Research Paper

Gender differences in the relationship between attachment styles, self-esteem and online deception: A mediation model

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A B S T R A C T

Online Deception is growing as a topic of research due to its potential risks for mental health and behaviors. This study explored the relationships between attachment styles and intentional misrepresentation of oneself in online dating (i.e., online deception) and investigated the mediating role of self-esteem. A cross-sectional online survey was conducted with voluntary Italian participants (N = 272) to test the proposed hypotheses. It was found that anxious attachment styles positively predicted online deception. Also, self-esteem was found to be mediator between anxious attachment styles and online deception, as well as between close attachment styles and online deception. Our results demonstrate the need to develop prevention interventions that target individuals' styles of attachment that in turn foster self-esteem which co-contribute to promote a sensible and healthy use of online dating.

1. Introduction

Several studies targeting the behavior of people using online dating show that many tend to give a deceptive representation of themselves; both physical distance and anonymity distinctive of online exchanges may favor false self-description (Bonilla-Zotita et al., 2021; Ellison, et al. 2012; Guadagno et al., 2012)

Deception in online dating seems aimed at becoming attractive to potential partners (Toma, et al., 2008) gaining other's interest, obtaining approval, admiration, protection, and limiting conflict (Drouin, et al., 2016). When introducing themselves to potential desirable partners, research suggests that men tend to engage in deceptive self-presentation more frequently than women (Rowatt et al., 1998). Furthermore, existing literature indicates that men tend to express a greater willingness to use deception to portray themselves as more dominant, resourceful, and kind than their true attributes. In contrast, women arere more inclined to use deception to enhance their physical appearance and make it appear more appealing than it actually was (Guadagno et al., 2012).

Certainly, deception serves intimacy regulation within relationships (Cole, 2001). Such regulation is influenced by individuals' state of mind about themselves and others. In this perspective, individual's attachment may provide the framework for explaining the use and function of deception in online dating (Cole, 2001; Mosley et al., 2020).

Attachment theory (Bowlby, 1988) proposes that adults differ in their mental representations of romantic relationships (Hazan & Shaver, 1987; Mikulincer & Shaver, 2003). Indeed, the quality of past experiences with the caregiver influences what people expect and want from intimate relationships. The attachment styles appear to affect the choice of the partner as well as how a person presents herself to possible partners.

Within such view, several scholars have shown that both attachment anxiety and avoidance are associated with higher deception in romantic relationships (Cole, 2001; Lopez & Rice, 2006). Undeniably, the possibility to alter one's own image and dissemble communications in the online dating setting may be particularly suitable for anxiously attached individuals who are preoccupied by how they are appraised by others. On the other side, the physical distance distinctive of online dating may be particularly congenial to avoidantly attached individuals who dismiss intimacy (Chen et al., 2012).

In addition, various research have verified that secure attachment is associated with positive self-esteem (Bringle & Bagby, 1992; Feeney & Noller, 1990; Foster et al., 2007; Huntsinger & Luecken, 2004; Mickelson, et al., 1997), that is among the psychological characteristics that seem implicated in resorting to online dating (Bryant & Sheldon, 2017, Valkenburg et al., 2006, Blackhart et al., 2014).

As proposed by Rosenberg (1965), self-esteem may be defined as a general valuation of one's own worth and global feelings of competence

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and self-acceptance. Numerous studies have established the impact of self-esteem on romantic relationships Definitely, individuals with lower self-esteem may find online dating as a more comfortable way to reveal themselves and meet a romantic partner (Johnson & Galambos, 2014; Marshall, et al., 2014; Mund et al., 2015; Orth et al., 2012).

Undeniably, a secure attachment with the caregiver supports the development of a positive self, that is valuable, loveable and capable. On the contrary, it is expected that insecure attachment styles are linked to lower self-esteem levels (Arbona & Power, 2003; Kim & Koh, 2018; Mikulincer & Shaver, 2003).

To our knowledge, no research has been carried out to take into account the simultaneous impact of attachment styles and self-esteem on the predisposition to intentional misrepresentation of oneself in online dating. Therefore, the aim of the present study is to evaluate the direct effect of attachment styles on online deception and the mediating role of self-esteem.

In addition, in light of the emerged differences between men and women in the perception and behavior within romantic relationships (Dreber & Johannesson, 2008; Haferkamp et al., 2012; Shulman & Scharf, 2000), the study will examine the influence of gender on the considered variables.

We propose the model in Fig. 1 and hypothesize that:

H1. Insecure attachment styles are positively linked with the intentional misrepresentation of oneself in online dating;

H2. Insecure attachment styles are negatively associated with self-esteem;

H3. Low self-esteem will increase the negative effect of insecure attachment styles on intentional misrepresentation of oneself in online dating.

2. Material and methods

2.1. Procedure and participants

All procedures performed in the present study involving human participants were applied following the ethical guidelines defined by the institutional research committee, by the American Psychological Association (APA), and by the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. This cross-sectional study was performed in Italy via an internet survey. The survey was distributed through email and social networks (Twitter, Instagram, Whatsapp, and Facebook). The inclusion criteria were: a) 18 years old or above and (b) living in Italy. Participants were invited to take part in the research through a brief advertisement posted on Italian platforms, including social media and social groups inviting them to share the link with their friends. Participants completed the questionnaire by connecting directly to the Google platform. Participants were also informed that their participation was strictly voluntary, anonymous.
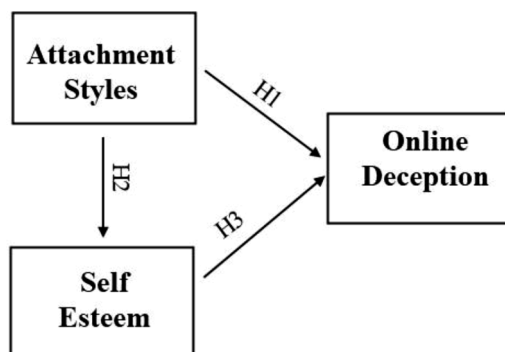

Fig. 1. Hypothetical model's diagram.

The participants answered anonymously by filling up an informed consent letter in the first section of the e-survey. A total of 272 participants (158 women; mean age = 24.01years [SD 3.88=; range 18 to 35 years]) was enrolled for this investigation. All participants were Caucasian. Most of the sample was university students (72 %).

2.2. Measures

2.2.1. Attachment styles

To assess the attachment styles, we used the Revised Adult Attachment Scale (RAAS; Collins & Read, 1990; Collins, 1996). This scale consists of 18-items, it uses a five-point Likert scale (*from 1=not at all characteristic to 5=very characteristic of me*) and contains three subscales, each composed of six items. The three subscales are closeness, dependency, and anxiety. High scores on the anxiety dimension characterize individuals who worry about being unloved or abandoned by romantic partners. High scores on the closeness dimension characterize individuals who find closeness with others easy and high scores on the dependent dimension characterize individuals who feel that others are trustworthy and dependable (Collins, 1996). The RAAS has demonstrated adequate validity and reliability (Collins & Read, 1990). In the original version, Cronbach's alpha method demonstrated internal consistencies of 0.77, 0.78, and 0.85 for the closeness, dependency and anxiety factors, respectively. In the present study, Cronbach's alpha coefficients were 0.71 for closeness, 0.70 for dependency and 0.73 for anxiety.

2.2.2. Self-Esteem

To assess the degree of self-esteem, we used the Rosenberg Self-Esteem scale (RSE; Rosenberg, 1965; Italian version by Prezza et al,. (1997)). This scale consists of 10 items and it uses a five-point Likert scale (from *strongly disagree to strongly agree)*. An example item is "*I wish I could have more respect for myself*". The original tool exhibited a Cronbach's α of 0.88. In the present study, the instrument demonstrated a notably high level of internal consistency, with Cronbach's α measuring at 0.90.

2.2.3. Online deception

To assess the intentional misrepresentation of oneself in online dating we used four items of the Online Deception and Intimacy (MODI) scale (Stanton et al. 2016) The four items evaluated the willingness to deceive others online and experiencing a sense of thrill in doing so ("*get a sense of thrill in misleading others online"; "continue to misrepresent myself online"; "sense of excitement in misrepresenting myself online"* and *"scam or con others online"*). The items are rated on a 5-point scale from "not at all like me" to "very much like me". In the original version, the Cronbach's alpha method exhibited internal consistencies of 0.89. In the current study, the Cronbach's alpha coefficient measured 0.81.

2.2.4. Data analysis

Independent sample *t*-tests were conducted to examine gender differences in attachment styles, self-esteem, and online deception scores. Pearson correlational analyses were conducted to examine bivariate correlations among variables. A structural equation model (SEM) was created to test the proposed model. All models were tested via maximum likelihood (ML) estimation using AMOS 6.

The model established for this study had three observed predictor variables—dependence, anxiety, and closeness—with the observed mediator variable being self-esteem and the latent outcome variable being online deception. The online deception latent variable was assessed with the use of the four items of the MODI scale.

We conducted an a priori power analysis for structural equation modeling (SEM) using a significance level (alpha) of 0.05, a power level of 0.80, eight observed variables, and one latent variable, in accordance with the guidelines of Westland (2010). Cohen's d was used to represent small effect sizes (Cohen, 1988). The a priori power analysis determined

a minimum sample size of 87 required to detect the specified effects. As our study sample consisted of N=272, it significantly exceeded this calculated minimum, providing us with substantial statistical power to test our hypotheses.

Following the recommendations of several authors (e.g., Ullman & Bentler, 2012), the goodness of the model fit was evaluated using Chi-squared goodness of fit statistics (p > .05), the comparative fit index (CFI), the Tucker Lewis Index (TLI), the root mean square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Generally, CFI and TLI values of 0.90 or higher reflect a good fit. RMSEA values lower than 0.08 indicate an excellent fit, and SRMR values of 0.08 or less indicate that the model adequately fits the data.

3. Results

The results of descriptive statistics and correlation between attachment styles, self-esteem and online deception are reported in Table 1. The age of the study participants showed no statistically significant correlations with any of the assessed variables.

Independent samples *t*-tests were conducted to determine whether females and males differed in terms of attachment styles, self-esteem, and online deception.

Results revealed that female are more likely to have anxiety attachment style than males t (270) = -4.264, $p < .001$; $d = 0.51$), while males have higher scores on self-esteem than females (t (270) = 5.41, $p < .001$; $d = 0.67$). However, females and males showed comparable levels of the closeness (t (270) = 1.08, $p = .31$; $d = 0.11$) and dependent attachment dimensions (t (270) = 1.19, $p = .23$; $d = 0.15$) as well as on the online deception (t (270) = -1.10, $p = .27$; $d = 0.14$).

Bivariate correlations showed that the dependent attachment style had a significantly positive correlation with self-esteem, anxiety had a significantly negative correlation with self-esteem and a positive correlation with online deception, and close attachment style and self-esteem were positively correlated. Significant negative correlations were observed between closeness and online deception and between self-esteem and online deception. However, no significant correlations were observed between dependence and online deception.

3.1. Mediational model

In our hypothetical model, it was assumed that attachment styles directly predicted online deception and indirectly predicted online deception through self-esteem. As the measured goodness-of-fit was: χ^2= 19.172, df = 14, p = .16, CFI = 98, TLI= 96, RMSEA = 0.04 (90 % [CI]: 0.00 to 0.07), SRMR =0.04 which met the standard model adaptation, our hypothetical model was accepted.

However, the standardized regression coefficients between dependence and self-esteem (0.014), dependence and online deception (0.022) and closeness and online deception (0.012) did not range a significance level of 0.05.

To develop a parsimonious model, the non-significant paths were removed to simplify the model and ensure better fit. When this study omitted the three regression paths that were not significant, the modified goodness-of-fit was: χ^2= 19.389, df = 17, p = .31, CFI = 99, TLI=

99, RMSEA = 0.02 (90 % [CI]: 0.00 to 0.06), SRMR =0.04 which indicated that the modified goodness-of-fit was adequate. Compared with the first model, the value for χ^2 in the modified model was not significantly larger; however, the CFI and TLI values increased and RMSEA value decreased. Therefore, the modified model was more adequate. The results of the relationships between the variables are shown in Fig. 2.

The standardized path coefficients (Fig. 2 and Table 2) reveal significant direct and indirect effects between attachment styles, self-esteem and online deception variables. Anxiety attachment has a negative influence on self-esteem and positive influence on online deception.

Closeness attachment positively influences self-esteem and self-esteem negatively influences online deception. Additionally, there is an indirect influence of anxiety and closeness attachment styles on online deception following the path through self-esteem.

4. Discussion

In this study, we hypothesized that self-esteem can be an intervening factor between insecure attachment style and online deception.

We also aimed to investigate whether gender affects attachment styles, self-esteem and online deception patterns. In general, our findings supported these expectations.

As regards gender characteristics, no differences were found in the online deception between male and female participants as well as in the closeness and dependent attachment styles. However, in line with other research, the self-esteem levels for men were found to be significantly higher than women (Sechi et al., 2020; Zeigler-Hill & Myers, 2012). It could be suggested that this difference may depend on the strain on female's body beauty compared to males on behalf of the media. Such pressure may lead women to decrease their self-esteem (Gentile et al., 2009).

Also, we found that females scored significantly higher on anxiety attachment than males. This result is in accordance with the meta-analysis of 100 studies with attachment style instruments that showed sex differences in the same path as our study (Del Giudice, 2011). Partner's comfort with closeness was more significant for women who scored high on anxious attachment compared to their male partners (Collins & Read, 1990). From this perspective, women who are anxiously attached, albeit aware about their feelings, lack in the capacity of affect regulation, thus, they are particularly vulnerable in face of stressful situations as online dating.

In addition, it was found that an anxious attachment style positively predicted online deception, which supported H1. Indeed, anxiously attached individuals may benefit from online deception that allows them to select how to appear to others, reducing the expectation of refusal and abandonment. On the other hand, a significant negative correlation was found between a close attachment style and online deception, secure attachment styles were not found to significantly predict online deception.

With respect to H2, in line with other research, our findings showed that closely attached participants are more likely to report higher levels of self-esteem. Definitely, closely attached people are eager to defend their opinions, cope with their life events, and perceive others as genuine (Collins & Read, 1990). Conversely, an anxious attachment

Table 1
Descriptive statistics and bivariate correlations of key variables.

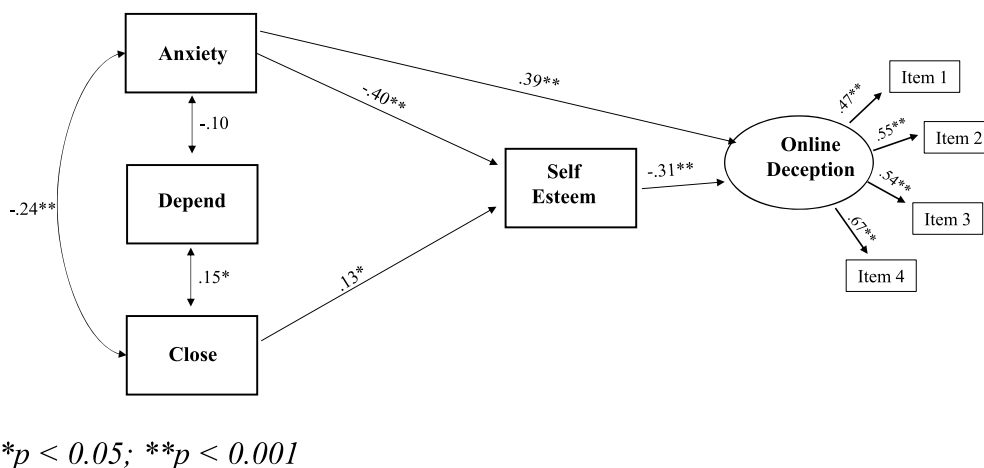| Variables	Females M (SD)	Males M(SD)	1	2	3	4	5
1.Depend	17.27 (2.7)	17.66 (2.5)					
2. Anxiety	17.44 (4.1)	15.39 (3.7)	-0.198**				
3. Close	16.54 (2.6)	16.46 (2.5)	.435***	-0.242***			
4.Self-esteem	27.72 (7.2)	32.00 (5.8)	.132*	-0.428***	.230***		
5. Online Deception	7.27 (2.7)	6.89(2.9)	.019	.438***	-0.169**	-0.398***	

*p < 0.05; **p < 0.001*

Fig. 2. Attachment styles and online deception correction path model diagram.
*p < .05; **p < .001

Table 2
Indirect effects of anxiety and closeness attachment styles on online deception via self-esteem.

Link	Indirect effect
Anxiety attachment style – online deception	.12**
	95 % CI
	.06 to. 20
Closeness attachment style–online deception	-0.04*
	95 % CI
	-0.09 to.-0.01

CI = confidence interval
* p <0.05;
** p <0.01.

style was found to negatively predict self-esteem. Indeed, anxiously attached individuals have a lower sense of self-esteem, poor determination and self-confidence; so, they have a negative representation about themselves and others (Collins & Read, 1990).

Finally, self-esteem was found to negatively predict online deception, supporting the H3. Our findings seem to confirm that self-esteem is related with self-presentation styles. In fact, some studies have shown that those with high self-esteem present themselves authentically, whereas individuals with low self-esteem are more likely to give a false representation of the self (Fullwood et al., 2016; Gil-Or et al. 2015). Grieve and Watkinson (2016) found those who were more genuine on social network experienced better social relatedness and less social stress.

In addition, self-esteem was found to significantly mediate the relationships between anxiety attachment style and online deception; the results showed that higher levels of anxiety (insecure) attachment style are associated with minor self-esteem, which in turn increases the tendency to misrepresent oneself or mislead others online. Undeniably, because of their negative representation of self and/or others, insecurely attached subjects may be more deceitful or dishonest in their online relationships (Gillath et al., 2010).

4.1. Limitations

The main limitation of this study is the use of a cross sectional study design preventing any inference about causality. Since information about attachment styles and online deception were both collected retrospectively, reverse causality between online deception and attachment styles cannot be entirely rule out. Future research could use longitudinal research design methods to prove the causal relationships between attachment styles, self-esteem, and online deception.

Furthermore, the use of convenience sample from an Italian state might limit the generalizability of the findings due to the possible impact of cultural variables. Although validated and psychometrically robust measures of attachment styles and self-esteem were used in this study, the use of self-report measures may be subject to recall bias.

In addition, gender differences may be especially strong in some specific aspects of online dating and deception and may be significantly reduced when dimensions are flattened by the broad attachment dimensions as measured in the present study.

Also, in our study the age of participants showed no statistically significant correlations with any of the assessed variables; however, age may play a role on online deception. It is well known that middle-aged women are at increased risk of being scammed (Coluccia et al., 2020), whereas, younger men prioritize sexual attraction to a greater extent than older individuals do in the realm of online dating (Menkin et al., 2015).

Finally, the mediating effect of self-esteem on the relationship between attachment styles and online deception should account for the potential confounding effect of environmental and personality confounders, including social exclusion and social support, personal and religious values and other personality traits.

4.2. Conclusions and implications

Deception is an active and complex process that may serve to regulate relationships and protect the self (Buller & Burgoon,1996). Our study highlights that people with an anxious attachment seems at higher risk to use intentional misrepresentation of oneself in online dating and to being negatively impacted by it, especially women. Indeed, through online deception these individuals may be socially reinforced, therefore increasing the likelihood to develop a dependence on online dating.

Consequently, special care should be directed to the affective needs linked with attachment style. In particular, favoring a more secure representation of romantic relationships should enhance self-esteem that eventually seem to support the creation of healthy interactions and to promote wellness (Han et al., 2022; Huntsinger & Luecken, 2004; Ringer et al., 2014).

Informed consent

Consent was obtained from all participants included in the study.

Ethical approval

All procedures performed in studies involving human participants

were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Consent was obtained from all participants included in the study.

Funding information

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

Cristina Sechi: Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Laura Vismara:** Conceptualization, Methodology, Data curation, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no competing interest.

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