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How passion and personality impact the ranking of League of Legends players

Como paixão e personalidade impactam no ranking de jogadores da League of Legends

Álysson Oliveira Pacheco[1], Sílvio José Lemos Vasconcellos[1]

[1] Universidade Federal de Santa Maria, Departamento de Psicologia, Programa de Pós-Graduação em Psicologia. Santa Maria, RS, Brasil. Correspondence to: S. J. L. VASCONCELLOS. E-mail: <silviojlvasco@hotmail.com>.

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Abstract

Objective
The present study aims to identify how personality factors and passion for the act of playing impact the improvement or worsening of performance in the League of Legends players.

Method
The survey included 335 players, over 18 years old, who answered an online questionnaire containing questions about player profile, as well as the Reduced Personality Markers (MR-25) and Passion for the Activity Scale. Correlational analysis and multiple linear regression analysis were used in the study.

Results
The results of the correlations indicated positive associations between passion criteria, harmonious passion, conscientiousness, and socialization with performance, and negative associations with neuroticism between seasons 8 and 10.

Conclusion
The multiple linear regression analysis resulted in the construction of a model capable of explaining 22.6% of the variance in performance between seasons, and that consolidated socialization and neuroticism as important elements for performance, as well as passion for the game.

Keywords: Passion; Personality; Sports psychology; Video games.

Resumo

Objetivo
A presente pesquisa tem como objetivo identificar como os fatores de personalidade e a paixão pelo ato de jogar impactam na melhora ou piora do desempenho em jogadores de League of Legends.

Método
Participaram da pesquisa 335 jogadores, maiores de 18 anos, que responderam a um questionário online contendo perguntas relativas ao perfil do jogador, além dos instrumentos Marcadores

Reduzidos de Personalidade (MR-25) e Escala de Paixão pela atividade. Para a análise dos resultados, utilizou-se análises correlacionais e regressão linear múltipla.

Resultados

Os resultados das correlações indicaram associações positivas entre critério de paixão, paixão harmoniosa, conscienciosidade e socialização com desempenho e negativa deste com neuroticismo entre as temporadas 8 e 10.

Conclusão

A análise de regressão linear múltipla resultou na construção de um modelo capaz de explicar 22,6% da variância no desempenho entre temporadas e que consolidou socialização e neuroticismo como elementos importantes para o desempenho, assim como a paixão pelo jogo.

Palavras-chave: *Passion; Personalidade; Psicologia do esporte; Jogos de vídeo.*

Discussions about the impacts of video games on both the personal and social spheres of individuals are quite common. Many studies involving video games have focused on the investigation of their negative effects, especially when related to violent games, while the positive effects remain relatively unexplored (Jones et al., 2014). Additionally, games in the Multiplayer Online Battle Arena (MOBA) genre, a group to which League of Legends belongs and which is currently the most popular, still do not have support of the scientific literature compatible with their importance and scope in terms of number of players and commercial impact (Bertran & Chamarro, 2016). Thus, this research aims to investigate how passion and personality impact the ranking performance of the League of Legends players in Brazil.

League of Legends is a real-time strategy game in the Multiplayer Online Battle Arena (MOBA) genre. At their core, MOBA games consist of two teams of five players competing against each other, with each player controlling a single character (Mora-Cantallops & Sicilia, 2018b). In each League of Legends match, two teams face off on a map called Summoner's Rift. The objective is to destroy the enemy base called Nexus. To achieve this goal, the five players on each team, usually unknown in the most popular ranked mode, interact with the goal of optimizing resources (gold), building advantages over the opponent's mistakes and destroying structures, such as towers (which act as a line of defense for the enemy base) and eliminating neutral monsters that reward those who eliminated them with different benefits (Mora-Cantallops & Sicilia, 2018c).

League of Legends is a game that focuses heavily on cooperation and teamwork (Bertran & Chamarro, 2016). In order to achieve victory, each player must perform their individual role well and there must be good teamwork among the team members, as players are interdependent in order to perform their particular task well. In addition, each player can choose a champion (character) from a universe of more than 140 – according to the champions section on the League of Legends website (https://www.leagueoflegends.com/en-us/champions/) – with each champion displaying 4 unique abilities, resulting in a very broad combination of strategy possibilities to achieve the final objective.

The game has a ranking system that classifies each player individually into different Leagues or rankings. The possible classifications, in ascending order of performance or presumed skill, are: unranked, which includes those who do not play competitively; Iron, Bronze, Silver, Gold, Platinum, Diamond, Master, Grandmaster and Challenger, the latter being considered the best players in the region. At the end of each match, the system itself evaluates and classifies the player's performance individually and awards a score in the event of a victory (the so-called league points or LP) or subtracts them in the event of defeats, which allows the players to advance or regress to the different levels (Mora-Cantallops & Sicilia, 2018a; Pereira, 2018).

In order to ensure fair competition, the game's creators promote a matchmaking system that puts players of similar skill levels against each other (Sapienza et al., 2018). In other words, Platinum League players will not face players ranked in, for example, the Master or Silver Leagues in ranked matches. Thus, in order to sustain progression in the Leagues, which is usually the players' objective who dedicate themselves to ranked matches, the player must constantly evolve in terms of skill level. This requirement arises from the fact that a player who is positioned in a League, which represents their current skill level, will tend to have a winning percentage close to 50%. When their win rate is below 50%, they tend to move down to lower leagues (where they will face less skilled players) until you reach a balance point, i.e., a win rate per number of matches close to 50% (which indicates that the position you are currently occupying represents your skill level in the game). The opposite happens when the ratio is positive. You tend to move up in the leagues until you find players with similar skill levels, resulting in a win rate of around 50%. In this way, the ranking system in the leagues ends up being a great tool for measuring players' skills.

In traditional sports, a lot of research has been conducted in an attempt to understand the factors that influence performance. However, in electronic sports or "e-sports", research is still in its infancy, despite its great popularity (Bertran & Chamarro, 2016). Among these studies, Bertran and Chamarro (2016) attempted to understand the influence of passion on both performance and abusive use (playing as a way to escape reality and other negative consequences) in the game League of Legends. To address the implications of passion on performance, the authors used as a reference the work of Vallerand et al. (2003), creators of the concept of Dualistic Model of Passion, who defined passion as "a strong tendency to perform an activity that pleases the individual, seems important to him or her, and in which he or she invests time and energy" (Bertran & Chamarro, 2016, p. 29).

For an activity to represent a passion, according to Vallerand et al. (2003), it has to be important, in other words, something that people enjoy and spend time on regularly. The authors define two types of passion, Harmonious Passion (HP) and Obsessive Passion (OP), which are distinguished by the way in which the passionate activity is internalized into people's identity. Passions are internalized into the identity as central or defining characteristics of the self, which results in a self-description that encompasses the activity. For example, many people have a passion for running or swimming. They do not simply run or swim; they are runners or swimmers (Vallerand et al., 2003).

However, there is a difference in how the activity is internalized that allows the distinction between the two types of passion. In HP there is an autonomous internalization of the activity into the person's identity. That is, the individual freely chose to engage in the activity without any other contingency or coercion. Such internalization causes a motivation for the activity in which it is seen as important, but it does not displace other activities or occupy an oversized role in the identity. Thus, such involvement is in harmony with other aspects of the individual's life (Vallerand et al., 2003; Vallerand et al., 2006).

In OP, on the other hand, there is a "controlling internalization". Since internalization originates from interpersonal or intrapersonal pressure resulting from needs such as social acceptance, self-esteem or even the excitement of the activity itself, it becomes uncontrollable. Although individuals enjoy the activity, they feel compelled to engage in it because of these internal contingencies. The activity may end up being beyond the person's control and become oversized, harming other activities and areas of the individual's life (Vallerand et al., 2003; Vallerand et al., 2006).

In summary, both types of passion can have consequences resulting from the practice of the activity. However, in HP there are more positive and adaptive consequences, while in OP there

is a tendency to have fewer positive effects and, sometimes, maladaptive consequences. In HP, because it provides greater quality in engagement with the activity, there is a tendency to promote higher levels of self-growth. People with obsessive passion, on the other hand, can often feel a sense of insecurity and threat to the self when practicing a passionate activity, due to the nature of internalization. For example, people with OP may perceive damage to their self-esteem when their performance in the passionate activity is poor, as well as experience negative feelings, such as shame or guilt. The reactive style leads them to see failures as threats and not as opportunities for learning (Vallerand, 2015).

Still regarding the two types of passion, Bertran and Chamarro (2016) highlight that in HP the subject may abandon the activity if he/she understands that it is harmful to him/her. In OP, on the other hand, engagement in the activity becomes more rigid and the person tends to maintain the activity even in the absence of positive feelings, which may even result in a deterioration of interpersonal relationships or in the failure to fulfill work obligations.

Vallerand (2015), regarding the Dualistic Model of Passion, also defines that HP and OP are part of a continuum. The internalization of passionate activity is rarely completely autonomous or controlled. Thus, it is possible for both types of passion to coexist in a person, from the moment it is defined that the activity is a passion. In other words, one may experience similar levels of Harmonious Passion and Obsessive Passion for an activity, as if one were in the middle of the continuum, which would define the mixed type, while one of the passions may also predominate over the other (Vallerand, 2015). Thus, it is possible to consider the existence of four possibilities, regarding the passion for the activity that a subject may experience: (a) harmonious passion; (b) obsessive passion; (c) mixed passion (similar levels of OP and HP); and; (d) absence of passion. However, Vallerand (2015) highlights that passion is not an immutable and definitive construct, and it is therefore possible to change from HP to OP, or vice versa, depending on the context or over time.

Regarding the relationship between performance and type of passion, Bertran and Chamarro (2016) hypothesized that OP would be positively related to abusive use of the game League of Legends and performance while HP would be negatively related to abusive use, but positively related to performance. The results of the survey partially confirmed the hypotheses. Players who scored higher in OP presented a higher level of abusive use and better performance, while individuals who were characterized by presenting harmonious passion type had a lower level of negative consequences, but no relationship with performance. Thus, the authors concluded that OP appears as a predictor of maladaptive play, while HP can be considered as a protection against the negative consequences of playing League of Legends.

Regarding the explanation of the results found between passion and performance, Bertran and Chamarro (2016) state that the League of Legends ranking stimulates the purpose of achieving social recognition within the game. Therefore, it should be a primary objective for players with a prevalence of obsessive passion, as social desirability is one of the causes of non-autonomous internalization due to the need to demonstrate competence (Bertran & Chamarro, 2016).

Vallerand et al. (2008) attempted to test the hypothesis derived from the Dualistic Model of Passion regarding the supposed predictive factor of both HP and OP for performance. The research developed involved two distinct studies: the first with high school basketball players, seeking to understand the predictive character of the two types of passion for performance; and the second with water polo and synchronized swimming athletes that replicated study 1, but also investigating the relationship of the two types of passion with subjective well-being and the type of approach in relation to goals.

Vallerand et al. (2008) suggest that in order to achieve high levels of performance in an activity, an active learning process is necessary, the specific objective of which is to improve skills. Among the various works cited that support this hypothesis is the research carried out by Helsen et al. (1998), which found a positive and linear relationship between the accumulation of deliberate practice, an active, highly structured training process aimed at improving skills, and the level of soccer players at state, national and international levels. Since Vallerand et al. (2008) consider passion to be a force that drives the individual to greater deliberate practice, they suggest that passion is essential to achieve high-level performance.

Regarding the passion models, both types of passion will lead to greater deliberate practice, which will consequently affect performance. However, the way in which this deliberate practice occurs tends to be different depending on the type of passion. In HP, it is assumed that there is a coherent process focused on achieving specific objectives characterized by adaptive activities that promote mastery and individual development (Vallerand et al., 2008). On the other hand, in OP, a tendency towards a more conflictive process is assumed, where adaptive/functional strategies would coexist with maladaptive/dysfunctional ones. While HP predicts the use of strategies with the objective of achieving mastery (the evolution of skills for that activity), in OP there may be the adoption of three types of approaches (focused on the search for mastery, focused on performance/results by comparing oneself with others, and adoption of avoidant strategies, due to the fear of failure in the comparative process with other individuals). Thus, the authors suggest that of the three possibilities, only the focus on achieving mastery promotes greater deliberate practice (structured training with the objective of improving skills) and, consequently, improves performance. Therefore, HP would tend to predict better performance, while OP would not necessarily (Vallerand et al., 2008). The results found were consistent with the model created. There was a positive correlation between both types of passion and deliberate practice and performance. Regarding study 2, the research concluded that HP actually predicts a more adaptive and functional process than OP. HP was a predictor only of the approach focused on the pursuit of mastery, while OP was a predictor of the three types of approach, including the performance-avoidant approach that showed a negative correlation with performance. Furthermore, HP was positively associated with subjective well-being while OP was not.

Vallerand et al. (2008) discussed the results of the survey, presenting two possible paths. The first, originating from a HP, promotes an attempt to achieve mastery in the activity. This focus would lead the person to seek an improvement in their skills, and deliberate practice would result in an evolution in performance. Furthermore, this path is fully compatible with subjective well-being. The second, on the other hand, originates from an OP through the activity that is more winding due to the coexistence of adaptive and maladaptive strategies. This path would, therefore, be less optimal and with less possibility of satisfaction.

Thus, based on the studies considered, the present research hypothesizes that: (1) Obsessive passion will be associated with improved performance between the 2018 and 2020 seasons – both due to the importance attributed to social recognition by individuals with high OP and possibly satisfied in the ranking classification, and due to greater deliberate practice and; (2) Harmonious passion predicts improved performance – due to greater deliberate practice, use of more adaptive strategies and search for mastery.

Derived from the lexical hypothesis, a theory that argues that important personality traits would eventually become descriptors incorporated into language, the Big Five Personality Factor Model emerged. The Big Five model has become a consensus among researchers as being an adequate representation of personality structure (Pereira, 2018).

For Hauck Filho et al. (2012), the five fundamental dimensions are: extroversion, agreeableness, conscientiousness, neuroticism and openness. Individuals with high scores in extroversion are characterized by being assertive, socially active, communicative and reinforced by positive emotions. Pereira (2018) highlights that, at the other extreme, there are quiet and withdrawn individuals. Socializing or agreeableness characterizes individuals with pro-social tendencies, such as loyalty, generosity, flexibility and altruism. On the opposite side of the continuum are individuals who demonstrate indifference, selfishness, cynicism and envy. Conscientiousness involves aspects such as competence, determination, organization, discipline, persistence and impulse control. Low scores indicate negligence, irresponsibility and careless individuals. Neuroticism or emotional instability characterizes individuals with a tendency to experience anxiety, hostility, anger, depression, impulsivity, maladaptive coping strategies and negative affects in general. A low score on neuroticism indicates that individuals are calm, content, and emotionally stable. Finally, openness encompasses aspects such as intellectual curiosity, creativity, flexibility regarding personal beliefs, and appreciation for complexity and new and unconventional experiences. On the other side of the spectrum are individuals who prefer simplicity and the ordinary (Allen et al., 2011; Hauck Filho et al., 2012; Pereira, 2018).

A study that sought to identify the associations between personality, sports participation and success as an athlete showed that high-level athletes score higher in each of the personality dimensions, except openness, when compared to "non-athletes", while lower-level athletes presented higher scores than "non-athletes" only in extroversion and agreeableness (Steca et al., 2018). In addition, conscientiousness and emotional stability (low neuroticism) differed only between "non-athletes" and high-level athletes, indicating that these dimensions are more associated with athletic success than with sports participation. Thus, regarding the association between personality and sports success, the results indicated that the most successful athletes score significantly higher in agreeableness, conscientiousness and are more emotionally stable than less successful athletes (Steca et al., 2018).

The association between personality traits and performance in electronic sports or e-sports was investigated by Matuszewski et al. (2020). These investigators used a sample of 206 League of Legends players and considered the ranking in the game itself as a measure of performance, dividing the sample into two groups: players positioned at the top of the ranking (therefore, with better performance) and players positioned at the lower strata in the ranking.

The authors point out that some research on traditional sports has shown associations between extroversion and performance, conscientiousness as a predictor of sports success, and the combination of high conscientiousness and low neuroticism as a predictor of performance, in addition to this combination characterizing athletes who compete at higher levels (nationally and internationally). They also add that two studies have indicated that superior athletes have high scores in conscientiousness and socialization, as well as low neuroticism (Matuszewski et al., 2020).

The results indicated a significant difference between players in the lower rankings and those in the higher rankings, regarding personality factors. Players within the low-performance group presented significantly higher scores in extroversion and agreeableness, as well as lower scores in openness (Matuszewski et al., 2020). Due to the cooperative nature of League of Legends, a positive association between performance and extroversion and agreeableness was expected, which was not confirmed.

For Matuszewski et al. (2020), the low scores in socialization and extroversion can be explained by the nature of the ranking measure. Although the game is cooperative, climbing

the ranking is an individual's quality. Thus, it is possible that those players who are more focused on themselves during the game are more likely to adopt an individualistic mentality, assuming full responsibility for the outcome of the match. After all, although the League of Legends is a cooperative game, in the most popular ranked mode, teammates are not chosen. Consequently, there is a high degree of variation in terms of team performance in each match. Thus, a more self-centered approach to the game, focused more on individual performance, may be a good strategy, in the long term, to reach higher positions.

Regarding the personality factor openness, which was more prominent in the group of higher-ranked players, people with higher scores in openness tend to be more flexible and creative. In the context of the League of Legends, where the game is constantly changing and requires players to be able to adapt, players with low scores in openness may have difficulty dealing with such demands and, consequently, perform worse (Matuszewski et al., 2020).

Regarding neuroticism, the study did not show significant results with performance. For Matuszewski et al. (2020), a possible explanation for the lack of associations may be that the sample was comprised of non-professional competitors. Therefore, they would not experience the same level of pressure, in relation to performance, when compared to professional athletes. Thus, perhaps low neuroticism is a crucial characteristic for professional athletes, but not so important for ranked competitors, the same being true for the lack of association involving conscientiousness (Matuszewski et al., 2020).

Thus, considering the studies cited, our study r hypothesizes that: (3) High neuroticism predicts a worsening in the ranking classification between the 2018 and 2020 seasons and; (4) openness, socialization, conscientiousness and extroversion will predict an improvement in the ranking classification.

Still regarding the game, its competitive model is organized in seasons, which usually start at the beginning of each year and end at the end of it, but the system that guides the competition, the ELO, does not restart each season. The ELO is a system used in games such as chess to mainly measure performance, classify in rankings and pair opponents. In League of Legends, it has the same function (Li et al., 2020). Therefore, it was decided to evaluate the performance of the participants between seasons 8 and 10, in order to promote results that are more consistent with the game's competitive dynamics and the ELO system. For example, a player who was a challenger in the previous season will return to that classification much more quickly than a player who leaves platinum and tries to climb to that position, as his ELO continues to be higher even with the start of a new season, since it is not reset.

Additionally, the learning curve, due to the complexity of the game, makes it extremely rare for a player with 1 year of experience, for example, to be ranked in the most advanced positions. Thus, when comparing seasons 8 and 10, it becomes possible to identify the factors that imply in the improvement or worsening of performance throughout the seasons, making the analysis of the factors that influence performance more precise, both by expanding the time frame and greater adaptation to the ELO system, and by homogenizing the sample by removing players with little experience and knowledge of the game who could impact the validity of the results.

Method

Participants

The survey included 335 League of Legends players, of both genders and over 18 years old, who were invited to participate in the survey through forums about the game, streaming channels

and social networks. The sample comprised 214 (63.9%) male players and 121 (36.1%) female players. The average age was 22.1 years (*SD* = 3.69).

Regarding the ranking in 2020, 49 (14.6%) have no ranking, 4 (1.2%) are ranked in iron, 34 (10.1%) in bronze, 55 (16.4%) in silver, 94 (28.1%) in gold, 58 (17.3%) in platinum, 38 (11.3%) in diamond and 3 (0.9%) master or above.

Instruments

A questionnaire was used to characterize the sample and identify the profile of the participants. The "summoner name" was also requested, which was used to conduct the survey on the BR.OP.GG research site (www.op.gg/), to collect statistics related to performance. The final classification in the Ranking in seasons 8 (2018) and 10 (2020) of the player on the Brazilian server was verified, in addition to statistics such as the number of games played in 2020.

The Passion Scale for the activity was also used as a 7-level Likert-type scale ranging from "I do not agree" to "I fully agree", validated for Brazil (Peixoto et al., 2019). The scale comprises 6 items relating to Harmonious Passion, 6 referring to Obsessive Passion and 5 items indicating Passion. The Brazilian scale presented good validity indicators, with 0.813 Cronbach's alpha for Harmonious Passion and 0.750 for Obsessive Passion.

Finally, to investigate personality factors, the Reduced Personality Markers (RM-25) instrument was used, which is composed of adjectives currently used to describe salient personality characteristics that refer to the Big Five Personality Factors (BFF). The instrument has 25 adjectives, divided into five subscales: extroversion, openness, neuroticism, agreeableness and conscientiousness (Machado et al., 2014). The response to the adjectives is given on a 5-point Likert-type scale, ranging from "I completely disagree" to "I completely agree". Regarding the internal consistency of the subscales, the validation results indicated a reasonable to satisfactory level. Cronbach's alphas ranged from 0.61, in the Openness subscale, to 0.83, in the Extroversion subscale (Hauck Filho et al., 2012).

Procedures

Data collection was performed by participants accessing the online questionnaire, which also included the scales used. The objectives of the investigation were explained and the participants had to agree to the terms established in the Informed Consent Form (ICF) to continue participating in the study.

The research complied with the standards and guidelines of resolution 510/2016 of the National Health Council and was approved by an Ethics Committee of the Federal University of Santa Maria under opinion number: 4,313,499.

Data Analysis

The IBM®SPSS® (version 23.0) software was used for data analysis. After tabulating the data, the normality of the dependent variable and descriptive statistics were verified. Bivariate correlation and multiple linear regression were used in data analysis. Multiple linear regression is a statistical technique that aims to describe how a metric variable behaves. In our study, it was the difference in performance measured by comparing the rankings in 2020 and 2018, checked on the BR.OP.GG website, based on a linear combination of variables called predictors, which are statistically significant (Hair et al., 2009).

According to Hair et al. (2009), the objective of multiple regression analysis is to predict changes in the dependent variable in response to changes in the independent variables. Using the multiple regression technique, each predictor variable is weighted and the weights denote the relative contribution of each predictor variable to the overall prediction and facilitate the interpretation of the influence of each variable in making the prediction (Pereira, 2018). Thus, the independent variables were added in 3 blocks: 1) player profile data, such as age, education, number of weekly hours playing and number of games in the 2020 season; 2) variables related to personality and; 3) variables concerning passion for the activity.

Regarding the input method, Backward elimination was chosen, which is a variable selection method that starts by including all variables and discards those that do not offer a significant contribution to the prediction (Hair et al., 2009). The Backward entry method was chosen due to the exploratory nature of the research and the relative incipience of studies on performance with passion or personality related to video games. Finally, for the multiple linear regression analysis, only players who have been playing since season 8, related to the year 2018, were considered, totaling 172 participants with experience of 3 seasons or more in the game.

Results

The first stage of analysis sought to investigate the bivariate correlations between the main variables of the study. Regarding performance, measured based on progression in the ranking between seasons 8 and 10, a negative correlation was found with neuroticism and a negative correlation with age and education. Positive associations were found with conscientiousness and socialization, passion criterion, harmonious passion, weekly hours and number of games in 2020. No associations were found between obsessive passion and performance. Table 1 summarizes the main correlations found.

Table 1
Summary of correlations found

Attribute	1	2	3	4	5	6	7	8	9	10	11	12
1 Ranking												
2 Passion	0.318**											
3 Harm. P.	0.174*	0.687**										
4 Obsessive P.	0.120	0.638**	0.389**									
5 Conscient.	0.188*	0.055	0.153*	-0.039								
6 Openness	0.043	0.115	0.299**	0.145	0.208**							
7 Socialization	0.240**	0.206**	0.265**	-0.050	0.421*	0.295**						
8 Neuroticism	-0.168*	0.041	-0.029	0.206**	-0.204**	-0.086	-0.171**					
9 Extroversion	0.031	-0.030	0.100	0.008	0.041	0.229**	0.291**	-0.067				
10 Games	0.332**	0.281**	0.216**	0.277**	0.126*	0.108	0.032	-0.064	0.024			
11 Week hours	0.118	0.343**	0.277**	0.358**	-0.085	0.037	-0.062	0.074	-0.018	0.218**		
12 Education	-0.155**	0.007	0.062	0.043	0.135	0.005	0.168*	-0.182*	0.026	-0.007	0.135	
13 Age	-0.247**	-0.204**	-0.125	-0.104	0.030	0.009	0.046	-0.139*	0.100	-0.126*	0.085	0.525**

Note: *Statistically significant at the 0.05 level. **Statistically significant at the 0.01 level.

The multiple linear regression analysis resulted in a statistically significant model with F (5, 166) = 10.994 p < 0.001 and which explained 22.6% (adjusted R^2 = 0.226) of the variance in performance progression. The final model, after excluding the variables that were not significant

from the backward elimination, included the variables number of games (β = 0.252; *t* = 3.584; *p* < 0.001), education (β = -0.213; *t* = -3.080; *p* < 0.01), passion criterion (β = 0.223; *t* = 3.100; *p* < 0.01) socialization (β = 0.156; *t* = 2.211; *p* < 0.05) and neuroticism (β = -0.173; *t* = -2.484 *p* < 0.05). The equation that describes the relationship between variables and performance, in turn, was as follows: performance (ranking 20 - 18) = 0.374 + 0.001 x (number of games) - 0.298x x (education) + 0.038 x (passion criterion) - 0.052 x (neuroticism) + 0.070 x (socialization). The summary of the results can be seen in the Table 2.

Table 2
Multiple Linear Regression Model Summary

Variable	*B*	SE	β	*t*	*P*
(Constant)	0.374	0.882		0.424	
Games	0.001	0.000	0.252	3.584	0.000
Education	-0.298	0.097	-0.213	-3.080	0.002
Passion	0.038	0.012	0.223	3.100	0.002
Neuroticism	-0.052	0.021	-0.173	-2.484	0.014
Socialization	0.070	0.031	0.156	2.211	0.028
Adj R^2	0.226				
F	10.99				
Durbin-Watson	1.933				

Note: Equation: performance (ranking 20 - 18) = 0.374 + 0.001 x (number of games) - 0.298 x x (education) + 0.038 x (passion criterion) - 0.052 x (neuroticism) + 0.070 x (socialization).

Thus, among the hypotheses tested, the ones that were confirmed were: (2) harmonious passion correlated with improved performance and; (3) neuroticism predicts worsening performance. Hypothesis (4), the personality factors conscientiousness, openness, agreeableness and extroversion as predictors of improved performance, was partially confirmed. Conscientiousness and agreeableness were predictors of improved ranking, while the other factors were not. Finally, hypothesis (2), obsessive passion as a predictor of improved ranking, was not confirmed.

Discussion

This study aimed to identify how personality factors and passion for playing impact the improvement or worsening of performance in the League of Legends players in Brazil. The analysis of correlations regarding performance, measured from the progression in the ranking between seasons 8 and 10, confirmed some of the hypotheses investigated. As expected, harmonious passion was positively associated with performance, while obsessive passion was not shown to be statistically significantly correlated with performance.

The results of our study support the hypotheses of Bertran and Chamarro (2016) regarding the association between harmonious passion and performance in the League of Legends, although the authors did not confirm this hypothesis in the results of their study. A possible explanation for this discrepancy may be due to the difference in method, since the authors considered the ranking classification in the season (a strategy more consistent with obsessive passion due to immediacy and focus on results) and ignored the evolution between seasons (which is more in tune with the process of seeking mastery and evolution of skills, consistent with the characteristics of players with harmonious passion).

The findings are also consistent with the results of Vallerand et al. (2008) regarding harmonious passion in the context of traditional sports. Furthermore, the fact that harmonious passion was statistically significantly correlated with improved performance over the seasons, while obsessive passion lacked this association suggests that the pursuit of mastery, the use of more adaptive strategies, the protective nature in relation to the negative consequences of the game, autonomy in relation to engagement in the activity and subjective well-being, all of which are factors associated with harmonious passion, are elements that favor performance.

Regarding personality factors associated with performance, Steca et al. (2018) had already reported in studies with traditional sports the association between high scores in conscientiousness and socialization and low scores in neuroticism with higher-level athletes, therefore with better performance. In addition, Steca et al. (2018) highlighted that conscientiousness and emotional stability were the personality factors that predicted sports success; that is, indicating that among those who practice sports, these two factors are what distinguish successful athletes. The results of the present study are completely in line with such findings. Conscientiousness and low neuroticism were presented as personality factors associated with greater success throughout the seasons, as well as socialization. Thus, success in the League of Legends appears to be predicted by the same personality factors as in traditional sports.

In the case of the League of Legends, diligence, commitment, dedication, responsibility and the pursuit of tasks or objectives, characteristics of the conscientiousness factor, are clearly beneficial elements for performance, especially if this is a passion. Such characteristics associated with the harmonious, altruistic, generous and pro-social tendencies of the socialization factor, – extremely important for a cooperative competitive game with unknown people – added to emotional stability (low neuroticism), which promotes greater ability to cope with stressful situations and positive affects, seem to be the foundations for good performance in the League of Legends, at least in the non-professional context of ranked queues. The last analysis carried out in relation to performance was the construction of a mathematical model that considered some variables of the player's profile, the personality and passion factors. Linear regression was able to explain 22.6% of the variance in performance progression between the 2018 and 2020 seasons. Although the value is not that high, it is still significant, especially when considering other factors that impact playing ability and performance and that were not part of our study, such as motor dexterity or cognitive skills or even the material conditions of the players, such as the quality of internet connection and equipment.

Among the profile variables, the number of games played in 2020 and education level remained in the model, after the exclusion of variables that were not significant. The increase in the number of games, in a coherent manner, contributes to the improvement in performance, while education level predicts a decline in performance. Education level as a predictor of a decline in performance is explained by the correlations found between age and performance. Age was negatively and statistically significantly correlated with performance over the seasons, indicating that younger players tend to show greater improvement between seasons. Younger players, logically, will tend to have a lower level of education.

Additionally, younger players tend to play more matches, according to the results of correlation analyses, which, as already mentioned, contributes to evolution; they are also more passionate about the game. It is possible, as already suggested by Pereira (2018), that older players have other obligations, which results in less time to dedicate to the game or less desire and/or need to engage in the activity, as suggested by the negative association with passion, implying a decrease in performance over the seasons.

The second block was comprised of personality variables. Neuroticism and socialization remained in the model, with the former being inversely proportional to performance over the seasons, thus indicating that the greater the neuroticism, the greater the probability of a decline in performance over the seasons, and the latter directly proportional, corroborating socialization as a factor that contributes to performance.

Thus, the absence of conscientiousness in the model, which was present in the correlational analysis, and the reaffirmation of the importance of neuroticism and socialization for performance, based on their presence in the model, suggest that interactions with the rest of the players, emotional stability and the promotion of cohesion among the team, formed by strangers, contribute more to climbing the ranking between seasons than the characteristics of the conscientious player. This does not imply that the characteristics of the conscientious player are not important for performance, but only that they are possibly less relevant than social skills and emotional stability.

Regarding the third block, related to passion, only the passion criterion remained in the model. This result suggests that passion, as a whole, is more important for performance between seasons than the distinction between types. The passion criterion had already been identified in the correlations as having a greater impact on performance than the two types of passion, as it had greater significance than harmonious passion, the only type of passion that was significant in the correlations. The absence of harmonious and obsessive passion in the model is consistent with the findings of Cid et al. (2016) who also imagined associations between these variables and performance in swimming athletes and did not find any, although another study confirmed such an association (Vallerand et al., 2008).

Thus, considering that correlations were found between harmonious passion and improved performance between seasons 8 and 10, as well as between the personality factors conscientiousness, emotional stability (low neuroticism) and socialization, and that the multiple linear regression model supported the last two personality factors, in addition to the passion criterion, it can be considered that the results of our study support the ideas regarding the association between a healthy path between the practice of an activity and performance. Since both harmonious passion and personality factors, especially emotional stability and socialization are associated with positive consequences, such as subjective well-being, positive affects and healthy and supportive relationships.

Regarding the limitations of our study, in connection with the performance and personality factors, it is important to highlight that the sample did not include professional players or even those at the absolute top (the top 200 players in the Challenger category). Thus, it is possible that the presence of players from this stratum could produce different results, such as, perhaps, an increase in the importance of conscientiousness for performance.

The personality scale used also stands out as a limitation. The choice of the Reduced Personality Markers (MR-25) facilitates data collection as it is a quick-to-apply and easy-to-understand instrument. However, it does not allow for the evaluation of the dimensions of each personality factor separately, which could provide important elements for the analysis and understanding of the phenomena studied.

Finally, playing video games has become more than just a leisure activity for many, as e-Sports or electronic sports have become more established and are transforming gamers into athletes. Therefore, due to the limitations highlighted and the gaps that still exist in scientific knowledge on the subject, it is understood that further investigations need to be produced, also expanding to other games, in order to consolidate more robust scientific knowledge on the activity.

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Contributors

Conceptualization: A. O. PACHECO. Data curation: A. O. PACHECO and S. J. L. VASCONCELLOS. Investigation: A. O. PACHECO. Methodology: A. O. PACHECO and S. J. L. VASCONCELLOS. Writing–original draft: A. O. PACHECO. Writing–review and editing: A. O. PACHECO and S. J. L. VASCONCELLOS.