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Social Media User Profiles and Addiction Levels According to Five-Factor Model of Personality Traits

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Abstract. Problematic social media use has emerged as a growing concern among university students, with potential consequences for academic performance and psychological well-being. Yet the personality profiles that make some students more susceptible than others remain poorly understood. In this study, we investigated whether personality-based user profiles—based on the Five-Factor Model (FFM)—are associated with varying levels of problematic social media use, using a person-centered approach. A sample of 993 university students (47.9% female, 52.1% male; M_{age} = 20.18) completed the Big-Five Inventory and the Bergen Social Media Addiction Scale. K-means cluster and DBSCAN analyses revealed three distinct personality profiles: Cluster 1 (80.6% of participants) characterized by low extraversion, moderate agreeableness, and high conscientiousness; Cluster 2 (3.2%) exhibiting high extraversion, agreeableness, neuroticism, and openness with low conscientiousness; and Cluster 3 (16.2%) displaying moderately high agreeableness with low conscientiousness and openness. ANOVA results demonstrated significant differences in social media addiction levels across these clusters, with Cluster 2 reporting the highest addiction scores, followed by Cluster 3, and Cluster 1 exhibiting the lowest levels. These findings suggest that personality configurations—rather than isolated traits—meaningfully predict problematic social media use, with individuals high in neuroticism and extraversion but low in conscientiousness being particularly vulnerable. The identification of these distinct user profiles advances understanding of psychological risk factors for social media addiction and provides a foundation for developing targeted interventions tailored to specific personality configurations, potentially enhancing prevention and treatment efficacy in educational and clinical settings.

Keywords: Personality Profiles, Five-factor Model, Social Media Addiction, Cluster Analysis, Person-centered Approach, Digital Behavior.

Introduction

The pervasive nature of social media has reshaped how individuals, particularly young adults, interact, communicate, and engage with the world. With the global proliferation of smartphones and increased internet accessibility, social media platforms like Instagram, TikTok, X (formerly Twitter), and Snapchat have become intensively embedded in daily routines. According to recent statistics, young adults aged 18–29 are the most active demographic on these platforms, with more than 90% reporting daily use (Statista, 2024; We Are Social, 2025). However, this constant connectivity has raised concerns about excessive use, with a literature identifying behavioral patterns consistent with social media addiction (Kircaburun & Griffiths, 2018). Social media addiction is typically characterized by compulsive use, mood modification, withdrawal symptoms, tolerance, conflict, and relapse criteria closely mirroring other behavioral and substance-related addictions (Andreassen, 2015).

From a psychological standpoint, social media addiction is thought to arise from multifaceted interactions between cognitive, emotional, and behavioral factors. Theoretical models, such as the Interaction of Person-Affect-Cognition-Execution (I-PACE) model (Brand et al., 2016; 2019), suggest that individual predispositions including personality traits interact with affective and cognitive responses to digital environments, ultimately leading to problematic use. The reward systems activated by social feedback (likes, shares, comments) and the constant availability of stimuli make social media platforms especially potent in reinforcing habitual behaviors. These addictive tendencies are not uniformly distributed across the population, suggesting that individual psychological differences, such as personality traits, may play an important role in determining susceptibility. Recent meta-analyses have provided substantial evidence supporting the relationship between personality traits and problematic social media use across various platforms and populations (Akbari et al., 2023; Meynadier et al., 2024).

Personality traits and digital behaviors

A prominent theoretical framework for understanding stable individual differences in personality is the Five-Factor Model (FFM), often referred to as the "Big Five" (McCrae & Costa, 1999). This model posits that personality can be categorized into five broad dimensions: Openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each dimension represents a continuum and encompasses a range of behaviors, emotions, and cognitive styles. For example, openness involves creativity and curiosity; conscientiousness reflects organization and goal-directed behavior; extraversion relates to sociability and assertiveness; agreeableness captures traits like empathy and cooperation; and neuroticism refers to emotional instability and negative affect. The FFM is widely regarded for its empirical robustness and cross-cultural

applicability, making it a suitable tool for examining personality in the context of digital behaviors (Soto & John, 2017).

Several studies have explored how these traits influence online behavior and social media engagement. For example, extraverted individuals tend to use social media to expand social networks and seek stimulation, whereas neurotic individuals may use it for emotional regulation or avoidance of real-life interactions (Marino et al., 2018). High openness has been linked with diverse content consumption and expression, while conscientious users tend to regulate their usage more effectively and are less prone to addictive patterns. Conversely, low conscientiousness and high neuroticism have consistently emerged as predictors of problematic social media use (Andreassen et al., 2013; Montag et al., 2021). These associations suggest that personality plays a substantial role in shaping how individuals interact with social media platforms, both in terms of frequency and purpose of use. The strength and consistency of these relationships vary across platforms, with some research indicating that the design features and affordances of specific social media applications may interact differently with particular personality traits (Kircaburun & Griffiths, 2018; Zhou et al., 2021).

Although the relationships between individual personality traits and social media use have been extensively studied, most research has taken a variable-centered approach examining bivariate correlations or linear regressions between single traits and usage outcomes. While informative, such approaches may oversimplify the complexity of personality and fail to account for interactions among traits that produce unique behavioral profiles (Liu & Campbell, 2017). A person-centered approach, such as clustering individuals based on the combination of their Big Five traits, presents a richer understanding of how patterns of personality traits co-occur and influence digital behavior holistically. This approach enables researchers to identify distinct personality profiles or user types, each potentially exhibiting unique patterns of social media engagement and addiction. This methodological shift represents an important advancement in understanding the detailed relationship between personality and technology use, moving beyond simplistic single-trait correlations toward a more comprehensive and ecologically valid framework (Marengo et al., 2021).

Only a few recent studies have begun to adopt such profiling methods in digital contexts. For example, Sindermann et al. (2020) applied cluster analysis to derive personality-based user groups and explored their relation to smartphone addiction, but similar efforts specific to social media addiction remain limited. Moreover, there is a need for updated research that reflects current usage patterns, especially considering the rise of newer platforms and shifting digital habits. By applying a clustering methodology, this study aims to move beyond linear trait-outcome relationships and provide a typological perspective on social media use and addiction susceptibility. This approach acknowledges the complicated interplay

between multiple personality dimensions and recognizes that individuals with similar overall addiction risk may arrive at problematic usage through different psychological pathways (Marengo et al., 2021; Starcevic & Aboujaoude, 2017).

The primary objective of this study is to derive user profiles based on combinations of Five-Factor personality traits and to compare the social media addiction levels of these identified clusters. This methodological approach can help uncover whether certain personality configurations are more prone to problematic use than others. Such knowledge is valuable not only for theoretical advancement in personality psychology and behavioral addiction research but also for the development of targeted interventions. For example, prevention strategies could be tailored to specific personality-based risk groups, enhancing their effectiveness (Burke & Kraut, 2016). Moreover, understanding these personality-based user profiles could inform platform design considerations that promote healthier engagement patterns while minimizing features that may exploit psychological vulnerabilities associated with specific trait combinations (Montag et al., 2021). Based on these explanations, we formulated the research questions (RQ_s):

RQ_1. Can the participants be divided into meaningful clusters according to their personality traits?

RQ_2. Do these personality-based clusters differ in their social media addiction levels?

Method

Participants and procedure

The study was conducted with a sample of 993 university students from various faculties of a state university in the Eastern Anatolia region of Türkiye. The mean age of the participants was 20.18 years (SD = 1.58), with a fairly balanced gender distribution: 47.9% identified as female and 52.1% as male. Inclusion criteria required participants to be actively enrolled university students aged between 18 and 25, and regular users of at least one social media platform. Individuals were excluded if they reported any diagnosed psychiatric disorders or were currently receiving treatment for behavioral addictions, to avoid confounding influences. A power analysis was also conducted using G*Power (v.3.1) to determine the minimum required sample size for detecting a medium effect (f = .25) in ANOVA with three groups and $\alpha = .05$, power = .95. The analysis indicated a required sample of 252 participants. The final sample size of 993 was thus more than adequate to detect statistically significant effects with high power. Furthermore, this sample size is also considered sufficient for cluster analysis, exceeding minimum recommendations such as Formann's (1984) guideline of 2^m cases (i.e., 32 for five variables) and Dolnicar's (2003) recommendation of 20 observations per variable.

Participation in the study was entirely voluntary and anonymous, and no identifying information was collected to ensure participant confidentiality and data privacy. The data were collected using an online

survey platform, allowing participants to complete the questionnaires at their convenience. The link to the survey was distributed through university academic stuffs and social media channels by researchers. Before participation, individuals were presented with an informed consent form explaining the aim of the research, emphasizing the voluntary nature of participation, and assuring anonymity. No incentives were offered. Ethical approval for the study was obtained from the university's Institutional Ethics Committee, ensuring that all procedures adhered to research ethics standards.

Measures

Personality Traits: To assess participants' personality traits, the Big-Five-Inventory (BFI) was utilized. Originally developed by John et al. (1991), the BFI is a widely used self-report inventory designed to measure five major dimensions of personality: extraversion, neuroticism, openness to experience, agreeableness**,** and conscientiousness. The original version consists of 44 items, with subscale distributions of eight items for extraversion, eight for neuroticism, 10 for openness, nine for agreeableness, and nine for conscientiousness. The Turkish adaptation of the BFI was carried out by Karaman et al. (2010), resulting in a 40-item version, each rated on a five-point Likert scale ranging from totally agree to totally disagree. The Turkish version includes seven items for extraversion (e.g. "*I have an enterprising personality*"), eight for neuroticism (e.g. "*I'm a mood swings person*"), 10 for openness (e.g. "*I am open to original, new ideas*"), seven for agreeableness (e.g. "*I enjoy collaborating with others*"), and eight for conscientiousness (e.g. "*I work hard until the job is done*"). Internal consistency coefficients ranged from .75 to .86 across sub-dimensions, supporting the scale's reliability. In the current study, Cronbach's α was found to be .93 for the full scale. Subscale reliability coefficients were as follows: .89 for extraversion, .95 for agreeableness, .79 for conscientiousness, .91 for neuroticism, and .93 for openness, all of which indicate excellent internal consistency.

Social Media Addiction: To assess participants' levels of social media addiction, the Bergen Social Media Addiction Scale (BSMAS) was employed. The scale was originally developed by Andreassen et al. (2016) to capture core addiction components as applied to social media. The Turkish adaptation of the BSMAS was conducted by Demirci (2019). The scale is unidimensional and consists of six items (e.g. "*Have you felt the desire to use social media more and more?")*, each rated on a five-point Likert scale ranging from strongly disagree to strongly agree. The scale captures behavioral, cognitive, and emotional aspects of problematic social media use. The internal consistency of the Turkish version was validated in multiple samples, yielding Cronbach's α coefficients of .83 (exploratory factor analysis), .82 (confirmatory factor analysis), and .83 (test-retest). In the present study, the reliability of the BSMAS was found to be .90, indicating high internal consistency and suitability for assessing addiction-

related symptoms among young adults in a Turkish context. Following the cut-points recommended by Andreassen et al. (2016), total BSMAS scores were categorized as non-problem (≤ 18), sub-clinical risk (19–23), and severe/problematic (≥ 24).

Data analysis

Prior to the main analyses, data cleaning was performed to ensure accuracy and reliability. Cases with missing responses or extreme outliers were removed, resulting in a final sample of 993 participants. Descriptive statistics were calculated, and normality of the data was evaluated using skewness and kurtosis values (±2), which indicated that the distributions of all relevant variables were within acceptable ranges (George & Mallery, 2010). Therefore, the data were considered approximately normally distributed.

To extract user profiles based on personality characteristics, a K-Means Cluster Analysis was conducted using the standardized scores (z-scores) of the five personality traits. These standardized values ensured equal weighting of each trait in the clustering process. The optimal number of clusters was determined using hierarchical cluster analysis with Ward's method, and the results were visualized through a dendrogram. Based on the dendrogram, a cluster solution was identified and subsequently applied in the K-Means clustering algorithm. Each participant was assigned to one of the clusters, representing distinct personality-based user profiles. Furthermore, to check cluster validity, we reanalyzed the same five z-scored personality dimensions with the density-based DBSCAB (Density-Based Spatial Clustering of Applications with Noise) algorithm ($\varepsilon = .62$, min_samples = 7; parameters were selected from the 4-nearest neighbor distance plot) to test whether the three-cluster solution was robust to algorithm selection. DBSCAN detected three significant clusters plus 14 noise points (1.4% cases).

To examine whether there were significant differences in social media addiction levels among the identified personality clusters, a one-way Analysis of Variance (ANOVA) was performed. The cluster membership acted as the independent variable, and the social media addiction scores were the dependent variable. The assumption of homogeneity of variances was tested using Levene's Test, which indicated that the variances were equal ($p > .05$). Upon finding a statistically significant ANOVA result, Tukey's HSD post-hoc test was used to identify the specific between-group differences. All statistical analyses were conducted using IBM SPSS (v.23), and the significance level was set at $\alpha = .05$.

Results

Identification of personality-based cluster

To explore whether participants could be grouped into distinct profiles based on their personality characteristics, a K-Means cluster analysis was performed. This analysis utilized standardized (z-scores)

values of the five dimensions from the five-factor model of personality (FFMP). To determine the optimal number of clusters, an initial hierarchical cluster analysis using Ward's method was conducted, and the resulting dendrogram indicated that a three-cluster solution provided the most parsimonious and interpretable grouping. Subsequently, this three-cluster solution was implemented in the K-Means analysis. The final cluster centers, based on standardized scores, are presented in Table 1, and the distribution of participants across clusters is summarized in Table 2.

Table 1. Final cluster centers for standardized personality traits

Personality traits	Cluster 1	Cluster 2	Cluster 3
Extraversion	-1.14	2.58	0.20
Agreeableness	-0.36	1.45	1.51
Conscientiousness	1.10	-0.83	-0.34
Neuroticism	-0.09	2.63	-0.06
Openness	-0.03	2.63	-0.38

Table 2. Number of participants per cluster

Cluster	Frequency	Percentage
Cluster 1	800	80.6%
Cluster 2	32	3.2%
Cluster 3	161	16.2%

Cluster 1 (n = 800) was characterized by low extraversion, moderate levels of agreeableness, and high conscientiousness, with near-average scores on neuroticism and openness. This profile suggests individuals who are likely organized and disciplined but tend to be more reserved and socially withdrawn. Cluster 2 (n = 32), the smallest group, exhibited very high scores on extraversion, agreeableness, neuroticism, and openness, alongside low conscientiousness. This pattern indicates a group of individuals who are highly emotionally expressive, socially open, imaginative, and cooperative, but may struggle with organization and self-regulation. Cluster 3 (n = 161) showed moderately high agreeableness, combined with low conscientiousness and low openness to experience, and average levels of extraversion and neuroticism. This profile may reflect individuals who are generally cooperative and pleasant but more routine-bound, less goal-oriented, and less inclined toward intellectual curiosity. The identification of these three distinct clusters supports the notion that individual differences in personality can be meaningfully grouped into latent user profiles, presenting a foundation for examining behavioral differences in this case, levels of social media addiction across these profiles.

Validation of the cluster solution with DBSCAN

DBSCAN reproduced three clusters of comparable sizes (n = 792, 166, 29) and flagged 14 participants as noise/outliers. Trait profiles of the three clusters closely matched those obtained with K-means. Concordance between the two partitions was high (Adj. Rand = .82) and average silhouette values were virtually identical (K-means = .41; DBSCAN = .42). Thus, the 3% high-risk profile appears to be a genuine subgroup rather than an artefact of centroid-based clustering.

Differences in social media addiction levels across clusters

To assess whether social media addiction levels differed significantly across the personality-based user clusters, an ANOVA was conducted. The dependent variable was participants' total score on the BSMAS, and the independent variable was cluster membership as determined by the K-Means analysis. The ANOVA showed a statistically significant main effect of cluster membership on social media addiction scores, $F_{(2, 990)} = 219.38$, $p < .001$, indicating that at least one group differed from the others. The effect size, calculated as eta squared ($\eta^2 = .31$), suggests a large practical significance, with approximately 31% of the variance in social media addiction scores explained by differences in personality profiles. Descriptive statistics for each group are presented in Table 3.

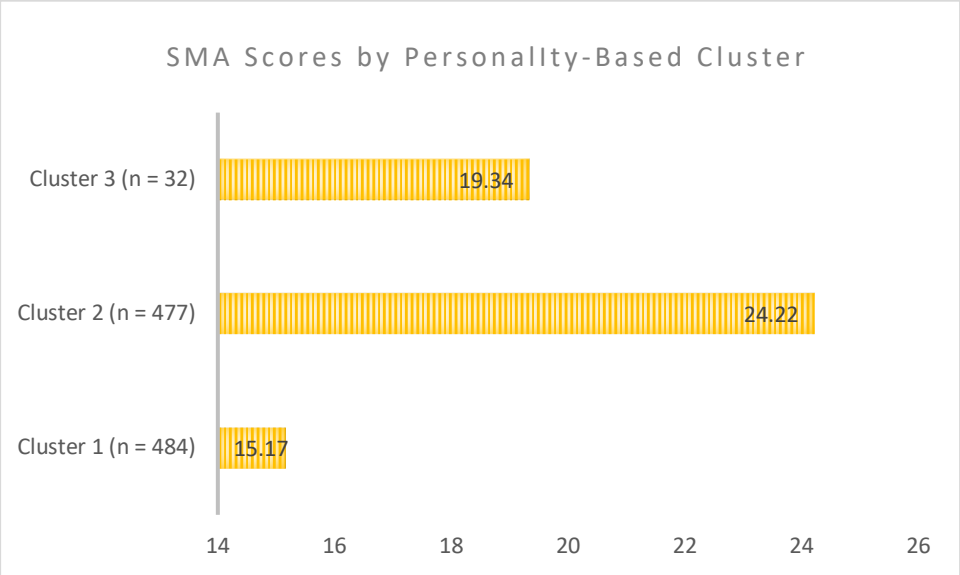
Table 3. Number of participants per cluster

Cluster	n	M	*SD*	95% CI
Cluster 1	800	15.17	2.99	14.96—15.37
Cluster 2	32	24.22	1.76	23.59—24.85
Cluster 3	161	19.34	4.24	18.68—20.00
Total	993	16.13	3.84	15.89—16.37

The post-hoc analysis, conducted using Tukey's HSD test, provided further insight into these differences: Participants in Cluster 2 (M = 24.22, *SD* = 1.76) reported significantly higher levels of social media addiction than those in both Cluster 1 and Cluster 3 ($p < .001$). This group's high neuroticism and low conscientiousness likely contribute to greater emotional reactivity and reduced self-control, factors known to predict problematic digital engagement. Individuals in Cluster 3 (M = 19.34, *SD* = 4.24) also had significantly higher addiction scores compared to those in Cluster 1 ($p < .001$), although not as elevated as those in Cluster 2. Participants in Cluster 1 (M = 15.17, *SD* = 2.99) exhibited the lowest average levels of social media addiction, consistent with their higher conscientiousness and lower extraversion traits that are often associated with more restrained and purposeful online behavior.

These findings provide empirical support for the hypothesis that personality configurations are significantly associated with varying levels of social media addiction. Specifically, individuals exhibiting emotionally unstable, extroverted, and disorganized personality traits appear to be more vulnerable to excessive and potentially maladaptive social media use. This relationship is visually depicted in Figure 1, which illustrates the gradient of addiction scores across the three clusters.

Figure 1. Mean social media addiction (SMA) score by personality-based cluster



Discussion

This study revealed that personality-based user profiles, derived from the FFM, are significantly associated with differing levels of social media addiction among university students. The profile marked by high extraversion, agreeableness, neuroticism, and openness, combined with low conscientiousness (Cluster 2), reported the highest addiction levels. This finding supports existing psychological theories, which emphasize that high emotional reactivity (neuroticism) and novelty-seeking (openness and extraversion), when coupled with low self-discipline (low conscientiousness), increase vulnerability to compulsive behaviors (Brand et al., 2016; Montag et al., 2019). These results parallel with the I-PACE model, which posits that individual predispositions interact with cognitive and affective responses to online stimuli, ultimately leading to problematic use patterns (Brand et al., 2016; 2019).

In contrast, the low-risk Cluster 1 profile, characterized by low extraversion and high conscientiousness, reported the lowest mean scores of social media addiction. This is consistent with research showing that conscientious individuals are better able to set limits, resist impulses, and engage in planned, purposeful online activity (Kuss & Griffiths, 2015;

Sindermann et al., 2020). The protective role of conscientiousness observed in our findings corroborates meta-analytic evidence suggesting that this trait consistently predicts reduced vulnerability to problematic internet use across diverse populations and platforms (Meynadier et al., 2024; Zhou et al., 2021). Thus, the current study reinforces the view that personality traits are not only relevant but also decisive in shaping digital behavior patterns, particularly in environments with persistent online stimuli and minimal external constraints. Furthermore, the identification of an intermediate profile (Cluster 3), which had moderately high agreeableness and moderately low conscientiousness and openness, highlights the subtlety of digital behavior and the need to move beyond simple linear trait-addiction models. Clustering techniques can detect subtle personality constellations that are more ecologically valid than trait-by-trait analyses. Reanalyzing the data with the density-based DBSCAN algorithm replicated the three-profile structure originally obtained with K-means. The smallest, high-risk profile still comprised 3.2% of participants, and the partition showed strong concordance with the K-means solution (Adj. Rand Index = .73). This agreement, coupled with comparable silhouette values (DBSCAN =.26; K-means = .24), indicates that the high-risk subgroup is not an artefact of centroid-based clustering but a stable, if small, segment of the sample.

To gauge the practical importance of the clusters, we applied the recommended BSMAS cut-points (≤ 18 = non-problem, 19–23 = sub-clinical, ≥ 24 = severe; Andreassen et al., 2016). In our sample, 83 students (8.4%) met the severe criterion. A cross-tabulation showed that 66% of these severe cases fell in Cluster 3 (the high-risk profile), 29% in Cluster 2, and 5% in Cluster 1. Thus, while the high-risk personality profile captures the majority of clinically severe users, a substantial minority appear in the other two clusters—mirroring the heterogeneity reported by Turner et al. (2011) and anticipated by Blaszczynski and Nower's (2002) pathways model. This pattern underscores that multiple personality configurations can lead to severe social-media problems and highlights the need for tailored prevention strategies.

What's more, the relationship between personality traits and problematic social media use has been widely documented, with particular attention given to neuroticism and conscientiousness. In line with prior studies, this research confirms that high neuroticism and low conscientiousness are consistent risk factors (Andreassen et al., 2013; Marengo et al., 2020). High neuroticism has been linked to increased use of social media as an emotion-regulation strategy, often resulting in compulsive or excessive engagement (Blachnio et al., 2016; Elhai et al., 2017). This pattern may reflect attempts to alleviate negative affect through social validation and distraction, creating a maladaptive reinforcement cycle that strengthens over time (Brailovskaia et al., 2020; Rozgonjuk et al., 2019). Similarly, low conscientiousness has repeatedly been associated with poor digital self-regulation, procrastination, and higher susceptibility to addictive usage patterns (Kircaburun et al., 2019).

However, the current study adds to the literature by adopting a personality-profile approach, rather than analyzing traits in isolation. While earlier studies often use regression models to assess individual trait effects, cluster analysis allows for a person-centered understanding of how traits combine within individuals (Schivinski et al., 2018). This approach is in line with emerging perspectives in personality psychology that emphasize intra-individual patterns over trait averages (Wright et al., 2015). Person-centered methodologies acknowledge the multifaceted interplay between multiple personality dimensions and recognize that individuals with similar overall addiction risk may arrive at problematic usage through different psychological pathways (Marengo et al., 2021; Starcevic & Aboujaoude, 2017). Besides, the observed link between openness and higher addiction levels in Cluster 2 contrasts with some earlier findings that associated openness with healthier digital engagement. However, recent research by Marino et al. (2022) and Kayis et al. (2016) suggest that when high openness cooccurs with low conscientiousness and high neuroticism, it may reflect impulsive novelty-seeking behavior that fosters addictive use, particularly on visually stimulating platforms like Instagram or TikTok.

Our findings also contribute to the growing body of evidence suggesting that personality traits may interact with platform-specific features to influence addiction vulnerability. For example, the combination of high extraversion and neuroticism observed in Cluster 2 may be particularly problematic in social media environments that present immediate social feedback and variable reward schedules (Kircaburun & Griffiths, 2018; Sha et al., 2019). These platform characteristics can exploit psychological vulnerabilities, creating engagement loops that are especially difficult to resist for individuals with certain personality configurations (Montag et al., 2021; Throuvala et al., 2019).

Given the strong associations between certain personality configurations and social media addiction, this study offers valuable insights for designing targeted interventions. In particular, users who match the high-risk Cluster 2 profile can be considered for early screening and support services, especially within university settings. Digital mental health tools, such as app-based trackers or self-regulation programs, could be customized for users with high emotional volatility and poor organizational control (Tateno et al., 2019). These interventions could incorporate elements of cognitive-behavioral therapy that specifically address maladaptive cognitions relation to fear of missing our (FoMO) and social comparison, which are known mediators between personality traits and problematic social media use (Oberst et al., 2017; Wolniewicz et al., 2019). Educational institutions could incorporate personality-informed digital literacy training, particularly for students displaying high extraversion and neuroticism. These students may benefit from structured social engagement offline, as well as mindfulness and cognitive-behavioral strategies to cope with emotional triggers for excessive use (Carbonell et al., 2018; Rozgonjuk et al., 2019).

In contrast, profiles with high conscientiousness and low extraversion may require less intensive intervention, as their self-regulatory capacities act as protective factors. From a public health perspective, personality profiles can act as risk indicators for preventive targeting. For example, awareness campaigns can be tailored to emphasize the risks of passive scrolling or emotional dependency on social validation for neurotic users. Similarly, training programs that build self-control, planning, and emotional awareness could be integrated into digital education curricula. Such approaches align with the principles of precision prevention, which advocates for tailoring interventions based on individual risk factors rather than applying one-size-fits-all solutions (Kiraly et al., 2020; Vondrackova & Gabrhelik, 2016). As such, personality-based clustering may inform evidence-based strategies for reducing digital addiction risk at both the individual and institutional levels.

Moreover, these findings can be interpreted in light of the cultural and developmental context of the sample—university students in Türkiye. As emerging adults, many university students are navigating key identity, relational, and academic transitions, often while living away from home for the first time (Arnett, 2000). Social media use during this phase can function as a critical tool for maintaining familial and peer bonds, managing stress, and expressing personal identity. However, this developmental stage also entails elevated vulnerability to social comparison, FoMO, and emotional instability especially among individuals with personality profiles high in neuroticism and extraversion (Kovan., 2024; Kovan et al., 2024). In the Turkish cultural context, where collectivist values such as social connectedness, family orientation, and interpersonal harmony are emphasized (Hofstede, 2011; Kağıtçıbaşı, 2005), social media can function as both a bridge and a burden (Kovan, 2024). For example, high agreeableness and extraversion traits linked to social receptivity may lead students to feel a stronger pull toward maintaining digital contact, potentially reinforcing compulsive patterns of use. Furthermore, in academic settings that are increasingly competitive and digitally integrated, students may feel pressure to remain constantly accessible, both socially and academically, via online platforms (Kovan, 2025). These contextual dynamics could intensify the emotional and cognitive triggers associated with social media addiction, especially for personality profiles low in conscientiousness and high in openness or neuroticism.

Limitations and future studies

One important limitation of this study is the sample composition, which was restricted to students from a single university. As such, the generalizability of the findings may be limited to similar academic and cultural contexts. Future studies can include more diverse and representative samples across institutions and regions to enhance external validity. Another limitation is the self-report nature of the measurement tools. Although widely used and validated, self-report scales are subject to

social desirability bias and subjective distortions. Incorporating objective behavioral metrics (e.g., actual screen time data, engagement patterns, or passive sensing methods) would provide more ecologically valid assessments of social media use and potentially reveal different relationships with personality profiles (Ellis et al., 2019). A further limitation is that cluster validity was examined with only one external indicator (BSMAS level); future studies can incorporate additional behavioral and psychosocial measures (e.g., usage logs, well-being indices, etc.) to provide a more comprehensive validation of personality-based profiles. Including behavioral metrics (e.g., screen time logs) or informant reports in future research could provide a more comprehensive understanding of addiction patterns.

Future studies could also benefit from longitudinal designs to examine causal relationships between personality traits and social media addiction trajectories over time. Such designs would help clarify whether personality configurations predispose individuals to addiction or whether prolonged social media use might influence certain personality expressions a question that remains underexplored in the current literature (Huang, 2022; Twenge & Campbell, 2019). Moreover, additional analyses could explore whether the identified clusters differ significantly in terms of demographic variables such as age, gender, or academic field. Such insights could further refine profile-based intervention efforts and broaden the applicability of the clustering model in different educational and psychological contexts.

Another promising direction for future research would be to investigate potential mediating and moderating factors between personality profiles and social media addiction. For example, examining how specific motivations for use (e.g., social connection, information seeking, or entertainment) might mediate the relationship between personality clusters and addiction outcomes could provide a more detailed understanding of the mechanisms involved (Ryan et al., 2014; Throuvala et al., 2021). Similarly, exploring how contextual factors such as academic stress, social support, or cultural norms might moderate these relationships would contribute valuable insights for developing more effective interventions (Brailovskaia et al., 2022; Chen & Lee, 2013).

Conclusion

This study provides strong evidence that personality traits act as key determinants of social media addiction levels among university students. By using a clustering approach grounded in the FFMP, we identified three distinct user profiles that differ significantly in their addiction scores. These profiles demonstrate that trait constellations rather than individual differences meaningfully predict patterns of digital behavior. The person-centered approach employed in this study represents an important methodological advancement in understanding the multifaceted relationship between personality and technology use, moving beyond

simplistic single-trait correlations toward a more comprehensive and ecologically valid framework (Marengo et al., 2021; Starcevic & Billieux, 2017).

The identification of these profiles presents a practical foundation for developing personalized digital well-being programs. Interventions tailored to specific personality profiles may be more effective than generalized efforts, especially for youth populations navigating identity, socialization, and self-regulation in a digital age. This personalized approach aligns with contemporary perspectives in prevention science that emphasize the importance of matching intervention strategies to individual risk profiles (Kiraly et al., 2020; Vondrackova & Gabrhelik, 2016). Promoting profile-based digital literacy could be a critical step toward mitigating the psychological risks of technology overuse.

In an era where digital platforms are increasingly designed to maximize user engagement, understanding the psychological vulnerabilities that predispose certain individuals to problematic use becomes increasingly important. Our findings suggest that personality-based risk assessment could be integrated into broader digital wellness initiatives within educational settings, potentially serving as an early identification tool for students who may benefit from targeted support (Montag et al., 2021; Sohn et al., 2019). By recognizing that different personality configurations interact uniquely with social media environments, educators, mental health professionals, and platform designers can work collaboratively to create digital spaces that support healthy engagement patterns across diverse user profiles (Throuvala et al., 2019; Wu et al., 2016). As social media continues to evolve and integrate further into daily life, the ability to predict problematic usage patterns based on personality profiles could inform both prevention strategies and platform design considerations. Future research can build upon these findings by exploring how personality-based interventions might be implemented and evaluated in real-world settings, potentially leading to more effective approaches for promoting digital well-being among young adults navigating an increasingly connected world (Kiraly et al., 2020).

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Statement of Competing Interests

None.

Author's contributions

AK contributed to conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, software, validation, visualization, writing – original draft, and writing – review & editing. AG provided supervision. All authors commented on previous versions of the manuscript and approved the final version.

Ethics Approval

This research was approved by the Atatürk University Social and Human Sciences Ethics Committee (Approval No. E-56785782-050.02.04-2400045205, 01/14). Informed consent was obtained from all participants. All procedures guaranteed anonymity, confidentiality, and voluntary participation.

Research Promotion

This study explored how personality-based user profiles, derived from the Five-Factor Model, relate to different levels of social media addiction among university students. Findings demonstrated that individuals high in neuroticism and extraversion but low in conscientiousness were particularly vulnerable, emphasizing the importance of personality-informed interventions.

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