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RESEARCH PAPER

THE DARK TRIAD AND TRAIT EMOTIONAL INTELLIGENCE AS PREDICTORS OF PROBLEMATIC SOCIAL MEDIA USE AND ENGAGEMENT: THE MEDIATING ROLE OF THE FEAR OF MISSING OUT

Nadia Barberis, Maria-Jose Sanchez-Ruiz, Marco Cannavò, Danilo Calaresi, Valeria Verrastro

Abstract

Objective: Problematic social media use is becoming a significant social and clinical concern, and there is growing research interest in the psychological factors involved, such as personality predispositions and the fear of missing out (FOMO). The present study investigated both the dark triad (DT, namely, narcissism, Machiavellianism, and psychopathy) and trait emotion intelligence (trait EI) in relation to the problematic use of technology and social media engagement and the mediating role of FOMO.

Method: A total of 788 people between 18 and 35 years old (M = 24.22; SD = 3.91; 75% women) were surveyed.

Results: The results showed that social media engagement was positively related to problematic social media use and negatively related to trait EI. In addition, problematic social media use was positively related to DT and negatively related to trait EI. Fear of missing out was positively related to social media engagement, problematic social media use, and DT, and negatively related to trait EI. Fear of missing out had a mediating effect on the relationship between personality dimensions, problematic social media use, and social media engagement.

Conclusions: The extent to which personality traits may underpin problematic use of social media and the practical implications of the findings are discussed.

Key words: dark triad, trait emotional intelligence, fear of missing out, problematic social

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Introduction

In recent years, web-based activities have become widespread and the daily use of social media has increased markedly (Boyd & Ellison, 2007; Villanti et al., 2017). The extent to which an individual is involved in social media activities may be labelled social media engagement (SME; Przybylski et al., 2013). Although the use of social media can be beneficial in terms of socialising, communicating, and accessing real-time information (Barker, 2009; Przybylski et al., 2013; Ryan et al., 2014), several studies have raised concerns regarding the potentially harmful effects of individuals' excessive engagement (Alt, 2015, 2016; Przybylski et al., 2013). For instance, Reer et al. (2019) reported that a high level of SME was related to greater levels of subjective ill-being and psychopathology, whilst other scholars have suggested that SME is a way of counteracting negative emotional states such as loneliness (Burke et al., 2010) and boredom (Lampe et al., 2007). Social media engagement has behavioural, cognitive, and emotional dimensions (Trunfio & Rossi, 2021) and involves click-based interactions, content viewing, and reading (Khan, 2017). Problematic social media use is closely related to SME. It involves spending a great amount of time and effort on social media and

a compulsion to use accounts to the point where it impairs everyday activities, interpersonal relationships, and/or psychological well-being (Andreassen, 2015).

Although SME and problematic social media use have certain overlapping features relating to the time and the amount of thinking that go into them (Charlton, 2002), problematic social media use dominates the individual's life through the urge to undertake the activity (salience); an imbalance with other life dimensions (conflict); the occurrence of maladaptive states when the activity is not performed (withdrawal); and unsuccessful efforts to stop (relapse; Charlton, 2002).

Charlton and Danforth (2007) reported that individuals showing such behavioural and thinking patterns were more likely to display problematic use of screen-based devices compared with those who simply devoted a great deal of time frequently checking for updates and notifications. Charlton and Danforth (2010) later noted that aspects of pathological screen-based activities clustered separately from those of extensive engagement in computing activities. This is in keeping with the ample research that emphasises how such engagement and perceptions of absorption do not necessarily develop into problematic use of videogames (Barberis et al., 2021a; Costa et al., 2020; Griffiths, 2009; Wood & Griffiths, 2007). Billieux et al. (2015) proposed a transition from a purely criteria-based approach to one that emphasises psychological underpinnings to understand the problematic use of technological devices, thereby highlighting how it is not merely the quantity of time spent engaging in the activity that determines whether this has an adaptive or maladaptive effect, but rather the psychological experience of such behaviour.

A wealth of research has demonstrated that problematic social media use has harmful effects. These include poorer working and interpersonal functioning (Abbasi, 2019; Zivnuska et al., 2019); higher levels of depression and anxiety (Keles et al., 2019); impaired quality of sleep (Alonzo et al., 2021; Wong et al., 2020); and body image dissatisfaction and disordered eating (Zeeni et al., 2018). Prior studies provided mixed results about gender differences in problematic social media use; while there are studies showing non-significant gender differences (Flynn et al., 2018; Primack et al., 2021; Tang et al., 2018), others found that women scored higher than men (Andreassen et al., 2017; Kircaburun & Griffiths, 2018; Kircaburun et al., 2018), and some others reported men are more likely to be problematic users of social media than women are (Alnjadat et al., 2019; Azizi et al., 2019). It is therefore very important to understand the factors that draw individuals into problematic social media use, and several recent studies have sought to do so (Barberis et al., 2021a; D'Arienzo et al., 2019; Elhai et al., 2019).

Of these various factors, fear of missing out (FOMO; Elhai et al., 2020) has been shown to play a prominent role in the onset and maintenance of technological addiction. The term refers to a willingness to stay abreast of what other people are doing and an apprehension that they may have more fulfilling experiences when one is absent (Elhai et al., 2020). Some scholars have concluded that individuals who are more disposed to FOMO are likely to spend more time using social media and exhibit higher levels of psychological maladjustment (Baker et al., 2016; Elhai et al., 2020). Consistently, FOMO has been found to be a predictor of problematic use of technology (Dhir et al., 2018; Elhai et al., 2018, Servidio, 2019), and internet and smartphones in particular (Alt & Boniel-Nissim, 2018; Elhai et al., 2016; Sha et al., 2019; Wolniewicz et al., 2019). Prior findings were fairly consistent in showing that FOMO peaks in individuals aged 18-35 (Ruyandy & Kartasasmita, 2021; Song et al., 2017; Wu-Ouyang, 2022) because of the intense social interactions experienced during this life stage (Przybylski et al., 2013). At the same time, mixed findings about sex differences have been reported; while in some studies men scored higher in FOMO when compared to women (Przybylski et al., 2013), the opposite was true in other studies (Casale et al., 2018; Elhai et al., 2018; Stead & Bibby, 2017). In addition, some studies indicate non-significant gender differences in FOMO (Li et al., 2022; Rozgonjuk et al., 2021).

Some researchers have reported that both problematic social media use and FOMO may be self-distracting coping mechanisms that are employed to cope with unwanted emotional states (Błachnio & Przepiórka, 2018; Demirci et al., 2015; Harwood et al., 2014). Numerous studies have demonstrated that problematic social media use may play a role in emotional regulation, such that engagement with social networking sites may regulate the individual's affective state (Hormes et al., 2014; Liu & Ma, 2019; Marino et al., 2019; Pontes et al., 2018). Andreassen and Pallesen (2014) argued that social media addicts use social media as a maladaptive strategy to deal with negative feelings and interpersonal problems. Similarly, Dolev-Cohen and Barak (2013) suggested that certain features of virtual platforms (e.g., instant messaging) were used as means to self-regulate organisational and reflective behaviours.

Recent findings have indicated that the appropriate acknowledging and management of one's emotions may be a protective factor against the onset of problematic social media use (Drach et al., 2020; Pontes et al., 2018). For this reason, the role of trait EI (or trait emotional self-efficacy) can be crucial because it relates to "how good we believe we are in terms of understanding, managing, and utilizing our own and other people's emotions" (Petrides et al., 2018, p. 50). Research has shown that trait EI is implicated in a myriad of life domains, including education (Barberis et al., 2021b; Costa et al., 2018a; Sanchez-Ruiz & El Khoury, 2019) and mental health and well-being (Barberis et al., 2016; Costa et al., 2018b; Martins et al., 2010). In particular, trait EI has been associated with lower psychological and physiological reactivity to stress (Barberis et al., 2023a; Barberis et al., 2023b; Mikolajczak et al., 2007); lower depression and physical pain (Mavroveli et al., 2007); and lower aggression (Sanchez-Ruiz & Baaklini, 2018). In addition, trait EI has been associated positively with adaptive and meaning-centred coping (Barberis et al., 2023c; Sanchez-Ruiz et al., 2021) and physical exercise (Barberis et al., 2019) and healthy diets (Sakflofske et al., 2007, Barberis et al., 2018). Because low-trait EI individuals are more likely to experience greater psychological maladjustment and impaired social functioning (Petrides et al., 2016), they may be more prone to unhealthy habits and low-impulse control activities such as drug use, smoking, and self-harming behaviours (Schutte et al., 2011), as well as technology overuse (Kuss & Griffiths, 2012). In the present context, researchers have consistently stressed the importance of trait EI in regulating symptoms and attitudes associated with social media overuse. Süral et al.'s (2018) cross-sectional study showed that low trait EI may be linked to problematic social media use and the motivation to access social media sites (i.e., self-promotion). Other findings have confirmed the role of particular aspects of trait EI in problematic social

media use, such as emotional regulation or self-control (Marino et al., 2019).

In addition to considering a personality trait that fosters life satisfaction and social adjustment (Baudry et al., 2018; Petrides & Furnham, 2001) and is essentially agreeable (Akhtar et al., 2015; Chamorro-Premuzic et al., 2007), it is also important to evaluate the contribution of less desirable personality-related variables. A well-established construct that parsimoniously encapsulates a set of socially aversive personality traits is DT (Furnham et al., 2013), which comprises narcissism, Machiavellianism, and psychopathy. Although each of these constructs has distinct features, they all share a common core of disagreeableness (Furnham et al., 2013; Paulhus & Williams, 2002).

Jauk and Dieterich (2019) provided evidence of how the darker aspects of personality are playing an increasingly prominent role in undesirable behaviours, for instance, the problematic use of technology (Chung et al., 2019). Lee (2019) argued that social media use becomes more problematic when individuals have more DT subcomponents. Demircioğlu and Göncü Köse (2018) advanced a mediated model showing that social media addiction is predicted by darker personality traits (e.g., psychopathy). There is a consensus that individuals with a higher degree of callousness or lack of empathy are prone to technological addiction (Chung et al., 2019; Demircioğlu & Göncü Köse, 2018; Trumello et al., 2018). Abell and Brewer (2014) found that Machiavellianism was implicated in problematic social media use because highly Machiavellian individuals tend to use more strategic and self-presentational tactics during their online interactions. Furthermore, because highly narcissistic people use social media sites as a means to express their feelings of entitlement and superiority, greater problematic use of social media may be likely to develop (Casale & Fioravanti, 2018). Meanwhile, psychopaths may use virtual communities to express antisocial attitudes without fear of repercussion (Jonason & Webster, 2012).

The present study

There is therefore clear evidence of the impact of both trait EI and DT on problematic social media use. Fear of missing out in particular may explain some of the dynamics between the two dimensions. Trait EI is a set of emotional self-perceptions that may buffer the development of a longstanding need to stay connected with one's social network(s). More specifically, trait EI represents a comprehensive operationalization of the affective aspects of personality and has a well-established factor structure comprising four different dimensions: Emotionality, Self-control, Sociability, and Well-being (Petrides, 2009). Given that Trait EI has been positively associated with adaptive coping styles, peer relations, and socio-emotional competence (Cannavò et al., 2022; Frederickson et al., 2012) having underdeveloped trait EI is likely to be related to increased levels of problematic screen-based because they are often linked to difficulties in real-life interactions and with deficits in impulse control (Brand et al., 2016; Kircaburun et al., 2019a). In addition, because individuals high in trait EI are more likely to understand and regulate their emotions to be adapted to the context (Baudry et al., 2018), a persistent fear of being excluded from potentially rewarding activities may be less likely to occur. In addition, previous findings (Elhai et al., 2016; Hoffner & Lee, 2015) suggested that higher levels of fear of missing out was positively related to poorer emotional self-regulation, which is a relevant component of trait EI. In this regard, Hoffner and Lee (2015) found in a cross-sectional study that habitual use of maladaptive strategies to handle emotions was associated with more intense fear of missing potentially rewarding experiences, such as entertainment and information content. Arguably, personal perceptions of affective experiences shape awareness, understanding, and acceptance of emotions (Gardner et al., 2014). Therefore, trait EI may help individuals better deal with feelings such as fear of rejection and loneliness (Marengo et al., 2021) and manage concerns related to interpersonal connections. Thus, high trait EI scorers might be less likely to feel out of touch with rewarding social events (Fioravanti et al., 2021).Als o, their greater clarity of emotions might act as a buffer for any worry or unpleasant state arising from being disconnected from friends and acquaintances and protect them from turning to a dysregulated use of social media as a coping strategy to help deal with unmet social needs. In contrast, Darker personality traits are closely linked to reward and sensation-seeking behaviors (Miller et al., 2010). Thus, the presence of a higher degree of DT with underdeveloped self-regulation skills may foster FOMO and lead to problematic social media use. In addition, DT entails a tendency to exploit others in order to meet personal goals (Machiavellianism), an exaggerated self-image dependent on the admiration of others (Narcissism), and a sense of disregard for other people (Psychopathy; Golec de Zavala, 2018; Jonason et al., 2009; Pineda et al., 2022). Therefore, it can be argued that high DT scorers may experience FOMO due to their need to stay in touch with virtual communities so they can reach their desired gratifications (Akat et al., 2022), and thus might be more prone to engage in problematic use of social media platforms.

The present study sought to test the hypothesis that an association between trait EI, DT, and problematic use of social media is mediated by FOMO. In particular, the study aimed to test a model in which higher levels of trait EI are related to lower levels of FOMO, and this, in turn, leads to lower levels of problematic social media use and lower SME. Conversely, higher levels of DT relate to higher levels of FOMO, which were predicted to be related to higher problematic social media use and SME.

Method

Participants

The sample consisted of 788 individuals (75% women) recruited via social media posts ranging in age between 18 and 35 years (M=24.22; SD=3.91). Participants were all of Italian nationality and were Italian native speakers. Regarding educational level, 4% had completed secondary school, 56% had a high school diploma, and 38% had a university degree. With regard to marital status, 35% were engaged in a relationship, 14% were married, 1% were divorced, 41% were single, and 9% were cohabitating. Concerning professional status, 5% was freelance, 16% was an employee, 7% was an employee, and 72% was a student.

Measures

Social media engagement

The social media engagement Questionnaire (SMEQ; Przybylski et al., 2013) was used. This is a

5-item self-report questionnaire that assesses to what extent individuals use social media during five key times of the day (e.g., "within 15 minutes of waking up"). Items were responded on an 8-point scale ranging from 0 (not one day last week) to 7 (every day last week). The SMEQ has been widely used and previous research has shown satisfactory psychometric properties of this instrument (Przybylski et al., 2013; Reer et al., 2019). In this sample, the internal consistency of this test scores was .76. The SMEQ was widely used in several studies and has shown good level of reliability, even with Italian samples, with Cronbach's alphas that ranged from 0.76 to 0.82 (Barberis et al., 2021; Lai et al., 2016; Przybylski et al., 2013).

Problematic use of social media

The Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016; Andreassen et al., 2012) was used. This is a 6-item (e.g., "Felt an urge to use social media more and more") self-report questionnaire rated on a 5-point Likert scale ranging from 1 (very rarely) to 5 (very often). Past research has shown satisfactory psychometric properties (Leung et al., 2020; Stănculescu, 2022). In this study, the internal consistency value is .80 and the Italian validation of the instrument was used (Monacis et al., 2017).

Fear of missing out

The Fear of Missing Out scale (FoMO; Przybylski et al., 2013) was used. This is a 10-item (e.g., "I fear others have more rewarding experiences than me") self-report questionnaire rated on a 5-point Likert scale ranging from 1 (not at all true of me) to 5 (extremely true of me). Past research has provided evidence for the robust psychometric properties of this instrument (e.g., Spitzer, 2015). In this sample, the internal consistency of this test scores was .80 and the Italian validation of the instrument (Casale & Fioravanti, 2020) was used.

Trait emotional intelligence

The Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides, 2009) was used. This is a 30 item (e.g., "I can deal effectively with people") self-report questionnaire rated on a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). Past research provided evidence for the robust psychometric properties of this instrument (Andrei et al., 2015). In this study, the internal consistency value is .88 and the Italian validation of the instrument was used (Di Fabio & Palazzeschi, 2011a; 2011b).

Dark triad

The Dark Triad Dirty Dozen (DTDD; Jonason & Webster, 2010) was used. This is a 12 items (4 items for each trait) self-report questionnaire rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) with statements on the three dark triad traits (e.g. "I tend to manipulate others to get my way"). In line with previous studies, items were averaged to create a global index (Pineda et al., 2018; Schimmenti et al., 2019). Higher scores indicate higher levels of dark triad traits (i.e., Machiavellianism, narcissism, and psychopathy). Previous research provided evidence for the robust psychometric properties of this instrument (Chiorri et al., 2019; Dinić et al., 2018). In this study, the internal consistency value is .85 and the Italian validation of the instrument was used (Schimmenti et al., 2019).

Procedure

The participants were enrolled through advertisements published on social network platforms and asked to complete an online survey. No missing data were gathered because all questions in the electronic survey had been set as mandatory. The study procedures were explained before the participants filled in the questionnaire. The participants were asked to give their consent to take part after a brief description of the nature of the study. They received no remuneration. The responses were gathered in a single session and confidentiality was guaranteed. Data were gathered from 5 January 2020 to 5 March 2020. The inclusion criteria were that all participants had to be fluent in Italian; aged 18−35; and own at least one social media account for at least one month previous to their recruitment. The Italian validated versions of the questionnaires assessing the key variables were used when available. In cases where a validated version was not available, the back-translation method was used to translate the original versions of the questionnaires into Italian by researchers fluent in English. We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. This study was conducted in accordance with the Declaration of Helsinki. The protocol was approved by the Institutional Review Board of the University of Messina.

Statistical analysis

A-priori sample size calculator for Structural Equation Models with latent variables was carried out to determine the sample size. The results suggest a minimum sample of 200 participants, considering a medium effect size (0.3), a two-tailed test with $\alpha = 0.05$, and a power level of 0.8 (Cohen, 1988; Westland, 2010). Correlations and descriptive analyses were carried out for all the observed variables. A structural equation modelling (SEM) with latent variables was used to examine the relationship between trait EI, dark triad, FOMO, social media engagement and problematic use of social media. For the latent construct, a parceling approach has been used that consists of the aggregation of items (randomly selected) from the scales as three indicators of each latent variable (Little et al. 2002). Parcels are less likely to be influenced by method effects and are more likely to meet the assumptions of normality (Little et al., 2002; Marsh et al., 1998). The analysis of the covariance matrices was conducted using the Lavaan Package for R with the integration of RStudio, and solutions were generated on the basis of maximum-likelihood estimation. Significance of the indirect effects that emerged was explored (i.e., drop from the total to direct effect) by using a bootstrap-generated bias-corrected confidence interval approach (Preacher & Hayes, 2004; Shrout & Bolger, 2002).

Results

Descriptive Statistics and Correlations

Means and Standard Deviations, Skewness and Kurtosis and internal consistencies of scores of each variable are shown in **table 1**. In addition, **table 1** shows the intercorrelations among the key study variables. The results of this study showed that social media engagement was positively related to problematic social media use (moderate effect size) and negatively related to trait EI (moderate effect size). In addition,

Table 1. *Descriptive statistics and correlations*

	Min	Max	M	SD	Skew	Kurt	α	1	2	3	4
1. Fear of missing out	1.00	5.00	2.43	.72	.41	-.07	.80				
2. Social media engagement	.00	7.00	3.33	1.62	.32	-.20	.76	.30**			
3. Problematic use of social Media	6.00	30.00	12.61	5.16	.85	.28	.80	.53**	.49**		
4. Dark triad	1.00	6.33	2.60	1.07	.75	.28	.85	.32**	.18**	.32**	
5. Trait EI	2.77	6.20	4.50	.57	-.37	.13	.88	-.29**	-.15**	-.24**	-.10**

*Note: *p < .05. **p < .01.*

problematic social media use was positively related to dark triad (moderate effect size) and negatively related to trait EI (moderate effect size). FOMO was positively related to social media engagement (moderate effect size), problematic social media use (moderate effect size), dark triad (moderate effect size) and negatively related to trait EI (moderate effect size). Moreover, dark triad was negatively related to trait EI (small effect size).

Mediation model

In a first step we have conducted a measurement model, with covariates among all constructs. The model solution showed an acceptable fit: $\chi2(80) = 377.23$; $p < .001$, CFI = .95, RMSEA = .07 (90% CI = .06 .08), SRMR = .05, TLI = .94. The standardized factor loadings ranged from 0.61 to 0.95, and all were statistically significant ($p < .001$). The correlations between latent variables were all significant ($p < .001$).

In a second step we conducted a structural equation modeling (SEM) with latent variables to verify the hypothesized model. The model solution showed an acceptable fit: $\chi2(80) = 377.23$; $p < .001$, CFI = .95, RMSEA = .07 (90% CI = .06 .08), SRMR = .05, TLI = .93. Specifically, results showed a significant path from trait EI to FOMO (β =-.44) and problematic use of Social Media (β = -.15), while the path from trait EI to social media engagement was not significant (β =-.03). Furthermore, there was a significant path from dark trait to FOMO (β =.28), social media engagement (β =.09), and problematic use of social media (β = .16). Moreover, FOMO was related to social media engagement (β =.28), and problematic use of social media (β =.54). There was a statistically significant indirect association between trait EI and social media engagement (β =-.12), and problematic use of social media (β =-.22), through FOMO. In addition, there was a statistically significant indirect association between dark trait and social media engagement (β =.08), and problematic use of social media (β =.15), through FOMO **(table 2)**.

In a third step in order to control the background variables of age and gender we conducted a hybrid structural equation modeling (SEM) with age and gender as the observed variables and trait EI, dark trait, FOMO, social media engagement and problematic use as the latent variables. In this model age and gender were included as covariates with trait EI and dark trait and were included as predictors of all the other variable. The model solution showed an acceptable fit: $\chi2(101) = 496.20$; $p < .001$, CFI = .94, RMSEA = .07 (90% CI = .06 .08), SRMR = .05, TLI = .91. Significant paths were found from gender (β =.10), age (β =-.12), dark trait (β =.31) and trait EI (β =-.42) to FOMO. Moreover,

Table 2. *Path estimates, SEs and 95% CIs*

	β	SE	Lower bound (BC) 95% CI	Upper bound (BC) 95% CI
Direct effects				
Trait EI → Fear of missing out	-.44	.04	-.32	-.44
Dark triad → Fear of missing out	.28	.03	.29	.28
Fear of missing out → Social media engagement	.28	.10	.31	.70
Trait EI → Social media engagement	-.03	.08	-.21	.10
Dark triad → Social media engagement	.09	.06	.00	.24
Fear of missing out → Problematic use of social media	.51	.07	.42	.70
Trait EI → Problematic use of social media	-.15	.05	-.24	-.05
Dark triad → Problematic use of social media	.16	.04	.07	.21
Indirect effects via Fear of Missing out				
Trait EI → Social media engagement	-.12	.04	-.28	-.12
Trait EI → Problematic use of social media	-.22	.04	-.15	-.22
Dark triad → Social media engagement	.08	.03	.17	.08
Dark triad → Problematic use of social media	.15	.03	.17	.15

Note: SE = standards errors; BC 95% CI = Bias Corrected-Confidence Interval.

significant paths were found from gender (β =.13), dark triad (β =.13), and fear of missing out (β =.26) to social media engagement. Furthermore, significant paths were found from gender (β =.20), dark triad (β =.23), trait EI (β =-.16), and fear of missing out (β =.48). In addition, There was a statistically significant indirect association between trait EI and social media engagement (β =-.11), and problematic use of social media (β =-.20), through FOMO. In addition, there was a statistically significant indirect association between dark trait and social media engagement (β =.08), and problematic use of social media (β =.15), through FOMO.

In a fourth step, a multigroup analysis was conducted to test the role of gender. A constrained model with the paths of the hypothesized model set equal across the two groups, $\chi2(168) = 474.68$, p<.001, CFI = .95, was compared to an unconstrained model with all paths allowed to vary across the two groups, $\chi2(160) = 466.30$, p <.001, CFI = .95. The fit indices of the unconstrained model did not significantly differ from the constrained model, indicating structural equivalence across the two groups, $\Delta\chi2(8) = 7.33$, p = .50, ΔCFI <.001.

In a fifth step, alternative models were tested to better verify and support our hypotheses. A first alternative model was tested observing trait EI and dark trait as predictor variables, social media engagement and problematic use of social media as mediator variables, and FOMO as the outcome. The model solution showed the following fit indices: $\chi2(82) = 485.48$, p<.001; CFI = .93, RMSEA = .08 (90% CI = .07 – .09), SRMR = .07. Moreover, a second alternative model was tested with FOMO as a predictor variable, trait EI and dark trait as mediator variables, and social media engagement and problematic use of social media as outcomes. The model solution showed the following fit indices: $\chi2(82) = 421.32$, p<.001; CFI = .94, RMSEA = .07 (90% CI = .07 – .08), SRMR = .05. These models performed worst compared to our hypothesized model.

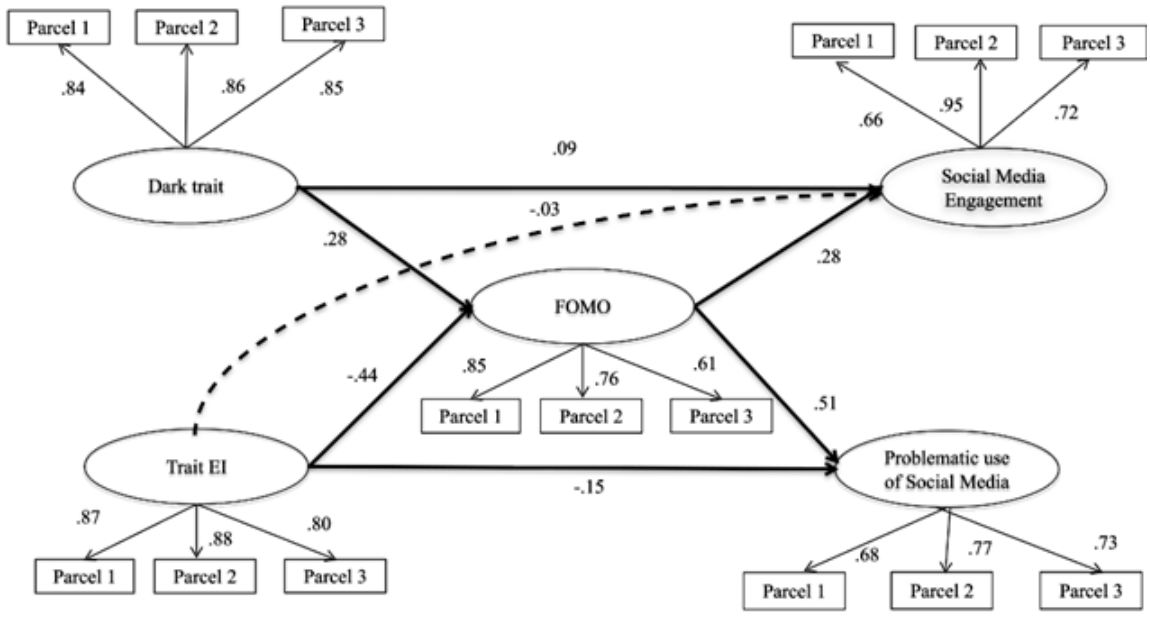
Discussion

The present study aimed to assess the relationships between personality traits (namely, trait EI and DT), SME, and problematic use of social media and investigate whether FOMO might act as a mediator of these relationships. The results showed that SME was positively related to problematic social media use and negatively related to trait EI. Furthermore, problematic social media use was positively linked to DT and negatively related to trait EI. Fear of missing out was positively related to SME, problematic social media use, and DT, and negatively related to trait EI. The dark triad was negatively related to trait EI. Finally, in line with the expectations, FOMO was shown to be a mediator of the association between trait EI and DT, problematic social media use, and SME.

The results suggest that trait EI, in addition to its indirect association with all the outcome variables via FOMO, also had a direct association with addiction symptomatology. The dark triad was positively correlated with problematic use of social media and SME, both directly and mediated, via FOMO. Individuals who can understand and regulate their emotions are more likely to adjust successfully to the social world (Baudry et al., 2018); employ face-to-face interactions; and behave in socially appropriate ways, thereby avoiding the need to access virtual communities to stay in touch with people or share social activities. In the long run, this may prevent the development of a compelling urge to engage with social media and lower the risk of overusing them. The findings thus confirm previous studies showing that underdeveloped trait EI may be a major risk factor in Internet-related disorders (Kircaburun et al., 2019b, 2019c; Sechi et al., 2020).

Conversely, individuals who have a propensity to exploit others and a tendency to seek admiration may tend to overuse social media due to intense concerns about missing out on potentially rewarding social experiences that would bolster their maladaptive personalities (Servidio et al., 2021). The results are consistent with recent findings that personality characteristics are closely linked to higher levels of FOMO (Rozgonjuk et al., 2021; Ryan et al., 2014; Stead & Bibby, 2017), as well as theoretical contributions suggesting that variations in social media use are distinguished by different personality traits (Brand et al. 2016). The present study complements those findings

Figure 1. *Mediation model between personality traits, fear of missing out, and problematic use of social media. Coefficients shown are standardized path coefficients. Dotted lines represent non-significant parameters*



by examining the effects of other relevant personality dimensions in the context of problematic SME (namely, DT and trait EI). In particular, the emotionally detached interpersonal behaviour of individuals higher in the darker personality traits may impair their ability to turn to other people for help or comfort (Jones & Figueredo, 2013) and may therefore develop dysregulated use of social media sites to avoid dealing with real-life emotions. However, it may also be that individuals high in trait EI may be prone to process emotions effectively, and subsequent use of social media sites as a means to handle distress will be unlikely. On the other hand, individuals high in darker traits have difficulties in regulating their emotions (Garofalo et al., 2020; Zeigler-Hill & Vonk, 2015), so they may use virtual communities as compensatory tools to fulfil their psychosocial needs and deal with their distressing states.

The results show that FOMO and SME were higher when darker traits were higher. The impulsive nature of individuals high in dark traits would render them prone to potentially rewarding activities because of their chronic lack of control and preference for immediate gratification (Jonason et al., 2010). This is in line with Fox and Rooney (2015), who suggested that DT predicted the number of activities undertaken on social media. Conversely, given that individuals with high trait EI are highly capable of regulating their emotions to cope with everyday stressors (Baudry et al., 2018), they may feel less compelled to use compensatory strategies to cope with challenging situations (Kircaburun et al., 2019c). In a similar vein, the results show that high trait EI individuals have lower levels of FOMO. Indeed, individuals capable of expressing and regulating their feelings are likely to use emotional clues to interact with other people to communicate effectively and to be aware of potentially rewarding social experiences (Baudry et al., 2018); a longstanding apprehension of missing relevant interpersonal interaction may then be less likely. The results corroborate previous studies indicating individuals with higher levels of FOMO have difficulty managing their emotions (Fabris et al., 2020; Fang et al., 2020; Przybylski et al., 2013). Furthermore, given the close correlation between FOMO and emotion dysregulation (Hussain et al., 2021), the results suggest that trait EI is an important protective factor against longstanding FOMO-related apprehensions.

In the present study, FOMO was positively associated with problematic social media use and SME. This is consistent with empirical and theoretical evidence that individuals higher in FOMO may suffer more problematic behaviours and feel a greater need to engage with social media (Elhai et al., 2020; Przybylski et al., 2013). Given that FOMO is a marker of a longstanding apprehension of being excluded from social events, it is reasonable to suggest that individuals may use social media platforms to access real-time information about such activities and subsequently use them more than those with less FOMO. Moreover, the model structure was equal in both genders, suggesting that no differences could be detected across these groups. These results endorse prior evidence suggesting that there are non-significant gender differences in FOMO and problematic social media use (Fioravanti et al., 2021; Lopes et al., 2022). This can be reflective of the fact that both genders are equally exposed to social media platforms and may experience similar positive thoughts and emotions during their use, either pleasant (i.e., feeling a strong sense of connection with significant others) or unpleasant (i.e. experiencing a sense of frustration for one's life) (Lopes et al., 2022).

Limitations, recommendations, and implications for future research

The present study has some limitations. First, its cross-sectional nature meant that we were not able to infer causality. Future studies might substantiate our findings using a longitudinal design. Second, the exclusive use of self-reports may have led to measurement bias; this could be overcome by the use of a mixed-method approach and objective measures. Larger and more diverse samples (including clinical ones) and objective measures could be incorporated into future studies to investigate the dynamics between the variables that were used herein and problematic media use. It should be also noted that one of the questionnaires used in the current study, the SMEQ, has not yet been validated in Italian, even though it has shown excellent reliability when used in Italian samples (Barberis et al., 2021; Lai et al., 2016), thus results regarding this scale should be interpreted with caution. In addition, because the data for the present study were not gathered from clinical interviews or multiple-rating resources, it was not possible to report on participants' pre-existing psychopathological disorders, hence the accuracy of individual reports cannot be guaranteed. Observing clinical populations may be relevant to deepen our knowledge on problematic use of social media. Research is also needed to compare clinical samples with community samples in order to assess whether levels of severity of problematic social media use differ between the two. Furthermore, future research would benefit from incorporating indicators of psychopathology, such as symptoms of depression or anxiety, because they may be closely related to abnormal use of social media platforms (Cunningham et al., 2021; Fioravanti et al., 2021). Upcoming research may also want to integrate the assessment of one's level of self-esteem or motivations for social media use (Huang, 2022; Schivinski et al., 2020; Süral et al., 2018), as they are considered relevant components in determining the level of engagement in social media use (Huang, 2022).

Despite these shortcomings, the study's findings have significant implications. The results suggest that trait EI may be a protective factor against the onset of more problematic use of social media. It would be useful to tailor interventions aimed at promoting trait EI so such behaviours could be prevented or at least mitigated (Petrides et al. 2016). The components of DT may be a risk factor for the onset of abnormal social media use, so interventions could be designed to target these dimensions. Because FOMO appears to be a mediator in the relationship between personality dimensions and the problematic use of social media and SME, it too might be targeted. From a public health perspective, these results highlight the detrimental effects of abnormal social media use and emphasize the need for the implementation of health promotion programs. Policy makers and health institutions could create health promotion interventions aiming at raising awareness of problematic social media use and facilitating access to mental health resources related to this phenomenon. In addition, these programs should also include the transmission of messages aimed at raising awareness about the importance of interacting effectively with others to prevent the onset of screen-based compensatory strategies This is in line with recent findings that highlight how mental health literacy may assist individuals in reaching their optimal psychosocial functioning (Bullivant et al., 2020) and with recent meta-analytic findings emphasizing how prevention

programs may constitute a promising strategy in the context of problematic social media use (Romero Saletti et al., 2021; Throuvala et al., 2019).

Finally, the joint observation both of agreeable and less desirable personality traits may provide broader insights into the psychological underpinnings of problematic social media use.

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