Personality and Individual Differences 234 (2025) 112949

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Emotional and physical pathways to sexual satisfaction and problematic sexual behaviour in dating, monogamous and non-monogamous relationships

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ARTICLE INFO

Keywords:
Trait emotional intelligence
Sexual satisfaction
Problematic sexual behaviour
Monogamous relationships
Non-monogamous relationships
Dating
Touch
Body appreciation

ABSTRACT

Background: Sexuality significantly impacts well-being. Trait Emotional Intelligence (EI) has been increasingly recognized as a crucial factor in promoting psychological well-being and higher-quality relationships. However, the potential of trait EI as a protective factor in sexuality remains understudied. This study aimed to 1) investigate a model where trait EI influences insecure attachments, which are hypothesized to be negatively linked with comfort with interpersonal touch and body appreciation, subsequently predicting higher sexual satisfaction and lower problematic sexual behaviour (PSB); and 2) explore the model's replicability across different types of relationships.

Methods: 672 Italian adults in monogamous, non-monogamous and dating relationships (71.4 % females) aged 18–77 (M = 34.6; SD = 12.2) completed an anonymous online survey. Path analysis and multi-group analysis were conducted.

Results: Trait EI indirectly predicted sexual satisfaction through attachment avoidance and comfort with interpersonal touch. It also indirectly predicted PSB through attachment avoidance and anxiety. Multigroup analysis revealed that, only in the dating group, trait EI predicted PSB through attachment anxiety and comfort with interpersonal touch.

Conclusions: The findings highlight the importance of trait EI in mitigating negative emotions linked to insecure attachments, reducing the risk of PSB, and improving overall sexual satisfaction.

1. Introduction

Sexuality significantly impacts overall well-being throughout the lifespan (World Health Organization, 2006). Sexual satisfaction, defined as the affective response to one's evaluation of their sexual relationship's positive and negative aspects (Lawrance & Byers, 1995), plays a key role in individuals' sexual health and overall well-being (Sánchez-Fuentes et al., 2014). Conversely, difficulties in regulating sexual behaviour can adversely affect social, occupational, and psychological well-being (Soraci et al., 2023).

Although emotion regulation processes are pivotal in both sexual satisfaction and problematic sexual behaviour (PSB) (Fischer et al., 2022; Lew-Starowicz et al., 2020), the Trait Emotional Intelligence (EI) (Petrides et al., 2007) remains underexplored in this field. Trait EI refers to a constellation of emotional self-perceptions and emotion-related behavioural dispositions located at the lower levels of the personality (Petrides et al., 2007). Individuals with high levels of trait EI have an enhanced ability to perceive, manage, express, and regulate their emotions; they demonstrate strong self-control when confronted with impulsive urges and exhibit greater abilities to maintain satisfying interpersonal relationships (Petrides et al., 2007). These abilities may likely contribute to enhance sexual satisfaction, by effectively addressing both personal and partner emotional and sexual needs, improving communication, and fostering relational well-being, all factors related to higher sexual satisfaction (Freihart et al., 2020; Vowels et al., 2022).

Trait EI may also play a key role in PSB. With the term "problematic sexual behaviour" in this work we refer to a pattern of intense, repetitive and excessive preoccupations with sexual fantasies, urges, and behaviours that dominate an individual's life, often to the detriment of other functioning areas (Fong et al., 2012; Soraci et al., 2023). Individuals with PSB frequently engage in sex to reduce negative emotions and struggle to control their impulses, leading to significant distress (Soraci

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https://doi.org/10.1016/j.paid.2024.112949
Received 2 July 2024; Received in revised form 31 October 2024; Accepted 4 November 2024
Available online 9 November 2024

et al., 2023).

The literature also indicates that greater EI is linked to a secure attachment in adulthood (Eilert & Buchheim, 2023; Walker et al., 2022). Conversely, individuals with either attachment anxiety or avoidance exhibit difficulties in emotion regulation and lower EI (Mikulincer & Shaver, 2019; Walker et al., 2022). In particular, anxiously attached individuals react strongly to perceived threats of abandonment, making stress and emotion management challenging and engaging in more frequent sexual activity to alleviate insecurity and enhance intimacy. Avoidantly attached individuals feel uncomfortable with emotional closeness, and typically suppress their emotional responses, but still experiencing emotional stress, despite appearing detached (Eilert & Buchheim, 2023; Stefanou & McCabe, 2012).

Both trait EI and adult attachment are related with affectionate touch (e.g., hugging, kissing) and body appreciation. A greater predisposition for affectionate touch correlates with higher interpersonal EI and better emotion recognition (Trotter et al., 2018) and a positive body perception is linked to higher levels of the well-being dimension in trait EI (Swami et al., 2010). On the other hand, insecure attachments, especially anxious attachment, are related to lower satisfaction with body image and physical appearance (Cash et al., 2004). Additionally, individuals with higher attachment avoidance exhibit less desire for intimate touch compared to those with higher attachment anxiety (Jakubiak et al., 2021).

A secure adult attachment, greater affectionate touch and body appreciation all significantly influence the likelihood of experiencing a satisfying sexual life (Linardon et al., 2023; Muise et al., 2014; Stefanou & McCabe, 2012). On the other hand, insecure attachments, lower body appreciation and body uneasiness, and greater difficulties with affectionate touch and intimacy are often found in individuals with PSB (Carnes, 2013; Efrati et al., 2021; Gillen & Markey, 2019).

The type of relationship an individual is involved in can influence sexual satisfaction as well (Birnie-Porter & Hunt, 2015). However, over time, romantic relationships have evolved, leading to increased interest and involvement in new types of relationship such as consensually non-monogamous (CNM) relationships. Unlike infidelity, CNM relationships such as polyamory, open relationships and swinging, are based on agreements among all partners involved, allowing for varying degrees of romantic and sexual involvement with multiple partners (Mogilski et al., 2023). CNM people are less likely than monogamous people to have an avoidant attachment style (Moors et al., 2015). Although individuals in monogamous and CNM relationships show similar levels of relationship satisfaction, those in monogamous relationships tend to report slightly lower sexual satisfaction (Conley et al., 2018).

Despite this growing body of evidence, the way in which affective and body-related dimensions are interrelated and contribute to sexual satisfaction and PSB across various types of relationships is still underexplored.

1.1. The current study

This study proposes a path analysis (see Fig. 1) to understand how trait EI, anxious and avoidant attachments, comfort with interpersonal touch, and body appreciation are associated with sexual satisfaction and PSB. It is hypothesized that trait EI is negatively associated with attachment avoidance and anxiety, which, in turn, are negatively associated with comfort with affectionate touch and body appreciation. In sequence, comfort with affectionate touch and body appreciation are hypothesized to be positively associated with sexual satisfaction and negatively associated with PSB. Age, sex, gender identity, sexual orientation, perceived impact of health on sexuality, and relationship type were included as covariates, as previous research (see Supplementary Materials S1) indicates their relevance to the variables under study. Lastly, we assessed whether these associations showed similar patterns across various types of relationship (i.e., monogamous, non-monogamous, dating).

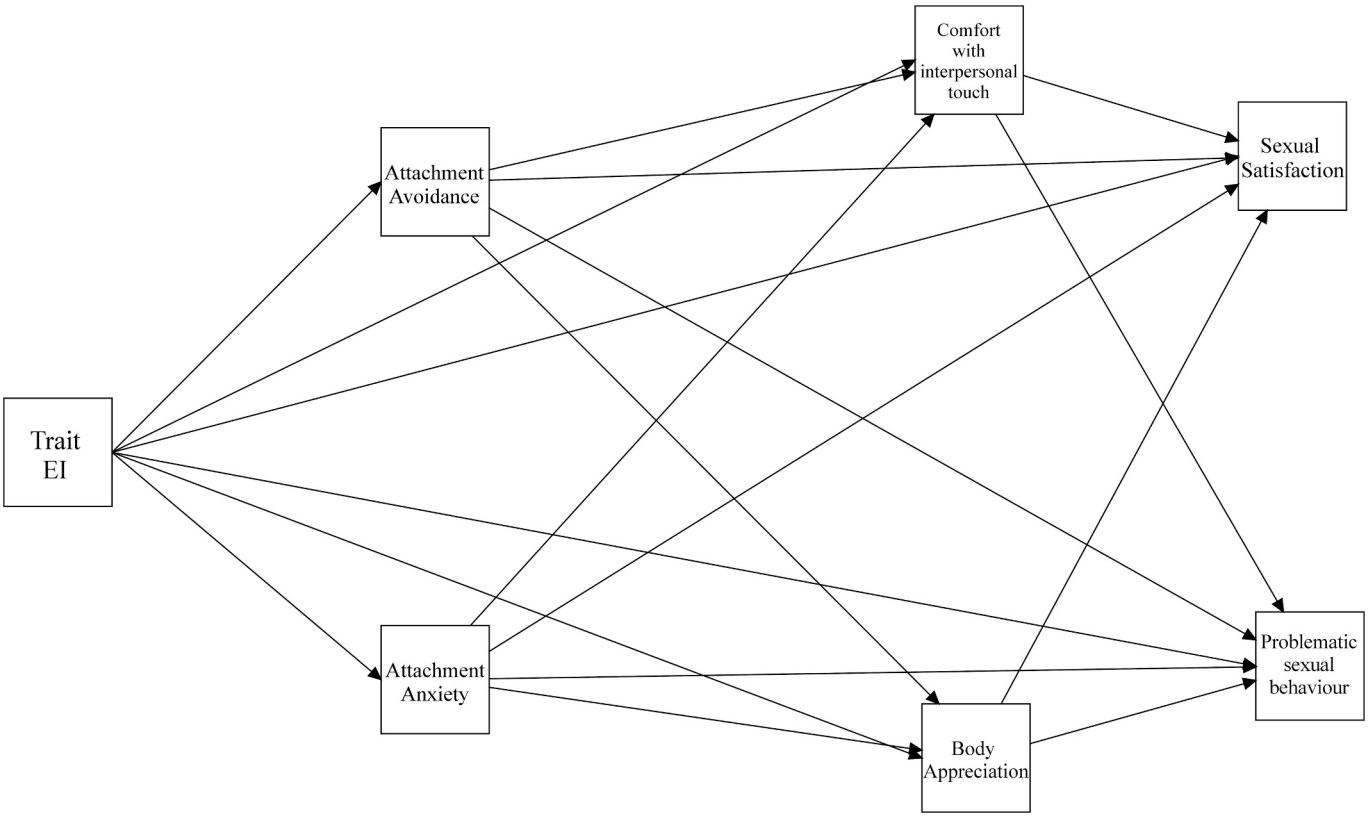

Fig. 1. Diagram of the hypothesized model. The model accounts for the covariates: age, sex, gender identity, sexual orientation, perceived impact of health on sexuality, and type of relationship.

2. Materials and methods

2.1. Participants and procedure

This study is part of the larger project "The shapes of sexuality in the digital era", aimed at exploring current forms of sexuality among adults in Italy. The study utilized an observational, cross-sectional design and employed a snowball sampling technique to recruit adult individuals across the country. The inclusion criteria were being aged 18 or older and currently residing in Italy. Data collection was conducted from the 7th of February to the 4th of May 2024. An anonymous online survey, developed using Qualtrics, was distributed via e-mail, social networks and instant messaging applications. The invitation to potential participants included a brief description of the study and a link to the online survey. The first survey page contained the information sheet and informed consent, which participants had to provide before proceeding. No compensation was offered to participants. Respondent could complete the survey only once. Participants were encouraged to forward the survey link to as many eligible individuals as possible. The study received approval from the Ethical Committee of University of Bologna (Approval number: n. 0031816 - 06/02/2024) and was conducted in accordance with the ethical outlined in the 1964 Declaration of Helsinki and its later amendments.

The survey link was accessed by 1192 individuals, of whom 864 agreed to participate and completed the questionnaire. Those who failed to meet inclusion criteria ($N = 2$), those not currently involved in any romantic or dating relationships ($N = 182$) and those who never had sexual intercourses in the lifetime ($N = 8$) were removed, resulting a final sample size of 672 participants. Sociodemographic characteristics of the participants are shown in Table 1.

Table 1
Sociodemographic characteristics of the sample.

Characteristics	N = 672
Born in Italy (yes) N (%)	659 (98.0)
Age (years) mean (SD) [range]	34.6 (12.2) [18–77]
Sex N (%)	
Females	480 (71.4)
Males	192 (28.6)
Gender identity N (%)	
Cisgender	664 (98.8)
TGNC	5 (0.7)
Prefer not to say	3 (0.4)
Sexual orientation N (%)	
Heterosexual	576 (85.7)
Gay/lesbian/bi+	79 (11.8)
Do not know	13 (1.9)
Prefer not to say	4 (0.6)
Having children (yes) N (%)	185 (27.5)
Living with the partner (yes) N (%)	330 (49.1)
Civil status N (%)	
Unmarried	462 (68.8)
Married	179 (26.6)
Separated	17 (2.5)
Divorced	12 (1.8)
Widowed	2 (0.3)
Education level N (%)	
None	3 (0.4)
Secondary school	15 (2.2)
High school	205 (30.5)
Bachelor's degree	179 (26.6)
Master's degree	186 (27.7)
PhD/specialization	84 (12.5)
Professional situation N (%)	
Student	168 (25.0)
Employed	467 (69.5)
Not employed	23 (3.4)
Retired	10 (1.5)
Other	4 (0.6)
Type of relationship N (%)	
Monogamous relationship	560 (83.3)
Non-monogamous relationship	36 (5.4)
Dating	76 (11.3)
Perceived interference of health on sexual activity mean (SD) [range]	2.40 (1.27) [1.00–5.00]
TEIQue-SF mean (SD) [range]	4.95 (0.68) [2.83–6.53]
ECR-12 Anxiety mean (SD) [range]	19.39 (8.44) [6–42]
ECR-12 Avoidance mean (SD) [range]	14.33 (7.05) [6–39]
TB Comfort with interpersonal touch mean (SD) [range]	4.05 (0.81) [1–5]
BAS-2 mean (SD) [range]	34.16 (7.83) [10–50]
NSSS mean (SD) [range]	38.40 (8.09) [14–55]
BYSAS mean (SD) [range]	6.91 (4.85) [0–24]

Note: TGNC = transgender or gender-nonconforming; TEIQue-SF = Trait Emotional Intelligence – Short Form (global score); ECR-12 = Experiences in Close Relationships; TB = Tactile Biography; BAS-2 = Body Appreciation Scale 2; NSSS = New Sexual Satisfaction Scale; BYSAS = Bergen-Yale Sex Addiction Scale.

2.2. Measures

2.2.1. Sociodemographic information

Participants were asked about their place of residence, age, sex assigned at birth, gender identity and sexual orientation (as defined by APA, 2020), living with the partner, having children, civil status, education level, professional situation, perceived level of interference of physical/emotional health on their normal sexual activity in the last four weeks (1 = Not at all; 5 = Very much) and current type of relationship.

Regarding gender, participants were asked to specify the gender they identify with. Response options included "Male," "Female," "Nonbinary", "Prefer not to say" and "Other". No respondents selected the "Other" option.

For further details on the item related to type of relationship, please refer to S2 in Supplementary Materials.

2.2.2. Trait EI

The Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF; Petrides, 2009) was used to assess trait EI. It includes 30 items designed to measure global trait EI, rated on a 7-point scale (1 = Completely disagree; 7 = Completely agree). The global trait EI score was considered, with higher scores reflecting higher levels of trait EI. In the current study, the internal consistency of the global score was good (Cronbach's $\alpha = 0.85$).

2.2.3. Attachment anxiety and attachment avoidance

The Italian version of the Experience in Close Relationship Scale 12 (ECR-12; Brugnera et al., 2019) was used to measure attachment in close relationships. The scale is composed of two dimensions: Attachment Anxiety and Attachment Avoidance. Each subscale is composed of 6 items, scored on a 7-point scale (1 = Strongly disagree; 7 = Strongly agree), with higher scores indicating greater attachment avoidance and attachment anxiety and lower scores indicating a greater secure attachment in close relationships. The internal consistency for this study was good for both Attachment Anxiety score (Cronbach's $\alpha = 0.84$) and Attachment Avoidance score (Cronbach's $\alpha = 0.89$).

2.2.4. Comfort with interpersonal touch

The subscale Comfort with interpersonal touch of the Italian version of the Tactile Biography (TB; Mariani Wigley et al., 2022) was used to assess comfort with various forms of affectionate interpersonal touch (e.g., Holding hands, hugging, massaging) in close relationships. The subscale is composed of six items, scored on a 5-point scale (1 = Very uncomfortable; 5 = Very comfortable). Cronbach's alpha for this study was high ($\alpha = 0.85$).

2.2.5. Body appreciation

The Italian version of the Body Appreciation Scale-2 (BAS-2; Casale et al., 2021) was used to assess body appreciation, that is, embracing and maintaining positive attitudes towards the body. The scale is composed of ten items, rated on a 5-point scale (1 = Never; 5 = Always).

Cronbach's alpha for this study was high (α = 0.94).

2.2.6. Sexual satisfaction

The New Sexual Satisfaction Scale short form (NSSS-S; Brouillard et al., 2019), composed of 12 items rated on a 5-point scale (1 = Not at all Satisfied; 5 = Extremely Satisfied), was used to assess sexual satisfaction. Higher scores indicate higher levels of sexual satisfaction. Cronbach's alpha for this study was high (α = 0.91).

2.2.7. PSB

The Italian version of the Bergen–Yale Sex Addiction Scale (BYSAS; Soraci et al., 2023) was utilized to evaluate the risk of PSB (higher score indicates greater risk). It is composed of six items on a 5-point scale (0 = Very rarely; 4 = Very often).

2.3. Data analysis

The software SPSS (IBM Corp., 2017) was used to generate descriptive statistics and preliminary analysis (for details on preliminary analysis, see Supplementary Materials S3). Pearson's correlation coefficients were calculated to examine the relationships between variables of interest.

Before testing the model, a set of binary variables was created: gender identity, sexual orientation, non-monogamous relationship, and dating. For gender identity, in accordance with the guidelines (APA, 2015), the label "Cisgender" was used for people whose sex assigned at birth was aligned with their gender identity, whereas all other gender identities were categorized as "Transgender or gender-nonconforming (TGNC)". Responses of "Prefer not to say" were excluded from the path analyses. For sexual orientation, the categories "Gay or lesbian", "Bisexual", "Pansexual", "Asexual" and "Other" (if the relative open-ended response was pertaining) were combined into "Gay/Lesbian/Bi+". Participants who indicated "Do not know", "Prefer not to say", or "Other" without specifying were excluded from the path analyses. All remaining cases were categorized as "Heterosexual". For non-monogamous relationships, participants currently in a polyamorous relationship ($N = 6$), open relationship ($N = 14$), or currently cheating on their partner ($N = 15$) were coded as 1, with all other cases coded as 0. For dating, participants currently dating someone were coded as 1, with all other cases coded as 0. No missing data occurred in the dataset. However, since 20 cases were excluded for unspecified gender or sexual orientation, the final sample for the path analysis resulted in $N = 552$ cases.

To test the hypothesized pathways, a path analysis was carried out with the software Mplus 8 (Muthén & Muthén, 2017), using maximum likelihood estimation. Age, sex, gender identity, sexual orientation, perceived level of interference of physical/emotional health on normal sexual activity in the last four weeks, being in a non-monogamous relationship, and being in a dating were entered as covariates for all paths. Model fit was assessed using the chi-square statistic, the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the standardized root mean square residuals (SRMR) (Hu & Bentler, 1999; Marsh et al., 2005; Yu, 2002). The MODEL INDIRECT command was used to conduct exploratory tests of indirect effects. The tests of the indirect effect used the percentile bootstrap confidence interval approach (based on 10,000 resamples), which produces preferable confidence limits and standard errors for the indirect effect test (Biesanz et al., 2010). The mediating effects were considered significant only if the confidence interval did not contain 0.

Multigroup analyses were conducted to test the model invariance across three types of relationship (monogamous relationship; non-monogamous relationship; dating). First, an unconstrained model was generated, which allowed parameters to vary freely. Then, a fully constrained model, where parameters were constrained to be equivalent across groups was generated. As recommended by Cheung and Rensvold (2002) and by Chen (2007), ΔCFI/ΔTFI ≥0.01 (i.e., decrease indicates worse fit) and ΔRMSEA ≥0.015 (i.e., increase indicates worse fit) were used as model comparison criteria to consider the tested model as invariant.

3. Results and discussion

Descriptive statistics and bivariate correlations among the study variables are shown in Tables 1 and 2, respectively.

The fit measures of the hypothesized model on the whole sample were $\chi^2(2) = 1.987$, $p = .370$, RMSEA = 0.000 (0.000; 0.077), CFI = 1.000, TLI = 1.000, SRMR = 0.004, indicating a good fit.

In terms of direct effects, as illustrated in Fig. 2, consistent with our hypothesis, trait EI negatively predicted attachment avoidance and attachment anxiety, and positively predicted body appreciation, comfort with interpersonal touch and sexual satisfaction.

The negative associations between trait EI and insecure attachments aligns with the notion that individuals with high trait EI generally excel in recognizing and regulating their emotions (Petrides et al., 2007) which enhances the formation of secure relationships (Eilert & Buchheim, 2023).

The positive link between trait EI and comfort with interpersonal touch might be explained by the fact that individuals with a greater dispositional inclination towards effective emotional regulation and social interaction management tend to feel more secure in relationships (Eilert & Buchheim, 2023), thereby reducing barriers to physical intimacy. Lastly, the positive associations between trait EI and body appreciation and between trait EI and sexual satisfaction confirmed previous evidence (Fischer et al., 2022; Swami et al., 2010).

The hypotheses regarding an inverse association between insecure attachments and body-related variables were only partially confirmed, suggesting that different forms of insecure attachment may have distinct impacts on body-related variables. Specifically, attachment avoidance is associated with reduced comfort with interpersonal contact, possibly due to a general discomfort with intimacy and closeness. In contrast, attachment anxiety is negatively linked to body appreciation, probably due to an underlying fear of rejection and a heightened sensitivity to perceived flaws in one's appearance.

Attachment avoidance and comfort with interpersonal touch (but not attachment anxiety and body appreciation) were significantly associated with sexual satisfaction. This suggests that individuals who feel less comfortable with emotional closeness and physical intimacy may find it more challenging to experience fulfilling sexual activities, confirming previous research (Mark et al., 2018).

The indirect effect between trait EI and sexual satisfaction through attachment avoidance and comfort with interpersonal touch (see Table 3) suggests that better emotional regulation may contribute to a reduced fear of intimacy and closeness, leading to greater comfort with physical contact, which in turn would enable individuals to experience more satisfying sexual relationships.

In contrast, the pathway from trait EI to sexual satisfaction through attachment anxiety is non-significant, possibly because the individuals with high attachment anxiety may experience persistent worries about their partner's commitment and fears of abandonment. This can lead to a constant state of emotional arousal and vigilance (Eilert & Buchheim, 2023) which undermines the positive effects of trait EI on sexual satisfaction.

There was no significant direct relationship between trait EI and PSB. However, both attachment anxiety and avoidance (but not comfort with interpersonal touch and body appreciation) were positively associated with PSB, and trait EI indirectly predicted PSB through insecure attachments. These findings suggest that the emotional dysregulation inherent in insecure attachments may drive individuals towards addictive sexual behaviours as a coping mechanism, with a greater effect stemming from attachment anxiety. This may be due to the fact that individuals with high attachment anxiety are likely to use sex as a way to

Table 2
Bivariate correlations among the study variables.

	1.	2.	3.	4.	5.	6.	7.
1. Trait EI	–	−0.267**	−0.399**	0.377**	0.501**	0.280**	−0.178**
2. Attachment avoidance		–	0.172**	−0.224**	−0.090*	−0.366**	0.198**
3. Attachment anxiety			–	−0.114**	−0.293**	−0.142**	0.268**
4. Comfort with interpersonal touch				–	0.202**	0.248**	−0.008
5. Body appreciation					–	0.186**	−0.136**
6. Sexual satisfaction						–	−0.040
7. Problematic sexual behaviour							–

* $p < .05$.
** $p < .01$.

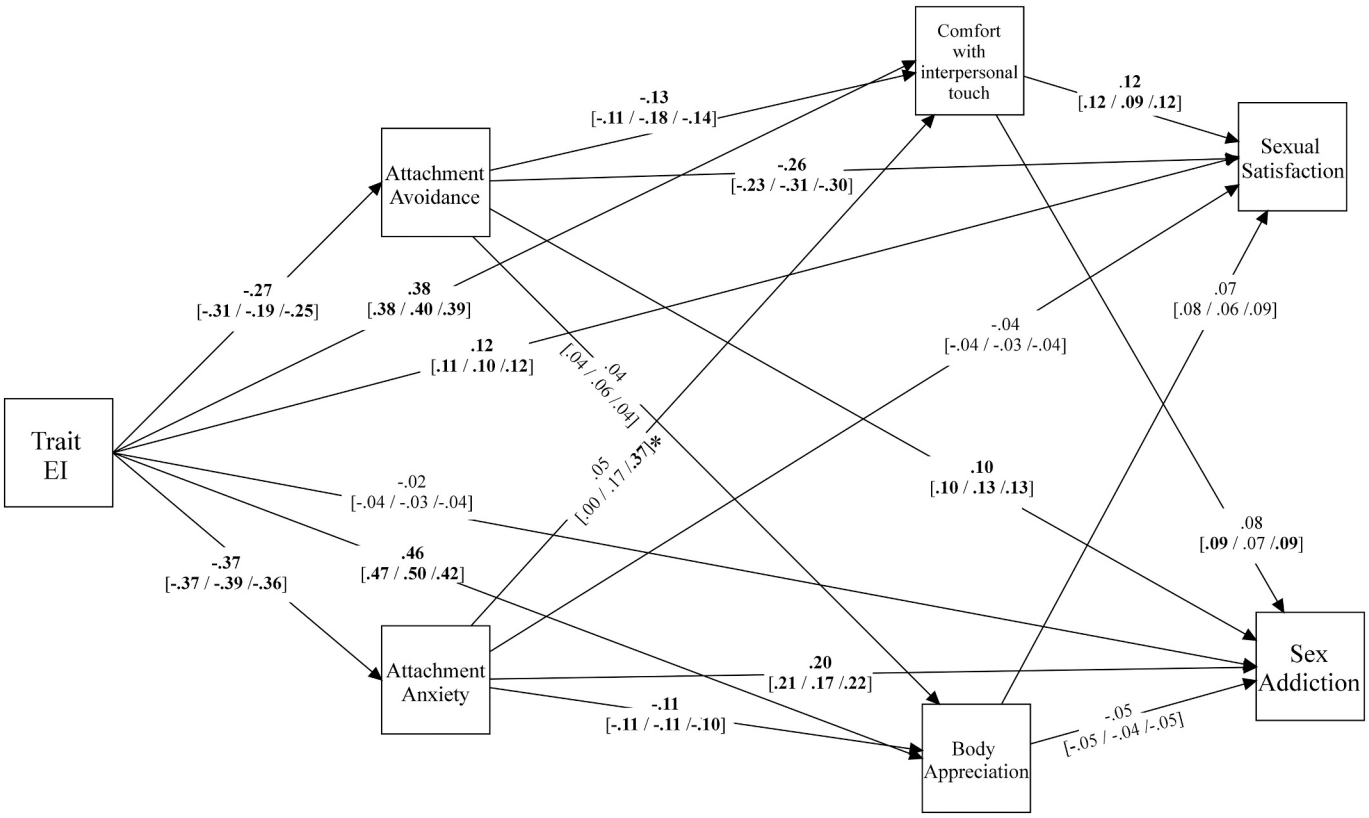

Fig. 2. Standardized estimates of tested model within the total sample and across different types of relationship.
Note: The paths shown are adjusted for covariates age, sex, gender identity, sexual orientation, perceived impact of health on sexuality, and type of relationship within the total sample and for covariates age, sex, gender identity, sexual orientation and perceived impact of health on sexuality within the model across type of relationship. The values divided by a forward slash indicate the coefficients of monogamous, non-monogamous and dating groups, respectively. Bold type indicates significant effects. *Unconstrained path from the partially invariant model across types of relationship.

alleviate their anxiety and gain reassurance (Roels & Janssen, 2022), thereby making the anxious component more prominent in the risk of PSB. Furthermore, the results emphasize the importance of psychological and emotional factors over purely physical or body-related factors in the development of PSB. This is supported by the notion that its underlying process is "an enduring, inordinately strong tendency to engage in some form of pleasure-producing behaviour as a means of relieving painful affects, regulating one's sense of self, or both" (Goodman, 2001, p. 207).

The effects of covariates are summarized in Table 4.

Regarding the multigroup analysis, fits were adequate ($\chi^2(6) = 6.911$; CFI = 0.999; TLI =0.972; RMSEA = 0.026). However, the initial comparative fit indices with the fully constrained model suggested differences across types of relationship. Hence, freely estimated paths with the highest contribution to non-invariance of the model were iteratively identified until an adequate fit was obtained ($\chi^2(106) = 113.615$; CFI = 0.992; TLI =0.987; RMSEA = 0.018). As a result, three paths were freely estimated, but only one of them was related to the hypothesized model (attachment anxiety → comfort on interpersonal touch).

Examining this path across types of relationship we found that attachment anxiety positively predicted comfort with interpersonal touch among individuals in a dating, but this link was non-significant in monogamous and non-monogamous groups (see Fig. 2). Additionally, only in the dating group trait EI resulted associated with PSB through levels of attachment anxiety and comfort with interpersonal touch (see Table 3). These findings may be explained by the fact that anxiously attached people may desire greater levels of touch than others in contexts where commitment is ambiguous (i.e., when dating) but not when commitment is relatively more stable (i.e., in marriage) (Jakubiak et al., 2021). However, considering the limited sample size of some of the groups compared, findings from the multigroup analysis should be interpreted with caution.

Table 3
Standardized estimates and 95 % percentile bootstrapped confidence intervals of the indirect effects of tested models within the total sample and across different type of relationships.

Specific indirect effects	Whole sample		Monogamous relationship		Non-monogamous relationship		Dating	
	β	95 % CIs	β	95 % CIs	β	95 % CIs	β	95 % CIs
Trait EI ➔ Attachment avoidance ➔ Sexual satisfaction	**0.072**	0.047, 0.097	**0.071**	0.048, 0.097	**0.059**	0.039, 0.086	**0.073**	0.048, 0.103
Trait EI ➔ Attachment avoidance ➔ Comfort with interpersonal touch ➔ Sexual satisfaction	**0.004**	0.001, 0.008	**0.004**	0.001, 0.008	**0.003**	0.001, 0.007	**0.004**	0.001, 0.008
Trait EI ➔ Attachment avoidance ➔ Body appreciation ➔ Sexual satisfaction	−0.001	−0.003, 0.001	−0.001	−0.003, 0.001	−0.001	−0.002, 000	−0.001	−0.003, 0.001
Trait EI ➔ Attachment anxiety ➔ Sexual satisfaction	0.014	−0.010, 0.040	0.014	−0.011, 0.040	0.011	−0.009, 0.035	0.014	−0.011, 0.043
Trait EI ➔ Attachment anxiety ➔ Comfort with interpersonal touch ➔ Sexual satisfaction	−0.002	−0.007, 0.001	0.000	−0.004, 0.003	−0.006	−0.018, 0.002	−0.016	−0.027, −0.006
Trait EI ➔ Attachment anxiety ➔ Body appreciation ➔ Sexual satisfaction	0.003	0.000, 0.006	0.003	0.000, 0.007	0.003	0.000, 0.006	0.003	0.000, 0.007
Trait EI ➔ Attachment avoidance ➔ Problematic sexual behaviour	**−0.028**	−0.050, −0.009	**−0.031**	−0.053, −0.012	**−0.026**	−0.046, −0.010	**−0.031**	−0.055, −0.012
Trait EI ➔ Attachment avoidance ➔ Comfort with interpersonal touch ➔ Problematic sexual behaviour	0.003	0.000, 0.006	0.003	0.000, 0.006	0.002	0.000, 0.006	0.003	0.000, 0.007
Trait EI ➔ Attachment avoidance ➔ Body appreciation ➔ Problematic sexual behaviour	0.001	−0.001, 0.002	0.001	−0.001, 0.002	0.000	−0.001, 0.002	0.001	−0.001, 0.002
Trait EI ➔ Attachment anxiety ➔ Problematic sexual behaviour	**−0.074**	−0.101, −0.047	**−0.077**	−0.107, −0.051	**−0.064**	−0.097, 0.040	**−0.078**	−0.112, −0.049
Trait EI ➔ Attachment anxiety ➔ Comfort with interpersonal touch ➔ Problematic sexual behaviour	−0.001	−0.004, 0.001	0.000	−0.003, 0.003	−0.005	−0.014, 0.002	**−0.011**	−0.022, −0.002
Trait EI ➔ Attachment anxiety ➔ Body appreciation ➔ Problematic sexual behaviour	−0.002	−0.006, 0.001	−0.002	−0.005, 0.001	−0.001	−0.005, 0.001	−0.002	−0.005, 0.001

Note: Bold type indicates significant indirect effects.

Table 4
Standardized effects of the covariates on the variables in the model within the total sample.

	Trait EI	Attachment avoidance	Attachment anxiety	Comfort with interpersonal touch	Body appreciation	Sexual satisfaction	Problematic sexual behaviour
Age	0.15 (0.04)***	0.12 (0.04)***	−0.03 (0.04)***	−0.02 (0.04)	−0.01 (0.03)	−0.16 (0.03)***	−0.17 (0.04)***
Sex	−0.01 (0.04)	0.10 (0.04)**	−0.08 (0.03)*	0.00 (0.04)	0.01 (0.04)	−0.07 (0.04)*	0.36 (0.04)***
Gender identity	0.01 (0.04)	−0.01 (0.03)	−0.02 (0.03)	0.03 (0.03)	−0.04 (0.04)	0.03 (0.02)	0.02 (0.03)
Sexual orientation	−0.05 (0.05)	−0.13 (0.03)***	0.09 (0.04)*	−0.00 (0.04)	−0.06 (0.04)	0.07 (0.04)	0.05 (0.04)
Health	−0.19 (0.04)***	0.05 (0.04)	0.04 (0.04)	0.02 (0.04)	−0.04 (0.04)	−0.19(0.04)***	0.06 (0.04)
In a non-monogamous relationship	−0.04 (0.04)	0.16 (0.05)**	0.03 (0.03)	0.03 (0.04)	0.03 (0.03)	−0.00 (0.04)	0.11 (0.04)**
Dating	−0.05 (0.04)	0.32 (0.04)***	0.17 (0.04)***	−0.02 (0.04)	0.02 (0.04)	0.02 (0.04)	0.10 (0.04)**

Note: Health = Perceived level of interference of physical/emotional health on sexual activity in the last four weeks.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.1. Limitations

Several limitations need to be considered when interpreting the results of this study. Firstly, using self-report measures may have introduced bias due to participants' potential misinterpretation or desire to present themselves in a socially favourable manner. Secondly, we used a snowball sampling technique. Since this method relies on referrals from initial respondents to recruit additional participants, it inherently increases the likelihood that the sample may not be fully representative of the population (Fricker, 2012). However, to minimize sample bias, the survey link was deliberately not shared on forums, social media groups, or websites dedicated to sexuality and/or sexual relationships. The small sample sizes for consensual and non-consensual non-monogamous relationships forced us to analyse these groups together, which might obscure specific differences. Moreover, although our variable selection is grounded on clinical theoretical assumptions, our focus on specific emotional and body-related variables may have overlooked other potentially relevant variables (i.e., confounders, colliders, and mediators), which may have raised bias in estimation. Additionally, we did not conduct a sensitivity analysis to test the robustness of our findings against potential unmeasured or uncontrolled confounding (Grosz et al., 2020; Vowels, 2023). Thus, our findings should be interpreted with caution.

These limitations highlight the need for cautious interpretation and suggest directions for future research to address these methodological issues.

4. Conclusions

This study aimed to understand the role of trait EI, attachment avoidance, and attachment anxiety, comfort with interpersonal contact, and body appreciation in sexual satisfaction and PSB in individuals currently in monogamous, non-monogamous relationships, and dating. To our knowledge, this is the first study to investigate all these variables together.

The study reveals that trait EI enhances secure relationships by reducing attachment avoidance and anxiety. Furthermore, trait EI increases sexual satisfaction by decreasing attachment avoidance and increasing comfort with interpersonal touch. Conversely, higher trait EI reduces the risk of PSB by mitigating attachment insecurities, particularly attachment anxiety, underscoring the importance of emotional factors over body-related ones in the development of PSB, except for the dating group, where trait EI resulted associated with PSB also through the comfort with interpersonal touch. These findings highlight the role of emotional regulation in fostering sexual relationships and in reducing risks associated with PSB. Consistent with this finding, our results suggest that providing trait EI trainings (Petrides et al., 2016) and enhancing skills in identifying, expressing, and regulating emotions may mitigate negative emotions associated with insecure attachments, reduce the risk of PSB, and improve overall sexual satisfaction.

CRediT authorship contribution statement

Federica Ambrosini: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Roberta Biolcati:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Data curation, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve readability and language of the work. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Funding sources

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

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2024.112949.

Data availability

Data will be made available on request.

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