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PERSONALITY TRAITS OF ESPORTS PLAYERS

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Abstract: The fastest growing segment of sports is esports, or electronic sports, where players compete by playing video games. This paper presents a narrative review of the literature with the aim of systematizing the literature on personality traits of esports players. Research shows that esports players have lower levels of extraversion and agreeableness compared to athletes, which is explained by the lower social interaction in esports. Differences in agreeableness can be explained by the less structured environment in esports, where there is no developed system of clubs and coaches as in traditional sports. Compared to athletes, esports players show higher levels of neuroticism. Athletes have more self-confidence and a positive physical and emotional self-image, while esports players spend more time in the virtual world. Lower-ranked esport players in competitions had more pronounced agreeableness, extraversion, and lower openness to new experiences. In traditional sports, the results were different. Extraversion and agreeableness are correlated with high performance in traditional sports. Narcissism (Dark personality traits) had a positive effect on player success as measured by players' peak rankings potentially through better emotional regulation while playing.

Keywords: esports, personality traits, esports players

Introduction

The fastest growing segment of sports is esports, or electronic sports, where players compete by playing video games. Esports has become a global phenomenon thanks to the development of the internet, the availability of technology, especially computers and mobile phones needed to play video games. Since esports is a lucrative industry,

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investors from all over the world are trying to invest some of their capital in the rapidly expanding trend of playing video games. Definitions of esports are few and not precise enough (Bányai, Griffiths, Király, Demetrovics, 2019, Steinkuehler, 2020). Esports commonly refer to an organized and competitive approach to playing computer games. Esports are organized and global competitions where success relies on precise movements and advanced cognitive skills (Guttmann, 2004, Pedraza-Ramirez, Muscullus, Raab, Laborde, 2020). A form of sports where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams as well as the output of the esports system are mediated by human-computer interfaces. With over 3 billion video gamers worldwide (compared to less than 2 billion in 2015), esports is expanding incredibly quickly (Behnke, Gross, Kaczmarek, 2022). Even as esports becomes an increasingly global phenomenon, the scientific community still knows very little about it.

Electronic sports are played mainly on computers, consoles, or even mobile devices, where players compete, individually or in teams of usually 2-10 people, with opponents sitting on the other side of a virtual world where everything happens. The video games most associated with esports are League of Legends, Dota 2, Overwatch, CS:GO, Paladins, Smite, Fortnite, PUBG, and Call of Duty. Esports video games generally have a specific set of rules and require the development of muscle memory for many maneuvers to be performed in the game, all of which require years of intensive training/play (Himmelstein, Liu, Shapiro, 2017). Each game has its own community with specific norms, rules, aesthetics, and identities.

Esports is typically categorized as an intellectual sport. Still, it also demands reaction speed, coordination of movements and motor abilities. A collection of required skills typically hinges on the game's genre. Card games such as Hearthstone are purely intellectual. Real-Time Strategies require effective strategic thinking, high levels of automatism and fast reactions to a changing situation on the map. First-Person Shooters are mainly about motor skills and reaction regarding Player vs Player combat, though, fight strategy and solid communication in the team are also very important.

To remain competitive in a rapidly changing eSports industry an average athlete spends 5–6 hours daily on gaming, although some players can dedicate up to 12–14 hours a day playing game matches. Nonetheless, playing the game is not the sole responsibility of professional esports players. They take part in team meetings with the coach, develop new strategies, watch replays to study their opponents and to find their own weak points, communicate with the fans and press. Akin to traditional sport, esports demands not only physical abilities which can be evaluated using sensing technologies, but also particular psychological traits. A pro-player is often exposed to stressful situations, e.g. competitions with a huge number of observers, critical in-game situations and lengthy, tedious training sessions. Indeed, rapidly changing con-

text and ever new game situations imply strict requirements on decision-making within a short time period. Hence, methods from traditional sport cannot be directly adapted to esports. All these points may impact the performance, thus, it is very important to keep the athletes in a good mental condition. Lately, esports teams have begun to collaborate with psychologists to assist the players to cope with the psychological difficulties (Smith, Birch, Bright, 2019).

Since professional esports are demanding, it is essential to take care of the mental and physical health of players (Trotter, Coulter, Davis, Poulus, Polman, 2020, Trotter, Coulter, Poulus, Polman, 2021). Due to the high demands, they may experience burnout, drop out of esports, and develop health problems including pain in various parts of the body and sleep disorders (Peracchia, Curcio, 2018, DiFrancisco-Donoghue, Valentine, Schmidt, Zwibel, 2019, Smith, Birch, Bright, 2019), which are also common among traditional sports professionals (Rice et al., 2016).

Participants develop connections with people around the world through digital platforms, forming virtual teams and communities that encourage collaboration and understanding of cultural differences. These activities also promote values like teamwork and sportsmanship, which positively influence personal and social development (Dašić, Vitković, Ilijevska Kostadinović, 2024).

Games are often organized as amateur or professional national or international competitions that involve sponsors, organizers and spectators. The marketing and promotional potential of e-sports is gaining importance with the emergence of social networks and streaming platforms such as 'Twitch' (Ratković, Pećić, 2024). Video games were previously played exclusively for fun and relaxation, and the only people who watched them were friends, family and siblings. However, as time went on, the popularity and reach of video games have grown. Millions of fans now watch e-sports and cheer for their favorite teams or players.

The academic exploration of esports remains relatively limited, with available data on the subject being sparse. This study employs a descriptive-qualitative methodology. This paper presents a narrative review of the literature with the aim of systematizing the findings of previous empirical studies that have investigated on the psychological characteristics of esports players such as their personality traits, motivation and emotions. A literature search was conducted on Google Scholar, Scopus and PsycINFO databases, using the keywords: "esports", "personality traits of esports players", "HE-XACO model of personality of esport players", "Big five model of personality of esport players", "Dark personality traits of esport players". Empirical studies published between 2010 and 2024 were taken into account, which examined the personality traits of esports players. Papers (three papers) that exclusively deal with technical, physiological or sociological aspects without a psychological dimension, review papers,

diploma papers, papers that were not available in their entirety (only the abstract is available) were excluded from the review. Considering that this is a newer field of research, studies that had a small number of respondents, studies that did not measure the constructs with questionnaires, but that used interviews as a way of collecting data, were also taken into account. The found studies were analyzed qualitatively with a focus on identifying dominant psychological traits of esports players.

Big five personality traits of esports players

Personality represents a comprehensive whole, the integration of an individual's traits into a relatively stable and unified organization that determines his or her activity in a changing environment, and is shaped and changed under the influence of that activity (Petz, 2005). There are many theories that explain the structure and development of personality in different ways, but there is agreement that personality significantly influences human behavior.

In the last two decades of the twentieth century, the "Big Five" model has developed into a dominant theoretical and research paradigm when it comes to the structure of basic personality traits (Costa & McCrae, 2008; Goldberg, 1990; John, Naumann, & Soto, 2008). According to this model, personality is structured by five basic, mutually orthogonal traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness. These five traits have been shown to be successful predictors of various types of behavior (Soto & Jackson, 2013)

Athletes have been extensively studied in contrast to esports players (Piepiora, 2020, Allen, Laborde, 2014). Athletes are less neurotic, more open to new experiences, more extroverted and more conscientious than non-athletes (Eagleton, McKelvie, De Man, 2007). In study (Zubić, Milenković, 2024) which examined personality trait differences between athletes and non-athletes according to the HEXACO model, results showed that athletes have higher extraversion and conscientiousness, and lower emotionality and openness to new experiences than non-athletes. There are no statistically significant differences between athletes and non-athletes in honesty and agreeableness. Athletes also differ from each other, for example, team athletes tend to be more open to new experiences and less conscientious than individual athletes (Nia, Besharat, 2010, Allen, Greenlees, Jones, 2011). Compared to athletes who engage in low-risk sports, extreme sports participants are less hardworking and more extroverted (Rhea, Martin, 2010, Castanier, Le Scanff, Woodman, 2010). Martial arts athletes are less neurotic than team sports athletes (Bojanović, Nedeljković, Šakan, Mitić, Milovanović, Drid, 2019). Compared to athletes at lower levels of competition, elite athletes are less neurotic and more conscientious (Piepiora, 2021a, 2021b). Research examining

differences between esports players and non-players has found that esports players were less neurotic and conscientious than non-players (Braun, Stopfer, Müller, Beutel, Egloff, 2016, Kim, Nam, Keum, 2022).

Research (Behnke, Stefanczyk, Zurek, Sorokowski, 2023) found differences in personality traits between esports players and athletes. It was collected cross-sectional data on esports players' (n = 416) and athletes' (n = 452) personalities and performance characteristics. It was assess personality with the Ten Item Personality Inventory (TIPI-PL) personality questionnaire based on the Big Five personality model. The results showed that esports players were less extroverted and conscientious than athletes. The less social engagement in esports compared to standard sports may account for the differences in extroversion. People who prefer to interact with others indirectly may be more open to participating in esports. In addition, extroverted individuals spend less time sitting at home in their free time and are more likely to be physically active (Ebstrup, Aadahl, Eplov, Pisinger, Jorgensen, 2013, Stephan, Boiché, Canada, Terracciano, 2014). Differences in conscientiousness may be a consequence of engaging in a specific form of activity (Allen, Laborde, 2014). Especially at the beginning of an esports career, esports is a less planned and structured activity than sports. Traditional sports have created a network of clubs and venues where young athletes can develop their skills under the guidance of professional coaches. This network is only just developing in esports, and the nature of esports competitions is also less time-limited. Esports athletes practice on their own and are not required to adhere to a training regimen in a club. It is also important to note that esports players engage in video games differently than regular players: they spend more time playing, are more competitive, and are motivated by developing their skills (Bányai, Griffiths, Demetrovics, Király, 2019).

A study (Šunje, Vardo, 2023) in Bosnia and Herzegovina examined the differences in personality traits between esports players and athletes. The research has been conducted on 67 examinees, 30 of whom are semi-professional or professional esports players who participate in state-level and regional-level competitions. The remaining 37 examinees are the highest-ranked athletes in Bosnia and Herzegovina. The Big Five Personality Inventory - The BFI (the Big Five Inventory) is an instrument that enables the (self) assessment of the big five personality dimensions. The results showed that esports players have less pronounced extraversion and agreeableness and higher neuroticism compared to athletes. No statistically significant differences were found on the openness dimension. In essence, extraversion is an essential component of every athlete, along with emotional stability. In esports players, these characteristics are not necessary for optimal performance, since they are at the other end of the extraversion-introversion continuum. Neuroticism in esports players may be related to their excessive use of computers and the Internet, which we know do not have very positive

consequences for any individual. Cooperativeness and conscientiousness are one component of sports that they should possess, in terms of cooperation, compromise, sacrifice in sports, as well as order and discipline, while for esports players these are not key components. An esports player may focus only on themselves, not build understanding and relationships outside the virtual world, and replace conscious efforts for order and discipline with somewhat unconscious and compulsive computer use. Also, the results did not show a statistically significant difference in cognitive and somatic anxiety between esports players and athletes, as each of them views the upcoming competition as important from their own point of view. Interestingly, there is a statistically significant difference between esports players and athletes in the dimension of self-confidence. In general, athletes have a more positive physical, emotional and social self-image, which may be associated with greater self-confidence than esports players.

Study (Matuszewski, Dobrowolski, Zawadzki, 2020) focuses on the relationship between personality traits, derived from the Big Five model, and performance in the competitive electronic sports (eSports) video game League of Legends (LoL). Data were gathered from 206 LoL players of various in-game success levels, as measured by their position within the competitive hierarchy (division) of the video game. The NEO-Five Factor Inventory (NEO-FFI) questionnaire was used to measure personality traits within the gathered sample, which was divided into two groups of higher and lower ranked players. It was found that achievements in esports are correlated with personality traits based on the Big Five model (extraversion, agreeableness, and openness to new experiences). Lower-ranked players in competitions had more pronounced agreeableness, extraversion, and lower openness to new experiences. In traditional sports, the results were different. Extraversion (Eagleton, McKelvie, de Man, 2007) and agreeableness (Nia, Besharat, 2010) are correlated with high performance in traditional sports. Esports players who spend more time practicing skills and progressing in video games have less time to interact with others, especially in the real world. Since many of them sleep less than 4 hours a day, esports players report a lack of sleep and time for social activities (Peracchia, Curcio, 2018). It may be possible that players who are highly focused on themselves during the game and do everything to "carry the game" on their own are more successful. Despite the fact that LoL is a team game, teams, and hence coplayers, change with every ranking game. This means that there is a high degree of variance in terms of team performance from match to match, which may mean that a self-centered approach to the game is a good strategy to maximize ranking in the long-term. In addition, there are differences in openness to new experiences between high-ranking players and those who are less successful. One possible explanation is that video games require adaptability and new patterns of play that

change every month. There was no difference in neuroticism or conscientiousness between high-ranking players and those who are less successful.

In study (Pereira, da Silva Nunes, Pires, 2022), it was investigated the association between measurements of Big Five Factor and coping strategies in professional League of Legends (LOL) players. 138 people participated, aged between 16 and 37 years ($M=21.24$, $SD=3.77$), who answered the Big Five Inventory and Athletic Coping Skills Inventory-28. Correlations were made between the scores of these instruments, and regression of coping skills in personality factors. Neuroticism and Conscientiousness are associated with the use of coping skills, which suggests that personality is a relevant variable in understanding the use of adaptative strategies to deal with adversity while playing LOL.

HEXACO personality traits of esports players

The best-known operationalization of this revised lexical model of personality is the HEXACO structure (Ashton, Lee, & De Vries, 2014; Lee & Ashton, 2012; Lee & Ashton, 2008), whose name is an acronym for the dimensions represented in it: honesty (H-Honesty/Humility), emotionality (E-Emotionality), extraversion (X-eXtraversion), agreeableness (A-Agreeableness), conscientiousness (C-Conscientiousness) and Openness (O-Openness).

The study (Singh, Sharma, Arya, 2022), intended to explore the psychosocial profile of Esports players and traditional sports players. The study sample consisted of 140 participants (73 esports & 67 sports). In this cross-sectional study, we recruited participants from Esports cafes, Youth Sports centers & Universities and collected their sociodemographic variables and psychosocial profile with Mini-International Personality Pool 6, SelfConcept Clarity Scale, UCLA Loneliness Scale Version 3, Satisfaction with Life Scale, and Depression, Anxiety and Stress Scale-21. No statistically significant difference was found between esports players and athletes in anxiety, stress, loneliness, life satisfaction, and depression. This study used the HEXACO personality model, the only differences between these subsamples were in the expression of honesty and openness to new experiences. Namely, it was found that esports players have a higher expression of honesty and openness to new experiences than athletes. The personality trait of openness is an indicator of the level of imaginativeness and creativity while honesty/humility relates to fairness, mutual aid and non-aggression. Individuals exhibiting higher scores on openness tend to engage in novel idea related tasks. Online games present challenges to the players where they are expected to make swift decisions and often think outside the box to proceed forward with the gameplay, thus esports tend to favor the individuals who are imaginative and creative, unlike sports

where physical traits are the most prominent aspect determining performance. Further, our study reported higher scores on honesty in esports players. Higher scores in esports players as compared to sports players tend to indicate that esports players believed in the idea of fairness, mutual aid and non-aggression. As esports require frequent social engagements and team play, this comes unsurprisingly that they tend to exhibit traits of mutual help and fairness.

This research (Abbasi, Nisar, Rehman, Ting, 2020) empirically validates the role of specific HEXACO personality factors that foster consumer engagement in electronic sports users. HEXACO 60 items and consumer video game engagement scales were used for data collection. Data were collected from esports users, with 250 valid responses. The results based on the structural model indicate that openness to experience, extraversion, agreeableness, and conscientiousness positively predict consumer engagement in esports. The research model carries the explanatory capacity for consumer engagement in esports concerning personality dimensions as indicated by the HEXACO model. It highlights the potential benefits of such research especially to marketers who could potentially employ personality modeling to develop tailored strategies to increase consumer engagement in video games.

Dark Tetrad traits and esport players

Dark personality traits measure aspects of personality that are often overlooked by the five-factor model. Dark Tetrad refer to a collection of socially aversive personality characteristics. These include Machiavellianism, narcissism, psychopathy, and sadism.

In study (Horne, Furnham, Grover, 2023) attempts to quantify this relationship of behavior and ranking, using trait Narcissism and five-factor model personality traits to measure these tendencies in behavior. Four hundred and forty-four players were recruited across paid and unpaid sampling. It was used The Narcissistic Personality Inventory-40, The Big Five Inventory 2 and measure of Peak Ranking. Narcissism had a positive effect on player success in LoL's temporary teams, as measured by players' peak rankings. No five-factor model personality trait had any significant association with peak ranking. Our results could mean that Narcissism has a minor beneficial role in emotional regulation but generally suggest that personality traits have a minor to negligible effect on long-term LoL ranking. The temporary team environments within LoL games may encourage players to ignore toxic comments and persevere, and if negative communication does escalate, it may just make a losing game a loss faster and allow players to play more games over time. As a result, the effects of positive team communication may only be useful in games that are otherwise close. However, as personality traits only predicted 2.8% of variance in LoL ranking, it is likely that

player skill and other contextual factors have a larger influence on performance. The nonsignificant effects of personality traits could be due to the superficial social environment within LoL games. Teams are only temporary in LoL, lasting just one game of typically 25–45 min. Within this period, players' communication is anonymous and only permitted through text or nonverbal signals. Therefore, differences in player communication may be minimized and more negative, narcissistic behavior may be more easily ignored by other teammates. Additionally, players may be encouraged to promote a positive social environment for the short duration of one game. Players on the same team share a common goal and experience the same consequences from their team's performance. Therefore, players may still be incentivized to facilitate a positive social environment within games and coordinate with their teammates. Equally, teammates may also tolerate antisocial behavior of their teammates that may arise from narcissistic traits for the duration of the game to maximize their own chances of winning. In this way, the performance effects of personality traits relating to social behavior on social behavior within LoL games, such as Extraversion and Agreeableness, may be minimized.

Conclusions

Esports is growing exponentially year after year, and players require psychological skills very similar to those required of traditional athletes.

This paper presents a narrative review of the literature with the aim of systematizing the literature on personality traits of esports players. Research shows that esports players have lower levels of extraversion and agreeableness and higher levels of neuroticism compared to athletes. Lower-ranked esport players in competitions had more pronounced agreeableness, extraversion, and lower openness to new experiences. In traditional sports, the results were different. Extraversion and agreeableness are correlated with high performance in traditional sports. Narcissism had a positive effect on player success as measured by players' peak rankings potentially through better emotional regulation while playing.

Previous research on the personality of esports players faces a number of methodological and theoretical limitations that reduce the reliability and generalizability of the findings. First, most studies use small sample sizes, often limited to specific countries, genders, or specific games, which reduces the representativeness and applicability of conclusions to the wider population of esports players. Also, research is mostly transversal, which makes it difficult to monitor personality changes over time and assess cause-and-effect relationships. In many cases, only self-reports through questionnaires are used, without triangulation of data by other methods (eg interviews, observations

or behavioral data), which may lead to subjective biases. In addition, the distinction between amateur and professional players is often not made, and differences in video game genres that can significantly shape the psychological profile of players are overlooked. The lack of a theoretical framework that is specifically adapted to the digital context is also an obstacle to the interpretation of the results. Finally, many studies ignore the broader social and cultural context of esports, including the influence of online communities, streaming, and digital audiences, which further limits understanding of the complex dynamics between individuals and the environment in which esports players operate.

Future directions of esports personality research should be directed towards a deeper understanding of the psychological mechanisms that contribute to their success, adaptation and well-being in a unique digital context. First, longitudinal follow-up of esports athletes is recommended to determine whether personality changes over the course of a career as a consequence of intense practice and competition. Also, it is important to investigate how specific games (eg, team vs. solo, strategy vs. shooter) shape the psychological profiles of players. It is necessary to pay attention to the differences between amateurs and professionals, because their lifestyle, motivation and pressure differ significantly. Additionally, research should include qualitative methods (eg interviews) in order to understand the inner experiences of esports players - their perception of identity, stress, self-confidence and attitude towards the audience. An interdisciplinary approach, including neuropsychology, sociology, and media studies, could deepen insights into the connection between the digital environment and personality development. Special attention should also be paid to the influence of digital culture, social networks and virtual interaction on the emotional stability and social connection of esports players. Finally, it would be useful to examine personality differences between esports players of different cultures and genders, in order to create a comprehensive and culturally sensitive model of personality in esports. These directions can contribute to better support for the esports community through the development of educational and mental health interventions adapted to their specific needs.

In light of the important psychological factors involved in esports, sports psychologists should play an important role in esports clubs. For example, it would be desirable for sports psychologists to train players in teamwork skills, communication skills, motivation-enhancing techniques, emotion management techniques, skills necessary for a successful professional sports career. It would be important for psychologists to include preventive treatments in their work with esports players to avoid potential negative health effects due to intensive computer and joystick use (e.g. sleep disorders, neck and back pain) (Difrancisco-Donoghue, Balentine, Schmidt, Zwibel, 2019, Pereira, Brito, Figueiredo, Verhagen, 2019). In short, every esports team should include a psychologist as a key member.

References

1. Abbasi, A., Nisar, S., Rehman, U., Ting, D. (2020). Impact of HEXACO Personality Factors on Consumer Video Game Engagement: A Study on eSports, *Frontiers in Psychology*, 11, <https://doi.org/10.3389/fpsyg.2020.01831>
2. Allen, M., Greenlees, I., Jones, M. (2011). An investigation of the five-factor model of personality and coping behaviour in sport, *Journal of Sport Scicience*, 29, 841–850 DOI: 10.1080/02640414.2011.565064
3. Allen, M., Laborde S. (2014). The role of personality in sport and physical activity, *Current Direction In Psychology Science*, 23(6), 460–465 DOI: 10.1177/0963721414550705
4. Ashton, M., Lee, K., De Vries, R. (2014). The HEXACO Honesty-Humility, Agreeableness, and Emotionality Factors: A Review of Research and Theory, *Personality and Social Psychology Review*, 18(2) 139–152.
5. Bányai, F., Griffiths, M., Demetrovics, Z., Király, O. (2019) The mediating effect of motivations between psychiatric distress and gaming disorder among esport gamers and recreational gamers, *Comprehensive Psychiatry*, 94 DOI: 10.1016/j.comppsych.2019.152117
6. Bányai, F., Griffiths, M., Király, O, Demetrovics, Z. (2019). The psychology of esports: A systematic literature review, *Journal of Gambling studies* ,35(2), pp. 351–365 DOI: 10.1007/s10899-018-9763-1
7. Behnke, M., Gross, J., Kaczmarek, D. (2022). The role of emotions in esports performance, *Emotion*, 22(5), 1059–1070 DOI: 10.1037/emo0000903
8. Behnke, M., Stefanczyk, M., Zurek, G., Sorokowski, P. (2023). Esports Players Are Less Extroverted and Conscientious than Athletes, *Cyberpsychology Behavior and Social Networking*, 26(1), pp. 50–56. DOI: 10.1089/cyber.2022.0067
9. Bojanić, Ž., Nedeljković, J., Šakan, D., Mitić, P., Milovanović, I., Drid, P. (2019). Personality traits and self-esteem in combat and team sports, *Frontier Psychology*, 10, <https://doi.org/10.3389/fpsyg.2019.02280>
10. Braun, B., Stopfer, J., Müller, K., Beutel, M., Egloff, B. (2016). Personality and video gaming: Comparing regular gamers, non-gamers, and gaming addicts and differentiating between game genres. *Computers in Human Behavior*, 55, 406–412 DOI: 10.1016/j.chb.2015.09.041
11. Castanier, C., Le Scanff, C., Woodman, T. (2010). Who takes risks in high-risk sports? A typological personality approach, *Res Q Exercise Sport*, 81(4) DOI: 10.1080/02701367.2010.10599709

12. Costa, P., McCrae, R. (2008). The revised neo personality inventory (NEOPI- R), Eds.: G. J Boyle., G. Matthews, D. H. Saklofske, The SAGE handbook of personality theory and assessment. Vol. 2: Personality measurement and testing, (179–198), Thousand Oaks, CA: Sage.
13. Dašić, D., Vitković, B., Ilijevska Kostadinović, A. (2024). The Influence of E-Sports on Economy Education and Cultural Communication, International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 12(3), 647-655. DOI: 10.23947/2334-8496-2024-12-3-647-655
14. Difrancisco-Donoghue, J., Balentine, J., Schmidt, G., Zwibel, H. (2019). Managing the health of the eSport athlete: An integrated health management model, BMJ Open Sport and Exercise Medicine, 5(1) DOI: 10.1136/bmjssem-2018-000467
15. Eagleton, J., McKelvie, S., de Man, A. (2007). Extraversion and neuroticism in team sport participants, individual sport participants, and nonparticipants, Perceptual and Motor Skills, 105(1), 265–275. DOI: 10.2466/pms.105.1.265-275
16. Ebstrup, J., Aadahl, M., Eplov, L., Pisinger, C., Jorgensen, T. (2013). Cross-sectional associations between the five factor personality traits and leisure-time sitting-time: The effect of general self-efficacy, Journal of Physical Activity and Health, 10, 572–580, DOI: 10.1123/jpah.10.4.572
17. Goldberg, L.R. (1990). An alternative “Description of Personality”: The Big-Five factor structure. Journal Personality and Social Psychology, 59(6), 1216–1229.
18. Guttmann, A. (2004). From Ritual to Record: The Nature of Modern Sports, New York: Columbia University Press
19. Himmelstein, D., Liu, Y., Shapiro, J. L. (2017). An exploration of mental skills among competitive League of Legend players, International Journal of Gaming and Computer-Mediated Simulations, 9(2), pp. 1-21. DOI: 10.4018/IJGCMS.2017040101
20. Horne, G., Furnham, A., Grover, S. (2023). Narcissism, Big Five Personality Traits, and Performance in Temporary Teams: An Investigation of League of Legends, Journal of Electronic Gaming and Esports, 1 (1), DOI: <https://doi.org/10.1123/jege.2022-0022>
21. John, O., Naumann, L., Soto, C. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues, Ed.: O. P. John, R. W. Robins, L. A. Pervin, Handbook of personality: Theory and research, (114–158), New York City, The Guilford Press.
22. Kim, D., Nam, J., Keum, C. (2022). Adolescent Internet gaming addiction and personality characteristics by game genre, PLoS One, 17(2) DOI: 10.1371/journal.pone.0263645

23. Lee, K., Ashton, M. (2008). HEXACO personality factors in the indigenous personality lexicons of English and 11 other languages, *Journal of personality*, 76(5), 1001-1054.
24. Lee, K., Ashton, M. (2012). Getting mad and getting even: Agreeableness and Honesty-Humility as predictors of revenge intentions, *Personality and Individual Differences*, 52(5), 596–600.
25. Lee, K., & Ashton, M.C. (2005). Psychopathy, Machiavellianism, and Narcissism in the five-factor model and the HEXACO model of personality structure. *Personality and Individual Differences*, 38(7), 1571–1582. <https://doi.org/10.1016/j.paid.2004.09.016>
26. Matuszewski, P., Dobrowolski, P., Zawadzki, B. (2020). The Association Between Personality Traits and eSports Performance, *Frontiere Psychology*, 11, 1490, <https://doi.org/10.3389/fpsyg.2020.01490>
27. Nia, M., Besharat, M. (2010). Comparison of athletes' personality characteristics in individual and team sports. *Procedia Social and Behavioral science*, 5 DOI: 10.1016/j.sbspro.2010.07.189
28. Pedraza-Ramirez, I., Musculus, L., Raab, M., Laborde, S. (2020). Setting the scientific stage for esports psychology: A systematic review, *International Review of Sport and Exercise Psychology*, 1 (1) DOI: 10.1080/1750984X.2020.1723122
29. Peracchia, S., Curcio, G. (2018). Exposure to video games: Effects on sleep and on post-sleep cognitive abilities. A sistematic review of experimental evidences, *Sleep Science*, 11(4), 302 doi: 10.5935/1984-0063.20180046
30. Pereira, A. M., Brito, J., Figueiredo, P., Verhagen, E. (2019). Virtual sports deserve real sports medical attention, *BMJ Open Sport and Exercise Medicine*, 5(1), 1-4. DOI: 10.1136/bmjsem-2019-000606
31. Pereira, R., da Silva Nunes, S., Pires, G. (2022). Personality and Coping in League of Legends Pro Players, *Revista Avaliação Psicológica*, 21(1), 25-33, DOI:10.15689/ap.2022.2101.16268.03
32. Petz, B. (2005). Психологијски речник. Јастребарско: Наклада Слап.
33. Piepiora, P. (2020) A review of personality research in sport, *Pedagogy and Psychology of Sport*, 6(4), 64–83, DOI:10.12775/PPS.2020.06.04.007
34. Piepiora, P. (2021a). Assessment of personality traits influencing the performance of men in team sports in terms of the big five. *Front Psychology*, 12, 23 DOI: 10.3389/fpsyg.2021.679724
35. Piepiora, P. (2021b). Personality profile of individual sports champions. *Brain Behavior*, 11(6) DOI: 10.1002/brb3.2145

36. Ratković, M., Pećić, M. (2024). Marketing potential of the e-sports market in Serbia, *Ekonomski signali*, 2024, 19(1), 123-142, DOI: 10.5937/ekonsig2401123R
37. Rhea, D., Martin S. (2010). Personality trait differences of traditional sport athletes, bullriders, and other alternative sport athletes, *International Journal of Sport Science and Coaching*, 5(1) DOI:10.1260/1747-9541.5.1.75
38. Rice, S., Purcell, R., De Silva, S., Mawren, D., McGorry, P., Parker, A. (2016) The mental health of elite athletes: A narrative systematic review, *Sports Medicine*, 46(9), 1333–1353 DOI: 10.1007/s40279-016-0492-2
39. Singh, P., Sharma, M., Arya, S. (2022). Esports and Traditional sports players: An exploration of psychosocial profile, *Research square*, 1 DOI:10.21203/rs.3.rs-1907986/v1
40. Smith, M., Birch, D., Bright, D. (2019). Identifying stressors and coping strategies of elite esports competitors, *International Journal of Gaming and Computer-Mediated stimulations*, 11 (2) DOI:10.4018/IJGCM.2019040102
41. Soto, C., Jackson, J. (2013). Five-factor model of personality, Ed.: D. S. Dunn, *Oxford Bibliographies in Psychology*, New York, NY: Oxford University Press.
42. Steinkuehler, C. (2020). Esports research: Critical, empirical, and historical studies of competitive videogame play, *Games and Culture*, 15(1), 3–8, DOI:10.1177/1555412019836855
43. Stephan, Y., Boiché, J., Canada, B., Terracciano, A. (2014). Association of personality with physical, social, and mental activities across the lifespan: Findings from US and French samples, *British Journal of Psychology*, 105, 564–580 DOI: 10.1111/bjop.12056
44. Šunje, H., Vardo, E. (2023). Examination of Differences in Pre-Competition Anxiety and Big Five Personality Traits in Esport Players and Athletes, *Društvene i humanističke studije*, 1 (22), 545-566 DOI:10.51558/2490-3647.2023.8.1.545
45. Trotter, M., Coulter, T., Davis, P., Poulus, D., Polman, R. (2020). The association between Esports participation, health and physical activity behaviour, *International Journal of Environmental Research Public Health*, 17(19) DOI: 10.3390/ijerph17197329
46. Trotter, M., Coulter, T., Poulus, D., Polman, R. (2021). Social support, self-regulation, and psychological skill use in E-athletes, *Frontier Psychology*,12, <https://doi.org/10.3389/fpsyg.2021.722030>
47. Zubić, I., Milenković, D. (2024). Differences in personality traits between athletes and non-athletes In: Dašić, D. (ed) Sporticopedia SMB2024, 2 (1), 87-98, DOI: <https://doi.org/10.58984/smbic240201087z>