



# A Compulsive Search for Love Online: A Path Analysis Model of Adult Anxious Attachment, Rejection Sensitivity, and Problematic Dating App Use

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Accepted: 7 April 2025

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## Abstract

Dating apps have become increasingly popular for seeking romantic partners. However, for a minority of individuals, their use can become problematic, making the study of risk factors increasingly relevant. Moreover, attachment-related vulnerabilities and sensitivity to rejection have been consistently associated with maladaptive relational behaviors and emotional dysregulation, which may increase susceptibility to problematic app use as a compensatory strategy. The present study explored the risk factors for problematic online dating app use among adults who use dating apps to find romantic partners, by specifically focusing on the role of adult anxious attachment and adult rejection sensitivity. A cross-sectional anonymous online survey was used to collect the data. The sample comprised 450 participants (54.9% female;  $M_{age}=27.57$  years;  $SD=6.044$ ) who had used dating apps daily to find a romantic partner. The data were analysed using path analysis to test the hypothesized model. Significant total effects were found in the relationships between the anxious adult attachment patterns and problematic online dating apps use (preoccupied attachment:  $\beta=.11$ ,  $p<.01$ ; fearful attachment:  $\beta=.18$ ,  $p<.001$ ). This association was mediated by adult rejection sensitivity (rejection expectancy and rejection anxiety). Problematic online dating apps use was also significantly and positively related to daily time spent on dating apps ( $\beta=.41$ ,  $p<.05$ ). These findings demonstrate the critical role of attachment-related vulnerabilities and rejection sensitivity in favouring problematic dating app use. Such data may provide useful insight to inform targeted clinical interventions.

**Keywords** Behavioral addiction · Internet addiction · Problematic internet use · Technological addiction · Problematic dating app use · Attachment · Rejection sensitivity

## 1. Introduction

Over the past decade, dating apps have become increasingly popular as instruments for initiating and establishing romantic and/or sexual relationships (Statista, 2024), providing alternative online methods that can potentially complement offline approaches in facilitating social interaction (see Anzani et al., 2018; Castro & Barrada, 2020 for reviews). More specifically, in both the United States

and Western Europe, data indicate that a significant proportion of new intimate relationships now begin online, highlighting a significant cultural change (Potarca, 2020; Rosenfeld et al., 2019).

These digital platforms offer several advantages. This includes their ease of use, affordability, and the ability to find partners based on specific personal attributes, which make dating apps highly appealing to their users (Chan, 2017). Moreover, features such as geolocation enhance the likelihood of meeting individuals nearby, facilitating the formation of connections (Danielsbacka et al., 2022; Miles, 2017), alleviating loneliness, and increasing social opportunities (Alexopoulos & Timmermans, 2020; Sumter et al., 2017). However, beyond these advantages, the structural features of dating apps such as unlimited access, anonymity, and instant gratification can contribute to dysregulated and problematic behaviors among vulnerable individuals. Indeed, these platforms are often designed to enhance user engagement by incorporating features such as push notifications and reward-based mechanisms which can foster excessive use (Bidargaddi et al., 2018; Garaialde et al., 2021). Compulsive use of dating apps has been associated with symptoms of anxiety, depression, and relational dissatisfaction (Holtzhausen et al., 2020; Sharabi & Timmermans, 2021).

Some users may experience difficulties in controlling the time spent on these apps, which begin to dominate their thoughts and behaviors, leading to negative effects on daily life (Orosz et al., 2016). In light of this, scholars have begun to study the problematic use of dating apps, highlighting characteristics that are comparable to behavioral addictions (Gori et al., 2024a; Orosz et al., 2016). In this framework, and applying the components model of addiction (Griffiths, 2005), problematic dating app use can be described through six key factors: (i) *salience*, which occurs when dating app use dominates the individual's thoughts and behavior; (ii) *mood modification*, which occurs when dating app use alleviates negative emotions or enhances positive ones; (iii) *tolerance*, which develops when individuals increasingly need to spend more time on dating apps to achieve the same mood-modifying effects; (iv) *withdrawal*, which manifests as a psychological discomfort when individuals are unable to use dating apps; (v) *conflict*, which arises when dating app use interferes with

professional and personal life; and (vi) *relapse*, which is characterized by a return to dating app use after a period of abstinence.

Given the increasing popularity of these instruments (Statista, 2024) and the clinical relevance of their problematic use (see Bonilla-Zorita et al., 2021; Vera Cruz et al., 2024 for reviews), scientific attention on the antecedents of problematic online dating app use (PODAU) is growing. However, empirical evidence is still scarce. Therefore, the present study contributed to this research field by exploring the relationships between the factors that may be associated with PODAU, with a specific focus on adult anxious attachment and adult rejection sensitivity.

### *1.1 The association between anxious attachment and problematic online dating app use*

Attachment theory provides a solid framework for understanding relational dynamics across the lifespan (Ainsworth et al., 1978; Bowlby, 1969). It was originally developed to describe the emotional bond between an infant and their primary caregiver and focused on the role of early interactions in shaping emotional regulation and strategies for meeting needs (Bowlby, 1969). These relationships facilitate the development of internal working models (IWMs), which influence how individuals perceive themselves and others in relationships (Bretherton, 1992; Mikulincer & Shaver, 2016). This perspective has now been expanded to include adult relationships, including romantic ones, emphasizing that IWMs remain relatively stable over time and influence expectations, behaviors, and emotional regulation strategies throughout life (Hazan & Shaver, 1987; Mikulincer & Shaver, 2016).

To better understand these dynamics, attachment has been described along two dimensions: anxiety, reflecting a hyperactivated need for closeness, and avoidance, reflecting a tendency to distrust others, maintain emotional distance, and minimize attachment needs (Brennan et al., 1998). These orthogonal dimensions combine to define four attachment styles, one of which is secure (low anxiety, low avoidance) and three of which are insecure: preoccupied (high anxiety, low avoidance), dismissing-avoidant (low anxiety, high avoidance), and fearful (high anxiety, high avoidance) (Bartholomew &

Horowitz, 1991; Fraley, 2002). Recent studies confirm that attachment patterns not only influence emotional well-being but may be also associated with dysfunctional behaviors (Li et al., 2024). For example, insecure attachment has been associated with both vulnerability to and maintenance of addictions (Gori et al., 2022, 2023a,b).

More specifically, research has identified a significant association between anxious attachment and increased use of dating apps (Chin et al., 2019; Coffey, 2022). This attachment style drives a strong emphasis on social connections and encourages the use of digital platforms to fulfil the need for contact and interaction (Coduto & Fox, 2024; Coffey, 2022). Consequently, dating apps, by offering an immediate and accessible means of connecting with others, are particularly appealing to those seeking frequent relationships or interactions (Rochat et al., 2019). Recent findings consistently suggest that individuals with high levels of attachment anxiety tend to use dating apps more intensively than others, leveraging the apps' features to increase the number of interactions and “matches” as part of a relationship-focused behavior (Timmermans & Alexopoulos, 2020).

### *1.2 The mediating role of adult rejection sensitivity*

The compensatory internet use theory (CIUT; Kardefelt-Winther, 2014) suggests that internet use, including specific platforms such as dating apps, can serve as a means to compensate for psychological or social difficulties, such as stress, anxiety, or loneliness. According to this theory, individuals often turn to online environments to address unmet emotional needs or to regulate negative psychological states arising from relational insecurities or social vulnerabilities. Dating apps, with their wide accessibility and the ability to control exposure to rejection, represent a particularly suitable context for individuals seeking to fill interpersonal deficits (Toma, 2022).

Individuals with anxious attachment are characterized by a hyperactivated attachment system, which manifests as chronic concern regarding acceptance and a heightened fear of rejection (Mikulincer & Shaver, 2016). This attachment style makes them particularly vulnerable to rejection sensitivity (RS), defined as a cognitive-affective disposition to “*anxiously expect, readily perceive, and overreact to*

*rejection*” (Downey & Feldman, 1996, p.1327). Previous studies have demonstrated a significant positive association between anxious attachment and rejection sensitivity, particularly in preoccupied and fearful attachment styles, which exhibit high levels of anxiety and a tendency to interpret ambiguous social signals as personal rejection (Bartholomew & Horowitz, 1991; Khoshkam et al., 2012). RS is associated with negative mental health outcomes, including depression, anxiety, and loneliness (Gao et al., 2017). Individuals with elevated RS tend to avoid social situations for fear of rejection, leading to reduced social networks and increased emotional distress. Simultaneously, their exaggerated reactions to rejection contribute to a self-perpetuating cycle that amplifies interpersonal problems and reinforces their fear of rejection (Downey & Feldman, 1996; Romero-Canyas et al., 2010).

Consistent with CIUT, individuals with high rejection sensitivity are more likely to prefer online activities, such as using dating apps, to manage their relational vulnerabilities (for a review, see Mishra & Allen, 2023). Moreover, dating apps provide a context where the risk of rejection is minimized. For instance, in many cases, the interaction is only allowed after a mutual “match”, reducing the likelihood of negative feedback (Blackhart et al., 2014). This mechanism protects users from explicit rejections, offering them a safer space to establish social connections and present their “true self” (Hance et al., 2018). Moreover, recent studies have shown that individuals with high RS tend to use dating apps more frequently, aligning with the compensatory function proposed by CIUT (Blackhart et al., 2021; Toma, 2022).

### *1.3 The present study*

Through the theoretical lenses of the attachment theory (Ainsworth et al., 1978; Bowlby, 1969) and the CIUT (Kardefelt-Winther, 2014), and based on the aforementioned empirical evidence, the present study explored the relationships between factors that may influence levels of PODAU, among adults who use dating apps to find a romantic partner. Although the variables of adult anxious attachment and rejection sensitivity have shown associations with PODAU (Blackhart et al., 2021;

Coffey, 2022), and the outlined theoretical models support reciprocal interactions between them, no previous studies have incorporated these variables into a unified model exploring the effects of their subdimensions (i.e., fearful and preoccupied attachment, rejection expectancy, and rejection anxiety). Therefore, using a path analysis model, it was hypothesized that:

- H<sub>1</sub>.** Adult anxious attachment patterns would be significantly and positively associated with PODAU;
- H<sub>2</sub>.** Adult anxious attachment patterns would be significantly and positively associated with the subdimensions of adult rejection sensitivity;
- H<sub>3</sub>.** The subdimensions of adult rejection sensitivity would be significantly and positively associated with PODAU;
- H<sub>4</sub>.** The subdimensions of adult rejection sensitivity subdimensions would significantly mediate the association between adult anxious attachment patterns and PODAU.
- H<sub>5</sub>.** PODAU would be significantly and positively associated with daily time spent on dating apps.

## **2. Method**

### ***2.1 Study design, procedure and ethics***

The present study adopted a cross-sectional online survey design. Participants were recruited online using a snowball sampling method and individually completed the survey using the *Google Forms* platform (Google LLC, n.d.). Data collection began in February 2024 and lasted approximately three months. participant recruitment initially started from the researchers' personal and professional contacts, primarily within academic and university networks. The online survey was initially shared via email, chat applications, and social networks (such as *WhatsApp* and *Messenger*) with individuals who met the inclusion criteria. These participants were then encouraged to distribute the survey within their networks to expand the sample. To be eligible, participants had to meet the following criteria: (i) using dating apps daily; (ii) not being in a romantic relationship at the time and using dating apps

to find partners, (iii) being at least 18 years old, (iv) having a good command of the Italian language, and (v) providing informed consent. Involvement was voluntary and did not involve any form of compensation. Before beginning the survey, participants received comprehensive information about the study's purpose and provided online informed consent. Privacy and anonymity were guaranteed. The research protocol was approved by the Ethical Committee of the the first author's university.

**2.2 Participants**

The sample comprised 450 participants (54.9% female; 45.1% male) who declared using dating apps daily to find a romantic partner (see Table 1). Their mean age was 27.57 years ( $SD = 6.044$ ). Most participants were single ( $n = 418$ ; 92.9%), followed by separated ( $n = 17$ ; 3.8%) and divorced ( $n = 15$ ; 3.3%). Regarding education levels, 40.2% had a university degree ( $n = 181$ ), and 29.6% had a high school diploma ( $n = 133$ ). In terms of occupation, 34.7% were students ( $n = 156$ ), 22.9% were working students ( $n = 103$ ), and 28.7% were employees ( $n = 129$ ).

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Table 1 here

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**2.3 Measures**

All measures used in the study were validated self-report scales administered in their respective Italian versions. Each scale has been psychometrically tested in previous research, ensuring their reliability and validity in the Italian context.

*2.3.1 Problematic Online Dating Apps Use Scale (PODAUS)*

The PODAUS (Gori et al., 2024a) is a self-report scale that assesses problematic dating app use. It includes six items, each reflecting a specific aspect described by the components model of addiction (Griffiths, 2005). Participants rate each item (e.g., “Over time I have increased the amount of time I spend using or thinking about dating apps”) on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The total score, representing a continuous measure of problematic online dating app use, is obtained by summing all the item responses. In the present study, the Italian

version of the PODAUS, which is also the original version (Gori et al., 2024a), showed good internal consistency ( $\alpha = .80$ ;  $\omega = .81$ ).

### 2.3.2 Relationship Questionnaire (RQ)

The RQ (Bartholomew & Horowitz, 1991; Italian version: Carli, 1995) is a self-report scale that assesses adult attachment. It includes four items, each representing a specific attachment style and integrating different levels of anxiety and avoidance. In the present study, a particular focus was placed on the anxiety dimension, which is operationalized in this scale through the subdimensions of fearful attachment (high anxiety and high avoidance) and preoccupied attachment (high anxiety and low avoidance). The remaining items assess secure attachment (low anxiety and low avoidance), and dismissing attachment (low anxiety and high avoidance). Participants rate each item (e.g., *“I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others”*) on a seven-point Likert scale, from 1 (*“It does not describe me at all”*) to 7 (*“It very much describes me”*). Alpha and omega coefficients cannot be calculated because the four attachment styles are assessed with a single item.

### 2.3.2 Adult Rejection Sensitivity Questionnaire (ARSQ)

The ARSQ (Downey Berenson, & Kang, 2006; Berenson et al., 2009; Italian version: Innamorati et al., 2014) is a self-report scale that assesses rejection sensitivity among adults. It presents nine hypothetical scenarios involving interactions with partners, family, friends, and strangers, each with the potential for rejection, assessed through 18 items. The scale evaluates two dimensions: rejection expectancy and rejection anxiety. For the items concerning rejection anxiety, participants rate their level of concern or anxiety about their relationships using a six-point Likert scale ranging from 1 (*very unconcerned*) to 6 (*very concerned*). For the items assessing rejection expectancy (e.g., *“You ask your supervisor for help with a problem you have been having at work. - How concerned or anxious would you be over whether or not the person would want to help you?”*), participants rate the

likelihood of experiencing rejection on a six-point Likert scale ranging from 1 (*very unlikely*) to 6 (*very likely*). The subscale scores, representing continuous measures, were calculated by summing the corresponding responses (after appropriately reversing specific responses where needed; Innamorati et al., 2014). In the present study, the internal consistency was good (rejection anxiety:  $\alpha = .79$ ;  $\omega = .78$ ; rejection expectancy:  $\alpha = .74$ ;  $\omega = .73$ ).

## **2.4 Data analysis**

The data were analysed using SPSS (version 27.0; IBM, New York, USA) and AMOS (version 24.0; IBM, New York, USA) for Windows. Because the survey was administered through *Google Forms* (Google LLC, n.d.), surveys could not be submitted unless all questions were completed. Therefore, there were no missing data. Unless stated otherwise, a significance threshold of  $p < .05$  was applied. Preliminary analyses included descriptive statistics for the sample and Pearson's correlations to assess the associations between the variables. Then, a path modelling approach (Bollen & Long, 1993) was employed to examine the relationships among anxious attachment patterns (preoccupied and fearful), the dimensions of adult rejection sensitivity (rejection anxiety and rejection expectancy), PODAU, and the time spent daily using dating apps. Model fit was assessed using the following indices: chi-square/degrees of freedom ( $\chi^2/df$ ), with values below 5 indicating a good fit between the model and the data (Marsh & Hocevar, 1985); the goodness of fit index (GFI), normed fit index (NFI), and comparative fit index (CFI), where values above .90 represent a reasonable fit (Hu & Bentler, 1999; Kline, 2015); and the standardized root mean square residual (SRMR), with values of .08 or below considered indicative of a reasonable fit (Hooper et al., 2008; Marsh & Hocevar, 1985). Finally, the bias-corrected bootstrap procedure, based on 5000 bootstrapped samples, was employed to assess the statistical stability of the model (Preacher & Hayes, 2008). The effects were considered significant if the 95% bias-corrected bootstrap confidence intervals (ranging from the lower limit confidence interval [boot LLCI] to the upper limit confidence interval [boot ULCI]) did not include zero.

### 3. Results

#### 3.1 Preliminary analyses

Descriptive statistics regarding the daily time spent using dating apps (Table 1) showed that three-quarters of participants (74.9%) reported using them for up to 1 hour ( $n = 337$ ), followed by one-fifth of participants (20.4%) who used them from 1 to 2 hours daily ( $n = 92$ ). A smaller proportion of participants (3.6%) reported using dating apps for more than 2 up to 5 hours ( $n = 16$ ), while five participants indicated using them for more than 5 hours daily (1.1%).

Correlations between the variables are shown in Table 2. PODAU was significantly and positively associated with both the preoccupied ( $r = .162, p < .01$ ) and fearful ( $r = .214, p < .01$ ) attachment patterns. Moreover, PODAU was also significantly and positively correlated with both subscales of adult rejection sensitivity (rejection anxiety,  $r = .150, p < .01$ ; rejection expectancy,  $r = .125, p < .01$ ).

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Table 2 here

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#### 3.2 Path analysis

The tested multiple mediation model demonstrated an excellent fit to the data:  $\chi^2/df = 4.480$ ; GFI = .984; NFI = .903; CFI = .920; SRMR = .046 (see Figure 1).

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Figure 1 here

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More specifically, significant total effects were shown in the relationships of preoccupied ( $\beta = .11, p < .01$ ) and fearful ( $\beta = .18, p < .001$ ) attachment patterns with PODAU ( $H_1$ ). Preoccupied attachment was also significantly and positively associated with rejection anxiety ( $\beta = .24, p < .001$ ), but did not have a significant relationship with rejection expectancy ( $p > .05$ ;  $H_2$ ). Moreover, fearful attachment was significantly and positively associated with both rejection anxiety and rejection expectancy ( $\beta = .16, p < .001$  and  $\beta = .12, p < .05$ , respectively;  $H_2$ ). Both rejection anxiety ( $\beta = .11, p < .05$ ) and rejection expectancy ( $\beta = .12, p < .05$ ) showed significant and positive associations with PODAU ( $H_3$ ). When included in the model, these variables fully mediated the effect of the adult attachment

patterns on PODAU, resulting in a non-significant direct effect ( $p = .079$ ) for preoccupied attachment and a significant direct effect ( $\beta = .152, p < .01$ ) for fearful attachment ( $H_4$ ). PODAU also showed a significant and positive association with daily time spent using dating apps ( $\beta = .41, p < .05$ ;  $H_5$ ). The statistical stability of the full multiple mediation model was confirmed through the bias-corrected bootstrap procedure, using 5000 bootstrapped samples (see Table 3).

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Table 3 here

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#### 4. Discussion

Recent research has highlighted the psychological and social challenges associated with the problematic use of dating apps (Coduto et al., 2020). Although these platforms have become an integral part of modern socialization and relationship formation, their structural characteristics, such as instant gratification and unlimited access, may predispose vulnerable users to compulsive and maladaptive patterns of use (Orosz et al., 2016). Given these findings, the present study explored the relationships between some risk factors for PODAU, specifically focusing on the role of adult anxious attachment and adult rejection sensitivity.

Results showed a significant total effect in the relationships between both fearful and preoccupied attachment patterns and PODAU (supporting  $H_1$ ). These attachment patterns also showed significant associations with each other. Moreover, although they represent attachment styles that differ in levels of avoidance, both are characterized by high levels of anxiety (Bartholomew & Horowitz, 1991). This finding further enriches previous evidence suggesting that individuals with higher levels of anxious attachment show a greater risk of compulsively using dating apps (Chin et al., 2019; Rochat et al., 2019). Additionally, these data align with prior research on behavioral addictions (Gori et al., 2023c; Topino et al., 2024), also encompassing outcomes associated with dysfunctional technology use (Gori et al., 2023d; Gori & Topino, 2024). The findings support Flores' (2004) conceptualization of addiction as an attachment disorder and reinforce the effectiveness of attachment theory (Ainsworth

et al., 1978; Bowlby, 1969) as a framework for studying and understanding this form of psychopathology (see Alvarez-Monjaras, 2019 for a review), including PODAU.

H<sub>2</sub> was partially confirmed. More specifically, both patterns of adult anxious attachment showed at least one significant and positive association with one subdimension of rejection sensitivity, which was consistent with previous research (Demircioğlu & Göncü Köse, 2021; Khoshkam et al., 2012). In this regard, the scientific literature has emphasized that individuals with higher levels of anxious attachment exhibit a higher desire for connection with others, accompanied by concerns and fears of abandonment (Campbell & Marshall, 2011). Some authors argue that rejection sensitivity is rooted in early life experiences, particularly within attachment relationships, shaped by past instances of rejection or social exclusion (Bowlby, 1969; Schaan et al., 2020).

Moreover, the dimensions with lower levels of anxiety, namely secure attachment and dismissing attachment, showed negative associations with both subdimensions of rejection sensitivity. This finding aligns with evidence supporting the protective role of secure attachment in relational dynamics (Kaurin et al., 2022) and the tendency of individuals with high avoidance levels to deactivate the attachment system and prioritize independence (Fraley & Shaver, 2000; Mikulincer et al., 2003). Consistently, secure attachment has been negatively associated with preoccupied attachment, because individuals with secure attachment are less likely to display the hyperactivation of the attachment system that characterizes patterns with higher anxiety (Mikulincer & Shaver, 2016).

The findings also indicated that preoccupied attachment only showed a significant and positive association with rejection anxiety but not with rejection expectancy, in contrast to fearful attachment, which was significantly related to both. Individuals with fearful attachment exhibit both a negative self-concept and negative expectations of others because they have often experienced indifferent and unavailable caregivers, and they perceive rejection as a highly probable outcome of their social

interactions (Bartholomew & Horowitz, 1991). This explains their levels of rejection anxiety and rejection expectancy because they continuously anticipate rejection while deeply fearing its impact (Downey et al., 1999; Romero-Canyas et al., 2010). On the other hand, individuals with preoccupied attachment maintain a positive view of others and tend to focus on maintaining closeness and intimacy, driven by a constant need for approval and validation to counterbalance their negative self-view (Bartholomew & Horowitz, 1991). This attachment style is characterized by hyperactive and anxious concerns about the risk of rejection, leading to heightened sensitivity to perceived or imagined rejection cues in interpersonal relationships (Mikulincer & Shaver, 2016). However, because they maintain a positive perception of others, they tend to place trust, albeit fragile, in their goodwill and do not necessarily anticipate rejection as an inevitable outcome (Downey & Feldman, 1996).

The findings also showed significant and positive associations between the subdimensions of adult rejection sensitivity and PODAU, confirming H<sub>3</sub>. This finding aligns with previous research (Blackhart et al., 2014), which suggested that individuals with higher sensitivity to rejection, being more reactive to social rejection, may find online dating particularly appealing. In this context, they can present their “true self” more effectively while filtering out and minimizing exposure to rejection cues (see Mishra & Allen, 2023 for a meta-analysis). Existing evidence consistently suggests that individuals with high rejection sensitivity perceive interactions in technology-mediated relationships as more pleasant and supportive, most likely because these platforms reduce the emotional intensity of face-to-face rejection (Bayer et al., 2021). This is consistent with other research regarding the use of the internet (Tao et al., 2022), smartphones (El Keshky et al., 2013), and, more specifically, social media (Demircioğlu, & Göncü Köse, 2021).

The subdimensions of adult rejection sensitivity significantly mediated the association between adult anxious attachment patterns and PODAU (supporting H<sub>4</sub>). This finding aligns with the perspective of

the compensatory Internet use theory (Kardefelt-Winther, 2014). Indeed, individuals with adult anxious attachment exhibit intense emotional connection needs and a strong desire for closeness associated with heightened sensitivity to rejection (Bowlby, 1969; Mikulincer & Shaver, 2016). Sensitivity to rejection was in turn related to negative mental health outcomes, such as depressive symptoms and loneliness (see Gao et al., 2017 for a review). In light of this, dating apps may provide a context where these negative experiences may be compensated for, offering an opportunity to seek intimate connections but increasing the risk of dysregulated use among more vulnerable individuals (Coffey et al., 2022).

This interpretation is further supported by the correlational data, which show that although secure and dismissing attachment styles were associated with rejection sensitivity, they were not correlated with PODAU. Consistently, secure attachment has been negatively associated with preoccupied attachment. A possible explanation is that while preoccupied and fearful individuals may use dating apps to fulfil their need for emotional closeness and alleviate rejection anxiety, those with a dismissing attachment style, who prioritize autonomy and independence (Mikulincer et al., 2003), may find dating apps less engaging or necessary. Similarly, individuals with a secure attachment style may use dating apps with greater self-regulation, engaging with them in a way that does not lead to problematic or compulsive use (Rochat et al., 2019).

Finally, PODAU was significantly and positively associated with time spent daily using dating apps (supporting H<sub>5</sub>). This is in line with the theories that identify salience and tolerance as core symptoms of addiction, which imply an increasing allocation of resources to the problematic behavior (Gori et al., 2024a; Griffiths, 2005). While these constructs do not directly assess objective time spent on dating apps, nor does prolonged use necessarily imply addiction, it is reasonable to expect that individuals experiencing salience and tolerance related to their engagement in problematic dating app use may spend more time on these platforms compared to other people. Therefore, those who engage

in PODAU to compensate for feelings of loneliness or dissatisfaction in their offline interpersonal relationships (Kardefelt-Winther, 2014; Toma, 2022) may struggle to establish fulfilling connections, potentially due to heightened sensitivity to negative and rejection cues (Hance et al., 2018). This dynamic may contribute to a negative vicious loop, wherein the failure to achieve satisfying relationships reinforces PODAU, exacerbating the very issues that prompted their overuse in the first place. Indeed, specific features of these apps are specifically designed to enhance user engagement, and this may, in turn, increase the risk of problematic use among vulnerable individuals (Bidargaddi et al., 2018; Garaialde et al., 2021; Gori et al., 2024b). In line with this, previous evidence has shown a significant association between time spent on dating apps and craving (Bonilla-Zorita et al., 2023), supporting the idea that time spent on these platforms is associated with problematic use.

#### ***4.1 Practical implications***

The findings of the present study may have practical implications for the development of interventions targeting PODAU. Therapeutic approaches could focus on enhancing secure attachment and addressing rejection sensitivity to reduce reliance on dating apps as a maladaptive compensatory strategy (Kardefelt-Winther, 2014). In this regard, the conceptualization of addiction as an attachment disorder (Flores, 2004) has paved the way for exploring the potential of attachment-based interventions in the treatment of substance use disorders (Fletcher et al., 2015; Schindler, 2019). This approach has also shown promising results in the treatment of behavioral addictions (Estévez et al., 2022). Although, to the best of the authors' knowledge, there is currently no evidence supporting the effectiveness of attachment-based treatments for PODAU, the present findings suggest that therapeutic interventions focusing on attachment-related vulnerabilities may be beneficial for individuals with problematic dating app use.

Moreover, individuals with PODAU and high rejection sensitivity may benefit from interventions aimed at enhancing self-regulation of daily interpersonal events (Meehan et al., 2019). Difficulties in

managing emotional reactions to perceived rejection can contribute to dysfunctional relational patterns, and within this framework, online platforms may serve as a coping mechanism for emotional distress and relational vulnerabilities (Kardefelt-Winther, 2014). In this regard, previous research has highlighted the effectiveness of mindfulness-based approaches, particularly those focused on nonjudgmental awareness, in reducing rejection sensitivity and its maladaptive consequences (Hafner et al., 2019; Peters et al., 2016). These approaches may help individuals develop a more adaptive response to social interactions, reducing reactivity to perceived rejection and fostering greater emotional resilience. Integrating such strategies into interventions targeting PODAU could therefore provide an additional way to promote more balanced and regulated online and offline relational behaviors.

Beyond therapeutic interventions, these insights may also inform the design of healthier app environments that prioritize user well-being. Many dating apps operate through mass evaluation systems, where users receive both positive and negative judgments in a rapid, high-volume manner. While this system may heighten fears of rejection, it also makes online rejection more manageable, because users can immediately shift their focus to a large pool of alternative matches, often leading to a superficial and compulsive engagement with the app. Given this, app design strategies should be focused on preventing mechanisms that encourage PODAU. This could be achieved by structuring interactions to promote more intentional and reflective engagement rather than rapid, high-volume matching dynamics.

#### ***4.2 Limitations and suggestions for future research***

The present study had some limitations that should be acknowledged. Indeed, although the relationships examined are supported by both prior empirical evidence and robust theoretical models (i.e., attachment theory and compensatory internet use theory), the cross-sectional design limits the ability to determine causality and directionality. Additionally, a snowball sampling method was used,

which offers specific advantages, such as facilitating access to specific populations that might otherwise be difficult to reach. However, this method can also introduce sampling biases. For example, a large proportion of participants in the present study were university students or individuals with at least a bachelor's degree. This overrepresentation of highly educated individuals may limit the generalizability of the findings to populations with different educational backgrounds. Moreover, the present study focused exclusively on adult users who utilize dating apps daily to seek romantic partners, which may exclude other patterns of use or demographic groups.

It should also be noted some potentially relevant participant characteristic data were not collected, including sexual orientation, the specific dating apps used, and the devices through which participants accessed them, such as smartphones or computers. Collecting these aspects could have provided further insights into their influence on the variables under investigation and allowed for a more detailed characterization of the sample. Finally, the data were collected using self-report instruments, which are susceptible to well-known biases such as social desirability or recall inaccuracies.

Future research should address the limitations of the present study and further investigate the mechanisms underlying problematic online dating app use (PODAU). Several key aspects require closer investigation. First, longitudinal designs are needed to clarify the directionality and causality of the observed relationships. Examining how attachment-related vulnerabilities and rejection sensitivity influence PODAU over time would offer a more dynamic perspective on the development of problematic use patterns. Second, diversified sampling strategies would improve the generalizability of findings. More heterogeneous recruitment methods, such as stratified or random sampling, would ensure broader representativeness and reduce potential selection biases. Third, a broader range of user profiles should be considered to capture different patterns of dating app engagement. The present study focused on adults using these platforms daily to seek romantic partners, but dating apps serve multiple purposes, including casual interactions and social networking. Investigating different motivations for app use, as well as cultural and demographic variations, would

provide a more comprehensive understanding of problematic engagement. Fourth, additional user characteristics should be assessed to refine the understanding of individual differences in PODAU. Variables such as sexual orientation, specific dating apps used, and the devices through which participants access these platforms could clarify how technological affordances and user experiences interact with psychological vulnerabilities. Finally, a multi-method approach would strengthen the validity of the findings. Integrating objective behavioral data, such as app use analytics, real-time tracking of engagement patterns, and third-party observational methods, would provide a more ecologically valid perspective on problematic dating app use.

## **5. Conclusions**

Technological advancements have led to numerous changes, including those related to modes of socialization and meeting contexts. Within this framework, the present study contributes to the growing body of literature exploring the psychological and social challenges associated with PODAU. By examining the roles of adult anxious attachment and rejection sensitivity, the findings highlighted critical pathways through which individual vulnerabilities can lead to dysregulated use of these platforms. More specifically, the significant associations between fearful and preoccupied attachment patterns, heightened rejection sensitivity, and problematic use highlight the importance of attachment-related and rejection-driven mechanisms in understanding this phenomenon.

**Acknowledgements:** None.

**Funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Declaration of interest:** The authors declare no conflicts of interest

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## Tables and Figures

**Table 1. Demographic characteristics of the sample (N = 450)**

| Characteristics                    | M ± SD                             | N (%)       |
|------------------------------------|------------------------------------|-------------|
| Age                                | 27.57 ± 6.044                      |             |
| Sex                                |                                    |             |
|                                    | <i>Males</i>                       | 203 (45.1%) |
|                                    | <i>Females</i>                     | 247 (54.9%) |
| Marital Status                     |                                    |             |
|                                    | <i>Single</i>                      | 418 (92.9%) |
|                                    | <i>Separated</i>                   | 17 (3.8%)   |
|                                    | <i>Divorced</i>                    | 15 (3.3 %)  |
| Education                          |                                    |             |
|                                    | <i>Elementary School diploma</i>   | 2 (.4%)     |
|                                    | <i>Middle School diploma</i>       | 13 (2.9%)   |
|                                    | <i>High School diploma</i>         | 133 (29.6%) |
|                                    | <i>University degree</i>           | 181 (40.2%) |
|                                    | <i>Master's degree</i>             | 93 (20.7%)  |
|                                    | <i>Post-lauream specialization</i> | 28 (6.2%)   |
| Occupation                         |                                    |             |
|                                    | <i>Student</i>                     | 156 (34.7%) |
|                                    | <i>Working student</i>             | 103 (22.9%) |
|                                    | <i>Employee</i>                    | 129 (28.7%) |
|                                    | <i>Manager</i>                     | 7 (1.6%)    |
|                                    | <i>Entrepreneur</i>                | 9 (2.0%)    |
|                                    | <i>Freelance</i>                   | 21 (4.7%)   |
|                                    | <i>Trader</i>                      | 2 (.4%)     |
|                                    | <i>Homemaker</i>                   | 2 (.4%)     |
|                                    | <i>Unemployed</i>                  | 21 (4.7%)   |
| Daily time spent using dating apps |                                    |             |
|                                    | <i>Up to 1 hour</i>                | 337 (74.9%) |
|                                    | <i>From 1 hour to 2 hours</i>      | 92 (20.4%)  |
|                                    | <i>From 2 hours to 5 hours</i>     | 16 (3.6%)   |
|                                    | <i>More than 5 hours</i>           | 5 (1.1%)    |

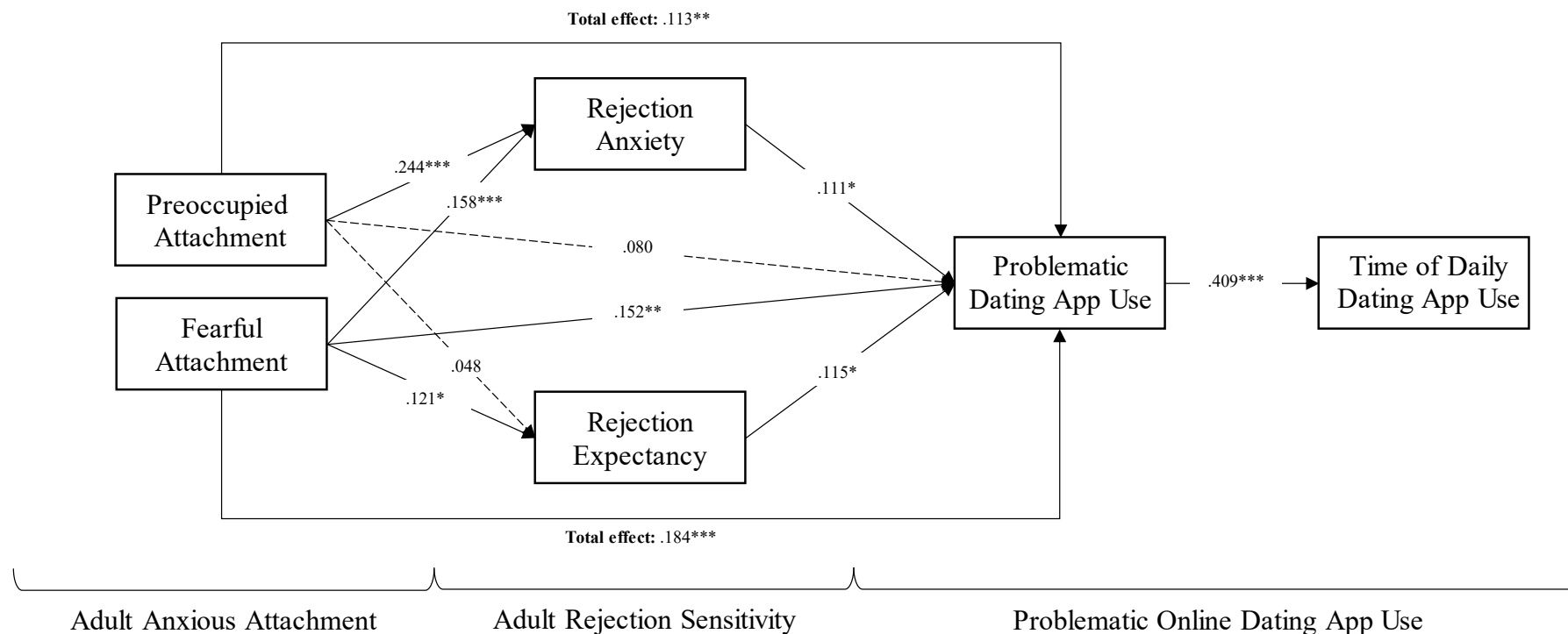
**Table 2.**

**Pearson's correlation (*r*) matrix for study variables**

|                                      | 1             | 2              | 3             | 4             | 5              | 6              | 7    |
|--------------------------------------|---------------|----------------|---------------|---------------|----------------|----------------|------|
| <i>Dating App Use</i>                |               |                |               |               |                |                |      |
| 1. Problematic online dating app use | --            |                |               |               |                |                |      |
| <i>Adult attachment</i>              |               |                |               |               |                |                |      |
| 2. Secure                            | .087          | --             |               |               |                |                |      |
| 3. Preoccupied                       | <b>.162**</b> | <b>-.164**</b> | --            |               |                |                |      |
| 4. Fearful                           | <b>.214**</b> | -.023          | <b>.264**</b> | --            |                |                |      |
| 5. Dismissing                        | -.010         | .016           | .045          | -.067         | --             |                |      |
| <i>Adult rejection sensitivity</i>   |               |                |               |               |                |                |      |
| 6. Rejection anxiety                 | <b>.150**</b> | <b>-.095*</b>  | <b>.285**</b> | <b>.222**</b> | <b>-.172**</b> | --             |      |
| 7. Rejection expectancy              | <b>.125**</b> | <b>-.195**</b> | .079          | <b>.134**</b> | <b>-.146**</b> | <b>-.155**</b> | --   |
| $\alpha$                             | .804          | -              | -             | -             | -              | .789           | .743 |
| $\omega$                             | .805          | -              | -             | -             | -              | .784           | .734 |

*Note:* \*Correlation is significant at the  $p < .05$  level (two-tailed); \*\*Correlation is significant at the  $p < .01$  level (two-tailed).

**Figure 1. The Path Analysis model exploring the relationship among adult anxious attachment patterns, the dimensions of adult rejection sensitivity, problematic online dating app use, and the time of dating app use (daily).**



**Note:** \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 3.****Unstandardised coefficients of the path analysis.**

|                                                                            | Estimate | SE   | <i>p</i>         | BootLLCI | BootULCI |
|----------------------------------------------------------------------------|----------|------|------------------|----------|----------|
| <i>Total effects</i>                                                       |          |      |                  |          |          |
| Preoccupied attachment → Problematic dating app use                        | .260     | .099 | <b>.007</b>      | .068     | .468     |
| Fearful attachment → Problematic dating app use                            | .387     | .105 | <b>&lt; .001</b> | .190     | .602     |
| <i>Direct effects</i>                                                      |          |      |                  |          |          |
| Preoccupied attachment → Problematic dating app use                        | .186     | .109 | .079             | -.021    | .405     |
| Fearful attachment → Problematic dating app use                            | .321     | .107 | <b>.002</b>      | .114     | .538     |
| <i>Partial indirect effects</i>                                            |          |      |                  |          |          |
| Preoccupied attachment → Rejection anxiety → Problematic dating app use    | .062     | .031 | <b>.016</b>      | .010     | .132     |
| Preoccupied attachment → Rejection expectancy → Problematic dating app use | .012     | .014 | .239             | -.010    | .048     |
| Fearful attachment → Rejection anxiety → Problematic dating app use        | .037     | .021 | <b>.012</b>      | .006     | .09      |
| Fearful attachment → Rejection expectancy → Problematic dating app use     | .029     | .015 | <b>.007</b>      | ..007    | .069     |
| <i>Total indirect effects</i>                                              |          |      |                  |          |          |
| Preoccupied attachment → Problematic dating app use                        | .075     | .033 | <b>.008</b>      | .018     | .148     |
| Fearful attachment → Problematic dating app use                            | .066     | .025 | <b>&lt; .001</b> | .024     | .121     |

**Note:** Bold values indicate significant *p*-values (below the .05 threshold).