Social Network Addiction and Personality: The Moderating Role of Fear of Missing Out

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Abstract

Social Network Addiction (SNA) in university students has aroused interest among researchers in the field to understand the possible association with individual differences. The objective of the investigation is to contribute to the knowledge about the relationship between Social Network Addiction, personality traits, and Fear of Missing Out (FOMO) in university students. A sample of 524 university students participated in this investigation. The instruments used were a Sociodemographic and Social Network Usage Questionnaire, the Social Network Addition Scale, the NEO Five Factor Inventory Personality Questionnaire (NEO FFI-20), and the Fear of Missing Out Scale. The main results indicated the existence of negative associations between SNA and the personality characteristics Conscientiousness and Extraversion and positive correlations with Neuroticism. Regression analyses suggested that SNA, Neuroticism, Agreeableness, and Extraversion predicted FOMO. It was also verified the mediating role of FOMO in the association between personality and SNA. The practical implications of the research, limitations and suggestions for future studies are also discussed.

Keywords: social network addiction, personality, fear of missing out, university students.

Adicción a las Redes Sociales y Personalidad: El Papel Moderador del Miedo a Perderse Algo

Resumen

La Adicción a las Redes Sociales (ARS) en estudiantes universitarios ha despertado el interés de los investigadores en este campo para comprender la asociación con las diferencias individuales. El objetivo de la investigación es contribuir al conocimiento sobre la relación entre ARS, personalidad y miedo a perderse algo (FOMO) en estudiantes universitarios. Una muestra de 524 estudiantes universitarios participó en esta investigación. Los instrumentos utilizados fueron un Cuestionario Sociodemográfico y de Uso de Redes Sociales, la Escala de Adicción a las Redes Sociales, el Inventario de Cinco Factores de Personalidad (NEO FFI-20) y la Escala de FOMO. Los resultados indicaron asociaciones negativas entre ARS y las características de personalidad Conciencia y Extraversión y positivas con Neuroticismo. Los análisis de regresión sugirieron que ARS, el Neuroticismo, la Amabilidad y la Extraversión predecían el FOMO. También se verificó el papel mediador de FOMO en la asociación entre personalidad y la ARS. Discuten se implicaciones de la investigación, limitaciones y sugerencias para futuros estudios.

Palabras clave: adicción a las redes sociales, personalidad, miedo a perderse algo, estudiantes universitarios.

Introduction

The use of the internet and social networks is transversal, continuous, and growing at a global level. The technological infrastructure underlying such digital platforms enables the dissemination of a substantial volume of information to an audience that is both vast and diverse. It is possible to access it through different electronic devices, as computers, tablets, and mobile phones, thus enabling a quick way of communication and interaction between people, obtaining information, expressing opinions and beliefs, and making decisions on certain subjects (Hernández et al., 2021; Ross et al., 2009).

Despite the variety of potentialities arising from the use of the Internet, there can also be negative consequences related to its excessive use (Lin et al., 2018; Pontes et al., 2016; Puerta-Cortés & Carbonell, 2013), for example, the inability to control the time of use and the neglect of daily activities for the use of social networks (Puerta-Cortés & Carbonell, 2013).

One of the groups most likely to develop problematic use of the Internet is university students. It is a tool that is present in their daily lives and routines (e.g. academic research) without parental control, both in terms of socialising and leisure, which means that they spend more and more hours online (e.g., Al-Gamal et al., 2016; Rayan et al., 2017). In addition, university students can find it difficult to make new friends and live away from their families, which can result in feelings of anxiety and stress, and can lead to excessive use of the internet (Romero-Rodríguez et al., 2019). Thus, the influence that the internet and, in turn, social networks have on each user can result in negative consequences that must be explored (Kircaburun & Griffiths, 2018; Kuss et al., 2013).

According to Andreassen and Pallesen (2014), social network addiction consists of the uncontrollable use of social media and the fact that the subject spends so much time on it that it interferes with normal social activities, as well as health and psychological well-being. Although the term, social networks addiction is extensively used in the scientific literature, it has not yet been recognized in the DSM-5 as a dependence disorder, but some authors consider that they can be included in the scope of behavioural dependencies (e.g. Andreassen & Pallesen, 2014; Griffiths, 2005).

One of the fields that has caused the most interest and that has been explored in recent years, associated with the use of social networks, is the personality characteristics of individuals contemplated in the five-factor model (Fagundes et al., 2020; Kosinski et al., 2013; Ross et al., 2009, Sindermann et al., 2020; Stead & Bibby, 2017). Research indicates that more extroverted individuals use social networks as a mechanism to improve social connections, maintain existing relationships and manage tasks (e.g., Bunz, 2021; Horzum, 2016; Kircaburun et al., 2018; Kuss & Griffiths, 2011). Other studies have not found that Extraversion has an influence on Social Network Addiction (Marengo et al., 2019; Whaitea et al., 2017). In turn, individuals with high scores on the Neuroticism trait may have low frustration tolerance, and be attracted to using these online platforms, with the aim of changing their emotional state and avoiding loneliness (Hawi & Samaha, 2019; Miceli et al., 2022; Ross et al., 2009; Tang et al., 2016) and prefer to communicate through a screen rather than in person (Coiro et al., 2017; Monteiro et al., 2020). Regarding the Conscientiousness dimension, less conscientious individuals tend to be less responsible, do not follow rules, avoid academic obligations, have greater difficulty controlling the time they use social networks, and spend more time online. On the contrary, individuals with high levels have a greater capacity to control the amount of time spent on social networks, as they realize that its use can negatively influence their productivity (Kayiş et al., 2016; Rajesh & Rangaiah, 2020; Randler et al., 2014; Ross et al., 2009). Thus, individuals with more emotionally stable personality traits are less likely to develop dependence on social networks, while others who demonstrate greater emotional instability

are more susceptible to developing this problem (Hawi & Samaha, 2019; Rajesh & Rangaiah, 2020; Sindermann et al.2020; Wegmann et al., 2017).

In a study conducted by Ross et al. (2009), in which the five personality traits were related to the use of the social network Facebook, the following conclusions were obtained: individuals who scored higher in Extraversion use this network as a social tool, but do not do so as an alternative to social activities or as a way to replace interactions with the real world. Individuals who scored higher on Neuroticism demonstrated greater control in the information shared on Facebook. Regarding individuals with high scores on Agreeableness, it was expected that they would be more involved in interpersonal relationships and have more online contacts, translating into a greater number of friends on Facebook, however this was not the case. The data also revealed that individuals with high levels of Openness to Experience revealed a greater tendency to be sociable online, through Facebook. It was also expected that conscientious individuals would not use Facebook recurrently, as they considered it to be a means of procrastination or distraction from daily tasks, however, the opposite was verified.

Zúñiga et al. (2017) in a study carried out in 20 countries, aiming to understand the relationship between the use of social networks and the five personality traits, concluded that the factors Extraversion, Agreeableness, Conscientiousness, and Openness to Experience are positive predictors of the use of social networks, while Neuroticism proved to be a negative predictor. Studies carried out, relating personality traits and the use of the social network Instagram (Fagundes et al., 2020; Kircaburun & Griffiths, 2018), describe positive correlations with Neuroticism, observing that emotionally unstable individuals tend to use this social network more intensely to hide their characteristics considered undesirable and show on their profiles only what they consider positive.

Lately, Fear of Missing Out (FoMO) was highlighted as a driver of engagement and Social Network Addiction (SNA) (Moore & Craciun, 2021). FoMO is defined as social anxiety and is characterized by an intense concern or apprehension that others may have more rewarding experiences without the individual being present. (Przybylski et al., 2013; Soriano-Sánchez, 2022). In this sense, the individual has the need to be constantly online so as not to miss any publication related to his social sphere (Budnick et al., 2020; Elhai et al., 2020; Reer et al., 2019). Fear of missing out has been related with more social isolation, anxiety, depression, lower quality of sleep, and feelings of inferiority in relation to others having a more exciting reality than one's own (Baker et al., 2016; Rajan et al., 2022).

Several studies show that some personality traits are associated with FoMO (e.g., Rozgonjuk et al., 2021; Savitri et al., 2021). Research has shown that Neuroticism is positively associated with FoMO (Alt & Boniel-Nissim, 2018; Blackwell et al., 2017; Rozgonjuk et al., 2021). Individuals with a neurotic personality, individuals who experience Fear of Missing Out also show anxiety because they consider themselves to be missing out on experiences considered rewarding (Przybylski et al., 2013). Research indicate that FoMO has a positive relationship with Agreeableness (Hamutoglu et al., 2020; Marshall et al., 2015) and no association with Extraversion and Openness to Experience (Rozgonjuk et al., 2021; Stead & Bibby, 2017). Concerning Conscientiousness, Wegmann et al. (2017) found a negative relationship with FoMO, the authors have report that individuals with less self-discipline and difficulty focusing on tasks, spend more time online (Wegmann et al., 2017).

Some research suggests that the associations between personality and SNA may be mediated by the FoMO (e.g., Alshakhsi et al., 2023; Ruyandy & Kartasasmita; 2021; Sindermann et al., 2021). In the study carried out by Ruyandy and Kartasasmita (2021) with emerging adults, the mediating effect of Fear of Missing Out in the relationship between personality traits and problematic internet use was analyzed, with the authors verifying

that Extraversion affects the use problems of the internet, with the FoMO variable not having a mediating effect. Regarding the Agreeableness and Conscientiousness dimensions, FoMO had a negative mediating effect. And in the Neuroticism dimension, FoMO had a positive effect as a mediating variable (Ruyandy & Kartasasmita, 2021).

Considering the literature review and the fact that there is still little research that focuses on the variables under study (Social Networks Addiction, personality traits and FoMO), particularly in a Portuguese context. Addiction to social networks is a growing phenomenon with an impact on mental health, productivity and personal relationships (Andreassen & Pallesen, 2014). Therefore, studying social media addiction, FoMO and the five personality factors is fundamental to understanding how individual characteristics influence digital behaviour given the impact it has on mental health, interpersonal relationships and general well-being (Reer et al., 2019; Ruyandy & Kartasasmita, 2021; Soriano-Sánchez, 2022). The present study aimed to: (i) study the relationship between SNA, personality and FoMO; (ii) investigate the predictive effect of personality traits on SNA; (iii) determine the predictive effect of personality and SNA on FoMO; (iv) study the mediating effect of FoMO in the relationship between personality and SNA.

Materials and Methods

Participants

In this study, 524 individuals (441 female and 83 male) aged between 18 and 56 years old (M=22.32, SD=5.65) were randomly recruited from portuguese universities. A total of 332 (63.4%) individuals reported attended a degree, 182 (34.7%) a master's and 10 (1.9%) a PhD. Regarding the time dedicated to Social Networks per day, excluding academic and/or professional tasks, 52 (9.9%) reported spending up to one hour, 142 (27.1%) up to two hours, 209 (39.9%) up to four hours and 121 (23.1%) more than four hours. As for the

perception of time spent on Social Networks, 381 (72.7%) said they had this perception and 143 (27.3%) said they did not. Of the total number of participants, 334 (63.7%) claimed to have control over the time they spend online. As for the social network, students preferentially use Instagram (67.9%), followed by Facebook (14.5%), Twitter (5.7%), WhatsApp (4.4%), and Youtube (3.4%). Regarding the most used device, 472 (90.1%) individuals indicated the cell phone.

Instruments

To carry out the present investigation, a sociodemographic questionnaire was used to collect information related to the participants' personal data (sex, age and level of education). In addition, participants were asked to answer a series of of questions concerning their utilisation of social networking websites, including the duration of their online leisure activity, the social networking platform most frequently employed, their perception and control of the time spent online, and the device most commonly used.

Regarding to addiction to social network was assessed using the Social Network Addiction Scale (Al-Menayes, 2015), adapted for the Portuguese population by Lira (2016). This scale built on the basis of Young's scale (1998) assesses internet addiction and symptoms of social network addiction. The original version consists of 13 items divided into three factors: Social Consequences, Inappropriate Use of Time, and Compulsive Feelings. The Portuguese version of the Social Network Addiction Scale (Lira, 2016) consists of 11 items, evaluated on a 5-point Likert-type scale, from 1 (totally disagree) to 5 (totally agree), divided into two factors: Social Consequences and Compulsive Feelings. With regard to internal consistency, the Cronbach's alpha values found are adequate, having been obtained .82 in the original scale (Al-Menayes, 2015) and .85 in the scale adapted by Lira (2016), regarding the sub-scales, it was obtained in the social consequences .83 and .73 in compulsive feelings (Lira, 2016). The Cronbach's alpha values

of the instrument in this study are .77 for the total scale, .63 for the Social Consequences dimension and .69 for the Compulsive Feelings dimension.

The two-factor model of the Social Network Addiction Scale in the present study revealed an acceptable goodness of fit ($\chi 2$/df = 4.37, CFI=.86, GFI=.93, RMSEA=.09 and P[rmsea ≤.05]<. 001) (Marôco, 2014).

Fear of Missing Out Scale (FoMOs) is a 10-item instrument that assesses the fear of "being left out. The response scale used is a 5-point Likert-type scale ranging from 1 (does not apply to me) to 5 (applies to me very much). The score ranges from 10 to 50 points. The higher the total score, the greater the present concern or apprehension (Przybylski et al., 2013). Regarding the internal consistency, the Cronbach's alpha value was .87 (Przybylski et al., 2013). Since the present instrument was not translated and validated for the Portuguese population, it was previously translated. In the present sample, the internal consistency analysis of this instrument revealed Cronbach's alpha values of .78. Taking into account the criteria of Kaplan and Saccuzzo (2017), we can say that Fear of Missing Out presents an appropriate reliability. A confirmatory factor analysis, was carried out to verify the adequacy of FoMO scale. The following fit indices were used: $\chi 2$/df (chi-square and degree of freedom ratio), CFI (comparative fit index), GFI (goodness of fit index) and RMSEA (root mean square error of approximation) and P [rmsea ≤.05]. The model fit was considered suitable for $\chi 2$/df values below 5, CFI and GFI above .9 and RMSEA below .10 (Marôco, 2014). The confirmatory factor analysis revealed a poor fit ($\chi 2$/df=8.44, CFI=.85, GFI=.89, RMSEA=.12, and P[rmsea ≤ .05] <.001).

The NEO Five Factor Inventory (NEO-FFI-20) (Costa & McCrae, 1992) is a 20-item scale that assesses the personality traits: Neuroticism, Extroversion, Openness to Experience, Agreeableness, and Conscientiousness. Items are answered on a Likert scale with five options ranging from 1 (strongly disagree) to 5 (strongly agree). The adaptation for the Portuguese population of this scale carried out by Bertoquini and Ribeiro (2006) presents satisfactory psychometric characteristics. The confirmatory factor analysis performed in the study supports the instrument's five factor structure, and this model demonstrates an acceptable fit to the data. The internal consistency of the NEO-FFI-20 can be considered satisfactory, with all scales showing Cronbach's alpha equal to or greater than .70 (Bertoquini & Ribeiro, 2006).

With regard to the reliability of the instrument for the dimensions Neuroticism, Extroversion, Openness to Experience, Agreeableness, and Conscientiousness, Cronbach's alpha is .67, .67, .77, .70 and .77 respectively. The goodness-of-fit indices produced through the CFA indicated that the NEO-FFI-20 model showed an adequate fit to the data ($\chi 2$/df=3.09, CFI=.88, GFI=.91, RMSEA=.06, P [rmsea ≤.05] <.001) and almost all items showed factorial weights greater than .50.

Procedure

The sample was collected through the dissemination of the questionnaires on social networks and in classrooms of a Portuguese university. Participation was voluntary and anonymity and confidentiality of responses were ensured. These ethical procedures were guaranteed through an Informed Consent statement completed by the participants at the beginning of the investigation. This study was approved by the Ethics Committee of the University of Trás-os-Montes and Alto Douro.

Data Analysis

Statistical analysis included the descriptive analysis of the sample and the variables under study. The normality of the variables was assessed using the skewness (Sk) and kurtosis (Ku), with criteria values ranging from -1 to 1 (Marôco, 2007). The study of the psychometric characteristics of the instruments used was based on the methodology of structural equation modeling (SEM) and significance of the regression coefficients was assessed using the maximum likelihood method. The models were evaluated using the following fit

indexes: chi square/degrees of freedom ($\chi 2/df$), Comparative fit index (CFI), Parsimony Goodness of fit index (PGFI), Root mean square error of approximation (RMSEA) and P [rmsea ≤.05] (Arbuckle, 2005; Marôco, 2014; McDonald & Ho, 2002). Cronbach's alpha was used to estimate the reliability of each of the scales.

To study the association between SNA and its dimensions Social Consequences and Compulsive Feelings, Fear of Missing Out, and the personality traits of the five-factor model, we used Pearson's correlation coeficiente. To determine the most parsimonious models for predicting SNA as a function of the personality traits and FoMO as a function of personality traits and Social Network Addiction, multiple linear regression analyzes were carried, after verifying the assumptions of normality and homoscedasticity.

Subsequently, a Path analysis was carried out to obtain a causal model of personality traits on SNA mediated by FoMO. The method used to estimate the parameters was the maximum likelihood method. The significance of direct and indirect effects was assessed using the Bootstrap resampling method. For the statistical treatment of the data, the Statistical Package for the Social Sciences (SPSS, v.27) and AMOS (v.22) where used. In all statistical analysis a significance level of .05 was considered.

Results

Table 1 gives descriptive statistics, as mean (M), standard deviation (SD), skewness, and kurtosis for the variables under study. Regarding normality, the values of skewness and kurtosis are in an interval associated with a normal distribution.

Table 1

Descriptive statistics and univariate normality.

Variables	Min.	Máx.	M	SD	Sk	Ku
Social Network Addiction	11	47	27.85	6.21	-.03	.01
Social Consequences	4	16	7.54	2.52	.59	-.07
Compulsive Feelings	7	33	20.31	4.46	-.20	.12
Fear of Missing Out	10	47	22.75	6.66	.55	.08
Neuroticism	4	20	12.64	3.00	-.10	-.35
Extraversion	4	20	12.10	2.77	-.33	-.01
Openness to Experience	4	20	13.30	3.56	-.06	-.72
Agreeableness	5	20	13.52	3.15	-.21	-.46
Conscientiousness	5	20	15.17	2.50	-.59	.88

Correlation and regression analysis

Regarding the association between Social Network Addiction and personality traits, the results obtained (Table 2) indicate negative and significant correlations between Conscientiousness (r=-.35, p<.001) and Extroversion (r=-.22, p<.001), and positive and significant with Neuroticism (r=.31, p<.001). As for the dimensions of the Social Network Addiction the results show that Social Consequences are negatively associated with Conscientiousness (r=-.41, p<.001), Extraversion (r=-.21, p<.001) and Agreeableness (r=-.11, p<.001),

and positive with Neuroticism (r=.30, p<.001). The Compulsive Feelings dimension is negatively associated with the personality traits Conscientiousness (r=-.25, p<.001) and Extraversion (r=-.19, p<.001), and positively with Neuroticism (r=.27, p<.001). The data suggests that more neurotic, less conscientious and less extroverted individuals tend to be more addicted to social networks. Regarding the dimensions of the Social Network Addiction, more neurotic, less conscientious, less extroverted and less agreeable individuals have higher scores in the Social Consequences dimension and more

neurotic, less conscientious and less extroverted individuals tend to have more scores in the dimension Compulsive Feelings. As for Fear of Missing Out, the results indicate negative and significant correlations with Extraversion (r =-.10, p<.05) and Conscientiousness (r=-.14, p<.001), and positive and significant correlations with Neuroticism (r=.32, p<.001) and Agreeableness (r=.26, p<.001).

Table 2 *Association between Social Network Addiction, Fear of Missing Out and Personality traits*

	SNA	SC	CF	FoMO	Neuro.	Extra.	OpExp	Agree.	Consc.
SNA	1	.80**	.94**	.43**	.31**	-.22**	-.05	-.07	-.35**
SC		1	.55**	.30**	.30**	-.21**	-.01	-.11*	-.41**
CF			1	.43**	.27**	-.19**	-.07	-.04	-.25**
FoMO				1	.32**	-.10*	.004	.26**	-.14**
Neuro.					1	-.46	.09*	-.04	-.30**
Extra.						1	-.01	.13*	.42**
OpExp.							1	.12**	.03
Agree.								1	.10*
Consc.									1

** p<.001, *p<.05   SC- Social Consequences; CF- Compulsive Feelings; Neuro- Neuroticism; Extra- Extraversion; OpExp- Openness to Experience; Agree- Agreeableness; Consc- Conscientiousness.

Prediction of Social Network Addiction according to personality traits

To determine the model that would allow predicting the sna as a function of the personality traits a multiple linear regression was performed with selection of variables using the Stepwise method. The variables that integrated the predictive equation were: Conscientiousness (β=-.687; p<.001) and Neuroticism (β=.470; p<.001). The final adjusted model is SNA= 32.329 - .687 Conscientiousness + .470 Neuroticism and explains 16.6% of the total data variability ($F_{(2, 521)}$ =51.945, p<.001, R^2=.166).

Prediction of Fear of Missing Out Addiction as a function of Personality traits and Social Network Addiction

To determine the most parsimonious model that would allow predicting Fear of Missing Out as a function of personality traits and Social Network Addiction, a multiple linear regression analysis was performed with selection of variables using the Stepwise method. This analysis selected the variables SNA (β=.40; p<.001), Neuroticism

(β=.55; p<.001), Agreeableness (β=.18; p=.03), and Extraversion (β=.21; p=.05), as significant predictors of Fear of Missing Out. The variables that most contribute to the explanation of FoMO are the sna and Neuroticism. The final adjusted model is FoMO=-.55+.40 SNA+.55 Neuroticism+.18 Agreeableness+.21 Extroversion. This model is significant and explains 23.7% of the variability of FoMO ($F_{(4, 519)}$=40.38; p<.001; R^2=.237). Based on the results, it is expected that individuals with high scores in sna, Neuroticism, Amiability and Extroversion will have high FoMO scores.

Fear of Missing Out Mediation Model on Social Network Addiction

To study the structural relationships (direct and indirect effects) between personality traits, FoMO and sna, Path analysis was used. Figure 1 presents the causal model of personality traits on Social Network Addiction mediated by Fear of Missing Out.

The fitted model explains 28% of the total variability in sna. The Openness to Experience personality trait was not considered as their trajectory

Figure 1. Fear of Missing Out Mediation Model on Social Network Addiction.
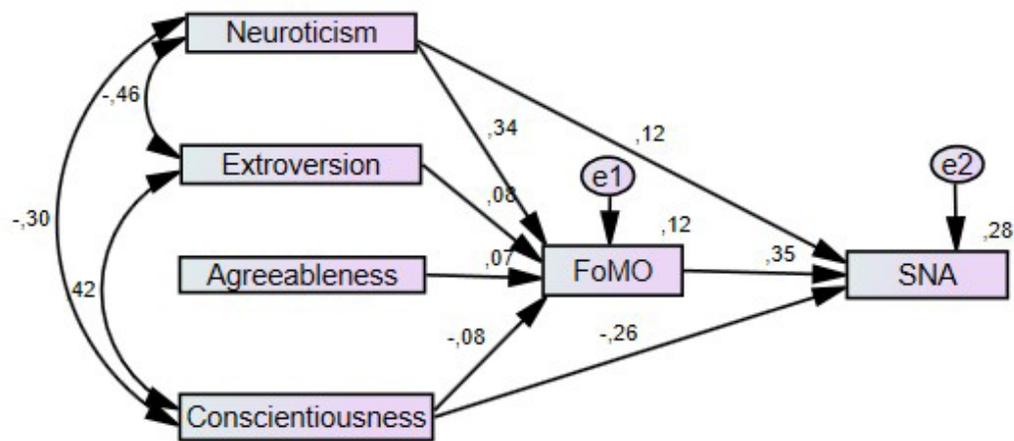
did not show significant results. The personality traits Agreeableness and Extroversion had an indirect effect of .02 and .03 on SNA mediated by FoMO. Conscientiousness had a total effect of -.29 on SNA with a direct effect of -.26 and an indirect effect mediated by FoMO of -.07. As for Neuroticism, the total effect is .24 on SNA with a direct effect of .12 and an indirect effect mediated by FoMO of .12. The fit indexes revealed an adequate fit of the model to the data ($\chi2/df=2.74$, CFI=.98, GFI=.99, RMSEA=.06) (Marôco, 2014) (Figure 1).

Discussion

The main goal of this study was to contribute to the knowledge about the relationship between Social Network Addiction, the personality traits defined in the five-factor model and Fear of Missing Out in university students. It was also intended to study the relationship between Social Network Addiction, personality and *Fear of Missing Out*; investigate the predictive effect of personality traits on Social Network Addiction and the predictive effect of personality and Social Network Addiction on the Fear of Missing Out. Finally, we studied the mediating effect of FoMO in the relationship between personality traits and Social Network Addiction.

With regard to the relationship between SNA and personality traits, the results indicated that more neurotic, less conscientious and less

extroverted individuals reveal a higher degree of SNA. With regard to Neuroticism, the results obtained in this study can be understood from the characteristics inherent to the factor, given that neurotic individuals due to lack of interpersonal skills, reduced resources in their social life and due to fear of loneliness, may present more anxiety and feelings of rejection in social contact (Hawi & Samaha, 2019; Rajesh & Rangaiah, 2020; Ross et al., 2009; Tang et al., 2016; Wegmann et al., 2017), thus feeling more comfortable in the interaction online, demonstrating less control over the use of Social Networks (Coiro et al., 2017; Miceli et al., 2021; Monteiro et al., 2020). In this sense, Neuroticism may represent a risk factor in the development of behaviors related to the problematic use of these platforms.

Regarding the Conscientiousness dimension, as previously mentioned, less conscientious students showed higher levels of SNA. Given that conscientiousness is described in the literature as the tendency to be organised, persistent, and responsible (Costa & McCrae, 1992), this explains why less conscientious individuals have higher SNA values. These results are in line with studies by Rajesh and Rangaiah (2020) and Randler et al. (2014) who state that less conscientious individuals tend to have less responsibility, do not follow rules, avoid academic obligations, have greater

difficulty in controlling the time of use of social networks, and spend more time online. On the contrary, more conscientious individuals have greater impulse control, reducing the amount of time spent on social networks, as they realize that its excessive use can have a negative influence on their productivity (Sindermann et al., 2020; Ross et al., 2009). It should be noted that higher Neuroticism and lower Conscientiousness also play an important role in predicting internet addiction (Monteiro et al., 2020) and problematic smartphone use (Marengo et al., 2020).

With regard to the Extroversion dimension, less extroverted students showed higher SNA. These results that are not reported in the literature (e.g., Horzum, 2016; Kircaburun et al., 2018; Kuss & Griffiths, 2011), indicate that individuals with high levels of Extraversion use this type of platforms more to improve their social connections, maintain existing relationships and manage tasks. However, these findings can be explained by the fact that introverts can use social networks to communicate and thus satisfy their social needs without the risks and negative feelings associated with face-to-face interactions, which they fear may occur in these relationships (Servidio, 2014).

As for the relationship between FoMO and personality traits, there were positive associations with Agreeableness and Neuroticism, and negative associations with Extroversion and Conscientiousness. Regarding the study between the variable FoMO and Agreeableness, the results are in line with other studies that refer that Agreeableness is positively associated with FoMO, thus demonstrating greater socialization online than face to face (Hamutoglu et al., 2020; Marshall et al., 2015). It should be noted that, in the investigation by Rozgonjuk et al. (2021), the personality trait Agreeableness did not correlate with FoMO. With regard to the relationship between the FoMO variable and Neuroticism, the results are in line with other investigations (Alt & Boniel-Nissim, 2018; Blackwell et al., 2017; Rozgonjuk et al., 2021), which refer that neurotic individuals show less affection

and more anxiety, just as individuals who experience FoMO feel anxiety about losing experiences that they consider important to them. Our results confirmed that FoMO plays an important role as a mediating variable. It is driven by the personality factor, which subsequently leads to the results obtained regarding Extroversion are not corroborated in some research studies, which states that there is no relationship between this personality trait and FoMO (Rozgonjuk et al., 2021; Stead & Bibby, 2017). It can be conjectured that these findings result from the fact that extroverted individuals are less inclined to engage in negative social comparisons on social networks, thereby mitigating the anxiety commonly associated with FoMO. As for the relationship with Conscientiousness, as in our study, other investigations (e.g., Rozgonjuk et al., 2021; Stead & Bibby, 2017) indicated a negative relationship between the two variables, which may demonstrate lower self-discipline (not stay focused on the task and react to interruptions) (Wegmann et al., 2017). This tendency could make individuals more susceptible to FoMO under the impact of social networks.

The predictive analyzes also indicated Conscientiousness and Neuroticism as predictive variables. In studies by Kircaburun and Griffiths (2018), Ross et al. (2009), and Zúñiga et al. (2017), the Conscientiousness trait is a negative predictor of the use of Social Networks, results that are in line with those found in this study. As for Neuroticism, it has been shown to be associated with the use of social networks, and people with high scores on this personality trait may be attracted to using these online platforms (Fagundes et al., 2020; Hawi & Samaha, 2019; Kircaburun & Griffiths, 2018; Tang et al., 2016).

Our results reflect what would be expected in that conscious individuals are more protected with regard to SNA, in turn, Neuroticism seems to constitute a risk factor in the development of behaviors related to the problematic use of social networks. Therefore, the results allow us to infer that personality characteristics that reflect

emotional instability make individuals with these traits more vulnerable to the problematic use of social media (Hawi & Samaha, 2019; Rajesh & Rangaiah, 2020; Wegmann et al., 2017). Thus, promoting self-regulation skills and increasing individual responsibility can contribute to reducing FoMO and its consequences.

The results also showed that SNA and the personality traits Neuroticism, Agreeableness, and Extroversion positively predict FoMO. In this sense, Pontes et al. (2016) and Pornsakulvanich (2017) report that moderate use of social network and adequate psychosocial adjustment contribute to lower levels of FoMO.

Regarding the mediating role of FoMO in the relationship between personality traits and SNA, the factors Neuroticism, Extroversion, Agreeableness, and Conscientiousness were found, highlighting the results referring to Conscientiousness and Neuroticism. Thus, we can state that when the Neuroticism, Extroversion, and Agreeableness traits influence the FoMO experience, the greater the level of SNA. Regarding Conscientiousness, this had a direct and indirect negative effect on SNA.

The results obtained are similar to those found in the study by Alt and Boniel-Nissim (2018), in which the Extroversion dimension was related to the problematic use of the internet, having FoMO as a mediating variable, and with the study by Ruyandy and Kartasasmita (2021) who report that in the Conscientiousness trait, a significantly negative effect of FoMO as a mediating variable was obtained. In turn, data referring to Neuroticism can be understood by the fact that the neurotic personality shows less affection and great anxiety, just as FoMO also incorporates states of anxiety due to the loss of rewarding experiences (Alshakhsi et al., 2023; Savitri et al., 2021). Our results confirmed that FoMO plays an important role as a mediating variable. It is driven by the personality factors, which subsequently leads to Social Network Addiction.

Conclusions

It is expected that the results of this investigation can somehow contribute to a greater understanding of the association between SNA, FoMO and personality. Also highlight that certain personality traits have a greater predisposition to SNA and FoMO. It is therefore considered that knowing the risk factors associated with Social Network Addiction and Fear of Missing Out is a necessary step to develop prevention and awareness actions among the university population, to promote a healthy use of social network and reflection on its main risks and benefits.

The present study has some limitations that may, however, pave the way for future investigations. We begin by emphasizing that this is a cross-sectional study, which therefore does not allow an assessment of the cause and effect relationship between the variables presented. Another limitation refers to the fact that the some of the questionnaires were answered online, which may have led to some lack of attention on the part of the participants, due to possible distracting stimuli, although it is a widely used data collection method because it is more economical and reaches a greater number of participants in various parts of the country. Another limitation refers to the fact that the instruments are self-reported, which can lead to some bias in the responses, corresponding not to the truth of the facts, but to the participant's perception, in addition to the fact that the social desirability dimension may also have had an effect on said responses. It should also be noted that FoMOs was used for the first time in a Portuguese context, which may represent a limitation of this study. It is therefore important to continue using the FoMOs in larger and more diverse samples and to study its psychometric characteristics.

Another aspect to consider is the size and representativeness of the sample. Although the number of participants is considerable and sufficient for the type of analyses carried out and the research objectives, it is not a representative sample

of the university population, so the results should be replicated with larger samples.

Given that studies that related to Social Network Addiction, Fear of Missing Out and personality traits are still scarce, it is important to continue to develop this line of investigation. It would also be interesting in future investigations to study the impact of the excessive use of social networks in the daily life of students, particularly in the family and social context. Likewise, its SNA and FoMO, given that it is a variable where inconsistent results have been found in the literature (e.g., Horzum, 2016; Kuss & Griffiths, 2011). Qualitative studies of FoMO should be carried out for a better understanding of the behaviors and feelings of individuals resulting from the persistent desire to stay connected with people in their social network(s).

Taking into account the characterization of the participants, in the habits of using social networks, we realized that university students use of Instagram more frequently and that the mobile phone is the device that they use the most to access these platforms, so future studies can investigate the variables addition to the smartphone and addition to the social network Instagram.

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