

# The Relationship between Big Five Model of Personality Traits and On-field Disciplinary Behavior among Moroccan Professional Football Players

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**Abstract** This study aimed to examine the relationship between personality traits, assessed through the Big Five model, and on-field behavior among Moroccan professional football players. A total of 264 players from 14 BOTOLA Pro1 clubs were assessed using the Moroccan Arabic version of the Big Five Inventory-2 Short Form (BFI-2S). On-field behavior (yellow card) and playing position (FIFA classification) were sourced from official LNFP and club records to examine their links with personality. Yellow card accumulation during the first 13 matchdays of the 2024/2025 season was recorded. Descriptive, correlational, and comparative statistical analyses were performed. The findings reveal that the players who received yellow cards scored significantly higher in neuroticism ( $p = 0.02$ ) and openness ( $p = 0.03$ ) than those without cards. Moreover, neuroticism was strongly associated with the number of yellow cards received ( $r = 0.29$ ,  $p < 0.001$ ). Players with four or more cards displayed markedly higher neuroticism compared to others. Playing position, coded from official FRMF match sheets, was significantly associated with both extraversion ( $p = 0.04$ ) and yellow card count ( $p = 0.01$ ). Post-hoc comparisons indicated that forwards, on average, received significantly more yellow cards than other positions, although this pattern likely reflects positional demands and match context rather than personality alone. Personality

traits, particularly neuroticism and openness, are significantly associated with on-field disciplinary behavior in Moroccan professional football. These findings highlight the importance of psychological profiling in player management, talent development, and performance optimization.

**Keywords** Personality Traits, Neuroticism, Openness, Moroccan Football, On-Field Behavior

## 1. Introduction

The Big Five model of personality traits provides a comprehensive framework for understanding individual psychological differences. It includes five principal dimensions: conscientiousness, associated with discipline, consistency, and impulse control [1], a link supported by neurobiological research on prefrontal cortex function [2]; neuroticism (or low emotional stability), characterized by vulnerability to negative emotions and heightened stress responses [3-5]; extraversion, linked to sociability, assertiveness, confidence, and reward sensitivity [1,2,6]; agreeableness, reflecting empathy, cooperativeness, and conflict resolution [6,7], with neural correlates in socio-

emotional brain regions [8,9]; and openness to experience, defined by intellectual curiosity, creativity, and receptivity to novelty [6,10]. Openness supports exploratory behaviors and cognitive flexibility [11] and is associated with distinct neurobiological profiles, including heightened dopaminergic activity and lower cortisol reactivity [12-14]. In sports psychology, these traits are fundamental for explaining variations in athletes' stress regulation, resilience, and overall adaptability [1,15].

In sport, while performance is shaped by physical, technical, and contextual factors [16,17], psychological determinants often prove decisive under competitive pressure, sometimes outweighing technical expertise in critical moments [18-20]. This is particularly true in professional football, a sport characterized by high physical, cognitive, and emotional intensity, which demands strong psychological adaptability to manage adversity and unpredictability [21,22]. Players face recurrent high-pressure situations—such as defensive transitions, match endings, and penalty shootouts—where mental performance becomes a central determinant [23]. In this context, personality traits directly influence on-field behavior. Meta-analytic evidence suggests an optimal profile for elite athletes, marked by higher conscientiousness and extraversion alongside lower neuroticism [1,7,15]. Specifically, conscientiousness fosters tactical discipline [1]; neuroticism increases the risk of emotional vulnerability and impulsive reactions, with neurobiological correlates in amygdala hyperactivity and elevated cortisol reactivity [9,24-27]; extraversion enhances confidence and assertiveness [28]; agreeableness supports team cohesion [29]; and openness promotes tactical creativity and decision-making flexibility [30,31]. These traits collectively shape not only performance but also disciplinary behaviors, such as fouls and yellow cards, reflecting an interaction between personality and situational pressure [32].

However, most foundational research on the personality–performance relationship originates from Western contexts. Although emerging studies in Africa highlight similar associations—for instance, extraversion and openness facilitating adaptability and engagement in team sports [33], while conscientiousness is more prominent in individual sports [34]—the influence of cultural and organizational factors remains underexplored [35]. This gap is especially pronounced in elite competitions such as Morocco's BOTOLA Pro 1. To date, no study has empirically examined the relationship between Big Five personality traits and on-field disciplinary behavior in Moroccan professional football.

Therefore, this study aims to provide the first investigation of this relationship. The general objective is to examine the association between personality traits,

assessed through the Big Five model, and on-field disciplinary behaviors, particularly the frequency of yellow cards, among Moroccan professional football players. Specifically, the study aims to: (1) determine whether certain personality traits are associated with a higher or lower number of yellow cards; (2) assess whether the frequency of yellow cards varies by playing position while comparing mean personality-trait scores across positions; and (3) explore the relationship between personality traits and on-field performance. By integrating psychological variables into competitive behavior analysis, the study offers contextualized insights and opens avenues for future research that considers the cultural and organizational characteristics of elite sport in Morocco.

In this context, the following hypotheses are proposed:

**H1.** Players with higher levels of neuroticism receive a significantly greater number of yellow cards.

**H2.** Forwards display a significantly higher frequency of yellow cards compared with other playing positions (defenders, midfielders, wingers, and goalkeepers).

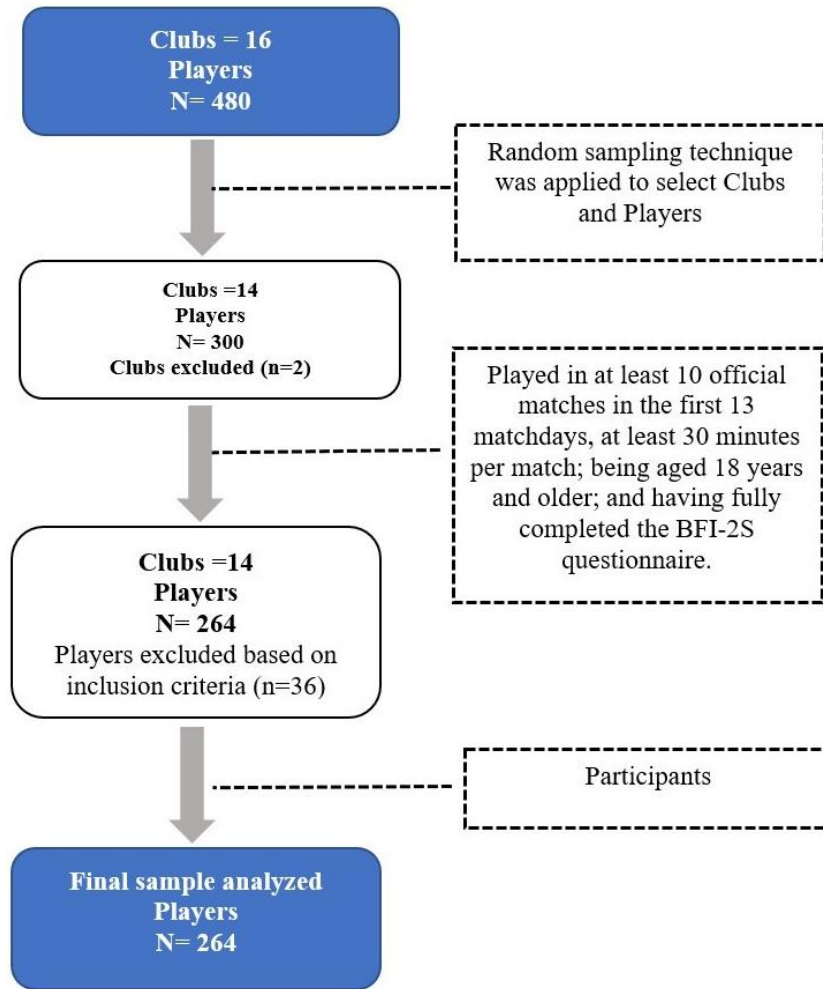
**H3.** The scores of certain personality traits (e.g., extraversion, neuroticism) differ significantly according to playing position and performance.

## 2. Materials and Methods

### 2.1. Study Design

This study is a descriptive, comparative, and correlational investigation conducted on a sample of 300 senior male football players aged 18 years and older. Participants were selected using a random sampling technique applied to BOTOLA Pro1 clubs during the 2024/2025 season. Botola Pro1, which has 16 clubs, is the highest-level national competition in terms of both structure and technical skill. There are 30 official matchdays in the league, and each team plays each other twice, once at home and once away. The Moroccan professional men's football league's first division is one of Africa's most competitive leagues.

This study aimed to investigate the relationship between players' personality traits and the number of yellow cards they receive. The analysis also looked at how personality traits and disciplinary behaviors differed between players in different positions, such as defenders, midfielders, goalkeepers, forwards, and wingers. Data were gathered from participating clubs following procedures sanctioned by the ethics committee and analyzed through descriptive, comparative, and correlational statistical techniques. The overall study design and sampling process are summarized in Figure 1.



**Figure 1.** Design and study sample

## 2.2. Participants

Of the initial sample, only players meeting the following inclusion criteria were retained for analysis: being a professional player officially licensed with a BOTOLA Pro1 club during the 2024/2025 season; having played in at least 10 official matches in the first 13 matchdays, with an average of at least 30 minutes per match; being aged 18 years and older; and having fully completed the BFI-2S questionnaire (Moroccan Arabic version) [36]. After applying these criteria, 264 players were retained for analysis. Six players were excluded due to injuries sustained during most of the observation period, and an additional 30 were excluded due to incomplete data or refusal to participate.

The mean age of the final sample was  $25.97 \pm 4.47$  years. Players who had received at least one yellow card ( $n = 129$ ) had a mean age of  $26.49 \pm 4.15$  years (range: 18-36), while those without any yellow card ( $n = 135$ ) had a mean age of  $25.48 \pm 4.72$  years (range: 18-38).

Informed consent was obtained from all participants. They were told the study's goals, their data's confidentiality, and the terms of their participation. All data were anonymized and processed with strict confidentiality,

in accordance with national regulations concerning the protection of personal information.

## 2.3. Measures

Personality traits were assessed using the Moroccan Arabic adaptation of the Big Five Inventory-2 Short (BFI-2S) [36], developed via committee-based translation and validation among young Moroccan adults. The five-factor structure was confirmed by factor analysis, with high internal consistency ( $\alpha = 0.89-0.96$ ) and strong correlations with the original English version ( $r > 0.95$ ) [37].

This 30-item questionnaire (6 items per trait) [38] employs a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree, assessing five personality domains: Extraversion is illustrated by items such as 'outgoing, sociable'; agreeableness is illustrated by items such as 'is compassionate, has a soft heart'; conscientiousness is illustrated by items such as 'is dependable, steady'; neuroticism is illustrated by items such as 'worries a lot'; and openness is illustrated by items such as 'is curious about many different things'.

For each personality dimension, a total score is computed by summing the corresponding item scores.

Some items are negatively worded and reverse-coded and require recording prior to score computation.

Scores for each personality dimension were grouped into three categories: low, moderate, and high using tercile cut-off points derived from the study sample. Low scores corresponded to values  $\leq$  the 33rd percentile, medium scores to the 34th-66th percentile range, and high scores to values  $\geq$  the 67th percentile [36]. This approach allows for a context-specific analysis of personality traits among professional Moroccan football players.

A score was considered low if it was  $\leq 21$  for extraversion,  $\leq 23$  for agreeableness,  $\leq 24$  for conscientiousness,  $\leq 11$  for neuroticism, and  $\leq 19$  for openness. Moderate scores corresponded to 22-23 for extraversion, 24-26 for agreeableness, 25-26 for conscientiousness, 12-14 for neuroticism, and 20-22 for openness. High scores were identified as  $\geq 24$  for extraversion,  $\geq 27$  for both agreeableness and conscientiousness,  $\geq 15$  for neuroticism, and  $\geq 23$  for openness.

On-field disciplinary behavior was quantified using the open sources of the official statistics from the National Professional Football League (LNFP) and club records. Indicators included the number of yellow cards and total minutes played, extracted from referee-validated match reports [39].

Playing position was included as an objective contextual variable, coded per International Federation of Football Associations (FIFA) classifications (goalkeeper, defender, midfielder, winger, forward) using official (LNFP) and club data.

## 2.4. Procedures

### The research comprised two phases:

A pilot study involving 40 professional players was conducted to verify the cultural and linguistic suitability of the translated questionnaire within the Moroccan football context. This phase also confirmed its internal reliability, with McDonald's omega coefficients indicating internal consistency: extraversion ( $\omega = 0.84$ ), agreeableness ( $\omega = 0.82$ ), conscientiousness ( $\omega = 0.89$ ), neuroticism ( $\omega = 0.85$ ), and openness ( $\omega = 0.81$ ) [40].

Following validation, the instrument was administered in person under standardized conditions across 14 clubs. Behavioral data were systematically recorded, documenting the number of yellow cards received during the first 13 matches of the 2024/2025 season (August 30 - December 19, 2024).

## 2.5. Statistical Analysis

All statistical analyses were carried out using IBM SPSS Statistics (version 24.0; IBM Corp., Armonk, NY, USA). Descriptive statistics were first computed for all study variables. Normality of the distributions and homogeneity of variances were examined prior to conducting parametric tests.

The inclusion criteria, namely participation in at least ten official matches during the first thirteen matchdays with an average playing time of no less than thirty minutes per game, were established to ensure sufficient competitive exposure and to minimize potential biases related to limited involvement in the championship. Furthermore, the final sample size ( $n = 264$ ) was determined to provide adequate statistical power. This sample size allows for the detection of medium effect sizes ( $d \approx 0.30$ ) with a power of 0.80 and a significance level of 5%, thereby ensuring the robustness of the analyses conducted in line with methodological recommendations [41].

An independent samples t-test was conducted to compare the mean personality trait scores between two groups: "group with one yellow card or more" and "group with no yellow cards." This parametric test was performed after verifying the normality and homoscedasticity of data. For this test, the magnitude of the difference was evaluated using Cohen's  $d$  effect size, which is interpreted as small at the level of 0.2, medium at the level of 0.5, and large at the level of 0.8 [40].

Pearson's correlation ( $r$ ) is a parametric test used to examine the relationship between two quantitative variables when they are normally distributed. We used it to test the correlation between "yellow card frequency" and "personality traits scores." For this test, the magnitude of the correlation was estimated using the  $r$  value. In personality and intelligence research, it is interpreted as small at the level of 0.1, medium at the level of 0.2, and large at the level of 0.3 [42].

One-way ANOVA was used to compare mean scores of personality traits between five groups according to the number of yellow cards received. This parametric test was performed after verifying the normality and homoscedasticity of the data. For this test, the magnitude of the difference was estimated using eta-square, which is interpreted as small at the level of 0.01, medium at the level of 0.06, and large at the level of 0.14 [43]. When significant ANOVA results emerged, a post-hoc test was performed to find out homogenous subgroups, using the Tukey test when homoscedasticity was met or the Games-Howell test when it was not.

MANOVA was also performed to evaluate the effect of playing position on personality traits and yellow card counts, with follow-up univariate tests and partial squared Eta ( $\eta^2$ ) reported when multivariate effects were significant.

For all analyses, statistical significance was defined as a  $p$ -value less than 0.05.

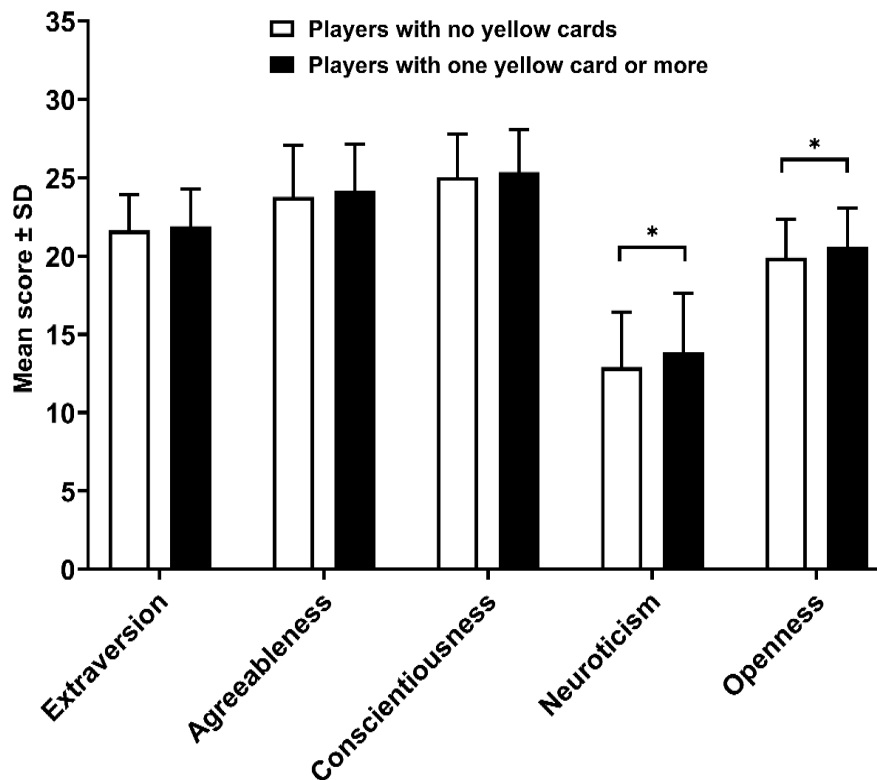
## 3. Results

### 3.1. Relationship between Personality Traits and Yellow Cards

Among the 264 players participating in the study, 129 (49%) received yellow cards, while 135 (51%) did not.

Figure 2 presents a comparison of the average scores for the different personality traits obtained from the BFI-2S test between players with one or more yellow cards (Yes) and those with none (No). In addition, the skewness and kurtosis values of trait scores are all close to zero for the two groups. This conclusion indicates that the data are normally distributed and justifies the use of a parametric test.

The results indicate that players with one or more yellow cards exhibit higher average scores for all personality traits compared to those without yellow cards. However, the difference is statistically significant only for neuroticism ( $t = 2.31, p < 0.05$ ) and openness ( $t = 2.16, p < 0.05$ ). Indeed, the scores for neuroticism and openness are significantly higher in players who received cards, with respective means of  $13.88 \pm 3.72$  and  $20.60 \pm 2.47$  (Table 1).



**Figure 2.** Comparison of mean scores between players with one yellow card and players without yellow cards, for each personality trait.

**Table 1.** Comparison of mean scores between players with yellow cards (Yes) and players without yellow cards (No), for each personality trait (n=264).

Trait (N = 264)	Yellow card (Yes/No)	Mean ±SD	Levene test p-value	t-test p-value	Cohen's d
Extraversion	Yes	21.90 ± 2.39	0.78	0.42	0.10
	No	21.67 ± 2.28			
Agreeableness	Yes	24.13 ± 2.98	0.22	0.42	0.10
	No	23.81 ± 3.31			
Conscientiousness	Yes	25.34 ± 2.69	0.11	0.45	0.14
	No	25.09 ± 2.74			
Neuroticism	Yes	13.88 ± 3.72	0.51	0.02*	0.28
	No	12.84 ± 3.59			
Openness	Yes	20.60 ± 2.47	0.89	0.03*	0.27
	No	19.94 ± 2.53			

*Note:* Mean scores ( $\pm$ SD) are presented by yellow card status. Levene's test confirmed homogeneity. Independent-samples t-tests showed significant differences for neuroticism ( $p = 0.02, d = 0.28$ ) and openness ( $p = 0.03, d = 0.27$ ); no other traits differed significantly ( $p > 0.05$ ).

In the next step of the study, we analyzed the correlations between football players' personality traits and the number of received yellow cards. For that purpose, we selected the 129 players who received one or more yellow cards. The results of this Pearson's correlation analysis (Table 2) revealed that neuroticism and openness are positively and significantly correlated with the number of yellow cards ( $p < 0.001$  and  $p = 0.04$ , respectively). A stronger correlation was observed for neuroticism ( $r = 0.29$ ) compared with openness ( $r = 0.12$ ). This finding implies that as the levels of neuroticism and openness increase, the player receives more yellow cards. The other traits are not significantly correlated with the number of yellow cards.

**Table 2.** Correlation (Pearson's  $r$ ) between the number of yellow cards and each of the personality traits ( $n = 264$ )

Personality traits	Pearson's	p-value	95% CI
Extraversion	0.08	0.21	[-0.04 ; 0.20]
Agreeableness	-0.009	0.89	[-0.13 ; 0.11]
Conscientiousness	0.007	0.91	[-0.11 ; 0.13]
Neuroticism	0.29	< 0.001	[0.17 ; 0.40]
Openness	0.12	0.04	[0.003 ; 0.24]

**Note:** Pearson's correlation coefficient ( $r$ ) indicates the association between the number of yellow cards and personality traits scores. Significant correlations were found for neuroticism ( $p < 0.001$ ) and openness ( $p = 0.04$ ); other traits were not correlated with the number of yellow cards.

Moving forward, this study will focus on neuroticism and openness, the two personality traits significantly associated with yellow cards. ANOVA will assess how these traits affect the number of yellow cards received. Figure 3 provides the distribution of the means of these two personality traits according to the number of yellow cards. The results indicated that the minimum level of neuroticism was recorded among players with only 1 yellow card ( $M = 12.84 \pm 3.44$ ), while the maximum was observed among players with 5 yellow cards ( $M = 19.67 \pm 0.58$ ). Regarding openness, slight differences were observed among players with different numbers of cards, with a maximum of  $21.08 \pm 1.56$  recorded among players with 4 cards (Figure 3).

The results in Table 3 show that skewness and kurtosis values are all close to zero, which implies that data meet the normality assumption and justify the use of the ANOVA parametric test to compare mean scores of neuroticism and openness between players with different numbers of yellow cards. In addition, the Levene test

indicates that the variance is homogenous among the compared groups ( $p > 0.05$ ). The one-way ANOVA revealed that the difference in scores is statistically significant for neuroticism ( $p < 0.001$ ) but not for openness ( $p = 0.93$ ). This result suggests that the number of yellow cards depends significantly on the level of neuroticism but not on the level of openness. The post-hoc analysis for neuroticism revealed that footballers with 4 yellow cards or more displayed significantly higher levels of neuroticism compared to those with fewer yellow cards (Table 3).

### 3.2. Relationship between Personality Traits and Yellow Cards by Playing Position

Table 4 presents the distribution of yellow cards based on playing position among the 264 professional Moroccan players included in the study. Overall, 51% of players ( $n = 135$ ) did not receive any yellow cards, while 49% received at least one. Forwards recorded the highest mean number of yellow cards ( $M = 1.45 \pm 1.43$ ), with only 32% remaining unsanctioned. In contrast, goalkeepers and wingers showed the lowest averages ( $M = 0.57 \pm 0.93$  and  $M = 0.69 \pm 0.97$ , respectively), with more than half of players in these positions receiving no yellow cards. Midfielders and defenders presented intermediate values ( $M = 0.78 \pm 1.14$  and  $M = 1.03 \pm 1.25$ ), with 59% and 46% of them, respectively, receiving no cards. Players with four or more yellow cards were primarily found among forwards (13%) and defenders (7%). These results suggest notable variation in disciplinary records across playing positions.

After having investigated the relationship between personality traits and yellow cards, a multivariate analysis of variance (MANOVA) was conducted to assess whether personality traits and yellow cards, all together, are significantly related to playing position (Table 5). The multivariate tests show a significant effect of playing position on personality traits and yellow cards (Box's  $M$   $p$ -value = 0.02 and Pillai's trace  $p$ -value = 0.001).

Indeed, the between-subjects effect given in Table 5 reveals that playing position is significantly associated with extraversion and yellow cards only ( $p = 0.04$  and  $p = 0.01$ , respectively), with small effect sizes (4% and 5%, respectively). Furthermore, Tukey post-hoc analysis for these two traits indicated that goalkeepers displayed significantly lower extraversion compared with wingers ( $p = 0.038$ ) and that forwards received significantly more yellow cards compared with all other positions ( $p < 0.05$  for all pairwise comparisons).

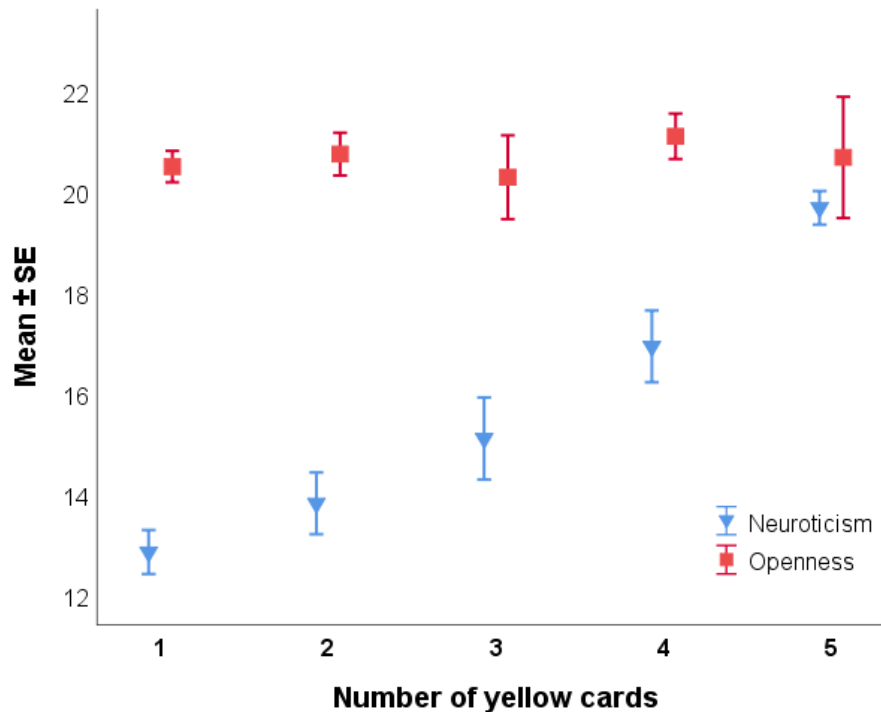


Figure 3. Distribution of mean scores of neuroticism and Openness according to the number of yellow cards

Table 3. Comparison of the mean scores of neuroticism and openness according to the number of yellow cards (n = 129).

Number of Yellow Cards	Neuroticism			Openness		
	Mean* ±SD	Skewness	Kurtosis	Mean	Skewness	Kurtosis
1	12.84 ± 3.44 <sup>a</sup>	0.45	0.05	20.48 ± 2.45	0.30	-0.29
2	13.80 ± 3.93 <sup>a</sup>	0.86	1.53	20.73 ± 2.72	-1.42	2.20
3	15.09 ± 2.70 <sup>ab</sup>	-0.01	-0.08	20.27 ± 2.76	-0.28	-1.37
4 or more	17.46 ± 2.47 <sup>b</sup>	-0.62	-0.68	21.00 ± 1.60	-0.36	-0.98
Levene test	p = 0.61			p = 0.33		
One-way ANOVA	p < 0.001			p = 0.84		

Note: ANOVA test showed that players with different numbers of yellow cards have significantly different scores in terms of neuroticism ( $p < 0.001$ )

but not in terms of openness ( $p = 0.84$ ).

\*: Different letters mean significantly different means, according to the Tukey post-hoc test. Players with four or more yellow cards displayed significantly higher scores on neuroticism compared with those with one card and those with two cards ( $p < 0.001$  and  $p = 0.003$ , respectively).

Table 4. Distribution of yellow cards by playing position among Moroccan professional football players (N = 264)

Playing Position	Number of yellow cards						Mean ± SD
	0	1	2	3	4 or more	Total	
Winger	28 (55%)	15 (29%)	6 (12%)	0 (0%)	2 (4%)	51	0.69 ± 0.97
Forward	12 (32%)	11 (29%)	7 (18%)	3 (8%)	5 (13%)	38	1.45 ± 1.43
Midfielder	47 (59%)	14 (17%)	13 (16%)	3 (4%)	3 (4%)	80	0.78 ± 1.14
Defender	34 (46%)	19 (26%)	12 (16%)	4 (5%)	5 (7%)	74	1.03 ± 1.25
Goalkeeper	14 (67%)	3 (14%)	3 (14%)	1 (5%)	0 (0%)	21	0.57 ± 0.93
Total	135 (51%)	62 (23%)	41 (16%)	11 (4%)	15 (6%)	264	0.91 ± 1.19

Note: values represent the distribution of yellow cards by playing position (absolute frequencies and percentage). Forwards recorded the highest mean number of yellow cards ( $M = 1.45 ± 1.43$ ), while goalkeepers had the lowest ( $M = 0.57 ± 0.93$ )

**Table 5.** Results of Levene's and ANOVA tests for personality traits and yellow cards according to playing position (n = 264)

Variables	Levene Test		ANOVA Test		
	F	p-value	F	p-value	Partial Eta-square
Extraversion	0.75	0.56	2.59	<b>0.04*</b>	0.04
Agreeableness	0.66	0.62	0.86	0.49	0.01
Conscientiousness	1.10	0.36	0.25	0.91	< 0.01
Neuroticism	0.74	0.57	1.99	0.10	0.03
Openness	3.35	0.01*	1.99	0.10	0.03
Yellow cards	2.26	0.06	3.41	<b>0.01*</b>	0.05

*Note: One-way ANOVA revealed significant effects of playing position for extraversion ( $p = 0.04$ ), while no significant differences were observed for agreeableness, conscientiousness, neuroticism, or openness ( $p > 0.05$ ).*

## 4. Discussion

The aim of this study was to investigate the relationship between personality traits and on-field disciplinary behavior among Moroccan professional football players. The findings provide strong evidence that psychological factors, and particularly neuroticism, play a central role in predicting sanctionable behaviors such as yellow cards.

### 4.1. Main Findings and Interpretation

The most salient result concerns neuroticism, which emerged as the most consistent and significant predictor of disciplinary behavior. Players with higher levels of neuroticism received a greater number of yellow cards, and those accumulating four or more cards displayed particularly elevated scores. This is consistent with previous research demonstrating that neurotic individuals are more emotionally reactive, less stress-tolerant, and more prone to impulsive reactions in competitive contexts [44,45]. This finding is consistent with recent systematic evidence indicating that neuroticism is a robust predictor of heightened emotional reactivity and maladaptive responses under competitive stress, thereby increasing the likelihood of impulsive behaviors in sport settings [46].

Within elite football, these core emotional and behavioral characteristics of neuroticism provide a plausible psychological pathway to on-field indiscipline, whereby compromised self-regulation under pressure can translate into impulsive fouls and sanctions.

A secondary finding concerns openness to experience, which was positively but moderately associated with yellow card frequency. While openness is often linked to creativity, adaptability, and tactical flexibility [30], it may also foster exploratory behaviors and risk-taking tendencies on the field. In rigid tactical systems such as those observed in some Moroccan clubs, this trait may manifest as unorthodox or disruptive actions, occasionally resulting in fouls. Neurocognitive studies suggest that openness is associated with increased dopaminergic activity, promoting curiosity and novelty-seeking [12,13]. While this can enrich playmaking abilities, it may

simultaneously increase the likelihood of sanctionable behavior when risks are poorly managed. This observation aligns with the psychological profile of elite players, who typically exhibit high openness to experience but lower agreeableness [47].

A tertiary result relates to playing position. Forwards recorded the highest frequency of yellow cards, while goalkeepers and wingers had the lowest. This pattern reflects the physical and tactical demands of different roles: forwards are more exposed to duels, provocations, and strategic fouls, while defenders also accumulate cards due to the necessity of disrupting opponents' advances [48,49]. Conversely, goalkeepers, whose role is less physically confrontational, showed lower sanction rates. These results support the idea that positional demands contribute to disciplinary outcomes; however, they should be interpreted cautiously, as other unmeasured factors, such as aggressiveness or team strategy, may also influence yellow-card incidence. In addition to positional effects, several potential confounding variables — such as tactical directives, team cultural norms, match-specific circumstances, and the referee's level of strictness — may also shape the likelihood of receiving a yellow card. Because these contextual factors were not accounted for in the present analysis, interpretations of the independent influence of personality traits on disciplinary outcomes should be made with caution.

### 4.2. Cultural, Contextual Considerations and Performance

The Moroccan context provides a unique lens for interpreting these results. Unlike in Western European academies, where psychological skills training is often an integral component of player development, Moroccan professional football tends to prioritize physical and technical preparation and still lacks a structured, widespread culture of psychological preparation within clubs. This relative neglect of psychological dimensions may exacerbate the behavioral consequences of certain personality traits, particularly neuroticism. Without systematic support, emotionally reactive players may lack

coping strategies, leading to higher vulnerability under competitive stress. Furthermore, stricter refereeing practices in North African football could amplify the behavioral impact of traits like openness and extraversion. These findings therefore emphasize the importance of situating personality-performance relationships within their cultural and organizational context [31,50]. Match importance, tactical roles, and the competitiveness of Moroccan football, including coaching norms and stricter officiating styles, may also interact with personality traits to shape disciplinary behavior and should be considered in future analyses.

Moroccan players' performance should be interpreted within the specific cultural and organizational context of Moroccan football. The predominant focus on physical and technical preparation, often to the detriment of psychological development, limits athletes' capacity to manage competitive stress effectively. This lack of structured psychological support particularly affects players with elevated neuroticism, who may exhibit difficulties in emotional regulation under pressure. Consequently, these individuals are at increased risk of performance inconsistency, as heightened emotional reactivity can undermine concentration, decision-making, and overall on-field effectiveness. Addressing this gap through integrated psychological skills training could therefore be critical to optimizing player performance in this context.

By contrast, the results showed no significant relationship between extraversion, conscientiousness, and agreeableness and yellow card incidence. This study did not directly link these traits to disciplinary outcomes, despite their potential to shape broader dispositions. Instead, their influence seems more indirect, supporting performance through improved cohesion, communication, and consistency. This aligns with recent integrative reviews indicating that conscientiousness and extraversion reliably predict athletic performance, particularly in team sports, but are not directly associated with on-field disciplinary outcomes [51]. Conscientiousness and extraversion are generally linked to higher athletic performance in team sports, whereas agreeableness and openness show more variable associations across cultural contexts [35]. Agreeableness promotes cooperation and interpersonal dynamics [52,53], but does not consistently predict on-field sanctions. Similarly, conscientiousness, defined by self-discipline and planning, is more predictive of performance stability than disciplinary behavior [54]. Thus, these traits contribute indirectly to performance through psychological mechanisms rather than directly shaping sanctionable actions [35,52].

Our analysis also confirmed positional differences in disciplinary behavior. Forwards registered the highest number of yellow cards, while goalkeepers and wingers received the fewest. This pattern supports earlier findings indicating that forwards are more exposed to tactical duels and physical contacts, increasing sanction likelihood

[48,49]. These behavior differences align with well-established position-specific profiles in physical and technical demands, where forwards engage in more high-intensity duels and explosive actions, while wingers and goalkeepers exhibit distinct movement patterns and defensive responsibilities [55].

Defenders also recorded relatively high sanctions rates, reflecting their role in disrupting opposition plays [49,56]. These results corroborate our second hypothesis (H2), which predicted disciplinary differences by playing position.

Furthermore, we found that playing position was associated with both extraversion and yellow card frequency. Goalkeepers scored lower in extraversion than wingers, while forwards received more yellow cards than other positions. These findings are consistent with previous findings highlighting positional differences in trait expression [57]. Given that extraversion is linked with assertiveness, impulsivity, and risk-taking [1,38], it may partly explain the higher sanctions rate among offensive players. Our third hypothesis (H3), which predicted differences in personality traits across playing positions, is therefore supported.

These results demonstrated how the interaction between personality demands influences behavior. Forwards higher extraversion fosters involvement and assertiveness but, under competitive pressure, also increases disciplinary risks. In contrast, the lower extraversion observed in goalkeepers aligns with the vigilance and attentional control required by their role. These insights highlight the value of position-specific psychological support [38,57].

Taken together, these results underline the importance of integrating an understanding of psychological profiling into the management of player behavior. Initial assessment helps identify individual strengths and vulnerabilities, facilitating targeted interventions to develop coping strategies for managing competitive stress [58]. Such practices could reduce impulsive actions that harm team outcomes, also fostering resilience.

Overall, this study demonstrates that personality traits go beyond disciplinary outcomes and are crucial for performance optimization. Conscientiousness, extraversion, and openness foster consistency, motivation, communication, and tactical creativity, whereas high neuroticism impairs stress management and decision-making. Incorporating psychological profiling into professional football can therefore enhance recruitment by identifying players with optimal profiles, enable more precise and targeted preparation, and support individualized psychological follow-up. It also provides tools for managing disciplinary risks, optimizing role allocation on the field, preventing burnout and stress-related injuries, and strengthening leadership and team cohesion. Establishing longitudinal monitoring within clubs could further ensure that training and support evolve with the players' careers. Such practices would not only improve individual performance but also reinforce

collective efficiency and resilience, complementing traditional physical and technical preparation [1,35]. Despite limitations related to sample size and contextual specificity, this study offers novel insights into Moroccan professional football and highlights the need for culturally adapted psychological interventions in elite sport.

### 4.3. Practical Implications

The study provides several important implications for applied sport sciences. Psychological profiling can support coaches in tailoring training strategies and allocating roles, for example, by identifying forwards with high neuroticism and implementing targeted interventions to reduce impulsive fouls. For sport psychologists, the integration of mental skills training, including emotional regulation, stress management, and cognitive reframing, should be prioritized, especially for players with heightened vulnerability. Early psychological assessments would benefit youth academies by anticipating disciplinary tendencies and fostering long-term resilience. In addition, performance analysts and support staff should monitor psychological variables alongside physical and technical indicators to enhance recruitment, match preparation, and individualized follow-up, thereby promoting both improved performance and better discipline.

### 4.4. Limitations and Future Directions

This study has several limitations. First, the sample was limited to male players from Morocco's first division, which restricts generalization to female players, youth athletes, or lower leagues. Second, the reliance on self-report questionnaires may introduce bias, including social desirability bias. To address this issue, it is important to note that future research would benefit from incorporating multimethod assessment strategies that reduce self-report bias and provide a more comprehensive evaluation of players' psychological profiles. Third, the cross-sectional design prevents causal inference. Future research should adopt longitudinal designs, integrate qualitative approaches (e.g., interviews with coaches and referees), and extend analysis to diverse contexts. Including situational variables, such as home vs. away matches, tactical strategies, and referee profiles, would further clarify the interaction between personality traits and disciplinary behaviors. Additionally, future studies should consider adapting or developing football-specific personality assessment tools that capture positional demands and contextualized behavioral tendencies.

## 5. Conclusions

In summary, this study demonstrates that neuroticism is the strongest psychological predictor of disciplinary behavior among Moroccan professional footballers, followed by openness and playing position. These findings

underline the relevance of integrating psychological assessment into player management, recruitment, and preparation. By combining traditional physical and technical preparation with psychological profiling and tailored interventions, Moroccan clubs could optimize both performance and discipline, while supporting the long-term mental well-being of players.

From a theoretical standpoint, the study extends existing frameworks that link personality to sport-related behaviors and contributes to their cross-cultural validation within the Moroccan context. While neuropsychological mechanisms were not directly assessed, the findings remain consistent with established models and highlight the need for future studies incorporating neurobiological and cognitive measures. Importantly, they also suggest that emotional regulation and psychological stability may be just as decisive as technical or physical ability, opening promising perspectives at the interface of sport sciences and applied psychology.

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