. AOPS consists of the Optimism and Pessimism sub-dimensions. The scale is a 5-point Likert scale, rated as Never (1), Rarely (2), Occasionally (3), Often (4), and Always (5).

Optimism: Items 1, 2, 3, 4, 5, 6, 7, 8, and 9 of the AOPS form the Optimism sub-dimension. A player's minimum score from this sub-dimension is 9, and the maximum score is 45. Scores between 9 and 20 indicate low Optimism, 21 and 30 indicate moderate Optimism and 31 and 45 indicate high Optimism. Cronbach's alpha was calculated as .91.

Pessimism: Items 10, 11, 12, 13, 14, 15, 16, 17, and 18 of the AOPS form the Pessimism sub-dimension. A player's minimum score from this sub-dimension is 9, and the maximum score is 45. Scores between 9 and 20 indicate low Pessimism, 21 to 30 indicate moderate Pessimism, and 31 to 45 indicate high Pessimism. Cronbach's alpha was calculated as .90.

To validate the construct validity of AOPS, a DFA analysis was conducted, yielding an χ^2/sd ratio of 3.49. Other fit indices obtained from the DFA were $\chi^2(134) = 468.98$, RMSEA = .09, PGFI = .67, PNFI = .82, GFI = .85, AGFI = .84, IFI = .95, NFI = .97, CFI = .98.

Mindfulness Inventory for Sport (MIS)

Athletes' Mindfulness levels were assessed using the Mindfulness Inventory for Sport (MIS), adapted into Turkish by Tingaz, E. O. (2020). The scale consists of 15 items and three sub-dimensions, rated on a 6-point Likert scale (1=Almost Never - 6=Almost Always). MIS has a minimum score of 40 and a maximum score of 65. Items 6, 7, 8, 9, and 10 are reverse-coded. The Cronbach's alpha for the scale was calculated as .82. Confirmatory factor analysis was conducted to validate the scale, yielding the following fit indices: $\chi^2 = 158.77$, $sd=86$, $\chi^2 /sd=1.84$, RMSEA=0.08, GFI=0.86, CFI=0.95, IFI=0.95.

Data Analysis

The data set was initially examined for errors, outliers, normality, and multicollinearity. All accurate data entries were observed during this process. Data analysis was conducted using the SPSS 25 program. The Shapiro-Wilk test was used to determine the normality of the distribution, and the data exhibited a normal distribution ($p > .05$).

For pairwise comparisons, t-tests were used, and one-way analysis of variance (ANOVA) was employed for multiple comparisons. Pearson's product-moment correlation coefficient was used to determine the relationships between variables. A significance level of $p < .05$ was adopted.

Results

Table 2. Results of t-Test for Athletes' Optimism, Pessimism, and Mindfulness Levels by Gender

Variables	Female (n = 78)		Male (n = 158)		t	sd	p
	\bar{X}	S	\bar{X}	S			
Optimism	35.70	6.24	35.93	6.46	-.262	234	.79
Pessimism	14.53	7.28	14.32	7.52	.203	234	.83
Awareness	23.97	4.54	23.66	4.02	.533	234	.59
Non-judgmental	16.10	4.79	14.93	4.82	1.759	234	.08
Refocusing	21.16	5.08	22.93	4.51	-2.716	234	.00*
MIS total	61.24	7.86	61.53	6.95	-.286	234	.77

* $p < .05$

When Table 2 was examined, no significant difference was found between athletes' Optimism, Pessimism, Awareness, Non-judgmental, and MIS total scores based on gender ($p > .05$). However, a significant difference was observed between male and female athletes in the Refocusing sub-dimension of the MIS scale, favouring males ($p < .05$). This suggests that male athletes may be better than females in terms of Refocusing.

Table 3. Results of t-Test for Athletes' Optimism, Pessimism, and Mindfulness Levels by Sport Type

Variables	Individual (n = 66)		Team (n = 170)		t	sd	p
	\bar{X}	S	\bar{X}	S			
Optimism	35.50	6.44	36	6.37	-.539	234	.50
Pessimism	13.59	6.32	14.71	7.81	-1.040	234	.30
Awareness	24.01	3.68	23.67	4.37	.566	234	.57
Non-judgmental	16.21	4.62	14.97	4.88	1.778	234	.07
Refocusing	22.04	5.17	22.47	4.61	-.613	234	.54
MIS total	62.27	7.06	61.11	7.31	1.104	234	.27

* $p < .05$

When Table 3 was examined, no significant difference was found between athletes' Optimism, Pessimism, Awareness, Refocusing, Non-judgmental, and MIS total scores based on sport type ($p > .05$). This suggests that the type of sport does not significantly influence athletes' Optimism, Pessimism, and Mindfulness scores.

Table 4. Results of ANOVA for Athletes' Optimism, Pessimism, and Mindfulness Levels by Education Level

Variables	Group	n	\bar{X}	S	Source of Variance	SS	sd	KO	F	p
Optimism	1. High School	82	36.70	6.26	Intergroup	103.42	2	51.71	1.27	.28
	2. Bachelor's	134	35.52	6.47						
	3. Master's	20	34.65	6.11	In-group	9468.95	233	40.63		

	Total	236	36.70	6.26	Total	9572.38	235			
Pessimism	1. High School	82	14.63	7.39	Intergroup	18.99	2	9.49	.17	.84
	2. Bachelor's	134	14.38	7.81						
	3. Master's	20	13.55	4.72	In-group	12971.56	233	55.67		
	Total	236	14.39	7.43	Total	12990.55	235			
Awareness	1. High School	82	23.50	4.35	Intergroup	56.01	2	28	1.60	.20
	2. Bachelor's	134	22.95	4.33						
	3. Master's	20	23.76	4.19	In-group	4074.17	233	17.48		
	Total	236	14.80	4.88	Total	4130.18	235			
Non-judgmental	1. High School	82	17.25	3.30	Intergroup	96.32	2	48.16	2.07	.12
	2. Bachelor's	134	15.31	4.83						
	3. Master's	20	23.01	4.47	In-group	5402.83	233	23.18		
	Total	236	21.98	4.92	Total	5499.16	235			
Refocusing	1. High School	82	22.25	4.78	Intergroup	90.83	2	45.41	2.04	.13
	2. Bachelor's	134	62.50	6.97						
	3. Master's	20	60.82	7.22	In-group	5281.90	233	22.66		
	Total	236	61.15	8.38	Total	5372.74	235			
MIS total	1. High School	82	14.63	7.39	Intergroup	143.94	2	71.97	1.37	.25
	2. Bachelor's	134	14.38	7.81						
	3. Master's	20	13.55	4.72	In-group	12216.10	233	52.43		
	Total	236	14.39	7.43	Total	12360.04	235			

When Table 4 was examined, no significant difference was found between athletes' Optimism, Pessimism, Awareness, Refocusing, Non-judgmental, and MIS total scores based on

education level ($p > .05$). This suggests that education level is not a significant variable influencing athletes' Optimism, Pessimism, and Mindfulness scores.

Table 5. Correlation Between Athletes' Optimism, Pessimism, and Mindfulness Levels and Age

Variables	n	Optimism	Pessimism	Awareness	Non-judgmental	Refocusing	MIS total
Age	236	-.07	-.08	.08	.06	-.01	.06

$p > .05$

When Table 5 was examined, no significant relationship was found between athletes' Optimism, Pessimism, Awareness, Refocusing, Non-judgmental, and MIS total scores and their ages ($p > .05$). This suggests that age is not a significant variable influencing athletes' Optimism, Pessimism, and Mindfulness scores.

Optimism scores and Non-judgmental scores ($r = -.17$). This indicates that their tendency to judge themselves decreases as athletes' Optimism increases.

Furthermore, athletes' Pessimism scores were negatively and significantly related to their Awareness ($r = -.17$), Refocusing ($r = -.23$), Non-judgmental ($r = -.13$), and MIS total scores ($r = -.35$) ($**p < .01$, $*p < .05$). This suggests that as athletes' Pessimism increases, their conscious Awareness decreases, and as their conscious Awareness decreases, their Pessimism increases.

There was also a negative and significant relationship between athletes' Optimism and Pessimism scores ($r = -.20$) ($**p < .01$). This indicates that as athletes' Optimism increases, their Pessimism decreases, and vice versa.

Discussion

This study explored the psychological attributes of Optimism, Pessimism, Awareness, Non-judgmental qualities, Refocusing, and overall Mindfulness in athletes, finding significant relationships among these factors. Importantly, our results suggest that these attributes are relatively stable across gender, sport type, educational level, and age.

Table 6. Correlations Among Athletes' Optimism, Pessimism, Awareness, Refocusing, Non-judgmental and MIS Total Scores

Variables	1	2	3	4	5	6
1. Optimism	1.00	-.20**	.37**	-.17**	.44**	.40**
2. Pessimism		1.00	-.17**	-.23**	-.13*	-.35**
3. Awareness			1.00	-.35**	.49**	.65**
4. Non-judgmental				1.00	-.37**	.23**
5. Refocusing					1.00	.68**
6. MIS total						1.00

** $p < .01$, * $p < .05$

When Table 6 was examined, a positive and significant relationship was found between athletes' Optimism scores and their Awareness ($r = .37$), Refocusing ($r = .44$). MIS total scores ($r = .40$) ($**p < .01$). This suggests that as athletes' Optimism increases, their conscious Awareness and Refocusing increase, and vice versa. Additionally, a negative and significant relationship was found between athletes'

Optimism is a psychological attribute that has been linked with a multitude of positive outcomes in various domains of life. In athletics, optimists are often characterized by a proactive approach to coping with stress, which is pivotal in high-stakes environments (Carver et al., 2010). This proactive coping is an anticipatory strategy that allows athletes to prepare for potential stressors by viewing them as challenges to be overcome rather than insurmountable threats (Nes & Segerstrom, 2006). The beneficial effects of Optimism extend beyond coping strategies. Research suggests that optimistic individuals, including athletes, tend to have better overall health, possibly due to their engagement in healthier behaviours and a greater propensity to seek social support when needed (Rasmussen et al., 2009). Optimism has also been associated with enhanced injury recovery, owing to an optimistic bias that promotes adaptive behaviours and adherence to rehabilitation protocols (Scheier & Carver, 1992). The notion of Optimism contributing to psychological well-being is further supported by findings that link this trait to greater life satisfaction, higher levels of positive emotions, and lower susceptibility to the adverse effects of stress (Seligman & Csikszentmihalyi, 2014). As such, Optimism in athletes can be considered a significant predictor of their psychological resilience and ability to maintain high performance levels under pressure.

In contrast, Pessimism has been associated with less effective coping and higher levels of psychological distress. Pessimistic athletes may be more likely to doubt their abilities and expect adverse outcomes, leading to increased anxiety and a focus on potential threats rather than on strategies to enhance performance (Gillham et al., 2000). This negative expectation can result in a self-fulfilling prophecy where pessimistic predictions increase stress and decrease performance, creating a feedback loop that reinforces the original pessimistic outlook (Lainé, 2018; Nowzohour & Stracca, 2020). Pessimists are also more prone to engage in avoidant coping strategies, which can exacerbate stress and lead to withdrawal from challenging situations rather than confronting them (Herzberg et al., 2006). Moreover, the tendency to expect adverse outcomes can diminish an individual's ability to recognize and capitalize on opportunities for success, potentially undermining athletic performance (Scheier, Carver, & Bridges, 1994). Furthermore, studies suggest that Pessimism may have a biological impact, affecting stress hormone levels and immune functioning, which can directly affect athletes' health and recovery processes (Rasmussen et al., 2009). The pervasive impact of Pessimism on the mind and body illustrates the critical need for interventions to reduce pessimistic thought patterns among athletes.

The results of this study showed no significant gender differences in overall Optimism, Pessimism, and Mindfulness scores, aligning with previous research indicating that these

psychological traits are relatively stable across genders (Gustafsson et al., 2015; Walker, 2013). However, a significant difference was observed in the refocusing sub-dimension, with males showing higher abilities. This finding is consistent with studies suggesting that males might exhibit greater cortical specialization for spatial and sensorimotor tasks, which could contribute to more effective refocusing under competitive stress (Halpern et al., 2007). Moreover, the study found no significant impact of sports type or education level on Optimism, Pessimism, and Mindfulness. This suggests that these psychological traits are stable across different sports and educational backgrounds. The stability of these traits across various demographics indicates that interventions to enhance Optimism and Mindfulness should be tailored to individual characteristics rather than demographic factors alone. Age did not significantly correlate with the psychological traits studied, supporting that traits like Optimism and Mindfulness are relatively stable throughout adulthood (Raes et al., 2011). This aligns with research indicating that while life experiences can influence these traits to some extent, their core aspects remain consistent over time (Isaacowitz & Blanchard-Fields, 2012). Therefore, psychological interventions can be effective for athletes at different stages of their careers. A positive association was found between Optimism and the Mindfulness subcomponents of awareness and refocusing, highlighting the beneficial role of Optimism in enhancing these aspects of Mindfulness. This finding supports previous research indicating that Optimism is linked to better emotional regulation and coping strategies (Scheier & Carver, 1992; Seligman & Csikszentmihalyi, 2014).

Conversely, Pessimism showed negative correlations with these Mindfulness subcomponents, suggesting its detrimental effect on athletes' psychological functioning. The absence of significant differences based on education level suggests that these psychological traits are more deeply ingrained and less influenced by formal education. This stability points to the need for personalized interventions focusing on individual psychological profiles rather than relying on educational enhancements alone. Future research could explore how specific educational experiences or targeted mental training programs interact with these stable traits to enhance overall psychological resilience and athletic performance.

The contrast between Optimism and Pessimism underscores the potential benefits of psychological interventions that foster Optimism while mitigating Pessimism among athletes. Techniques such as cognitive-behavioural therapy, Mindfulness-based stress reduction, and positive psychology interventions can be valuable tools for sports psychologists working with athletes to enhance mental resilience and performance (Gardner & Moore, 2004). In practice, such interventions may involve helping athletes to reframe negative thoughts, focus on past successes, set

achievable goals, and develop contingency plans for potential setbacks (Seligman, 2007). Athletes can improve their psychological well-being and coping capacity by promoting a more optimistic outlook, contributing to better performance and satisfaction in their sports careers.

Neuroscientific research has indicated that there may be inherent differences in male and female brain structures and functions, which can influence cognitive processes such as attention, memory, and emotion regulation (Gur et al., 2002). Males, for example, have been found to exhibit greater cortical specialization for spatial and sensorimotor tasks, which could translate into more effective Refocusing under physical strain or competitive stress in sports settings (Halpern et al., 2007). Sociocultural theories suggest that gender roles and socialization processes can shape cognitive and emotional development differently in males and females. Men are often socialized to be more competitive and to suppress emotions, which might encourage the development of skills like refocusing to maintain performance despite emotional or psychological distractions (Eagly & Wood, 1999). Conversely, women might be socialized to be more attuned to emotional and relational cues, which could influence their Mindfulness practices and attentional focus (Cyranowski et al., 2000). Gender differences in emotion regulation strategies have also been observed, with males typically employing more problem-focused and detachment strategies and females more often using emotion-focused and rumination strategies (Nolen-Hoeksema, 2012). The ability to detach from unhelpful thoughts could aid in Refocusing, giving male athletes an edge in rapidly shifting their focus under pressure.

Interestingly, the education level did not significantly impact the psychological traits studied, such as Optimism, Pessimism, and Mindfulness. This lack of significant differences suggests that these psychological attributes are relatively stable across different levels of education. One possible explanation is that traits like Optimism and Pessimism are more deeply ingrained and influenced by factors such as personality and early life experiences than formal education. As such, these traits may exhibit a degree of stability that is not easily altered by educational attainment alone. Moreover, the findings indicate that while education can provide individuals with various cognitive and emotional skills, it does not necessarily change their inherent dispositional traits. For athletes, this suggests that their psychological resilience and performance-related attitudes might be more closely linked to intrinsic factors rather than the level of education they have achieved. This insight can inform future research and intervention programs by highlighting the importance of targeting psychological traits directly through tailored interventions rather than relying solely on educational enhancements. This stability across education levels underscores the need for personalized

psychological interventions that consider individual differences in traits like Optimism and Pessimism. Such interventions can enhance these traits regardless of educational background, thereby supporting athletes in achieving optimal mental states for performance. Future research could further explore how specific educational experiences or targeted mental training programs interact with these stable traits to enhance overall psychological resilience and athletic performance.

In sports psychology, attention and concentration are critical factors for performance. Research has indicated that male athletes might have a more single-minded focus during competition, which helps immediately redirect attention when needed (Weinberg & Gould, 2019). Conversely, female athletes exhibit a broader attentional style that is advantageous in different aspects of sports but may not specifically benefit from Refocusing in the same way. The observed gender differences in Refocusing capabilities suggest that Mindfulness and attentional training might benefit from being tailored to address these disparities. For instance, interventions for female athletes might include specific techniques to enhance concentration and reduce emotional distractions, while training for male athletes might focus on integrating Mindfulness with spatial and sensorimotor tasks (Zhang et al., 2016).

Interestingly, the education level did not significantly impact the psychological attributes studied. This may suggest that the personal traits of Optimism and Pessimism are more deeply ingrained and less influenced by external factors like education. The stability of psychological traits such as Optimism and Pessimism across different levels of education suggests that these attributes may be more deeply ingrained within individuals and less susceptible to change through educational experiences (Campbell & Løkken, 2022; Newcomb-Anjo et al., 2022). This may point to the dispositional nature of these traits, which can be influenced by genetic factors, early life experiences, and personality development rather than formal education (Plomin et al., 1992).

While education itself may not directly influence levels of Optimism and Pessimism, it may play a moderating role in how these traits are expressed and utilized. Higher levels of education can provide individuals with better problem-solving skills and resources, amplifying Optimism's positive effects (Carver, Scheier, & Segerstrom, 2010). In the context of athletes, education may not change their inherent Optimism but could impact the strategies they use to apply it in their sports performance. The content and focus of education also play a role. Education fostering critical thinking and reflective skills could influence individuals' abilities to regulate emotions and maintain a realistic yet optimistic outlook (King, 1992). For athletes, this might translate into a more nuanced understanding of their

psychological states and an enhanced capacity to manage them effectively during training and competition.

Although the direct relationship between education and psychological attributes such as Optimism and Pessimism may be minimal, education can impact coping strategies, which are closely linked to these attributes. Athletes with higher educational levels might be better equipped with knowledge about psychological skills and techniques that can bolster their resilience and performance under pressure. The findings regarding education and psychological attributes have implications for sports psychology. It suggests that psychological interventions and mental skills training in sports should be tailored to the individual rather than based on their educational background. Such interventions can enhance traits like Optimism through targeted strategies such as mental imagery, goal setting, and self-talk, regardless of the athletes' educational level (Weinberg & Gould, 2019).

The concept of stability in traits like Optimism and Pessimism suggests a trait-like quality rather than states susceptible to frequent change. This idea is supported by research indicating that fundamental aspects of personality exhibit a significant degree of stability throughout adulthood. Moreover, Mindfulness, which can be both a trait and a state, is a quality that can be cultivated over time but is not inherently volatile (Brown & Ryan, 2003). Older adults can effectively engage in Mindfulness practices and achieve states of Mindfulness comparable to younger individuals (Raes, Pommier, Neff, & Van Gucht, 2011). This suggests that Mindfulness interventions can be beneficial across the adult lifespan.

Age-related experiences can influence one's outlook, suggesting that while the propensity towards Optimism or Pessimism may remain consistent, life events can affect these attitudes to a degree (Isaacowitz & Blanchard-Fields, 2012). The apparent stability of Optimism, Pessimism, and Mindfulness across different ages suggests that psychological interventions designed to enhance resilience could be broadly applicable and beneficial regardless of age. This is particularly relevant in sports, where psychological resilience is crucial to performance. Techniques such as cognitive-behavioural therapy, Mindfulness training, and positive psychology exercises can be adapted for athletes at different stages of their careers, recognizing that the potential for psychological growth and adaptation is not confined to a particular age group (Gardner & Moore, 2004). While traits may be stable, evidence suggests that individuals retain a degree of plasticity in their psychological attributes throughout their lifespan. Interventions and life experiences can lead to meaningful changes in how individuals experience and express Optimism, Pessimism, and Mindfulness (Lachman, 2006). Optimism is not just a buffer against depression; it actively enhances psychological well-being. It has been linked to various positive outcomes in mental health, including lower stress

levels and better coping strategies during adversity (Scheier & Carver, 1992). Optimistic athletes are likelier to engage in positive visualization and anticipate successful outcomes, increasing motivation and effort during training and competition. Further, Optimism has been shown to correlate with a higher level of Awareness and the ability to refocus attention away from negative stimuli. This capacity for Refocusing is precious in sports, where distractions must be managed effectively for optimal performance (Kabat-Zinn, 2023). The relationship between Optimism and Non-judgmental Awareness is central to Mindfulness practice, which encourages an open and accepting attitude toward one's experiences (Bishop et al., 2004).

Conversely, Pessimism can contribute to a negative mindset that may impair an athlete's ability to perform under pressure. Pessimistic individuals may be more likely to engage in negative self-talk and to anticipate failure, which can become self-fulfilling prophecies (Carver, Scheier, & Weintraub, 1989). The interplay between these psychological attributes can have a compound effect on an athlete's performance. Awareness and Non-judgmental qualities, components of Mindfulness, can help athletes remain focused on the present moment and perform with a clear mind, enhancing their ability to execute skills under pressure (Gardner & Moore, 2004). Mindfulness integrates these attributes by promoting openness and curiosity about the present moment. It encourages athletes to observe their thoughts and feelings without immediate reaction or judgment, which can lead to improved emotional regulation and stress resilience (Brown & Ryan, 2003).

Sports psychologists can facilitate interventions that specifically target the enhancement of Optimism. Such interventions include cognitive-behavioural strategies designed to challenge and reframe negative thought patterns and increase positive expectations for future events. Optimism training can also involve goal setting, where athletes are encouraged to set positive, attainable goals, reinforcing a sense of efficacy and a positive outlook (Luthans et al., 2006). Similarly, strategies to mitigate Pessimism involve teaching athletes to recognize and alter cognitive distortions that lead to negative expectancies. This can be achieved through techniques such as journaling, where athletes track their negative thoughts and work on reframing them into more positive or realistic ones (Beck, 2020).

Incorporating Mindfulness practices into training regimens can help athletes improve their focus, manage stress, and enhance present-moment Awareness. Mindfulness can be cultivated through meditation, yoga, and breathing exercises, all of which contribute to a more Non-judgmental and present-focused state of mind (Kabat-Zinn, 2003). These practices can also improve concentration and the ability to refocus, which are essential during competition. While the study's cross-sectional nature provides a snapshot of the

relationship between these traits and athletic performance, longitudinal research is necessary to understand these attributes' development and long-term impact. Following athletes over time would allow observing how interventions impact Optimism, Pessimism, and Mindfulness and whether these changes translate into improved performance (Weinberg & Gould, 2019).

Conclusion

In sports psychology, the impact of psychological traits on an athlete's performance is complex and multifaceted. Optimism, typically seen as a psychological asset, promotes resilience and positive coping mechanisms crucial for peak performance. Conversely, Pessimism may lead to maladaptive behaviours and negatively impact mental health, ultimately affecting athletic outcomes. Tailored interventions that focus on enhancing Optimism and mitigating Pessimism can play a vital role in an athlete's psychological strategy.

Gender differences in psychological traits, particularly in Mindfulness and its subcomponents like Refocusing, underscore the nuanced nature of these attributes. Although the study indicates that males may have superior Refocusing skills, it is essential to contextualize these findings within a broader framework that accounts for individual variability and the intricate nature of Mindfulness. The mechanisms driving these gender-specific differences warrant further exploration to determine how they influence sports performance and how interventions can be effectively customized.

The study also delves into the role of education, suggesting that while it may not directly affect inherent psychological attributes such as Optimism and Pessimism, it does contribute to the cognitive and emotional toolkit that athletes draw upon. This has implications for how sports psychologists and coaches approach mental skills training, emphasizing the need for personalized strategies that leverage educational experiences to enhance psychological resilience and performance. Recognizing that traits like Optimism, Pessimism, and Mindfulness show remarkable stability across the adult lifespan is essential. This stability, however, does not limit the capacity for growth and change through targeted psychological interventions. Athletes can benefit from interventions designed to cultivate a growth-oriented psychological profile at any age, suggesting a promising avenue for long-term performance enhancement.

In conclusion, an integrated psychological approach that fosters Optimism and Mindfulness while reducing Pessimism can contribute to a well-balanced and resilient mindset in athletes. Sports psychologists and coaches should consider incorporating evidence-based strategies into their programs to bolster athlete well-being and performance. Continuing research is vital to expand our understanding of these psychological attributes and their expression across different

sports and cultural contexts to optimize the support provided to athletes in their pursuit of excellence.

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