**An Exploratory Investigation of Personality in CS:GO**

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**Abstract**

Personality traits can provide insightful predictions relating to thoughts, feelings and behaviour. The aim of the present study was to examine differences in personality traits across in-game rank in Counter-Strike: Global Offensive (CS:GO). A total of 95 CS:GO players from the United Kingdom and North America were classified using CS:GO in-game rank and grouped into high, moderate and low in-game rank. The NEO-Five-Factor Inventory (NEO-FFI) questionnaire was utilised to measure the Big Five Personality traits. Using one-way MANOVA with follow-up tests of Discriminant Analysis, our main finding was that high in-game rank players reported significantly lower levels of neuroticism and significantly higher levels of conscientiousness than both moderate and low in-game rank players. The present study offers preliminary evidence elucidating personality differences across in-game rank in CS:GO players.

*Keywords:* Esports, Big Five, individual differences, in-game rank, performance

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**Introduction**

Over recent years competitive esports has expanded globally, with increasing numbers of individuals watching, playing and investigating empirical concepts, and international businesses willing to invest large amounts of money to sponsor esports competitions (Jenny et al., 2017; Reitman et al., 2019). Growth in esports has guided the development of professional competitors and teams to regularly compete in professional esports leagues (Taylor, 2012). Esports can be defined as the organised play of video games to a degree that offers professional development (Pedraza-Ramirez et al., 2020). Like traditional sports, esports can be team- or individual-based (Matuszewski et al., 2020), with the distinct differentiation being the lack of physical activity.

Increased attention of the demands placed on esports players has motivated researchers to develop their understanding of the influence of psychological concepts, including stress and coping (Leis & Lautenbach, 2022; Leis et al., 2022; Poulus et al., 2020; 2021; 2022), perceptions of training effectiveness (Abbott et al., 2022), and team cohesion and group communication (Swettenham & Whitehead, 2022; Tan et al. 2022). Counter-Strike: Global Offensive (CS:GO) is an esport that places high demands on players, including a range of stressors (Smith et al., 2019), associations with mental ill health (Smith et al., 2022), tactics, precision, and teamwork (Shin et al., 2012) as well as eliciting a considerable range of emotions amongst players (Behnke et al., 2021). Indeed, recent research has highlighted the appeal of investigating CS:GO due to its capacity to log in-game events and its simplicity and predictability of core game mechanics (see Sharpe et al., 2023 for discussion). Personality is argued to underpin how an individual approaches a given situation and how they respond to specific stimuli present in the environment (Carver & Scheier, 2004). Although we concede that personality should not be used in isolation to inform player evaluations, we believe examining personality might help researchers better understand CS:GO players. Given its appeal to researchers and the growing body of evidence examining the demands placed on players, the aim of the present study is to examine differences in personality traits across in-game rank in CS:GO.

**Personality**

Personality can be defined as ‘psychological qualities that contribute to an individual's enduring and distinctive patterns of feeling, thinking and behaving’ (Pervin & Cervone, 2010, p. 8). The most adopted theory of personality is the five-factor personality theory (also referred to as the Big Five Framework; McCrae & Costa, 1996) which posits that biological bases (organism) and external influences (the environment) are the principal inputs into the system. Such biological bases are represented by deeply embedded traits that operate through characteristic adaptations which reflect the fundamental dispositions of an individual and their typical responses to environmental stimuli (Allik & McCrae, 2002). The five-factor personality theory emphasises the importance of adaptation characteristics and the need to constantly respond to the environment for an individual to achieve performance success (Alik & McCrae, 2002). The five-factor personality theory has been reported to be a robust and valid representation of personality across culture, country, and lifespan (McCrae & Terracciano, 2005; Schmitt et al., 2007; Roberts & DelVecchio, 2000).

The Big Five Personality traits consist of conscientiousness, neuroticism, extraversion, openness, and agreeableness. Despite the absence of unified definitions (Goldberg, 1993; Saucier, 1994), each personality trait can be described. Individuals high in conscientiousness are typically characterized by high levels of achievement-oriented motivation and high reliability (Digman, 1990) and have been positively associated with better preparation (Woodman et al., 2010) and effective use of coping strategies (Kaiseler et al., 2012). Individuals with high neuroticism are reported to entertain personal concerns, neglect task-relevant goals, adopt in-effective coping strategies and tend to appraise situations as stressful (Matthews et al., 2003). Research has shown that national or international level athletes have increased levels of conscientiousness and lower levels of neuroticism, compared to those at club or regional level (Allen et al., 2011). Scoring high in the openness dimension refers to a broad intellectual curiosity with a non-conforming way of thinking (Migliore, 2011), while scoring high in agreeableness is commonly referred to as altruistic and sympathetic to others (Rothmann & Coetzer, 2003), and highly extraverted individuals are sociable, assertive and typically display positive emotions (Digman, 1990). However, agreeableness, extraversion and openness appear to have limited evidence for their practical significance (Mammadiv, 2022) and may only indirectly influence behaviour (Richardson et al., 2012). Although we can use literature to inform predictions surrounding traditional sports, minimal research has been conducted to examine personality traits in esports. In the context of CS:GO, research by Smith et al. (2019) examining stress and coping in professional players has provided preliminary evidence outlining the demands placed on performers. Given the established relationships between coping and personality in traditional sports (Allen et al., 2013), further understanding is needed about the impact of personality in CS:GO players.

**Personality and Esports**

Despite the lack of research examining the impact of personality in esports, numerous researchers have explored personality in video gaming (e.g., Braun et al., 2016; Peever et al., 2012). Video gaming is viewed as a recreational activity, primarily focused on participation for enjoyment and entertainment (Ma et al., 2013), in comparison to the competitive nature of esports (Griffiths, 2017). For example, research has reported conscientiousness to be linked to sport, racing, and fighting video games, all of which are highly task oriented (Peever et al., 2012). These findings suggest that traits associated with conscientiousness including achievement-focus, discipline, and a desire to accomplish tasks are all necessary for success in this game genre (Barrick et al., 2003; Costa & McCrae, 1992a). Further work has demonstrated that participants preferring action games hold the lowest neuroticism scores, compared to those who prefer role-playing and simulation games (Braun et al., 2016). However, further understanding of personality is required within competitive gaming (i.e., esports).

To our knowledge, Matuszewski et al. (2020) is the first study to explicitly explore personality and in-game rank in League of Legends (LoL). Contrary to previous research (e.g., Allen et al., 2011; Kaiseler et al., 2012; Woodman et al., 2010), no significant differences in conscientiousness and neuroticism were found across in-game rank. Notwithstanding, high in-game rank players reported significantly less agreeableness and extraversion, yet significantly more openness than low ranked players (Matuszewski et al., 2020). One possible explanation for the conflicting conscientiousness and neuroticism findings could be the absence of the highest LoL in-game ranks (i.e., Challenger, Grandmaster) captured in their sample. To obtain two distinct groups, the authors divided participants based on their placement in LoL in-game ranks, with Master, Diamond, and Platinum being classified as high ranked, and the bottom three (Gold, Silver, and Bronze) being classified as low ranked. It is plausible that research using participants who accurately represent the highest available in-game rank may glean different findings.

While remaining the most utilised measure of player performance (e.g., Toth et al., 2021), it is important to note that in-game rank is not a valid measure of player capability, competitive prowess, or eliteness (e.g., an amateur player may hold a higher in-game rank than a professional). Instead, in-game rank is merely an indicator of player success amongst temporary teams (Kou & Gui, 2014). Specifically, temporary teams consist of a group of individuals, who may be complete strangers, who are tasked with collaborating to achieve a common goal (Mora-Cantallops & Sicilia, 2018). The following manuscript will therefore refrain from making any suggestion that specific personality traits indicate a player's competitive ability, particularly when there is limited empirical evidence to identify indicators of individual performance within any esport (Sharpe et al., 2023). Despite the need for research to underpin practice, the exploratory nature of this research is focused on explicitly advancing empirical understanding of personality in CS:GO.

**Aim**

At present, only one study has provided preliminary evidence elucidating differences of personality traits across in-game rank in esports. We sought to advance the knowledge base by examining personality traits in the esport of CS:GO and by fully representing the spectrum of in-game rank in our sample, including representation of the highest rank. Therefore, the aim of the present study was to examine differences in personality traits across in-game rank in CS:GO.

**Method**

**Participants**

 A total of 95 competitive CS:GO players (*M age* = 21, *SD* = 2.89 years, males = 85, females = 10) residing in the United Kingdom and North America participated in the study. At the time of data collection all participants were actively participating in national (e.g., ESL premiership, formerly referred to as the Electronic Sports League) or university organised competition (e.g., NUEL, formerly referred to as National University Esports League). Given the spread of in-game ranks, we separated players into three distinct categories for ease of analysis. Since the widely adopted expertise classification system proposed by Swann et al. (2015) is not suitable for esports due to its specificity to traditional sports, an independent critical friend (Reinard, 2006) was employed to allocate groups. The critical friend was selected due to his 20 years playing experience in the franchise (accumulative play time = 11,053 hours) and seven years as a professional CS:GO player competing in 37 national and one international tournaments. As such, groups included high (*n* = 55), moderate (*n* = 20) and low (*n* = 20) in-game rank. The high in-game rank group (*M age* = 19.65, *SD* = 2.41 years, males = 52, females = 3) consisted of the two highest ranks in CS:GO (Supreme Master First Class and Global Elite) which represents 3.39% of the total population of CS:GO (“CS:GO Ranks List,” 2022). Representing 10.67% of the total population of CS:GO, the moderate in-game rank group (*M age* = 21.10, *SD* = 3.09 years, males = 15, females = 5) consisted of Distinguished Master Guardian, Legendary Eagle, and Legendary Eagle Master (“CS:GO Ranks List,” 2022). The low in-game rank group (*M age* = 19.50, *SD* = 2.42 years, males = 18, females = 2) encapsulated the remaining CS:GO levels ranging from Silver I to Master Guardian Elite.

G\*Power 3.1.9.4 software (Faul et al., 2007) was used to perform an *a priori* calculation of sample size based on the formula proposed by Faul et al. (2009). This was used to justify our sample size (e.g., Knottnerus & Bouter, 2001) and maintain our ethical obligation to consider the burden of individual participation (Baccetti et al., 2005; Dattalo, 2010). With a power (1-β) of .80 and two-tailed α of .05, a minimum of 59 participants were required to detect a medium effect (*f2* = .15) for MANOVA. A medium effect was selected to ensure our *a priori* calculation provided a realistic sample size given the expert population we intended to recruit (McAbee, 2018; McAbee & Oswald, 2017). To gather the full spectrum of available CS:GO in-game ranks, the data collection period remained open beyond the minimum sample require (*n* = 59). Ethical approval was awarded by the institution research ethics committee. All participants provided informed consent through the initial section of the online questionnaire.

**Measures**

***Personality***

Personality was measured using the 60-item NEO-FFI (Costa & McCrae, 1992b; McCrae & Costa, 2007) which is a shortened version of the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1989). The NEO-FFI measures the five personality dimensions of neuroticism, extraversion, openness, agreeableness, and conscientiousness. Participants respond on a 5-point Likert scale (strongly disagree to strongly agree) on how accurate the statement is to them. For example, an item for extraversion includes “I like to be where the action is”. Two-week retest reliability has been reported to be consistently high, with all five scales ranging from 0.86-0.90 (Robins et al., 2001). Factorial validity was supported by Costa and McCrae (1992a, 1992b). Previous research by McCrae and Costa (2007) has reported acceptable Cronbach’s alphas (Neuroticism = 0.86, Extraversion = 0.79, Openness = 0.78, Agreeableness = 0.79, Conscientiousness = 0.82). Cronbach’s alphas for the current study can be seen in Table 1, supporting the internal consistency of the questionnaire (Tavakol & Dennick, 2011). Acceptable Cronbach’s alpha was considered > 0.70 (Nunnally & Bernstein, 1994).

**Procedure**

Participants were recruited using personal contacts of the authors and via social media advertising (i.e., Twitter and Reddit) between March 2021 and July 2021. Our inclusion criteria consisted of adult (18 years plus) CS:GO competitors spanning the full spectrum of in-game ranks. Given the typical demographics of CS:GO competitors (i.e., age range 18-25) and the challenges associated with recruiting professional players, we targeted university-based players. Due to the implications of COVID-19, participants were required to complete an online questionnaire using Qualtrics (<https://www.qualtrics.com/>). Participants completed the questionnaire at a time and location suitable for them, and average completion time was 12.50 minutes (*SD* = 3.62 minutes). The questionnaire involved basic demographic questions followed by more specific questions related to the individual's CS:GO rank. Following this, participants were asked to complete the NEO-FFI.

**Data Analysis**

***Assumption Testing***

 NEO-FFI items were transformed and computed into scores before analyses. Scatterplots revealed a linear relationship between personality traits and in-game rank. No multicollinearity was present, as variables were not highly correlated (*r* < 0.9; Field, 2003; see Table 2). Boxplots revealed few univariate outliers, however, none were deemed extreme cases (Field, 2013). Mahalanobis distance (*D* = 16.93) did not exceed the critical chi-square ratio at *p* < .001 with five dependent variables (20.52; Tabachnick & Field, 2013). Skewness and kurtosis ratios for all variables revealed data was normally distributed (±1.96; Field, 2009). Homogeneity of variances was assumed (Field, 2003). Homogeneity of covariance-matrices was assumed (*p* = 0.017, *p* > 0.001; Hahs-Vaughn, 2016). As all assumptions were met, the data were deemed suitable for a MANOVA and Discriminant Analysis.

***MANOVA and Discriminant Analysis***

The study involved an independent variable with three levels at a categorical measure and five dependent variables at scale measure thus, a MANOVA was performed. Variables of age, gender, and number of years playing had no significant impact on the dependent variables and were therefore excluded from the MANOVA analysis (Field, 2009). Independence of observations were assumed, as each value of the outcome variable was derived from a separate entity (Field, 2009). Partial eta-squared (*ηp*2) were classified using Cohen’s (1992) effect sizes; 0.01 = small effect, 0.06 = medium effect, and 0.26 = large effect. Follow-up Discriminant Analysis was performed to examine differences between personality traits across in-game rank (Krenn et al., 2018). Canonical *R*2 were classified using Cohen’s (1988) effect sizes, 0.02 = small effect, 0.13= medium effect, and 0.26 = large effect. The grouping variable was in-game rank (high = 0, moderate = 1, low = 2), and predictor variables were the five personality traits. Structure coefficients were used to interpret the analysis where values less than 0.3 were deemed to not have a powerful contribution and were not interpretated (Tabahcnick & Fidell, 2007). There was no missing data from the analysis. All analyses were performed using SPSS (version 24, SPSS Inc) and alpha level was set at *p* < .05.

**Results**

Descriptive statistics for all variables are displayed in Table 1 below. Cronbach’s alpha values revealed that all NEO-FFI subscales had acceptable or higher reliability (Nunnally & Bernstein, 1994). Means and standard deviations for each personality trait across in-game rank are shown in Figure 1.

INSERT TABLE 1 AND 2

INSERT FIGURE 1

MANOVA results found a statistically significant difference between players’ in-game rank and personality traits (λ = .687, *F*(10, 176) = 3.631, *ηp*2 = .171 *p* < .001), with a large effect size. Follow-up discriminant analysis discovered two significant discriminant functions (*p* = 0.05). Discriminant function one accounted for 73.4% of the explained variance (λ = .687, χ2(10) = 33.762, *p* < .0001), with a canonical *R*2 = .236 representing a large effect size. Discriminant function two accounted for 26.6% of the explained variance (λ = .899, χ2(4) = 9.549, *p* = .049), with a canonical *R*2 = .100 representing a small effect size. The two functions accounted for about 24% and 10% of the total relationship between the predictor variables and between groups, respectively. Discriminant function centroids showed discriminant function one to discriminate high (*Zelite* = -.414) from moderate (*Zhigh* = .181) and low in-game rank (*Z*l*ow*= .957), and discriminant function two to discriminate moderate (*Zhigh*= -.628) to low (*Zlow* = .273) with high in-game rank (*Zelite* = .129) in-between. The structure matrix (Table 3) shows that neuroticism and conscientiousness are the superior predictors for discriminating between high from moderate and low in-game rank players for discriminant function one. Meanwhile agreeableness, conscientiousness, and neuroticism discriminated between moderate and low in-game rank players for discriminant function two with 69.5% of players being correctly classified. Prior probabilities were as follows, high in-game rank = .579, moderate in-game rank = .211, and low in-game rank = .211. High in-game rank players were correctly classified at 96.4%, low in-game rank players also improved considerably with 45% being classified correctly, however, we saw a negligible reduction in moderate in-game rank classification with only 20% being correctly classified.

INSERT TABLE 3 HERE

**Discussion**

The aim of the present study was to examine differences in personality traits across in-game rank in CS:GO. We found personality traits of neuroticism, conscientiousness, and agreeableness significantly discriminated between in-game rank, while extraversion and openness did not discriminate between in-game rank. Personality differences across in-game rank are discussed below. We would like to highlight that caution should be taken when interpreting our findings given the exploratory nature of our study and the use of in-game rank to categorise players. Furthermore, we would like to emphasise that our study is focused on explicitly advancing empirical understanding of personality in CS:GO, and not to provide guidance for practitioners to underpin evaluations of players.

**Neuroticism and Conscientiousness**

We found that high in-game rank players reported significantly lower levels of neuroticism than both moderate and low in-game rank players. The five-factor personality theory (McCrae & Costa, 1996) posits the interaction between the dynamic performance environment and neuroticism shape a player’s characteristic adaptations and behaviours (e.g., McCrae & Costa, 2008), and in turn, may promote performance success (Alik & McCrae, 2002). Research has shown that national or international level athletes have increased levels of conscientiousness and lower levels of neuroticism, compared to those at club or regional level (Allen et al., 2011), and positive associations between low levels of neuroticism and confidence (Piedmont et al., 1999) and athletic success (Allen et al., 2011; Allen et al., 2013; Piedmont et al., 1999; Piepiora, 2021). Evidence gleaned from meta-analyses has consistently shown the positive association between self-confidence and performance in traditional sports (e.g., Moritz et al., 2000, Woodman & Hardy, 2003).

We found that high in-game rank players reported significantly higher levels of conscientiousness than both moderate and low in-game rank players. According to the five-factor personality theory (McCrae & Costa, 1996), high levels of conscientiousness are related to goal-directed motivation which facilitate athlete characteristic adaptations and success (McCrae & Costa, 2008). Research in traditional sports athletes has found that high levels of conscientiousness are related to superior performance (Mirzaei et al., 2013; Piedmont et al., 1999), which has been linked to high levels of achievement-oriented motivation and high reliability (Digman, 1990), better preparation (Woodman et al., 2010) and effective use of coping strategies (Kaiseler et al., 2012). For example, CS:GO players high in conscientiousness may be predisposed to attending practice sessions on time, have low rates of absenteeism and be highly motivated to engage in high quality practice (Woodman et al., 2010). It is important to note that our findings do not imply that CS:GO players high in neuroticism and/or low in conscientiousness will not reap the aforementioned benefits, yet it may mean neuroticism and conscientiousness contribute to the prediction of success (Woodman et al., 2010).

Our findings oppose those of Matuszewski et al. (2020) who reported no significant association between neuroticism and conscientiousness across in-game rank in LoL. Importantly, Matuszewski et al. (2020) attributed their findings to in-game rank representation given the absence of the two highest in-game ranks in LoL (i.e., Challenger, Grandmaster). One plausible explanation for the observed differences is that the present study fully represented the two highest available CS:GO in-game ranks (i.e., Supreme Master First Class and Global Elite represented) in the high in-game rank group.

Despite the present study examining the independent effects of personality discriminating in-game rank, researchers have also identified the interaction of high levels of conscientiousness and low levels of neuroticism with athletic performance (Allen et al., 2011; Allen & Laborde, 2014; Piepiora, 2021; Piepiora & Piepiora, 2021). Indeed, the interaction of these personality traits are associated with self-efficacy (Brown & Cinnamon, 2016), self-control (Andrei et al., 2014), the use problem-focused strategies for dealing with stressors (Kaiseler et al., 2012), and the use of dysfunctional coping (Grant & Langan-Fox, 2006). Therefore, future research is warranted to explore how personality interactions within esport players impact their thoughts, feelings, and behaviours.

**Agreeableness, Openness, and Extraversion**

 We found moderate in-game rank players reported significantly higher levels of agreeableness than low in-game rank players. The five-factor personality theory posits the significance of external influences, such as teammates, on player characteristic adaptations and responses to their environment (Allik & McCrae, 2002). Traditional sports literature has identified a positive relationship between high levels of agreeableness and athletic success (Allen et al., 2011; Steca et al., 2018). Moreover, researchers (e.g., Barrick et al., 2003; Bell, 2007; Nia & Besharat, 2010) have shown the positive association between agreeableness and team sport athletes, with the effect being weaker with individual sporting athletes due to agreeable individuals being better able to maintain positive relations with others (Van der Zee & Wabeke, 2004). Indeed, research highlights the positive association between trusting relationships and team cohesion (Mach et al., 2010), and ultimately, the association between team cohesion and performance in traditional sports (Heuzé et al., 2006; Myers et al., 2004). However, we also found that the moderate in-game rank players reported significantly higher levels of agreeableness compared to the high in-game rank players. Interestingly, Matuszewski et al. (2020) found that low ranked LoL players reported significantly higher levels of agreeableness than high ranked players. The findings from the present study may suggest that the relationship between agreeableness and in-game rank in CS:GO may be complex and potentially non-linear (e.g., curvilinear), whereby an optimal level of agreeableness contributes towards the prediction of in-game rank. Therefore, a fruitful line of enquiry may be to examine the associations between agreeableness and in-game rank using more complex analyses (e.g., non-linear regression).

The personality traits of openness and extraversion did not discriminate between in-game rank. Our findings oppose Matuszewski et al. (2020) who found differences in both openness and extraversion across in-game rank, which could be explained due to the inherent perceptual-cognitive differences between the esports examined (i.e., CS:GO and LoL). An alternative explanation could be that openness and extraversion interact with other personality traits to discriminate between in-game rank (Allen et al., 2013). Our findings appear to be consistent with the debate that these personality traits, including agreeableness, may only indirectly affect behaviour (Richardson et al., 2012). Further research is needed to investigate their specific impact on CS:GO players.

**Limitations and Future Directions**

The present study sought to group participants based on in-game rank, often referred to as matchmaking rank, due to the lack of unified guidance regarding the formal classification of esport players (see Swann et al., 2015, for a traditional sporting system). To generate distinct groups amongst our participants, we employed a critical friend to generate our own classification method. Although the use of a critical friend may enable an author to receive critical feedback and/or guidance (Cowan & Taylor, 2016; Sparkes & Smith, 2009), it should be noted that the characteristics (e.g., in-game rank) and bias (e.g., personal experiences) of a critical friend will likely shape the direction taken by the author. Such characteristics and bias should be acknowledged and where possible authors should seek to build a transdisciplinary expert consensus to negate this limitation (see Albertella et al., 2023 for an example).

Furthermore, it is reasonable to suggest that the use of in-game rank, rather than expertise (e.g., Ericsson, 1996) or eliteness (e.g., Swann et al., 2015), may be viewed unfavourably by scholars. While it is acknowledged that in-game rank is not an accurate representation of a player's individual skill, caution should be taken when using arbitrary means to classify esports players (e.g., sub-elite, elite) until a taxonomy for classifying expertise/eliteness has been established. Future research could then harness these more accurate and representative categorisations to investigate the personality traits of esports players. Such an approach may help the field better understand how various personality traits (directly and/or indirectly) interact with concepts associated with athletic success. For example, it may advance our current understanding of the relationship between preparation (Woodman et al., 2010) and effective use of coping strategies (Kaiseler et al., 2012) with conscientiousness, as well as the relationship between neuroticism and confidence (Piedmont et al., 1999).

Despite the present study utilising the most adopted framework of personality (i.e., the Big Five), and in line with prior debate (e.g., McAdams, 1992), we encourage future authors to consider person-centred, non-trait-based personality frameworks (Ritchie & Sharpe, 2022). Indeed, we acknowledge the limitations of our cross-sectional design and the use of self-report measures given the inherent issues concerning the accuracy of collecting data at one time point only and retrospective recall bias (Spector, 2019). For example, the Knowledge-and-Appraisals Personality Architecture method of personality (Cervone, 2004; 2021) focuses on inter-individual idiographic contexts and constructs which do not group participants within a pre-defined category (e.g., trait). Such alternative theoretical approaches may enable researchers to understand their samples’ strengths and weaknesses in a context and time that relates to their own personal circumstances (e.g., interaction with context) and advance our understanding of the impact of personality in esports players.

**Conclusion**

 In conclusion, the findings indicate that neuroticism, conscientiousness, and agreeableness differentiate across in-game rank. Our main finding is that high in-game rank players reported significantly lower levels of neuroticism and significantly higher levels of conscientiousness than both moderate and low in-game rank players. The present study provides a unique exploration into the differences in personality traits across in-game rank of CS:GO players.

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| --- |
| **Table 1** *Descriptive Statistics and Cronbach’s alpha of NEO-FFI Big Five Personality Traits.*  |
| Variable  | *M*  | *SD*  | *ZSkewness*  | *ZKurtosis*  | *α*  |
| Neuroticism  | 25.52  | 7.73  | 1.03  | -0.51  | 0.86  |
| Extraversion  | 26.32  | 7.85  | -1.66  | 0.63  | 0.80  |
| Openness  | 30.19  | 7.16  | 0.22  | -0.31  | 0.72  |
| Agreeableness  | 28.81  | 6.12  | -1.40  | 0.63  | 0.78  |
| Conscientiousness  | 25.11  | 7.79  | 0.44  | 0.34  | 0.82  |
|  |
| *Note. M* = Mean; *SD =* Standard deviation; *α* = Cronbach’s alpha. |

|  |
| --- |
| **Table 2***Pearson’s Correlations between The Big Five Personality Traits.* |
|  | Neuroticism | Extraversion | Openness | Agreeableness | Conscientiousness |
| Neuroticism | - | -.402\*\* | .001 | .162 | -.495\*\* |
| Extraversion |  | - | .203\* | .060 | .227\* |
| Openness |  |  | - | .026 | .133 |
| Agreeableness |  |  |  | - | -.032 |
| Conscientiousness  |  |  |  |  | - |
| *Note.* \*\*Significance = *p <* 0.01, \*significance is at *p* > 0.05. |

**Figure 1**

*Means and Standard Deviations for personality traits across in-game rank group.*



*Note.* N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness.

|  |
| --- |
| **Table 3***Pooled Within-Groups Correlations Between Predictor Variables and Standardized Canonical Discriminant Functions.* |
|  | Function 1 | Function 2 |
| Neuroticism | .740\* | -.405\* |
| Extraversion | -.228 | -.745\* |
| Openness | -.431\* | .653\* |
| Agreeableness | .075 | .216 |
| Conscientiousness | .084 | .143 |
| *Note.* \*Largest absolute correlation between each variable and any discriminant function. |