MEANING AND SOURCES OF MEANING AMONG ATHLETES – RELATIONSHIPS WITH PERSONALITY TRAITS AND PSYCHOLOGICAL WELL-BEING

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ABSTRACT
The topic of the subjective perception of meaning in life is highly relevant in the field of psychology, yet it remains insufficiently explored within sport psychology. The presence of meaning in a person's life largely determines personal engagement and the experience of well-being, which are directly related to athletic performance. The aim of the study is to explore the presence of meaning and sources of meaning in life among athletes, as well as to reveal the relationships between meaning and its sources with personality traits and psychological well-being. A complex methodology, exploring meaning and sources of meaning, six-factor model of personality traits and psychological well-being was distributed among 173 participants, divided into three groups: international-level athletes, national-level athletes, and recreational athletes. The results reveal no significant difference between professional and recreational athletes within the present cross-sectional study. However, significant differences were registered in the levels of meaning in life among the studied individuals compared to the normative values for the same age group, in favor of the athletes. A similar trend was observed in the dimensions of community, personal growth, resilience, and faith. Regarding psychological well-being, meaning was found to positively influence personal growth and self-acceptance. The results provide a strong basis for including meaning-centered interventions in the work of sport psychologists.

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INTRODUCTION

The search for meaning is one of the most profound and universal human aspirations. From a psychological perspective, the need for meaning is regarded as a basic existential motive that strongly influences identity, motivation, and well-being (Frankl, 1996; Steger, 2012). The psychology of meaning explores not only how people form their understanding of life and self, but also how these interpretations serve as a buffer against stress, existential anxiety, and psychological disintegration.

Although the concept of meaning can be traced back to ancient philosophical systems – such as the Eastern Vedas, Sumerian and Egyptian texts, and the works of philosophers like Socrates, Plato, and Aristotle – psychology only began to explore meaning through the lens of personal experience, subjective significance, and inner self-consistency in the 20th century. Humanistic and existential psychologists such as Viktor Frankl, Rollo May, and Abraham Maslow placed meaning at the center of human existence, linking it to autonomy, freedom of choice, and the pursuit of self-actualization. A lack or loss of meaning may lead to symptoms and psychological issues (Frankl, 1996). These and other assumptions of logotherapy have been extensively researched in the field of psychology.

Later, cognitive and positive psychologists (e.g., Baumeister, Steger, Ryff) developed empirical models of meaning experience, encompassing dimensions such as purpose, comprehensibility, belonging, and significance. They view meaning not merely as a philosophical abstraction but as a psychological structure that brings coherence to life events and maintains mental equilibrium. In this context, experiencing meaning in life is associated with better emotional health, greater stress resilience, and a stronger sense of identity and direction (Schnell, 2009; Park, 2010).

Numerous studies have shown that experiencing meaning is associated with various benefits for physical and mental health and well-being. People who perceive their lives as meaningful tend to report better physical health (Scheier et al., 2006), a lower risk of cognitive decline in later life (Boyle, Buchman, Barnes & Bennett, 2009), greater emotional well-being (Zika & Chamberlain, 1992), and increased longevity (Hill & Turiano, 2014). A meaningful life is also a predictor of higher income (Hill et al., 2016). Frankl's assumption that a lack of

meaning is associated with lower levels of well-being is supported by empirical data.

The relationship between meaning and well-being has also been in focus for positive psychologists, mainly from an eudemonic perspective. Carol Ryff (1984, 2014), the main researcher of psychological well-being, conceptualized the construct as a multidimensional model, consisting of several factors, such as autonomy, self-acceptance, personal growth, and goals in life. The eudemonic perspective of psychological well-being gives a more profound and non-subjective view of one's happiness, as opposed to hedonic well-being, which usually consists of one scale and is more subjective. Furthermore, psychological well-being emphasizes the need for optimal functioning and the presence of meaning in life, rather than just feeling good, as in the hedonic model. There are, though, models that combine the two into one more, integrated model of complete mental health (Keys, Shmotkin & Ryff, 2002). Many studies demonstrate positive correlations between meaning and psychological well-being (Debats, 1998; Zika & Chamberlain, 1992; Oblinger-Peters et al., 2025). Overall, the main conclusion of research on the relationship between meaning and well-being is that the absence of meaning can lead to psychopathology, while the presence of meaning has a positive effect on the psyche (Scannell, Allen, & Burton, 2002).

Despite its growing importance in psychology, the topic of meaning is still insufficiently explored in the field of sport psychology. Having meaning in life implies possessing a clear long-term direction toward which to strive, organizing one's behavior and sense of self (McKnight & Kashdan, 2009; Ryff, 1989). The presence of meaning in one's life largely determines personal activity and the experience of happiness and well-being, which are directly related to athletic performance.

The aim of the current study is to explore the presence and sources of meaning in life among athletes with different levels of athletic achievement, and to examine the relationships between meaning and its sources, personality traits, and psychological well-being.

METHODOLOGY

Participants

The study was conducted with 173 individuals aged between 16 and 48 years. Participants were grouped by gender (63 women and 110 men), type of sport (recreational athletes, national-level athletes, and international-level athletes), and frequency of training (daily, 4–5 times per week, 2–3 times per week, once a week, and non-athletes). The data collection was carried out from February 2025 to May 2025. Each participant was informed about the research goals and gave their consent to participate.

Instruments

A complex methodology composed of several psychological questionnaires and a demographic block was applied.

- *Meaning and Purpose Scale* (MAPS; Schnell & Danbolt, 2023) – includes 23 items across seven subscales: meaning in life, crisis of meaning, resilience, faith, security, community, and personal growth. The scale uses a six-point Likert scale ranging from 0 ("strongly disagree") to 5 ("strongly agree"). The scale is used with written permission from the author.
- *HEXACO Personality Inventory* (Ashton & Lee, 2009), adapted by E. Tair, 2020 – consists of 48 items across six scales: conscientiousness, extraversion, emotionality, honesty, agreeableness, and openness to experience. The items are rated on a four-point Likert scale from 1 ("very inaccurate") to 4 ("very accurate").
- *Psychological Well-Being Scale* (Ryff et al., 2010) – contains 42 items divided into six subscales: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Rated on a reversed seven-point Likert scale from 1 - "strongly agree") to 7 - "strongly disagree".

Statistical Analyses

The data were processed using the SPSS 24 statistical software. The analyses included descriptive statistics, correlation analysis, nonparametric comparative tests (Mann-Whitney U test, Kruskal-Wallis H test), and regression analysis.

RESULTS AND ANALYSIS

Descriptive statistics reveal that the athletes scored highest on the meaning in life scale (M = 3.66) from the MAPS questionnaire (Table 1). This score is higher than the normative mean for this age group (M = 3.09). The highest scores were observed in the community (M = 3.73) and personal growth (M = 3.76) subscales, which also exceeded the age norms (M = 3.52 and M = 3.48, respectively). As expected, crisis of meaning had the lowest mean score (M = 0.76), compared to the norm of M = 1.70, given its inverse correlation with meaning. Resilience was

above average (M = 3.00) compared to the norm of M = 2.67, while faith and security showed relatively low values (M = 2.84 and M = 2.81), with normative values of M = 1.22 and M = 3.29, respectively (MAPS; Schnell & Danbolt, 2023).

Regarding the HEXACO personality traits, the highest scores were found in extraversion (M = 2.79), followed by honesty (M = 2.78), conscientiousness (M = 2.76), openness to experience (M = 2.61), and agreeableness (M = 2.54). Emotionality had the lowest mean score (M = 2.36). The findings are consistent with other studies showing that athletes tend to have high levels of extraversion and low levels of emotionality as personality traits.

Table 1. *Descriptive statistics for study variables*

	N	*Min*	*Max*	*M*	*SD*
Meaning	175	0.40	5.00	3.6617	0.65973
Crisis of meaning	175	0.00	5.00	0.7638	0.93058
Sustainability	176	0.00	5.00	3.0076	0.90217
Faith	178	0.00	5.00	2.8446	1.43061
Security	176	0.00	5.00	2.8163	0.98094
Community	177	0.00	5.00	3.7307	0.75356
Personal Growth	176	0.33	5.00	3.7689	0.83092
Conscientiousness	177	1.63	3.75	2.7620	0.42862
Extraversion	173	1.38	3.75	2.7941	0.45844
Emotionality	174	1.00	3.63	2.3621	0.48311
Honesty-Humility	175	1.00	4.00	2.7814	0.56532
Agreeableness	169	1.50	3.63	2.5466	0.42384
Openness_to_Experience	176	1.50	3.75	2.6136	0.48334
Autonomy	171	1.43	7.00	5.0643	1.00505
Environment_Management	171	1.43	7.00	4.7427	0.92939
WelLbeing_Personal_Growth	171	1.00	6.86	5.3250	1.04037
Positive_Relationships	172	1.71	7.00	5.1935	1.07447
Life_Goal	167	1.71	7.00	5.4636	1.05661
Self_acceptance	177	1.43	7.00	4.8959	0.94509

The comparative analysis of the data reveals significant differences between the studied variables by gender (Table 2).

Table 2. *Results from the comparative analysis along the factor sex*

	Emotionality	**Honesty-Humility**	**Openness to Experience**
Mann-Whitney U	1969.000	2243.000	2631.500
Wilcoxon W	7855.000	7914.000	8517.500
Z	-4.350	-3.443	-2.328
Asymp. Sig. (2-tailed)	.000	.001	.020

It was found that women scored significantly higher on the Emotionality scale compared to men. They also demonstrated higher levels of Honesty, a factor that differentiates the HEXACO model from the widely used Big Five model. Gender differences were also significant regarding Openness to Experience, where women again scored higher than men in the study.

No statistically significant differences were found with regard to type of sport, level of qualification, or frequency of training.

Since the sample did not meet the assumptions for normal distribution, a nonparametric method was applied for the correlational analysis as well. Spearman's rank correlation analysis revealed moderate associations between several of the studied variables (Table 3).

The data analysis also showed the following moderate correlations between Meaning and scales of psychological well-being: Extraversion (r = .368, p < .001), Environmental Mastery (r = .340, p < .001), Positive Relations with Others (r = .353, p < .001), Purpose in Life (r = .490, p < .001), and Self-Acceptance (r = .377, p < .001). Crisis of meaning showed a negative correlation with most of the above-mentioned variables (Table 3). Sustainability from the Meaning and Purpose Scale was moderately positively correlated with Openness to Experience from the Psychological Well-being Scale (r = .301, p < .001). Security was positively correlated with Conscientiousness (r = .338, p < .001) and Honesty (r = .329, p < .001) as personality traits. Commu-

nity showed a moderate positive correlation with Extraversion (r = .377, p < .001) and Positive Relations with Others (r = .369, p<.001). Personal Growth was also positively associated with Openness to Experience (r = .312, p < .001) *and Purpose in Life* (r = .492, p < .001).

Regarding personality traits, Conscientiousness was moderately positively correlated with Autonomy (r = .341, p < .001), Environmental Mastery (r = .380, p < .001), Personal Growth from the Psychological Well-being Scale (r = .375, p < .001), and Purpose in Life (r = 0.517, p < .001). Extraversion was positively correlated with Autonomy (r = .339, p < .001), Environmental Mastery (r = .343, p < .001), Purpose in Life (r = .320, p < .001), and Self-Acceptance (r = .424, p < .001). Honesty was moderately positively correlated with Purpose in Life (r = .334, p < .001).

Table 3. *Relationships between meaning, personal traits, and psychological well-being*

	Meaning	**Crisis of meaning**	**Sustainability**	**Faith**	**Security**	**Community**	**Personal growth**	**Conscientiousness**	**Extraversion**	**Emotionality**	**Honesty**	**Agreeableness**	**Openness**	**Autonomy**	**Environment. Manage.**	**Wellbeing per. growth**	**Positive rations**	**Life goal**	**Self-acceptance**
Meaning																			
Crisis of meaning	-.380**																		
Sustainability	.618**	-.124																	
Faith	.329**	-.031	.323**																
Security	.153*	-.060	.349**	.143															
Community	.291**	-.155*	.291**	.030	.136														
Personal_ Growth	.543**	-.267**	.406**	.309**	.301**	.224**													
Conscientiousness	.238**	-.157*	.195*	.096	.338**	.055	.294**												
Extraversion	.368**	-.372**	.166*	.116	-.049	.377**	.285**	.140											
Emotionality	-.042	.110	.033	.145	.257**	.101	-.028	-.069	-.233**										
Honesty_ Humility	.089	-.108	.184*	.084	.329**	.109	.193*	.292**	-.099	.249**									
Agreeableness	-.023	.070	.079	-.053	.133	-.019	.043	.208**	-.152	-.050	.281**								
Openness_to_ Experience	.244**	.020	.301**	.126	.066	.223**	.312**	.155*	.086	.074	.243**	.224**							
Autonomy	.206**	-.254**	.079	.034	.032	.085	.173*	.341**	.339**	-.275**	.254**	-.090	.120						
Environment_ Management	.340**	-.349**	.145	.070	.142	.112	.244**	.380**	.343**	-.096	.187*	.033	.075	.544**					
Wellbeing_ Personal_ Growth	.199**	-.223**	.142	.077	-.033	.115	.375**	.397**	.141	-.117	.171*	.113	.289**	.416**	.493**				
Positive_ Relationships	.353**	-.218**	.180*	.166*	.219**	.369**	.255**	.292**	.286**	.064	.180*	.129	.233**	.395**	.571**	.379**			
Purpose in life	.490**	-.356**	.268**	.212**	.085	.240**	.492**	.517**	.320**	-.068	.334**	.088	.275**	.454**	.596**	.582**	.499**		
Self_acceptance	.377**	-.401**	.182*	.105	.188*	.143	.270**	.265**	.424**	-.183*	.132	-.034	.149*	.499**	.591**	.399**	.440**	.465**	

*Note: **Correlation is significant at the level of .001 (2-tailed). * Correlation is significant at the level of .005 (2-tailed).*

To examine whether meaning and crisis of meaning influence the components of psychological well-being, a stepwise regression analysis was conducted (Table 4). The results show that meaning enhances personal growth (β = .286, p < .001) and self-acceptance (β = .264, p = .001).

Table 4. *Results from stepwise regression analysis in regard to meaning*

	Meaning		
	β	***t***	***p*-value**
Personal growth	**.286**	-3.607	**.000**
Self-acceptance	**.264**	3.275	**.001**

The crisis of meaning affects fewer variables than meaning, namely the Honesty factor from the HEXACO personality model (Table 5). The result demonstrates that Honesty is negatively affected in cases of a crisis of meaning among the participants.

Table 5. *Results from stepwise regression analysis in regard to crisis of meaning*

	Crisis of meaning		
	β	***t***	***p*-value**
Honesty	**-.195**	-2.166	**.033**

DISCUSSION

The present study provides valuable insights into how physically active individuals experience meaning in life and reveals significant associations between meaning, personality traits, and psychological well-being. The descriptive results indicate that athletes in the study report a significantly higher sense of meaning in life compared to normative age-based data, as measured by the Meaning and Purpose Scale (MAPS; Schnell & Danbolt, 2023). The elevated score on the overall meaning scale (M = 3.66 vs. norm M = 3.09) highlights the psychological relevance of structured physical activity, particularly sport, in fostering a sense of purpose and existential coherence. These findings align with previous research emphasizing the role of meaningful engagement — such as participation in sports — in cultivating a strong life direction and self-concept (Schnell, 2009; Frankl, 1996).

The highest mean scores were found on the subscales for community (M = 3.73) and personal growth (M = 3.76), both of which exceeded age-specific norms. These results underscore the inherently social and developmental aspects of athletic involvement. In the context of team dynamics, shared goals, and consistent self-improvement, athletes likely derive a sense of connectedness and a clear path for personal development — two major sources of meaning identified in both existential and positive psychological literature (Ryff, 1989; McKnight & Kashdan, 2009). The elevated score in community further supports the notion that social integration and mutual support are essential meaning-making mechanisms, particularly in group or competitive sport environments.

In contrast, the crisis of meaning subscale showed the lowest mean score (M = 0.76), which is substantially lower than the normative value (M = 1.70). This is consistent with the expected inverse relationship between a strong sense of meaning and the experience of existential crisis. Athletes may be buffered against such crises due to the presence of structured goals, consistent feedback, and identity reinforcement associated with sport participation. This protective role of meaning echoes the findings of Park (2010) and Steger (2012), who describe meaning as a psychological resource that mitigates existential anxiety and promotes emotional resilience.

On the other hand, faith and security yielded the lowest scores. While faith was still higher than the norm (M = 2.84 vs. M = 1.22), security fell slightly below its normative value (M = 2.81 vs. M = 3.29). This finding might reflect a shift away from traditional or religious sources of meaning toward more individualized, self-constructed meaning systems, a trend commonly observed in younger or more secular populations (Schnell, 2009). In the context of sport, meaning may be more readily derived from personal achievement, social identity, and goal-oriented action than from metaphysical or religious beliefs.

An interesting result is the observed correlation between meaning and extraversion, as well as between meaning and interpersonal relationships, indicating the social nature of the experience of meaning. This is particularly valid for athletes, for whom community is a major source of meaning — supporting the concepts of Ryff (1989) and McKnight & Kashdan (2009), who argue that meaning is often socially rooted and linked to belonging and purposeful engagement.

Another important observation is the significant role of conscientiousness and purpose in life — variables that predict both athletic success and high levels of self-regulation and personal motivation (Hill & Turiano, 2014). This further confirms the assumption that meaning is connected not only to mental health but also to external manifestations of adaptability and effectiveness.

CONCLUSION

In summary, the results suggest that athletes experience a high degree of meaning in life, particularly grounded in social belonging and personal growth. This pattern may serve as a psychological asset, promoting emotional stability, self-regulation, and motivation — qualities essential to athletic performance and wellbeing. Meaning emerges not only as a reflection of internal attitudes and beliefs but also as an important self-regulatory mechanism that supports personal growth and motivation. This positions the experience of meaning as a key variable in applied sport psychology and opens possibilities for interventions focused on personal reflection, motivational direction, and mental health.

LIMITATIONS

This study has several limitations that should be taken into account when interpreting the results. The instruments used were self-report questionnaires, which rely on subjective accounts. Future research could combine self-assessment scales with behavioral measurements or interviews to provide a richer and more objective profile. The cultural context was not included in the analysis. The concept of meaning and the pathways to discovering it may vary significantly across different cultures and social contexts. The study was conducted within the Bulgarian context, and future studies should incorporate cross-cultural comparisons. Finally, despite the good psychometric properties of the tools used, some of them (e.g., the meaning scales) may require further adaptation and validation within a sports context.

REFERENCES

Allen, M. S., Greenlees, I., & Jones, M. (2013). Personality in sport: A comprehensive review. *International Review of Sport and Exercise Psychology*, *6*(1), 184–208. https://doi.org/10.1080/1750984X.2013.769614

Ashton, M. C., & Lee, K. (2009). An investigation of personality types within the HEXACO personality framework. *Journal of Individual Differences*, *30*(4), 181–187. https://doi.org/10.1027/1614-0001.30.4.181

Boyle, P. A., Buchman, A. S., Barnes, L. L., & Bennett, D. A. (2010). Effect of a purpose in life on risk of incident Alzheimer disease and mild cognitive impairment in community-dwelling older persons. *Archives of General Psychiatry*, *67*(3), 304–310. https://doi.org/10.1001/archgenpsychiatry.2009.208

Debats, D. L. (1998). Measurement of personal meaning: The psychometric properties of the life regard index. In *The human quest for meaning: A handbook of psychological research and clinical applications* (pp. 237–259). Lawrence Erlbaum Associates Publishers.

Frankl, V. E. (2014). *The Will to Meaning: Foundations and Applications of Logotherapy*. Plume.

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing wellbeing: The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, *82*(6), 1007–1022. https://doi.org/10.1037/0022-3514.82.6.1007

Hill, P. L., & Turiano, N. A. (2014). Purpose in life as a predictor of mortality across adulthood. *Psychological Science*, *25*(7), 1482–1486. https://doi.org/10.1177/0956797614531799

Hill, P. L., Turiano, N. A., Mroczek, D. K., & Burrow, A. L. (2016). The value of a purposeful life: Sense of purpose predicts greater income and net worth. *Journal of Research in Personality*, *65*, 38–42. https://doi.org/10.1016/j.jrp.2016.07.003

McKnight, P. E., & Kashdan, T. B. (2009). Purpose in life as a system that creates and sustains health and wellbeing: An integrative, testable theory. *Review of General Psychology*, *13*(3), 242–251. https://doi.org/10.1037/a0017152

Oblinger-Peters, V., Henriksen, K., & Ronkainen, N. J. (2025). Searching for meaning and purpose in elite sport: A narrative review of sport psychology literature with theoretical insights from psychology. *Psychology of Sport and Exercise*, *76*, 102725. https://doi.org/10.1016/j.psychsport.2024.102725

Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, *136*(2), 257–301. https://doi.org/10.1037/a0018301

https://www.researchgate.net/publication/230887670_The_Meaning_in_Life_Questionnaire_Assessing_the_Presence_of_and_Search_for_Meaning_in_Life

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological wellbeing. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081. https://doi.org/10.1037/0022-3514.57.6.1069

Ryff, C. D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics*, *83*(1), 10–28. https://doi.org/10.1159/000353263

Scannell, E. D., Allen, F. C. L., & Burton, J. (2002). Meaning in life and positive and negative wellbeing. *North American Journal of Psychology*, *4*(1), 93–112.

Scheier, M.F., Wrosch, C., Baum, A., et. al. (2006). The Life Engagement Test: Assessing purpose in life. *Journal of Behavioral Medicine*, *29*(3). https://doi.org/10.1007/s10865-005-9044-1

Schmid, M. J., Oblinger-Peters, V., Örencik, M., Schmid, J., Conzelmann, A., & Ronkainen, N. J. (2025). Meaning in life of elite athletes: A person-oriented study. *Psychology of Sport and Exercise*, *76*, 102730. https://doi.org/10.1016/j.psychsport.2024.102730

Schnell, T. & Danbolt, L. J. (2023). The Meaning and Purpose Scale (MAPS): development and multi-study validation of short measures of meaningfulness, crisis of meaning, and sources of

purpose. *ResearchGate*.
https://doi.org/10.1186/s40359-023-01319-8

Schnell, T. (2009). The Sources of Meaning and Meaning in Life Questionnaire (SoMe): Relations to demographics and wellbeing. *The Journal of Positive Psychology*, *4*(6), 483–499.
https://doi.org/10.1080/17439760903271074

Schnell, T., & Becker, P. (2006). Personality and meaning in life. *Personality and Individual Differences*, *41*(1), 117–129.

Steger, M. F. (2012). Experiencing meaning in life: Optimal functioning at the nexus of wellbeing, psychopathology, and spirituality. In *The human quest for meaning: Theories, research, and applications, 2nd ed* (pp. 165–184). Routledge/Taylor & Francis Group.

Zika, S., & Chamberlain, K. (1992). On the relation between meaning in life and psychological wellbeing. *British Journal of Psychology*, *83*(1), 133–145.
https://doi.org/10.1111/j.2044-8295.1992.tb02429.x

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