

# ATTACHMENT STYLES AS PREDICTORS OF SELF-REPORTED EMPATHY IN MEDICAL STUDENTS DURING PRE-CLINICAL YEARS

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## Authors' Contributions

All authors contributed to the conception and intellectual work of the manuscript. SA: designed the study, collected and analyzed data, and wrote the manuscript. GR, MB: contributed to the design and to the final version of the manuscript. MGS: supervised the project, study design, data analysis, and the overall review of the final manuscript. All authors approved the final version of the manuscript for submission.

## Compliance with Ethical Standards

The research is approved by the University of Milano-Bicocca's ethics committee prior to participants recruitment (Prot. Num. 0039927/16).

## Conflict of Interest

No conflict of interest to declare.

## Human and animal rights

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments. Informed Consent was obtained from all individual participants included in the study.

## ABSTRACT

**OBJECTIVE** To assess medical students' attachment profile and to explore its relationship with empathy dimensions. **METHODS** Three cohorts of medical students were consecutively enrolled in the study at the beginning of their second year, before their clinical internship experience, and assessed using the Attachment Style Questionnaire (a self-report measure of attachment styles) and the Interpersonal Reactivity Index (a self-report measure of empathy). T-test, zero-order and partial correlations, and multiple linear regression models were used to analyze relationships between attachment styles and gender, age, and empathy dimensions. **RESULTS** A total of 361 out of 450 (80.2%) Italian second-year medical students participated in the study. Female students considered interpersonal relationships more important and showed a higher need for approval than did their male counterparts. Among the attachment styles, considering relationships as secondary to achievement was the most important significant predictor of both emotional and cognitive empathy variables. **CONCLUSIONS** This study shows that the attachment styles of medical students are related to self-evaluated empathy, over and above the effects of gender and age differences. **PRACTICE IMPLICATIONS** The Attachment Style Questionnaire may be a useful tool for medical educators to identify medical students with low empathy scores during their pre-clinical years of study.

**KEYWORDS** Medical students; Attachment styles; Empathy; Attachment Style Questionnaire; Interpersonal Reactivity Index.

- Medical students' attachment styles predict empathy dimensions
- Male medical students tend to be dismissing whereas females tend to be preoccupied
- Secure medical students show empathic concern without feeling distressed
- Dismissing medical students are less empathic in emotional and cognitive domains
- Preoccupied medical students are empathic but feel high emotional distress

## 1. INTRODUCTION

Attachment theory was originally formulated by Bowlby [1-3], who defined attachment as “the propensity of human beings to make strong affectional bonds to particular others” [4]. Bowlby described the attachment in infants as the main process used to seek the proximity of a protective caregiver in times of vulnerability [5]. During their developmental years, infants internalize their early experience with caregivers, building expectations about their amiability, and the emotional availability of the caregiver in situations of stress. These inner mental representations of the self and others [6-8] determine their style of attachment as adults, affecting personal cognitions, emotion regulation, interpersonal behaviors, and reactions to distress (e.g., separation, loss, personal threat, rejection, disease) [9].

Considering the adult attachment style, in literature, there are controversies concerning the number of attachment styles for explaining the complexity of the adult attachment behavior. For instance, following the infant attachment styles identified by Ainsworth and her colleagues [10], Hazan and Shaver [11] conceptualized a model of adult attachment based on three categories: secure, avoidant, and anxious/ambivalent. Paraphrasing Hazan and Shaver [11], secure people are described as trustful towards others and at ease in close relationships; avoidant people are characterized as being afraid of intimacy since they find it difficult to trust to others and to allow themselves to depend on them; anxious/ambivalent people are portrayed as worried that others are unwilling to get as close as they would like.

Moreover, Bartholomew and Horowitz [12] conceptualized four styles of adulthood attachment, defined in terms of the intersection of two underlying dimensions: “the object of mental models (self or other) and the predominant feeling about that object (positive or negative)” [13]. The four prototypical attachment styles derived from this

model are secure, preoccupied, dismissing, and fearful. The latter three are recognized as insecure attachment styles. According to the Bartholomew and Horowitz's model, *securely* attached individuals have a positive model of the self as worthy of love and others as supportive: they freely ask for support when they are in need, and they are confident in supporting other people [14-17]. In contrast, *preoccupied* attached people (negative model of self and positive model of others) show emotional instability, personal distress, and low self-esteem, so they approach relationships with concern and continually seek others' approval [18]. In the *dismissing* attachment style (positive model of self and negative model of other), on the other hand, others are perceived as never or rarely available in case of need, leading to compulsive self-reliance and the suppression of one's own emotional needs: for these reasons, dismissing individuals consider relationships as secondary to achievement and are uncomfortable with emotional closeness [16,19]. Individuals with *fearful* attachment show high levels of distrust of others and an image of the self as unworthy of support (negative model of self and others): they seek the proximity of others, but at the same time they avoid close relationships because of anxiety about possible rejection [12,16].

With regard to individual differences in attachment style, Bowlby's classical theory was formulated in sex-neutral terms. However, nowadays, there is a growing body of literature demonstrating sex differences in adult attachment styles [20,21]. In general, the data indicate that men tend to have higher levels of dismissing attachment while women have higher levels of preoccupied attachment [22]. In addition to gender differences, there are also important age differences in adult attachment. Various studies have found that older individuals have lower levels of preoccupied attachment than do younger ones [23,24].

Attachment style tells us how individuals differently approach relationships in both personal and professional fields [5,7,25]. Attachment needs are of primary

importance in the field of healthcare since treatments and illnesses expose healthcare providers and patients to conditions of stress, vulnerability, and the need for support [9]. A large body of research has studied the influence of the attachment style in the professional healthcare context [18,26,27], demonstrating that the attachment styles of practitioners and patients influence their empathic communication and relationship [9,28,29]. In particular, the attachment style of healthcare providers affects their ability to understand and communicate the patient's feelings and experiences [30,31]. This ability is directly in line with Davis's domains of empathy (cognitive and emotional) [32,33] and in particular the cognitive one, which is conceptualized as the ability to understand a patient's suffering and is associated with the intention to communicate this understanding and provide help [30,34,35].

Moreover, recent studies in the general population have investigated the role of attachment style in explaining empathy in infancy [36], adolescence [37], and adulthood [38]. Several have found a relationship between empathy and attachment security [39,40]. In contrast, few studies have examined attachment style in undergraduate medical students [41] and its relationship with empathy [42]; the majority have investigated the relationship between the attachment style and empathy in healthcare professionals and students (e.g., nursing, paramedic, and occupational therapy students) [43,44]. To our knowledge, there has been no research specifically focused on this topic in Italian undergraduate medical students.

## 1.1 AIMS

The aims of this cross-sectional study were: (1) to assess attachment styles in a sample of Italian medical students and to explore their association with demographic

variables, including gender and age; (2) to verify whether and to what extent attachment styles explain levels of general empathy amongst medical students.

Based on the above-mentioned literature, we hypothesized that:

(1a) male students would have higher levels of dismissing styles than female students would, while female students would show higher levels of preoccupied styles than those of their male counterparts; (1b) there would be a negative correlation between the age of students and the preoccupied domain of attachment.

(2a) Since *secure* individuals are confident in creating relationships of emotional support, a secure attachment style in medical students was expected to be positively related to a natural tendency to adopt others' viewpoints (cognitive side of empathy) and to concern for others' feelings (emotional side of empathy).

(2b) Due to the difficulties experienced by *dismissing* individuals in managing their own and others' emotional needs, insecure-dismissing styles among medical students were expected to be related to low empathy dimensions.

(2c) Given that emotional instability and concern for relationships characterize *preoccupied* individuals, medical students with high levels of insecure-preoccupied styles were expected to show high levels of personal distress and concern for unfortunate others (emotional dimensions of empathy).

## 2. METHODS

### 2.1 Procedure

A sample of three consecutive cohorts of second-year medical students from a medical school in northern Italy was invited after class to complete a set of paper-and-pencil questionnaires assessing attachment style, empathy levels, and demographics. All

individual participants included in the study signed an informed consent before the survey was administered. No class credit or monetary reward was given to the students for their participation in the study. Ethical approval was obtained through the University Institutional Review Board.

## 2.2 Materials

The questionnaire package included a socio-demographic section and two widely-used self-report instruments. These measures were selected because their psychometric properties in terms of both validity and reliability have previously been established as robust with Italian samples.

### 2.2.1 *Empathy*

Empathic dimensions were assessed using the Italian version of the Interpersonal Reactivity Index (IRI) [45,46], a 28-items questionnaire divided into four subscales. Respondents are asked to indicate how much each item describes them on a 5-point Likert scale ranging from 0 (“does not describe me well”) to 4 (“describes me very well”). Each subscale score is calculated by summing the scores on its seven items. Two IRI subscales quantify emotional empathy: (1) “Empathic Concern” (IRI-EC) assesses feelings of sympathy and apprehension for the misfortunes of others; and (2) “Personal Distress” (IRI-PD) measures feelings of personal anxiety and worry stressful interpersonal situations. The other two subscales evaluate the cognitive domain of empathy: (3) “Perspective Taking” (IRI-PT) is the natural propensity to assume the psychological point of view of others; and (4) “Fantasy” (IRI-F) measures respondents’ tendencies to feel like fictional characters in movies, plays, and books. In this study, the alpha reliability



coefficients for the IRI subscales were 0.78 for IRI-EC, 0.73 for IRI-PD, 0.79 for IRI-PT, and 0.85 for IRI-F.

### 2.2.2 Adult Attachment Styles

Adult attachment styles were identified using the 40-item Italian version of the Attachment Style Questionnaire (ASQ) [15,47]. Items are scored on a 6-point Likert scale ranging from 1 (“totally disagree”) to 6 (“totally agree”). The ASQ is composed by five subscales computed by summing the scores for each of their respective items: (1) “Confidence in oneself and others” (ASQ-C) (8 items) refers to security of attachment; (2) “Discomfort with Closeness” (ASQ-DC) (10 items) refers to the Hazan and Shaver’s [11] avoidant attachment; (3) “Relationships as Secondary to achievement” (ASQ-RS) (7 items) pertain to the Bartholomew and Horowitz’s [12] dismissing dimension of attachment style; (4) “Need for Approval” (ASQ-NA) (7 items) reflects the Bartholomew and Horowitz’s [12] fearful and preoccupied attachment styles; (5) “Preoccupation with Relationships” (ASQ-PR) (8 items) is related to the Hazan and Shaver’s [11] anxious/ambivalent dimension of attachment style. In our study, the five subscales of the ASQ showed adequate internal consistency, with a Cronbach’s alpha of 0.71 for ASQ-C, 0.79 for ASQ-DC, 0.78 for ASQ-RS, 0.74 for ASQ-NA, and 0.68 for ASQ-PR. In this paper, the authors referred to the ASQ-C as the *secure* attachment style, to the ASQ-DC and ASQ-RS as dimensions of the *dismissing* attachment style, and to the ASQ-NA and ASQ-PR as dimensions of the *preoccupied* attachment style.

### 2.3 Statistical analysis

Quantitative data were analyzed using IBM SPSS Version 24.0 for Mac. All data were screened for skewness and kurtosis in order to test assumptions of normality [48]. Demographic characteristics for the whole sample were investigated. Then, we examined relationships between the study variables by calculating Pearson's product-moment correlations and partial correlations controlling for gender and age of students. T-test analyses and Cohen's d calculation [49] were carried out to explore gender differences in attachment styles among the medical students. To test the role of adult attachment styles as predictors of empathy scores, we conducted separate hierarchical multiple linear regressions for each IRI subscale, adopting a two-block strategy with the enter method. Gender and age were entered at Step 1 of the regression model to control for the effect of confounding demographic factors. To avoid the problem of multicollinearity (statistical phenomenon in which there are very high intercorrelations among the independent variables in a regression model), the attachment variables (ASQ subscales) were separately entered at Step 2 to determine whether the inclusion of the ASQ scale in each regression model would enhance the total explained variance of the IRI dimension. A statistically significant variation in the F value ( $\Delta F$ ) and in the coefficient of determination ( $\Delta R^2$ ) at Step 2 would mean that the entry of the ASQ scale into the regression model explained the additional variance of the dimension of IRI. Results were considered statistically significant at a p-value < 0.05.

### 3. RESULTS

#### 3.1 Demographic characteristics and descriptive statistics for empathy and adult attachment styles

A total of 361 Italian second-year medical students (80.2% of the three cohorts) attending a medical school in northern Italy participated in the research study. Table 1 shows the demographics, the statistics of adult attachment styles, and empathy variables.

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### 3.2 Gender and age differences in attachment styles of medical students

For the overall sample, there was a significant gender effect for ASQ-RS [ $t(359) = 3.495, p = 0.001, d = 0.43$ ], with male students more prone than females to consider relationships as secondary to achievement. In contrast, female students scored significantly higher than males on ASQ-NA [ $t(359) = -2.301, p = 0.022, d = 0.28$ ]. Pearson product-moment correlations showed a small but significant inverse correlation [ $r = -0.21, n = 361, p = 0.001$ ] between age of students and their ASQ-PR scores.

### 3.3 Associations between attachment styles and empathy measures

Table 2 shows the partial correlations between measures of adult attachment and empathy, controlled for gender and age variables. Regardless of the gender and age of participants, ASQ-C had a positive and negative significant correlation with IRI-EC and IRI-PD, respectively. With regard to the insecure-dismissing dimensions of attachment, both ASQ-DC and ASQ-RS negatively correlated with IRI-EC, whereas only ASQ-RS had a significant negative correlation with IRI-PT and IRI-F. Regarding the insecure-preoccupied dimensions of attachment, both ASQ-NA and ASQ-PR scores positively correlated with IRI-EC, IRI-PD, and IRI-F.

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Hierarchical multiple regression analyses were performed to investigate the unique contribution of each of the five categories of attachment styles in explaining the variance of empathy dimensions, controlling for the effect of gender and age (Table 3).

With regard to the emotional dimensions of empathy, IRI-EC variance was significantly predicted by ASQ-C ( $p < .01$ ), ASQ-DC ( $p < .05$ ), ASQ-RS ( $p < .001$ ), ASQ-NA ( $p < .05$ ), and ASQ-PR ( $p < .001$ ), whereas IRI-PD variance was significantly predicted by ASQ-C ( $p < .05$ ), ASQ-NA ( $p < .001$ ), and ASQ-PR ( $p < .001$ ).

Regarding the cognitive dimensions of empathy, IRI-PT was significantly predicted by ASQ-RS ( $p < .001$ ), whereas IRI-F was significantly predicted by ASQ-RS ( $p < .01$ ), ASQ-NA ( $p < .01$ ), and ASQ-PR ( $p < .001$ ).

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#### 4. DISCUSSION AND CONCLUSION

The role of attachment style in a clinical context has been widely studied, with many efforts directed at assessing the attachment style of clinicians and patients as a key factor in difficulties in managing clinical encounters [50,51]. Attachment styles of medical students as a factor that can affect their empathic attitude have received little attention, but this represents a promising area of interest, mainly for its educational impact. Working on the detection and the management of cognitive, emotional, and behavioral dimensions of attachment during the pre-clinical years of medical studies can provide future healthcare professionals with valuable skills for managing difficult relationships.

## 4.1 Discussion

### *4.1.1 Gender and age differences in attachment styles*

From a descriptive viewpoint, male students showed a higher tendency to consider interpersonal relationships as less important than the achievement of individual life goals in terms of performance, while for females it was more important to measure up to other people and to be appreciated. Similar results emerged in another recent study [52], which found that men showed higher levels of self-reliance (dismissing attachment style) than women did while there were no differences in discomfort with closeness, and that neediness for others' availability (preoccupied attachment style) was higher in women than in men.

Our findings dealing with the correlation between age and attachment styles of medical students suggest that older students showed lower levels of worry about their interpersonal relationships than did younger ones. This result is consistent with the international literature [23,24]. However, given the narrow age range of the students enrolled in this study, future research should also include senior students and residents in order to confirm relationships between attachment style and age of medical students.

### *4.1.2 The relationship between medical students' empathy and attachment styles*

The results of the correlations between attachment and empathy variables were in line with the authors' hypotheses. According to previous studies [43,44], both secure and insecure attachment styles predicted an emphatic attitude in healthcare students. Focusing on the two facets of insecure-dismissing attachment style, Discomfort with Closeness and

Relationships as Secondary, our results showed that medical students who felt discomfort with closeness and considered interpersonal relationships as secondary to achievement were prone to exhibit difficulties in feeling emotional concern for others and in taking others' perspectives. Among the insecure-dismissing attachment styles, considering relationships as secondary to achievement was the most important predictor of empathy variables since it per se explained the 21% and the 10% of the Empathic Concern and Perspective Taking variance, respectively. These findings suggest that high scores on the Discomfort with closeness and on the Relationships as Secondary dimensions could be a barrier for medical students when building patient-centered relationships [29]. A negative relationship between insecure-dismissing attachment style and empathy was found in a previous study that considered only emotional empathy and applied a wider categorization of attachment styles [53].

Turning to the dimensions of insecure-preoccupied attachment, the Need for Approval, and the Preoccupation with Relationships scales predicted higher Personal Distress and higher Empathic Concern, confirming our hypothesis. Among the insecure-preoccupied attachment styles, the Need for Approval scale was the most important predictor of emotional empathy, accounting for 13% of the Personal Distress variance. The two insecure-preoccupied attachment dimensions could be considered risk factors for developing personal distress in tense relational situations, which often occur in the medical context. Moreover, reporting need for approval and preoccupation with relationships led students to show high levels of empathic concern for others, indicating a risk of failing to maintain an appropriate distance from patients' suffering. These results are consistent with those of other studies showing a relation of preoccupied attachment style with high levels of psychological distress [54], psychiatric symptomatology, and low levels of emotion regulation [18].

According to our expectations, secure attachment style per se, as defined by the Confidence scale, was a factor significantly correlated to the emotional empathy dimensions. This result is consistent with a previous Iranian study of nursing students [43] and with another study [55], which reported that securely-attached mental-health providers were better at attending and responding empathically to patients' needs. The negative correlation between secure attachment and personal distress confirms that the former can be considered an inner resource in times of interpersonal stress [56].

#### *4.1.3 Strengths and limitations*

To our knowledge, this is one of the few studies in the medical, educational context that deals with the relationship between attachment styles and empathy levels in undergraduate students. This preliminary study involved students from the second year of their medical course only; consequently, future research on this topic would benefit from comparisons with a sample of senior students and physicians in order to clarify the relationship between age and attachment styles.

Although the ASQ is easy to administer and possesses robust psychometric properties in terms of both validity and reliability, as established previously with Italian and international samples, it can be considered reliable only with subjects that have a good level of self-awareness about their attachment style. An external measure, such as observation by an expert in attachment or the effect on a real or simulated patient, should be used to obtain a more reliable attribution of a single style, as suggested in a previous study [29].

Another limitation of this study relates to its use of the IRI as a measure of empathy. Although the IRI is a widely used measure of empathy in research in the field of education of health professions and can assess both cognitive and emotional attributes

of empathy, it describes a general empathic attitude that is not specifically related to encounters with patients. Measures more closely related to clinical encounters might be more able to detect a relationship between attachment styles and medical empathy [44]. Moreover, the use of simulated patients and external evaluators, such as clinical supervisors or tutors trained to assess levels of empathy, could be the next step in confirming these preliminary results.

Finally, since the participants of our study were from only one Italian Medical School, the generalizability of these results needs caution. A possible suggestion for future studies is the implementation of multicentric research design.

## 4.2 Conclusion

This study found that the attachment style of the medical students examined was related to their self-evaluated empathy, over and above the effects of gender and age differences. These findings suggest that attachment theory may be a useful theoretical framework for medical educators attempting to provide tailored interventions in order to promote the empathy of students in interpersonal settings. In particular, medical students with secure attachment show empathic concern without feeling emotional distress; dismissing-attached students tend to be less empathic both in emotional and cognitive domains, otherwise, those who are preoccupied show both emotional and cognitive empathy, but pay a high cost of emotional distress.

Moreover, since the ASQ predicted low scores on both emotional and cognitive empathy among students who considered relationships as secondary to achievement, and high scores on personal distress among students looking for approval, it could be a useful tool for medical educators seeking to identify medical students who have difficulty in developing an empathic attitude during their pre-clinical years of study.



### 4.3 Practice implications

Our results provide preliminary evidence of the potential role of attachment styles in predicting self-reported empathy levels among medical students and highlight the usefulness of incorporating attachment styles screening and assessment in undergraduate medical curricula.

A possible suggestion for medical educators might be to introduce attachment theory as a key topic in human interactions at the beginning of the medical course, starting the process of reflecting on the implications of different patterns of attachment in both clinical and everyday interactions (e.g., with friends, mates, partners, relatives, colleagues, and patients).

In practice, class lessons [57] and university counseling services [58] might be educational contexts in which medical students can become aware of their attachment styles and learn how to manage them by using, for example, emotion regulation strategies and mindfulness practices [59]. In this way, students can enhance their ability to modulate the cognitive, emotional and behavioral implications of their attachment style before entering the clinical setting.

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## REFERENCES

1. J. Bowlby, *Attachment and Loss, Vol 1 Attachment*, Basic Books, New York, 1969.
2. J. Bowlby, *Attachment and Loss, Vol 2 Separation: Anxiety and Anger*, Basic Books, New York, 1973.
3. J. Bowlby, *Attachment and Loss, Vol 3 Loss: Sadness and Depression*, in J. Bowlby Hogarth Press, London, 1980.
4. J. Bowlby, The making and breaking of affectional bonds: I. Aetiology and psychopathology in the light of attachment theory, *Br J Psychiatry* 130 (1977) 201–10.
5. N. Kaya, Attachment styles of nursing students: A cross-sectional and a longitudinal study. *Nurse Educ Today* 30 (2010) 666–73.
6. G. Adshead, Becoming a caregiver: Attachment theory and poorly performing doctors, *Med Edu* 44 (2010) 125–31.
7. D.W. Griffin, K. Bartholomew, Models of the self and other: Fundamental dimensions underlying measures of adult attachment, *J Pers Soc Psychol* 67 (1994) 430–45.
8. C.R. Fraley, Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms, *Pers Soc Psychol Rev* 6 (2002) 123–51.
9. R. Maunder, J. Hunter, Adult attachment and health: The interpersonal dance in medical settings, in: M. O'Reilly-Landry (Ed.), *A psychodynamic understanding of modern medicine: Placing the person at the center of care*, Radcliffe Publishing, London, New York, 2012, pp. 93–107.
10. M.D.S. Ainsworth, M.C. Blehar, E. Waters, S. Wall, *Patterns of attachment: A psychological study of the Strange Situation*, Psychology Press, New York, 2015.

11. C. Hazan, P.R. Shaver, Romantic love conceptualized as an attachment process, *J Pers Soc Psychol* 52 (1987) 511–24.
12. K. Bartholomew, L.M. Horowitz, Attachment styles among young adults: A test of a four-category model, *J Pers Soc Psychol* 61 (1991) 226–44.
13. J.A. Feeney, P. Noller, *Adult attachment*, Sage Publications, Thousand Oaks (CA), 1996, pp. 51.
14. K. Sanford, Two dimensions of adult attachment: Further validation. *J Soc Pers Relat* 14 (1977) 133–43.
15. J.A. Feeney, P. Noller, M. Hanrahan, Assessing adult attachment, in: M.B. Sperling, W.H. Berman (Eds.), *Attachment in adults: Clinical and developmental perspectives*, Guilford Publications, New York, 1994, pp. 128–52.
16. A. Tan, C. Zimmermann, G. Rodin, Interpersonal processes in palliative care: An attachment perspective on the patient-clinician relationship, *Palliat Med* 19 (2005) 143–50.
17. J.R. Schore, A.N. Schore, Modern attachment theory: The central role of affect regulation in development and treatment. *Clin Soc Work J* 36 (2008) 9–20.
18. M.L. Cooper, P.R. Shaver, N.L. Collins, Attachment styles, emotion regulation, and adjustment in adolescence, *J Pers Soc Psychol* 74 (1998) 1380–97.
19. J.G. Holmes, Social relationships: The nature and function of relational schemas, *Eur J Soc Psychol* 30 (2000) 447–95.
20. M.H. van IJzendoorn, M.J. Bakermans-Kranenburg, Invariance of adult attachment across gender, age, culture, and socioeconomic status? *J Soc Pers Relat* 27 (2010) 200–8.
21. K.C. Haydon, G.I. Roisman, M.T. Owen, C. Booth-LaForce, M.J. Cox, Shared and distinctive antecedents of Adult Attachment Interview state-of-mind and inferred-experience dimensions, *Monogr Soc Res Child Dev* 79 (2014) 108–25.

22. M. Del Giudice, Sex differences in attachment styles, *Curr Opin Psychol* 25 (2019) 1–5.
23. F. Zhang, G. Labouvie-Vief, Stability and fluctuation in adult attachment style over a 6-year period, *Attach Hum Dev* 6 (2004) 419–37.
24. D.L. Segal, T.N. Needham, F.L. Coolidge, Age differences in attachment orientations among younger and older adults: Evidence from two self-report measures of attachment, *Int J Aging Hum Dev* 69 (2009) 119–32.
25. D. Griffin, K. Bartholomew K, The metaphysics of measurement: The case of adult attachment, in: K. Bartholomew, D. Perlman (Eds.), *Advances in personal relationships: Attachment processes in adulthood* (Vol. 5), Jessica Kingsley, London, 1994, pp. 17–52.
26. L. Morris, K. Berry, A.J. Wearden, N. Jackson, T. Dornan, R. Davies, Attachment style and alliance in patients with diabetes and healthcare professionals, *Psychol Health Med* 14 (2009) 585–90.
27. B. Klest, O. Philippon, Trust in the medical profession and patient attachment style, *Psychol Health Med* 21 (2016) 863–70.
28. V. Calvo, A. Palmieri, S. Marinelli, F. Bianco, J.R. Kleinbub, Reciprocal empathy and working alliance in terminal oncological illness: The crucial role of patients' attachment style, *J Psychosoc Oncol* 32 (2014) 517–34.
29. I. Fletcher, R. McCallum, S. Peters, Attachment styles and clinical communication performance in trainee doctors, *Patient Educ Couns* 99 (2016) 1852–7.
30. S.K. Fields, P. Mahan, P. Tillman, J. Harris, K. Maxwell, M. Hojat, Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: Health provider – Student version, *J Interprof Care* 25 (2011) 287–93.

31. M.G. Cherry, I. Fletcher, H. O'Sullivan, The influence of medical students' and doctors' attachment style and emotional intelligence on their patient-provider communication, *Patient Educ Couns* 93 (2013) 177–87.
32. M.H. Davis, Measuring individual differences in empathy: Evidence for a multidimensional approach, *J Pers Soc Psychol* 44 (1983) 113–26.
33. M.H. Davis, *Empathy: A social psychological approach*, Routledge, New York, 2018.
34. M. Hojat, *Empathy in patient care: Antecedents, development, measurement, and outcomes*, Springer Science & Business Media, New York, 2007.
35. M. Hojat, M.J. Vergare, K. Maxwell, G. Brainard, S.K. Herrine, G.A. Isenberg, J.S. Gonnella, The devil is in the third year: A longitudinal study of erosion of empathy in medical school. *Aca Med* 84 (2009) 1182–91.
36. J.A. Stern, J. Cassidy, Empathy from infancy to adolescence: An attachment perspective on the development of individual differences, *Dev Rev* 47 (2018) 1–22.
37. C.M. Gelb, The relation between empathy and attachment in the adolescent population, *Dissertation Abstract International B* 62 (2002) 9–B.
38. D. Troyer, T. Greitemeyer, The impact of attachment orientations on empathy in adults: Considering the mediating role of emotion regulation strategies and negative affectivity, *Pers Individ Dif* 122 (2018) 198–205.
39. P.C. Britton, J.M. Fuendeling, The relations among varieties of adult attachment and the components of empathy, *J Soc Psychol* 145 (2005) 519–30.
40. E.M. Boag, K.B. Carnelley, Attachment and prejudice: The mediating role of empathy, *Br J Soc Psychol* 55 (2016) 337–56.
41. P.S. Ciechanowski, J.E. Russo, W.J. Katon, E.A. Walker, Attachment theory in health care: The influence of relationship style on medical students' specialty choice. *Med Edu* 38 (2004) 262–70.

42. M. Wei, K.Y.H. Liao, T.Y. Ku, P.A. Shaffer, Attachment, self-compassion, empathy, and subjective well-being among college students and community adults, *J Pers* 79 (2011) 191–21.
43. M. Khodabakhsh, Attachment styles as predictors of empathy in nursing students, *J Med Ethics Hist Med* 5 (2012).
44. B. Williams, T. Brown, L. McKenna, B. Beovich, J. Etherington, Attachment and empathy in Australian undergraduate paramedic, nursing and occupational therapy students: A cross-sectional study, *Collegian* 24 (2017) 603–9.
45. M.H. Davis, A multidimensional approach to individual differences in empathy, *JSAS Catalog Sel Doc Psychol* 10 (1980) 85.
46. P. Albiero, S. Ingoglia, A. Lo Coco A, Contributo all'adattamento italiano dell'Interpersonal Reactivity Index di Davis [A contribution to the Italian validation of the Interpersonal Reactivity Index], *TPM* 13 (2006) 107–25.
47. A. Fossati, J. Feeney, F. Grazioli, S. Borroni, E. Acquarini, C. Maffei, L'Attachment Style Questionnaire (ASQ) di Feeney, Noller e Hanrahan [The Attachment Style Questionnaire (ASQ) of Feeney, Noller and Hanrahan], in: L. Barone, F. Del Corno (Eds.), *La valutazione dell'attaccamento adulto. I questionari autosomministrati* [The assessment of adult attachment. The self-report questionnaires], Raffaello Cortina, Italy, 2007, pp. 181–96.
48. B.G. Tabachnick, L.S. Fidell, *Computer-assisted research design and analysis*, Allyn & Bacon Inc, Needham Heights (MA), 2000.
49. J. Cohen, *Statistical power analysis for the behavioral sciences*, 2nd ed., Lawrence Erlbaum Associates, Hillsdale, 1988.
50. R.G. Maunder, A. Panzer, M. Viljoen, J. Owen, S. Human, J.J. Hunter, Physicians' difficulty with emergency department patients is related to patients' attachment style, *Soc Sci Med Pergamon* 63 (2006) 552–62.

51. J. Hunter, R. Maunder (Eds.) Improving patient treatment with attachment theory. A guide for primary care practitioners and specialists, Springer, 2016.
52. M. Del Giudice, Sex differences in romantic attachment: A facet-level analysis, *Pers Individ Dif* 88 (2016) 125–8.
53. H.A. Wayment, Attachment style, empathy, and helping following a collective loss: Evidence from the September 11 terrorist attacks, *Attach Hum Dev* 8 (2006) 1–9.
54. N. Turan, R.D. Kocalevent, S.M. Quintana, Ö. Erdur-Baker, J. Diestelmann, Attachment orientations: Predicting psychological distress in German and Turkish samples, *J Couns Dev* 94 (2016) 91–102.
55. M. Dozier, K.L. Cue, L. Barnett, Clinicians as caregivers: Role of attachment organization in treatment, *J Consult Clin Psychol* 62 (1994) 793–800.
56. M. Mikulincer, V. Florian, The relationship between adult attachment styles and emotional and cognitive reactions to stressful events, in: J.A. Simpson, W.S. Rholes (Eds.), *Attachment theory and close relationships*, Guilford Press, New York (NY), 1998, pp. 143–165.
57. M. Tyszkiewicz-Bandur, M. Walkiewicz, M. Tartas, J. Bankiewicz-Nakielska, Emotional intelligence, attachment styles and medical education, *Fam Med Primary Care Rev* 19 (2017) 404–7.
58. M.G. Strepparava, M. Bani, F. Zorzi, D. Corrias, R. Dolce, G. Rezzonico, Cognitive counselling intervention: Treatment effectiveness in an Italian university centre, *Br J Guid Counc* 44 (2016) 423–33.
59. M. Mikulincer, P.R. Shaver, Attachment orientations and emotion regulation, *Curr Opin Psychol* 25 (2019) 6–10.

Table 1 – Summary of means (M), standard deviations (SD), and observed range for study measures

|             | Male (M±SD)<br>(N = 175, 48.47%) | Female (M±SD)<br>(N = 186, 51.52%) | Total (M±SD)<br>(N = 361, 100%) | Observed range<br>(min-Max) |
|-------------|----------------------------------|------------------------------------|---------------------------------|-----------------------------|
| Age (years) | 19.49±1.11                       | 19.75±1.56                         | 19.62±1.35                      | 18-33                       |
| ASQ-C       | 30.81±4.51                       | 30.63±5.59                         | 30.72±5.07                      | 13-44                       |
| ASQ-DC      | 35.79±6.95                       | 36.22±7.95                         | 36.00±7.45                      | 15-54                       |
| ASQ-RS      | 17.17±5.41                       | 14.92±4.96                         | 16.05±5.29                      | 7-35                        |
| ASQ-NA      | 19.85±5.58                       | 21.48±5.91                         | 20.66±5.79                      | 7-40                        |
| ASQ-PR      | 28.58±5.79                       | 28.95±5.28                         | 28.77±5.53                      | 13-43                       |
| IRI-EC      | 17.99±4.66                       | 20.50±3.86                         | 19.24±4.45                      | 4-28                        |
| IRI-PD      | 7.31±4.06                        | 8.38±3.99                          | 7.85±4.05                       | 0-24                        |
| IRI-PT      | 18.29±5.09                       | 19.12±4.62                         | 18.70±4.87                      | 1-28                        |
| IRI-F       | 15.66±5.67                       | 18.01±5.69                         | 16.83±5.79                      | 1-28                        |

*IRI-EC* Empathic Concern, *IRI-PD* Personal Distress, *IRI-PT* Perspective Taking, *IRI-F*

Fantasy; *ASQ-C* Confidence, *ASQ-DC* Discomfort with Closeness, *ASQ-RS* Relationships

as Secondary, *ASQ-NA* Need for Approval, *ASQ-PR* Preoccupation with Relationships



Table 2 – Partial correlations between adult attachment styles and empathy dimensions controlled for gender and age

| Variable | 1 | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|----------|---|--------|--------|--------|--------|--------|--------|--------|--------|
| ASQ-C    | 1 | -.541a | -.438a | -.236a | -.287a | .166b  | -.140c | .083   | -.043  |
| ASQ-DC   |   | 1      | .513a  | .251a  | .233a  | -.145c | .030   | .045   | .034   |
| ASQ-RS   |   |        | 1      | .145c  | .047   | -.475a | .059   | -.319a | -.168b |
| ASQ-NA   |   |        |        | 1      | .452a  | .133c  | .358a  | .048   | .208b  |
| ASQ-PR   |   |        |        |        | 1      | .225a  | .220a  | .069   | .234a  |
| IRI-EC   |   |        |        |        |        | 1      | .179b  | .396a  | .361a  |
| IRI-PD   |   |        |        |        |        |        | 1      | -.030  | .154c  |
| IRI-PT   |   |        |        |        |        |        |        | 1      | .172b  |
| IRI-F    |   |        |        |        |        |        |        |        | 1      |

*ASQ-C* Confidence, *ASQ-DC* Discomfort with Closeness, *ASQ-RS* Relationships as Secondary, *ASQ-NA* Need for Approval, *ASQ-PR* Preoccupation with Relationships; *IRI-EC* Empathic Concern, *IRI-PD* Personal Distress, *IRI-PT* Perspective Taking, *IRI-F* Fantasy; *a*  $p < .001$ , *b*  $p < .01$ , *c*  $p < .05$

Table 3 – Hierarchical multiple regression analyses summary for attachment styles predicting empathy dimensions

|        | IRI-EC     |        |              | IRI-PD     |        |              | IRI-PT     |        |              | IRI-F      |        |              |
|--------|------------|--------|--------------|------------|--------|--------------|------------|--------|--------------|------------|--------|--------------|
|        | $\Delta F$ | p      | $\Delta R^2$ | $\Delta F$ | p      | $\Delta R^2$ | $\Delta F$ | p      | $\Delta R^2$ | $\Delta F$ | p      | $\Delta R^2$ |
| ASQ-C  | 7.27       | .007   | .03          | 5.13       | .024   | .02          |            | n.s.   |              |            | n.s.   |              |
| ASQ-DC | 5.49       | .02    | .02          |            | n.s.   |              |            | n.s.   |              |            | n.s.   |              |
| ASQ-RS | 74.62      | < .001 | .21          |            | n.s.   |              | 28.97      | < .001 | .10          | 7.40       | .007   | .03          |
| ASQ-NA | 4.59       | .033   | .02          | 37.57      | < .001 | .13          |            | n.s.   |              | 11.54      | .001   | .04          |
| ASQ-PR | 13.70      | < .001 | .05          | 13.07      | < .001 | .05          |            | n.s.   |              | 14.80      | < .001 | .05          |

*ASQ-C* Confidence, *ASQ-DC* Discomfort with Closeness, *ASQ-RS* Relationships as Secondary, *ASQ-NA* Need for Approval, *ASQ-PR* Preoccupation with Relationships; *IRI-EC* Empathic Concern, *IRI-PD* Personal Distress, *IRI-PT* Perspective Taking, *IRI-F* Fantasy; *n.s.* not significant