

# A Systematic Review on the Association between Adult Attachment and Interpersonal Problems

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## Abstract

**Objective:** The aim of our study was to identify characteristic associations between adult attachment and interpersonal problems, to enhance the understanding of human behavior in close interpersonal relationships.

**Method:** We conducted a systematic review of the scientific literature of the past 15 years. We focused on studies that link the two concepts via correlation. 17 articles fulfilled inclusion criteria and were systematically analyzed.

**Results:** Strong associations were detected between interpersonal distress and both attachment anxiety and avoidance. Furthermore, studies revealed a trend towards associations between friendly-submissive behavior and attachment anxiety, as well as between hostile-dominant interpersonal problems and attachment avoidance.

**Conclusion:** Our findings clearly suggest associations between adult attachment and interpersonal problems and enhance the knowledge about human behavior in interpersonal contact.

**Keywords:** Interpersonal problems; Attachment anxiety; Attachment avoidance; Correlation

## Key Practitioner Message

- This review demonstrates the close association between attachment patterns and interpersonal problems in adults.
- Attachment anxiety turned out to be related to friendly submissive interpersonal behavior.
- Attachment avoidance was associated with more hostile-dominant interpersonal problems.
- In line with our findings, we suggest bilateral therapy approaches over strategies that do only focus on either adult attachment or interpersonal behavior.

## Background

### Development and advancement of attachment theory

Attachment theory is one of the most common concepts in psychology and affects different fields of human perception and behavior. It combines emotional, motivational and behavioral aspects [1-3]. Because children show different forms of attachment, the categorization to specific styles has already had a long history that dates back to the late 1960s [4]. In the 1980s, scientists adapted the theory to adolescence and adulthood as well and were thereupon able to show links between childhood relationships to main attachment figures and adult relationships later in life. As a result, studies on the impact of childhood attachment on adult behavior were promoted [5]. Hazan and Shaver [6] were the first to investigate the combination of attachment theory and the field of close relationships in adults. This piece of research is of particular interest, because it focused on the current attachment experiences of their subjects and not on attachment representations to caregivers. This strategy was well received within attachment theory and was adopted by other scientists (for example [7-9]). Unfortunately, the progress led to a vague terminology of the construct and its sub-dimensions, so that today the terms ‘adult attachment’, ‘attachment in adults’, ‘romantic attachment’, etc. are often used inconsistently.

During the first decades of development, assessment of attachment was mainly structured along a categorical scheme in which each

subject is assigned to a specific attachment style. In the mid-1990s the trend moved towards a two-dimensional model [5]. By means of this approach a subject is characterized along the axes of attachment anxiety and attachment avoidance. The first dimension refers to the model of self and can consequently be described as a person’s expectations of being left and abandoned or not being loved sufficiently. People who are high on attachment anxiety are concerned with others and the effort of not being separated by loved ones. Therefore they show high levels of attachment behavior [5,10]. In contrast, attachment avoidance refers to the model of others and can be understood as a denial of dependence. Individuals who show high levels of attachment avoidance usually prefer self-reliance and avoid close relationships and intimacy. Accordingly, they hardly show any signs of attachment behavior [5,10]. Bartholomew and Horowitz [7] defined and visualized the conversion of the different approaches reasonably. Thus, secure attachment is characterized by low levels of both attachment anxiety and attachment avoidance. Preoccupied individuals show high levels of attachment anxiety and low levels of attachment avoidance, whereas people with a dismissing attachment style behave inversely. Fearful attachment consists of high levels of both attachment anxiety and avoidance [7]. Apart from these theories, several studies (e.g. [7-9,11,12]) have revealed that a two-dimensional model is of greater statistical quality.

### Assessment and study of interpersonal problems

Interpersonal research dates back to the theories of Horney [13], Sullivan [14] and Leary [15]. The main area of interest within this

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scientific field is patterns of behavior people show when they interact with each other. Two underlying postulates, derived from Leary [15], form the long-standing basis of contemporary interpersonal theory [16]: First, it is assumed that interpersonal behavior can be characterized within a two-dimensional model. The first dimension refers to affiliation and ranges from hostile to friendly behavior. The second dimension refers to dominance and ranges from submissiveness to dominance. These two axes form the interpersonal space, which can be divided into eight areas, called octants, arranged in a circle around the crossing point of the dimensions [15]. The second postulate assumes that two individuals reciprocally influence each other as they interact. More precisely, different patterns of behavior provoke specific patterns of reactions. These reactions are expected to be similar along the dimension of affiliation but reciprocal relating to the dimension of dominance, so that friendly-dominant behavior invites friendly-submissive behavior. If the expected reaction is not met, tensions arise within the interacting individuals that demand an adaptation of interpersonal behavior or a discontinuation of interaction [15].

During the last decades, research has focused on the field of interpersonal problems, headed by the publications of Horowitz (e.g. [17–20]). Interpersonal problems can be described as recurrent difficulties in human interaction and are commonly mentioned by patients at the beginning of psychotherapy [21]. Although different instruments have been created for assessing interpersonal problems (for an overview [22]), the Inventory of Interpersonal Problems (IIP [23]) turned out to have the greatest impact in psychological studies. This instrument assesses the eight spheres of interpersonal interaction as described by Leary [15], namely *domineering, vindictive, cold, socially avoidant/inhibited, non-assertive, exploitable/overly accommodating, overly-nurturant/self-sacrificing* and *intrusive* behavior [24]. As of this writing, the IIP has been the gold standard for assessing interpersonal problems.

### Links between adult attachment and interpersonal problems

As attachment describes the basis of behavior in close interpersonal contact, it is assumed that specific styles of adult attachment go along with specific patterns of interpersonal problems [25]. Bartholomew and Horowitz [7] were able to identify specific relationships between adult attachment and interpersonal problems, assessed both by self-ratings and ratings of subjects' close friends. Results of the study indicated a trend to introverted, submissive behavior in fearfully attached persons and to expressive behavior in preoccupied-attached persons. People in the dismissing group showed more interpersonal problems in the hostile regions of the circumplex, whereas securely attached individuals tended to be situated in the friendly regions. The latter, however, showed lower overall scores of interpersonal distress [7].

During the last years, research with a focus on the relationships between the concepts has found similar results (e.g. [26–28]). In addition, other studies did not focus on these specific associations, but assessed patterns of adult attachment and/or interpersonal problems as potential factors of influence or psychometric reference values (e.g. [29–31]). Unfortunately, these studies are dispersed across the scientific literature and have therefore only a low impact in psychological research. To summarize, the interaction of adult attachment and interpersonal behavior cannot be described as being well investigated [32].

As both attachment behavior and the experiences of interpersonal problems influence psychological wellbeing, a more detailed exploration of the association between these two concepts is of serious importance, especially within the fields of clinical psychology and psychotherapy

research. If specific associations are being detected, therapists and consultants may use this knowledge to enhance their working efforts. A better understanding might therefore form a solid basis for the adaptation and improvement of existing therapy manuals.

### Objective

As previously described, a lot of research has been conducted within these fields of human interaction and several studies have already assessed patterns of attachment and interpersonal problems in different populations. To our knowledge, however, no systematic review exists that analyses the relationship between adult attachment styles and interpersonal problems. To close the outlined gap of knowledge, the purpose of this review was to systematically search the scientific literature of the recent past, to identify characteristic patterns of interpersonal problems and adult attachment.

### Methods

We conducted a systematic review of research reports using the following computerized databases: MEDLINE, EMBASE, PsycINFO and PSYINDEX.

Inclusion and exclusion criteria included the following:

- Empirical, quantitative studies (excluding qualitative studies, case studies, reviews, etc.).
- Published in an academic journal (excluding monographs, grey literature, etc.).
- Published within the last 15 years, related to the beginning of data research in July 2014, therefore excluding papers that had been published before July 1999.
- Assessing adult attachment in a two-dimensional model of attachment anxiety and attachment avoidance (excluding categorical measures and data collected from people younger than 18 years of age).
- Assessing interpersonal problems with a one-dimensional global score and/or with a multi-dimensional model referring to the interpersonal circumplex.
- Data collection conducted in western societies (Europe, Northern America and Australia).
- Containing usable data that describes the link between the two concepts via correlation coefficient.
- Published in English or German.

The list of search terms included the following phrases (in alphabetical order):

<ul style="list-style-type: none"> <li>• Adult attachment</li> <li>• Attachment anxi*</li> <li>• Attachment avoida*</li> <li>• Attachment in adults</li> <li>• Attachment in close relationshi*</li> </ul>	<ul style="list-style-type: none"> <li>• Interpersonal behavio*</li> <li>• Interpersonal circumplex</li> <li>• Interpersonal difficul*</li> <li>• Interpersonal distress</li> <li>• Interpersonal functioning</li> </ul>	<ul style="list-style-type: none"> <li>• Interpersonal motiv*</li> <li>• Interpersonal probl*</li> <li>• Interpersonal styl*</li> <li>• Romantic attachment</li> </ul>
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The review process included combinations of the terms defined above in title, keywords, abstract and full text. Furthermore, the reference lists of retrieved studies were manually screened for other relevant studies.

In the second step, abstracts were screened by the first author and selected, if they did not meet exclusion criteria. Subsequently full texts of all the remaining papers were rated independently by two authors. Inclusion was based on the consensus of the two reviewers. If consensus was not reached, papers were discussed with the third author.

## Results

A total of >300 abstracts were screened, after which 233 full texts were examined in detail. The final sample comprised 17 studies that met all the inclusion criteria. Studies were based on 16 samples, since two studies [31,33] used the same sample. Sample sizes of the included studies ranged from 41 to 515, with a mean of ~191 subjects. Most of the studies' participants can be characterized as undergraduate students or as psychotherapy patients.

Tables 1-3 present the characteristics of the chosen studies and the correlation coefficients between adult attachment and interpersonal problem scales. Table 4 presents ranges of correlations between adult attachment and the interpersonal octants.

To display our findings in a clear way, we decided to cluster the studies based on which correlations had been calculated: Table 1 presents studies, which correlate attachment anxiety and attachment avoidance with the IIP-total-score or with the IIP-total-score and all interpersonal octants. Table 2 consists of papers that correlate adult attachment with specific interpersonal octants. Table 3 presents studies in which the underlying dimensions of the interpersonal circumplex or specific combinations of interpersonal octants were correlated with attachment anxiety and avoidance.

Regarding the assessment of the two concepts, almost each study utilized a version of the IIP [23] to assess interpersonal problems. Only the work by Gallo et al. [34] used the Big Five version of the revised Interpersonal Adjective Scales [35]. In contrast, adult attachment was assessed with different instruments: Eight studies used versions of the Experience in Close Relationships – Scale [8], another six used the Adult Attachment Scale [36], two studies were conducted with the Psychosis Attachment Measure [37] and one by means of the Relationship Styles Questionnaire [38].

### Adult attachment and interpersonal distress

Correlation coefficients between adult attachment and interpersonal problems seem to differ in effect size, but appear to be highly significant (Table 1). The studies by Berry et al. [39] and Berry et al. [37] show stronger correlations between interpersonal distress and attachment anxiety compared with interpersonal distress and attachment avoidance (0.58 and 0.60, respectively, compared to 0.28 each). All the other studies report lower differences between the two dimensions of adult attachment. In two studies [27,40] the correlations between attachment avoidance and interpersonal problems even exceeded those of attachment anxiety and interpersonal distress, although merely to a minor degree (0.63 vs. 0.58 and 0.32 vs. 0.37, respectively).

In summary, correlation coefficients for attachment anxiety and interpersonal distress ranged from 0.25 to 0.60 and for attachment avoidance and interpersonal distress from 0.24 to 0.63.

### Adult attachment and specific interpersonal octants

Added together, five studies addressed to the task of reporting product-moment correlations between adult attachment and either all or selected interpersonal octants (Table 2). Analyzing these results in more detail, one can observe that some studies tend to report mostly

significant results, while other studies report varying *p*-values. For example, Pearson et al. [41] show exclusively significant correlation coefficients and Kooiman et al. [42] report similar results. In contrast, results of the studies of Chen and Mallinckrodt [26] and Lawson and Brossart [43] range from not significant to highly significant. This may be a consequence of the low statistical power conditioned by the relatively small sample sizes. However, Haggerty et al. [27] report surprisingly good data, considering the smallest sample size of all, comprising only 41 subjects. To give a structured overview of the results, ranges of correlations are presented systematically in Table 4.

### Adult attachment and interpersonal clusters

A total of six studies did not contain data referring to specific octants of the interpersonal circumplex or the total level of interpersonal distress, but reported information about distinct interpersonal patterns (Table 3). Reasons for reducing the existing data differ across the studies. As research in this section cannot be summed up adequately, we analyze the results separately.

In the study of Cummings-Robbeau et al. [32] the correlation coefficient for aggression and attachment anxiety (0.62) is evidently higher than between aggression and attachment avoidance (0.18) whereas the results for interpersonal sensitivity and both attachment anxiety and avoidance (0.31 and 0.27, respectively) are more or less equivalent.

In the study by Gallo et al. [34] all the correlations turned out to be negative. For males, the correlations between adult attachment and the dominance-subscale (-0.28 and -0.35, respectively) as well as between attachment avoidance and the affiliation subscale (-0.34) showed statistical significant results. Only the link between attachment anxiety and affiliation did not reach statistical significance. For women, all results turned out to be significant, but correlation coefficients were slightly smaller (-0.20 and -0.36 for affiliation; -0.23 and -0.25 for dominance).

Lawson [44] displays results both for pre- and post-treatment. At the beginning of therapy, only the correlation between attachment anxiety and intrusive-socially avoidant interpersonal problems became significant and showed a suitable result of 0.26. Data changed however until post-treatment, where positive correlations between attachment anxiety and vindictive-exploitable, as well as between attachment avoidance and intrusive-socially avoidant interpersonal problems (0.30 and 0.31, respectively) are being reported. On the other hand, results show negative correlations between attachment avoidance and both dominance-submission and vindictive-exploitable interpersonal problems (-0.26 each). In all cases, the relatively small sample size of 45 subjects should be considered.

The papers by Lawson and Brossart [45] and Lawson and Malnar [46] both report positive correlations between attachment anxiety and hostile-dominant interpersonal problems (0.31 and 0.23, respectively) and negative correlations between attachment avoidance and hostile-dominant interpersonal problems (-0.47 and -0.40, respectively). The latter study, however, also reports the correlation coefficients for the link between adult attachment and friendly-submissive interpersonal problems (0.30 for anxiety and -0.20 for avoidance). In addition, results verify negative correlations between attachment avoidance and interpersonal problems.

MacBeth et al. [30] detected high correlations between attachment anxiety and both subscales of distancing and affiliating interpersonal problems (0.45 each). An even higher result (0.58) was found between

Authors	Sample size and description [Region in which data was collected]	Instruments used	Degree of correlation for $r_{AA-Anx-r_{IIP-tot}}$	Degree of correlation for $r_{AA-Avo-r_{IIP-tot}}$
Berry et al. [39]	96 patients (32% women) from psychiatric services [Manchester, UK]	IIP, PAM	$r_{AA-Anx-r_{IIP-tot}}=0.58$ n=81 p<0.001	$r_{AA-Avo-r_{IIP-tot}}=0.28$ n=81 p ≤ 0.01
Berry et al. [37]	323 undergraduate and postgraduate students (72% women) at University of Manchester [Manchester, UK]	IIP, PAM	$r_{AA-Anx-r_{IIP-tot}}=0.60$ n=323 p<0.001	$r_{AA-Avo-r_{IIP-tot}}=0.28$ n=323 p<0.001
Haggerty et al. [27]	41 patients (78% women) admitted to a psychotherapy treatment program [n/s]	IIP, ECR	$r_{AA-Anx-r_{IIP-tot}}=0.58$ n=41 p<0.0001 $r_{AA-Anx-r_{IIP-DO}}=0.46$ n=41 p<0.05 $r_{AA-Anx-r_{IIP-VI}}=0.55$ n=41 p<0.001 $r_{AA-Anx-r_{IIP-CO}}=0.51$ n=41 p<0.001 $r_{AA-Anx-r_{IIP-SI}}=0.52$ n=41 p<0.001 $r_{AA-Anx-r_{IIP-NA}}=0.27$ n=41 ns $r_{AA-Anx-r_{IIP-OA}}=0.30$ n=41 p<0.05 $r_{AA-Anx-r_{IIP-SS}}=0.43$ n=41 p<0.01 $r_{AA-Anx-r_{IIP-IN}}=0.26$ n=41 ns	$r_{AA-Avo-r_{IIP-tot}}=0.63$ n=41 p<0.0001 $r_{AA-Avo-r_{IIP-DO}}=0.55$ n=41 p<0.001 $r_{AA-Avo-r_{IIP-VI}}=0.52$ n=41 p<0.001 $r_{AA-Avo-r_{IIP-CO}}=0.72$ n=41 p<0.0001 $r_{AA-Avo-r_{IIP-SI}}=0.51$ n=41 p<0.001 $r_{AA-Avo-r_{IIP-NA}}=0.43$ n=41 p<0.01 $r_{AA-Avo-r_{IIP-OA}}=0.23$ n=41 ns $r_{AA-Avo-r_{IIP-SS}}=0.40$ n=41 p<0.01 $r_{AA-Avo-r_{IIP-IN}}=0.16$ n=41 ns
Kooiman et al. [42]	262 psychotherapy outpatients (70% women) [Rotterdam, the Netherlands]	IIP, ECR	$r_{AA-Anx-r_{IIP-tot}}=0.42$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-DO}}=0.30$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-VI}}=0.33$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-CO}}=0.30$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-SI}}=0.27$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-NA}}=0.29$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-OA}}=0.29$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-SS}}=0.33$ n=262 p<0.001 $r_{AA-Anx-r_{IIP-IN}}=0.32$ n=262 p<0.001	$r_{AA-Avo-r_{IIP-tot}}=0.40$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-DO}}=0.24$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-VI}}=0.29$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-CO}}=0.49$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-SI}}=0.38$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-NA}}=0.30$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-OA}}=0.25$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-SS}}=0.22$ n=262 p<0.001 $r_{AA-Avo-r_{IIP-IN}}=0.04$ n=262 ns
Wei et al. [40]	515 undergraduate students (69% women) [Midwestern USA]	IIP, AAS	$r_{AA-Anx-r_{IIP-tot}}=0.32$ n=515 p<0.0001	$r_{AA-Avo-r_{IIP-tot}}=0.37$ n=515 p<0.0001
Wei et al. [48]	390 undergraduate students (63% women) [Midwestern USA]	IIP, ECR	$r_{AA-Anx-r_{IIP-tot}}=0.41$ n=390 p<0.01	$r_{AA-Avo-r_{IIP-tot}}=0.31$ n=390 p<0.01
Wei et al. [31]	229 undergraduate students (65% women) [Midwestern USA]	IIP, ECR (36 Items and 12 Items-version)	36 Items: $r_{AA-Anx-r_{IIP-tot}}=0.27$ n=229 p<0.001 12 Items: $r_{AA-Anx-r_{IIP-tot}}=0.25$ n=229 p<0.001	36 Items: $r_{AA-Avo-r_{IIP-tot}}=0.25$ n=229 p<0.001 12 Items: $r_{AA-Avo-r_{IIP-tot}}=0.24$ n=229 p<0.001
Wei et al. [33]	229 undergraduate students (65% women) [Midwestern USA]	IIP, ECR (Items for each scale are clustered into 3 parcels)	$r_{AA-Anx-Parcel1-r_{IIP-tot}}=0.22$ n=229 p<0.01 $r_{AA-Anx-Parcel2-r_{IIP-tot}}=0.26$ n=229 p<0.01 $r_{AA-Anx-Parcel3-r_{IIP-tot}}=0.27$ n=229 p<0.01	$r_{AA-Avo-Parcel1-r_{IIP-tot}}=0.26$ n=229 p<0.01 $r_{AA-Avo-Parcel2-r_{IIP-tot}}=0.21$ n=229 p<0.01 $r_{AA-Avo-Parcel3-r_{IIP-tot}}=0.24$ n=229 p<0.01

Abbreviations: AA-Anx: Attachment Anxiety; AA-Avo: Attachment Avoidance; AAS: Adult Attachment Scale; ECR: Experiences in Close Relationships Scale; IIP: Inventory of Interpersonal Problems; IIP-CO: Cold subscale of the Inventory of Interpersonal Problems; IIP-DO: Dominant subscale of the Inventory of Interpersonal Problems; IIP-IN: Intrusive subscale of the Inventory of Interpersonal Problems; IIP-NA: Non-Assertive subscale of the Inventory of Interpersonal Problems; IIP-OA: Overly Accommodating subscale of the Inventory of Interpersonal Problems; IIP-SI: Socially Inhibited subscale of the Inventory of Interpersonal Problems; IIP-SS: Self-Sacrificing subscale of the Inventory of Interpersonal Problems; IIP-tot: Total score of the Inventory of Interpersonal Problems; IIP-VI: Vindictive subscale of the Inventory of Interpersonal Problems; n/s: not specified; ns: not significant; PAM: Psychosis Attachment Measure

**Table 1:** Studies, correlating adult attachment with an interpersonal-total-score or with an interpersonal-total-score and all interpersonal-octants.

attachment avoidance and distancing interpersonal problems. Only the link between attachment avoidance and affiliating interpersonal behavior turned out to be noticeably lower (0.21).

## Discussion

The purpose of this paper was to review the scientific literature of the last 15 years, to examine the relationship between adult attachment and interpersonal problems systematically and in more detail.

Interpersonal distress appeared to be significantly positive-correlated to both attachment anxiety and attachment avoidance. Correlation coefficients for the IIP-total-score and adult attachment ranged from 0.25 to 0.60 for attachment anxiety and from 0.24 to 0.63 for attachment avoidance. All the results turned out to be significant, at least at a level of  $p \leq 0.01$  (Table 1). These results indicate that higher levels of attachment anxiety and attachment avoidance are associated with greater difficulties in interpersonal contact. Data extracted from the selected studies confirm previous research (e.g. [7,25]) and research conducted in other parts of the world (e.g. [28]).

Correlation coefficients between attachment anxiety/avoidance and IIP-octants differed noticeably, both at the lower and upper limits. Some associations tended to be situated at a similar level of inter-correlation (e.g. 0.33–0.43 for attachment anxiety and self-sacrificing interpersonal problems) whereas others ranged from negative to highly positive correlations (e.g. -0.28–0.52 for attachment avoidance and vindictive interpersonal problems). Moreover, results regarding the analysis of interactions between adult attachment and specific interpersonal problems varied regarding statistical significance. Since studies, which report mainly significant results comprised more participants than those, which reported non-significant results more often, it is conceivable that the latter lacked adequate sample sizes and therefore statistical power. However, the research by Haggerty et al. [27] revealed surprisingly significant results, although the study was based on a sample of only 41 subjects.

For attachment anxiety, the most considerable associations could be detected for overly accommodating, self-sacrificing and intrusive interpersonal problems. These associations are consistent with the definitions of both attachment anxiety and the specific regions of the interpersonal circumplex: People who show overly accommodating, self-sacrificing and intrusive behavior can be characterized as not being able to stay out of other people's business, putting other people's needs before their own, and letting other people take advantage of them too much [25]. As people with high levels of attachment anxiety are usually concerned with others and their opinions, needs, and interests [5] the association appears clear.

For attachment avoidance, the correlations for socially inhibited and especially cold interpersonal problems showed substantial results. The latter reached the highest correlation coefficients of all, ranging highly significant from 0.49 to 0.72. Again, the relationship can be deduced from the theory: People with a tendency towards cold interpersonal problems keep others too much at a distance, whereas socially inhibited behavior refers to difficulties in socializing with other people [25]. People with high levels of attachment avoidance tend to show these behaviors, as they prefer to rely on themselves and avoid closeness [5].

The lowest association, however, was detected for attachment avoidance and the intrusive octant. Four out of five studies reported non-significant results, none of them reaching a correlation coefficient of 0.20. Only Pearson et al. [41] report significant results of 0.31. In view

of the fact that people with high levels of attachment avoidance have strong tendencies to rely on themselves and avoid close contact [10], it does appear plausible that these people do not tend to show intrusive behavior. The surprisingly high result in the study of Pearson et al. [41] might be explained because the sample comprised heterogeneous participants regarding the degree of depression.

One aspect has to be kept in mind, regarding the varying correlation coefficients in some fields of interpersonal behavior: Adult attachment is a rather vague description of people's attitude toward other individuals, whereas interpersonal problems are operationalized in a clear and structured way. Even though the assessment of attachment has had a long history and has undergone several steps in its development [5], the concept is yet not as precisely described as the concept of interpersonal problems. The method of assessment we used within this study is a two-dimensional approach. Although the interpersonal circumplex is arranged by two dimensions as well, it consists of eight specific fields that can be measured and analyzed separately. Therefore, we consider this difference as a possible confounding factor that may influence the results regarding correlations between the two concepts.

Results in general suggest a trend towards friendly-submissive interpersonal problems (nonassertive, exploitable, overly-nurturant and intrusive behavior) for people who are high on attachment anxiety and towards hostile-dominant interpersonal problems (dominant, vindictive, cold, and socially inhibited behavior) for individuals with high levels of attachment avoidance. Nevertheless, we have to remark that these results are only tendencies. Thus, some octants of the interpersonal circumplex, like the dominant and vindictive regions, cannot be assigned distinctly. Our findings still go in line with the findings of Bartholomew and Horowitz [7]. Lawson and Malnar [46] also report significant positive correlation between friendly-submissive interpersonal problems and attachment anxiety and significant negative correlation between friendly-submissive behavior and attachment avoidance. However, both this study and the study by Lawson and Brossart [45] report significant positive correlations between hostile-dominant interpersonal problems and attachment anxiety and significant negative correlations between hostile-dominant interpersonal problems and attachment avoidance. Yet the authors of both studies define their clusters in a different way: The hostile-dominant cluster includes the intrusive, but excludes the cold and socially inhibited subscales. Therefore, the friendly submissive cluster only comprises the nonassertive, exploitable and overly-nurturant subscales. It seems possible that the contrasting results are caused by the diverse approaches of clustering categories.

MacBeth et al. [30] formed their clusters in line with our understanding of friendly-submissive and hostile-dominant interpersonal problems, although the authors used a different nomenclature (affiliating vs. distancing interpersonal problems). Yet, results of the study are not completely verifying our findings. Although the correlation between attachment avoidance and problems in the hostile-dominant regions of the interpersonal circumplex (0.58) distinctly exceeds the correlation between attachment avoidance and affiliating interpersonal problems (0.22), the correlations between attachment anxiety and both clusters of interpersonal behavior are of similar extent (0.45 each).

The study by Cummings-Robeau et al. [32] revealed medium correlations between interpersonal sensitivity and adult attachment, suggesting a tendency towards emotionality and reactivity in mood for people with higher levels of attachment anxiety and/or avoidance. Apart from this, the study revealed a strong association between attachment anxiety and problems characterized by actively hostile

Authors	Sample size and description [Region in which data was collected]	Instruments used	Degree of correlation for $r_{AA-Anx}-r_{IIP}$	Degree of correlation for $r_{AA-Avo}-r_{IIP}$
Chen and Mallinckrodt [26]	76 counseling psychology graduate students (76% women) [Midwestern and Eastern USA]	IIP, ECR	$r_{AA-Anx}-r_{IIP-DO}=0.20$ n=76 ns $r_{AA-Anx}-r_{IIP-VI}=-0.32$ n=76 p<0.01 $r_{AA-Anx}-r_{IIP-CO}=0.17$ n=76 ns $r_{AA-Anx}-r_{IIP-SI}=0.12$ n=76 ns $r_{AA-Anx}-r_{IIP-NA}=0.24$ n=76 p<0.05 $r_{AA-Anx}-r_{IIP-OA}=0.34$ n=76 p<0.01 $r_{AA-Anx}-r_{IIP-SS}=0.39$ n=76 p<0.001 $r_{AA-Anx}-r_{IIP-IN}=0.54$ n=76 p<0.001	$r_{AA-Avo}-r_{IIP-DO}=0.24$ n=76 p<0.05 $r_{AA-Avo}-r_{IIP-VI}=0.35$ n=76 p<0.01 $r_{AA-Avo}-r_{IIP-CO}=0.66$ n=76 p<0.001 $r_{AA-Avo}-r_{IIP-SI}=0.20$ n=76 ns $r_{AA-Avo}-r_{IIP-NA}=-0.07$ n=76 ns $r_{AA-Avo}-r_{IIP-OA}=0.05$ n=76 ns $r_{AA-Avo}-r_{IIP-SS}=0.15$ n=76 ns $r_{AA-Avo}-r_{IIP-IN}=-0.07$ n=76 ns
Lawson and Brossart [43]	49 men, mandated to group treatment because of intimate partner violence. [Southwestern USA]	IIP, AAS	$r_{AA-Anx}-r_{IIP-DO}=-0.04$ n=49 ns $r_{AA-Anx}-r_{IIP-VI}=0.15$ n=49 ns $r_{AA-Anx}-r_{IIP-IN}=0.29$ n=49 p<0.05	$r_{AA-Avo}-r_{IIP-DO}=0.08$ n=49 ns $r_{AA-Avo}-r_{IIP-VI}=-0.28$ n=49 p<0.05 $r_{AA-Avo}-r_{IIP-IN}=0.04$ n=49 ns
Pearson et al. [41]	103 participants with current major depression, past major depression or no major depression (69% women) [n/s]	IIP, ECR	$r_{AA-Anx}-r_{IIP-DO}=0.30$ n=93* p<0.01 $r_{AA-Anx}-r_{IIP-VI}=0.36$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-CO}=0.52$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-SI}=0.50$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-NA}=0.39$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-OA}=0.45$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-SS}=0.39$ n=93* p<0.001 $r_{AA-Anx}-r_{IIP-IN}=0.37$ n=93* p<0.001	$r_{AA-Avo}-r_{IIP-DO}=0.32$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-VI}=0.48$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-CO}=0.62$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-SI}=0.45$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-NA}=0.21$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-OA}=0.32$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-SS}=0.21$ n=93* p<0.001 $r_{AA-Avo}-r_{IIP-IN}=0.31$ n=93* p<0.001

\* The authors report a sample size of n=93-101 due to missing data, but do not specify, which pieces of data are missing. Thus, we only refer to the lower limit

Abbreviations: AA-Anx: Attachment Anxiety; AA-Avo: Attachment Avoidance; AAS: Adult Attachment Scale; ECR: Experiences in Close Relationships Scale; IIP: Inventory of Interpersonal Problems; IIP-CO: Cold subscale of the Inventory of Interpersonal Problems; IIP-DO: Dominant subscale of the Inventory of Interpersonal Problems; IIP-IN: Intrusive subscale of the Inventory of Interpersonal Problems; IIP-NA: Non-Assertive subscale of the Inventory of Interpersonal Problems; IIP-OA: Overly Accommodating subscale of the Inventory of Interpersonal Problems; IIP-SI: Socially Inhibited subscale of the Inventory of Interpersonal Problems; IIP-SS: Self-Sacrificing subscale of the Inventory of Interpersonal Problems; IIP-VI: Vindictive subscale of the Inventory of Interpersonal Problems; n/s: not specified; ns: not significant

Table 2: Studies, correlating adult attachment with specific interpersonal-octants.

interactions and intentions toward others. Yet, the association toward attachment avoidance turned out to be distinctly lower (0.17 vs. 0.62). This difference may be explained by the fact that people with high levels of attachment avoidance do not let other people come close [10] and may therefore terminate contact before tensions, previously described, can arise.

In the study by Lawson [44], pretreatment results show a tendency towards intrusive behavior for people with high levels of attachment anxiety, confirming results described above. After 17 weeks of treatment, however, this tendency seems to have vanished, whereas the trend towards intrusive behavior for people with high levels of attachment avoidance seems to have emerged. In addition, therapy also seems to foster tendencies toward vindictive interpersonal problems for people who are high on attachment anxiety and towards exploitable, submissive behavior for people who are high on attachment avoidance. It is important to keep in mind that therapy may have led the patients to a differentiated sense of introspection. Beyond that, the small sample size of only 45 subjects may have influenced the results of the study.

The only research that reports solely negative correlation is the one by Gallo et al. [34]. It is important to remember that the authors used a different instrument for the assessment of interpersonal behavior. Unlike the IIP, where each octant is calculated separately, the Big Five version of the revised Interpersonal Adjective Scales consists only of the underlying dimensions of the interpersonal circumplex. As a result, correlations indicate the degree to which each dimension of adult attachment is related to the axes of affiliation and dominance. Therefore, results of this study suggest that higher scores of attachment anxiety and attachment avoidance are associated with more hostile-submissive interpersonal behavior.

There are some considerations regarding the interpretation of our findings: It is conceivable that the working models that people have adopted over their lifespan directly influence behavior in specific ways [2,47]. In this sense, one might take into consideration that interpersonal behavior is a specific manifestation of adult attachment or vice versa. Although the first case appears to be more convincing, it is, however, not possible to determine the direction of influence

Authors	Sample size and description [Region in which data was collected]	Instruments used	Degree of correlation for $r_{AA-Anx-r_{IIP}}$	Degree of correlation for $r_{AA-Avo-r_{IIP}}$
Cummings-Robbeau et al. [32]	217 undergraduates (74% women) from a private university [Southwestern USA]	Interpersonal Sensitivity and Aggression subscales of the IIP-PD, ECR	$r_{AA-Anx-r_{IIP-Sensitivity}} = 0.31$ n=217 p<0.01 $r_{AA-Anx-r_{IIP-Aggression}} = 0.62$ n=217 p<0.01	$r_{AA-Avo-r_{IIP-Sensitivity}} = 0.27$ n=217 p<0.01 $r_{AA-Avo-r_{IIP-Aggression}} = 0.17$ n=217 p<0.05
Gallo et al. [34]	294 undergraduate psychology students (64% women) from the University of Utah [Utah, USA]	Interpersonally focused dimensions of the IASR-B5, AAS	Women: $r_{AA-Anx-r_{IIP-Affiliation}} = -0.20$ n=187 p<0.01 $r_{AA-Anx-r_{IIP-Dominance}} = -0.23$ n=187 p<0.01 Men: $r_{AA-Anx-r_{IIP-Affiliation}} = -0.12$ n=107 ns $r_{AA-Anx-r_{IIP-Dominance}} = -0.28$ n=107 p<0.01	Women: $r_{AA-Avo-r_{IIP-Affiliation}} = -0.36$ n=187 p<0.01 $r_{AA-Avo-r_{IIP-Dominance}} = -0.25$ n=187 p<0.01 Men: $r_{AA-Avo-r_{IIP-Affiliation}} = -0.34$ n=107 p<0.01 $r_{AA-Avo-r_{IIP-Dominance}} = -0.35$ n=107 p<0.01
Lawson [44]	45 men attending treatment for partner violence [n/s]	IIP, AAS	Pretreatment: $r_{AA-Anx-r_{IIP-dominance-submission}} = 0.01$ n=45 ns $r_{AA-Anx-r_{IIP-vindictive-exploitable}} = 0.04$ n=45 ns $r_{AA-Anx-r_{IIP-intrusive-socially-avoidant}} = 0.26$ n=45 p<0.05 Post-treatment: $r_{AA-Anx-r_{IIP-dominance-submission}} = 0.05$ n=45 ns $r_{AA-Anx-r_{IIP-vindictive-exploitable}} = 0.30$ n=45 p<0.05 $r_{AA-Anx-r_{IIP-intrusive-socially-avoidant}} = 0.01$ n=45 ns	Pretreatment: $r_{AA-Avo-r_{IIP-dominance-submission}} = -0.04$ n=45 ns $r_{AA-Avo-r_{IIP-vindictive-exploitable}} = 0.12$ n=45 ns $r_{AA-Avo-r_{IIP-intrusive-socially-avoidant}} = 0.17$ n=45 ns Post-treatment: $r_{AA-Avo-r_{IIP-dominance-submission}} = -0.26$ n=45 p<0.05 $r_{AA-Avo-r_{IIP-vindictive-exploitable}} = -0.26$ n=45 p<0.05 $r_{AA-Avo-r_{IIP-intrusive-socially-avoidant}} = 0.31$ n=45 p<0.05
Lawson and Brossart [45]	132 men with documented histories of intimate partner violence [Southwestern USA]	Selective sample of items of the IIP, AAS	$r_{AA-Anx-r_{IIP-Hostile-Dominant}} = 0.31$ n=132 p<0.001	$r_{AA-Avo-r_{IIP-Hostile-Dominant}} = -0.47$ n=132 p<0.001
Lawson and Malnar [46]	100 men on probation for intimate partner violence [n/s]	IIP, AAS	$r_{AA-Anx-r_{IIP-Hostile-Dominant}} = 0.23$ n=100 p<0.05 $r_{AA-Anx-r_{IIP-Friendly-Submissive}} = 0.30$ n=100 p<0.01	$r_{AA-Avo-r_{IIP-Hostile-Dominant}} = -0.40$ n=100 p<0.01 $r_{AA-Avo-r_{IIP-Friendly-Submissive}} = -0.20$ n=100 p<0.05
MacBeth et al. [30]	182 undergraduate students and 31 employees (87% women) [n/s]	IIP, RSQ	$r_{AA-Anx-r_{IIP-Distancing}} = 0.45$ n=213 p<0.001 $r_{AA-Anx-r_{IIP-Affiliating}} = 0.45$ n=213 p<0.001	$r_{AA-Avo-r_{IIP-Distancing}} = 0.58$ n=213 p<0.001 $r_{AA-Avo-r_{IIP-Affiliating}} = 0.22$ n=213 p<0.01
Abbreviations: AA-Anx: Attachment Anxiety; AA-Avo: Attachment Avoidance; AAS: Adult Attachment Scale; ECR: Experiences in Close Relationships Scale; IASR-B5: Big Five version of the revised Interpersonal Adjective Scales; IIP(-PD): Inventory of Interpersonal Problems (-Personality Disorder scales); n/s: not specified; ns: not significant; RSQ: Relationship Styles Questionnaire				

Table 3: Studies, correlating adult attachment with clustered categories of interpersonal-octants.

with the approach used within this study. A similar explanation might be that both adult attachment and interpersonal problems refer to a common underlying concept. Results of our study are indicative of both hypotheses.

Our findings may be used within clinical contexts: Trends toward friendly-submissive behavior in interpersonal contact for people with high levels of attachment anxiety and hostile-dominant behavior for people with high levels of attachment avoidance are noticeable across the analyzed studies. Additionally, we were able to show that greater scores of attachment avoidance and attachment anxiety go in line with greater interpersonal distress. These findings are relevant for the understanding and amendment of human behavior in the process of therapy. As it is not

possible to determine the direction of influence that different psychological concepts have on each other, therapy manuals should not solely focus on the treatment of either interpersonal behavior or attachment orientation, but integrate both approaches. Hence, it is possible to treat causes for psychic strain more effectively. Nevertheless, we remark that further studies with a specific focus on the associations between these two concepts are needed, in order to produce data that can be analyzed in more detail.

There is one limitation to our study that refers to the selection of studies: As previously described, we only focused on studies that used a two-dimensional model of attachment and therefore excluded those with a categorical approach. This decision can mainly be explained by two arguments: First, categorical measures of attachment have to face criticism,

$r_{AA-Anx-IIP-DO} = -0.04-0.45$ $r_{AA-Anx-IIP-VI} = 0.15-0.55$ $r_{AA-Anx-IIP-CO} = 0.17-0.52$ $r_{AA-Anx-IIP-SI} = 0.12-0.52$ $r_{AA-Anx-IIP-NA} = 0.24-0.39$ $r_{AA-Anx-IIP-OA} = 0.29-0.45$ $r_{AA-Anx-IIP-SS} = 0.33-0.43$ $r_{AA-Anx-IIP-IN} = 0.26-0.54$	$r_{AA-Avo-IIP-DO} = 0.08-55$ $r_{AA-Avo-IIP-VI} = -0.28-0.52$ $r_{AA-Avo-IIP-CO} = 0.49-0.72$ $r_{AA-Avo-IIP-SI} = 0.20-0.51$ $r_{AA-Avo-IIP-NA} = -0.07-0.43$ $r_{AA-Avo-IIP-OA} = 0.05-0.32$ $r_{AA-Avo-IIP-SS} = 0.15-0.40$ $r_{AA-Avo-IIP-IN} = -0.07-0.31$
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Abbreviations: AA-Anx: Attachment Anxiety; AA-Avo: Attachment Avoidance; IIP-CO: Cold subscale of the Inventory of Interpersonal Problems; IIP-DO: Dominant subscale of the Inventory of Interpersonal Problems; IIP-IN: Intrusive subscale of the Inventory of Interpersonal Problems; IIP-NA: Non-Assertive subscale of the Inventory of Interpersonal Problems; IIP-OA: Overly Accommodating subscale of the Inventory of Interpersonal Problems; IIP-SI: Socially Inhibited subscale of the Inventory of Interpersonal Problems; IIP-SS: Self-Sacrificing subscale of the Inventory of Interpersonal Problems; IIP-VI: Vindictive subscale of the Inventory of Interpersonal Problems

**Table 4:** Ranges of correlation coefficients between adult attachment and interpersonal problems

because differences within each category are being neglected and because they show lower scores of statistical power [12]. Our second consideration referred to the homogeneity of attachment categories: Number and contents of attachment categories may differ, depending on which instruments are being used [5]. This factor complicates a comparison of both textual and statistical connections. In contrast, the two-dimensional model of attachment anxiety and attachment avoidance can be assessed consistently with different questionnaires and thus enables a structured analysis. Another limitation refers to the measurement of associations: In this study, we only analyzed results based on correlation coefficients, while other forms of statistical output had been excluded. Similar to the first limitation, we decided to focus on one approach of statistical evaluation, in order to facilitate a clear and comprehensible review.

## Conclusion

Our analysis illustrates the association between adult attachment and interpersonal distress, showing remarkable correlations between the overall score of interpersonal problems and both attachment anxiety and attachment avoidance. Further examination suggests a trend towards friendly-submissive interpersonal problems for people with high levels of attachment anxiety and towards problems in the hostile-dominant regions of the interpersonal circumplex for people with high levels of attachment avoidance.

Our findings enhance the understanding of human behavior in interpersonal contact and may contribute to an amendment of existing psychotherapy manuals. Yet more studies with a specific focus on the associations between adult attachment and interpersonal problems are needed.

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