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Attachment dimensions and the big five personality traits: Associations and comparative ability to predict relationship quality

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Abstract

Several studies have explored associations between measures of adult attachment style and the Big Five personality traits or factors, but the studies have not included current dimensional measures of attachment style (Brennan, Clark, & Shaver, 1998) or the most complete (NEO-PI-R; Costa & McCrae, 1992) and frequently used (BFI; John, Donahue, & Kentle, 1991) measures of the Big Five. Moreover, most studies after Shaver and Brennan's (1992) have not compared attachment style and Big Five measures as predictors of relationship quality. Here, we summarize past research and report two studies comparing Brennan et al.'s two-dimensional measure of attachment style with the BFI and NEO-PI-R measures of the Big Five. There are consistent and theoretically meaningful associations between the attachment-style and personality trait measures, but attachment-style dimensions still predict relationship quality better than measures of the Big Five. Implications are discussed.

Keywords: Adult attachment; Personality; Big Five; Relationship quality; Traits

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1. Introduction

Adult attachment theory (Fraley & Shaver, 2000; Hazan & Shaver, 1987; Mikulincer & Shaver, 2003) is an extension of Bowlby and Ainsworth's attachment theory (Ainsworth & Bowlby, 1991; Bowlby, 1969), designed to explain individual differences in cognitions, feelings, and behaviors that occur in the context of adolescent and adult close relationships. According to the theory, individual differences in "attachment style" emerge from experiences in previous close relationships, beginning with the attachment relationships between children and their primary caregivers. Since 1987, when the theory was first proposed, scores of studies (reviewed by Mikulincer & Shaver, 2003) have shown that measures of attachment style are associated in theoretically predictable ways with mental processes related to close relationships, behaviors observed in such relationships, and outcomes of such relationships, both subjective (e.g., satisfaction) and objective (e.g., breakup or divorce). In recent years, many studies have included both individual-difference measures and experimental manipulations, and have illuminated some of the mental processes, many of them implicit, that underlie variations in attachment style (Mikulincer & Shaver, 2003).

In their early research, Hazan and Shaver (1987, 1990) used a simple three-category self-report measure of attachment style based on hypothesized parallels between Ainsworth's (Ainsworth, Blehar, Waters, & Wall, 1978) three-category typology of infants' patterns of attachment to their parents. The three patterns were called secure, anxious (or anxious/ambivalent), and avoidant. This measure, which produced both self-ratings of the three category descriptions and selection of the most self-descriptive category, was used by Shaver and Brennan (1992) in an early longitudinal study of predictors of relationship quality and outcomes. In that study, the three category ratings were systematically associated with the then-current measure of the "Big Five" personality traits,[1] the NEO-PI (Costa & McCrae, 1985); but the attachment ratings proved to be better predictors of relationship outcomes over time. The study was important in the history of adult attachment research, because it was interpreted as a license to pursue attachment theory as a conceptual framework that was not easily or completely assimilated to the Big Five framework.

As is well known, the Big Five personality traits—Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness—have emerged as an overarching, empirically based framework capturing major between-person differences in personality (John & Srivastava, 1999). It is therefore considered parsimonious and sensible to make sure, when any new individual-difference variables are introduced, that they are not simply clones of the Big Five variables bearing new names (the so-called "jangle fallacy"; Block, 2000). Shaver and Brennan's (1992) study accomplished this task for the early measure of adult attachment style.

[1] Although Costa and McCrae (1992) used the term "Five Factor Model" to refer to the traits instead of the "Big Five" (which is more associated with the lexical approach to identifying the traits; e.g., Saucier & Goldberg, 1996), we generally use the term Big Five in the present article because the Five Factor Model refers specifically to a formal theory of personality (e.g., McCrae & Costa, 1999), rather than the five constructs per se.

Over the years, many improvements in the measurement of attachment style have been proposed (e.g., Bartholomew & Horowitz, 1991; Carver, 1997; Collins & Read, 1990; Simpson, 1990). Some of the improvement efforts are based on the assumption that dimensional measures are more accurate and valid than categorical measures; some are based on dimensional theoretical conceptions of the attachment-style domain, which supersede a simple categorical conception. The most influential of the dimensional schemes is Bartholomew's (1990), which posits two essentially orthogonal dimensions, model of self (or attachment anxiety) and model of partner (or attachment avoidance) as the factors defining four adult attachment styles.

In 1998, Brennan, Clark, and Shaver reported a large factor-analytic study involving virtually all of the self-report attachment style measures proposed up to that time. They found that a two-dimensional, continuous measure of attachment style (the Experiences in Close Relationships scale, or ECR), compatible with the conceptual scheme proposed by Bartholomew (1990; Bartholomew & Horowitz, 1991), could represent all of the existing measures while adding considerably to measurement precision. Brenan, Clark, and Shaver (1998) called the two dimensions "attachment-related anxiety" and "attachment-related avoidance," the first referring to anxiety about rejection, abandonment, and unlovability, and the second to avoidance of intimacy and dependency. Recent research has supported this two-dimensional representation of adult attachment (e.g., Fraley & Shaver, 2000), and also of infant attachment to parents (Fraley & Spieker, 2003).

In the personality arena, John, Donahue, and Kentle (1991), coming from the lexical tradition of personality research (rather than the questionnaire approach of Costa and McCrae), introduced their Big Five Inventory (BFI), which has become one of the most commonly used measures of the Big Five traits. During the same period, Costa and McCrae (1992) also improved their NEO-PI, creating the NEO-PI-R (for "revised"), which included six "facet" subscales for each of the Big Five traits. In the 1985 version of the NEO-PI, there were no facet scales for two of the traits, agreeableness and conscientiousness; now there are. For each major trait, the corresponding six facet scales correlate substantially with each other and, together, provide a microanalytic interpretation of the overarching trait.

The studies reported here had two main purposes. First, building on a brief review of studies that have examined the relation between attachment style and the Big Five traits (a review summarized in Table 1), we wished to examine how the ECR measure of attachment style relates to the BFI and the NEO-PI-R, two measures that have not been examined previously in association with attachment style. Second, we wanted to update Shaver and Brennan's (1992) conclusions by seeing whether the ECR, a dimensional measure of attachment style, provides unique predictive power with respect to a measure of relationship quality when the Big Five trait scales or the 30 facet scales of the NEO-PI-R are taken into account. Few studies since Shaver and Brennan (1992) have addressed this question, but since most studies find that attachment style measures and scales assessing the Big Five traits are only modestly or moderately related, it seems likely that the ECR attachment scales will still account for unique variance in relationship quality even after the Big Five traits are statistically controlled (but see Kurdek, 2002).

Table 1
A summary of past findings on attachment categories/dimensions and the big five

Attachment category/dimension	N	Attachment measure	Big Five measure	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Secure				– –	++	0	++	+
Shaver and Brennan (1992)	232	B	K	– –	++	0	++	+
Shaver, Billings, Eveleth, and Gilbert (1996)	172	D1	K	– –	+++			
Becker et al. (1997)	1181	H	N	– –	++	0	++	+
Carver (study 3, 1997)	169	I	M	+	++	0	+	0
Carver (study 4, 1997)	256	I	M	+	++	0	+	+
Carver (1997)	256	E	M	– –	++	++	+	++
Shafer (2001)[a]	250	G	O	– –	+++	0	++	++
Wilkinson and Walford (2001)	404	A	P	–	++			
Beitel and Cecero (2003)	187	A	M	– –	++			
Neyer and Voigt (2004)	200	J	Q	– –	++	++	++	+
			Average	– –	++	0	++	+
Anxious/Negative model of self				+++	–	0	–	–
Shaver and Brennan (1992)	232	B	K	++	0	0	–	0
Griffin & Bartholomew (1994)	470	E	K	+++	– –	0	– –	–
Griffin & Bartholomew (1994)	470	F	K	+++	– –	0	– –	– –
Shaver et al. (1996)	172	D1	K	++	– –			
Shaver et al. (1996)	172	D2	K	+++	– –			
Becker et al. (1997)	1181	H	N	++	–	–	0	0
Carver (study 3, 1997)	169	I (merger)	M	++	0	0	0	0
Carver (study 4, 1997)	256	I (merger)	M	++	0	0	–	0
Carver (study 3, 1997)	169	I (worry)	M	+++	0	0	0	0
Carver (study 4, 1997)	256	I (worry)	M	+++	0	0	0	– –
Carver (1997)	256	E	M	++	0	0	0	0
Baeckstroem and Holmes (2001)	515	F	K	+++	– –	0	– –	0
Shafer (2001)[a]	250	G	O	+++	– –	0	0	– –
Gallo, Smith, and Ruiz (2003)	294	C	L	+++	– –	0	–	–
			Average	+++	–	0	–	–

Avoidant/Negative model of others				+	– –	0	– –	0
Shaver and Brennan (1992)	232	B	K	++	– –	0	– –	–
Griffin & Bartholomew (1994)	470	E	K	0	– –	0	– –	0
Griffin & Bartholomew (1994)	470	F	K	++	– –	0	– –	0
Shaver et al. (1996)	172	D1 (fearful)	K	++	– –			
Shaver et al. (1996)	172	D1 (dismissing)	K	0	0			
Shaver et al. (1996)	172	D2	K	+	– –			
Becker et al. (1997)	1181	H	N	+	– –	0	– –	–
Carver (study 3, 1997)	169	I	M	0	– –	0	– –	0
Carver (study 4, 1997)	256	I	M	+	– – –	–	– –	– –
Carver (1997)	256	E (fearful)	M	++	– –	0	– –	0
Carver (1997)	256	E (dismissing)	M	– –	0	0	– –	0
Baeckstroem and Holmes (2001)	515	F	K	++	– – –	– –	– – –	0
Shafer (2001)[a]	250	G	O	++	– –	0	–	0
Gallo et al. (2003)	294	C	L	++	– –	0	– –	– –
			Average	+	– –	0	– –	0

0 refers to a non-significant correlation; – refers to a correlation between 0 and –.20; – – refers to a correlation between –.20 and –.40; – – – refers to a correlation between –.40 and –1.00; similarly, the pluses refer to the parallel ranges of positive correlation coefficients; all correlations marked with minuses or pluses, $p < .05$.

Attachment measures: A = Inventory of Peer Attachment (Armsden and Greenberg, 1987), B = attachment-style rating scale (Hazan & Shaver, 1987), C = adult attachment scale (Collins & Read, 1990) D1 = attachment-style categories ("secure," "preoccupied," and two avoidance-related scales: "dismissing" and "fearful;" Bartholomew & Horowitz, 1991), D2 = attachment-style dimensions ("model of self," "model of others;" Bartholomew & Horowitz, 1991). E = Relationship Qualities (same scales as D1; Griffin & Bartholomew, 1994), F = Relationship Scales Questionnaire (Griffin & Bartholomew, 1994), G = adult attachment measure (Feeney, Noller, & Hanrahan, 1994), H = composite of B, C, D1, and new items (Becker et al., 1997), I = Measure of Attachment Qualities (includes two anxiety-related scales, "ambivalence-merger" and "ambivalence-worry"; Carver, 1997); J = Relationship-specific attachment scales for adults (Asendorpf, Banse, Wilpers, & Neyer, 1997).

Big Five measures: K = NEO Personality Inventory (Costa & McCrae, 1985), L = Big Five version of the revised Interpersonal Adjective Scales (Trapnell and Wiggins, 1990), M = NEO Five Factor Inventory (Costa & McCrae, 1992) N = Big Five Markers (Goldberg, 1992), O = Brief Bipolar Markers (Shafer, 1999), P = Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975); Q = German version of the NEO-Five Factor Inventory (Borkenau and Ostendorf, 1993).

[a] Shafer (2001) did not report the correlations between Attachment scales and the Big Five and they were obtained directly from the author (Shafer, personal communication, August 8th, 2004).

For the purpose of this research, we selected a recent, carefully validated measure of relationship quality, the Perceived Relationship Quality Component Inventory (PRQC; Fletcher, Simpson, & Thomas, 2000). The PRQC is a highly reliable 18-item Likert-format scale that includes three items to measure each of six facets of relationship quality: satisfaction, commitment, intimacy, trust, passion, and love. (The logic and properties of the scale were well described by Fletcher et al., 2000.)

Shaver and Brennan (1992) were the first to report correlations between attachment-style ratings and the Big Five traits. Their findings, which included several significant correlations between the attachment and Big Five measures, indicated some degree of overlap or association between the two sets of constructs. As expected, attachment anxiety (measured by a single Likert-format rating) was positively associated with Big-Five neuroticism, but not to a degree indicating complete redundancy or substitutability ($r = .33$). Attachment anxiety specifically involves feelings and behaviors that arise in the context of close relationships, whereas neuroticism is conceptualized and measured as a broad trait connected with a range of negative emotions in relational and non-relational situations. Attachment anxiety, avoidance, and security were also modestly to moderately correlated with some of the Big Five trait scales, as summarized in Table 1.

Since the publication of Shaver and Brennan's (1992) study, several other researchers have reported correlations between a variety of different attachment measures and different measures of the Big Five (see Table 1). In general, the studies show that attachment security is moderately negatively correlated with neuroticism and moderately positively correlated with extraversion and agreeableness, modestly positively correlated with conscientiousness, and not correlated with openness. Attachment anxiety is moderately to strongly correlated with neuroticism and not correlated with openness. The relation of attachment anxiety to the other three dimensions is less certain; it has been modestly correlated with extraversion, agreeableness, and conscientiousness in some studies, but just as often *not* significantly correlated with these dimensions. Attachment avoidance has been modestly to moderately correlated (negatively) with extraversion and agreeableness, but not correlated with openness. Some studies, but not others, have found avoidance to be positively correlated with neuroticism and negatively with conscientiousness.

In the present study, we expected results similar to the trends between attachment and the Big Five consistently found by past researchers, despite the variety of attachment and Big Five measures used. In particular, we expected Attachment Anxiety, now measured by an 18-item scale with high internal consistency and strong test–retest reliability, to correlate with Neuroticism. We expected Attachment Avoidance, also measured by a reliable 18-item scale, to correlate negatively with Agreeableness and Extraversion. We expected neither Attachment Anxiety nor Avoidance to be correlated with Openness. We made no predictions about how Attachment Anxiety would be related to Extraversion, Agreeableness, or Conscientiousness, or about how Attachment Avoidance would be related to Neuroticism and Conscientiousness. Past studies have measured and conceptualized attachment in a number of ways (categorically, in terms of rated prototypes, and dimensionally), which may explain the inconsistent results.

2. Study 1: Attachment and the BFI

In Study 1, we examined how the two ECR attachment dimensions and the Big Five traits, as assessed with the BFI, were related in a large sample of undergraduates. We examined these relations in detail using three different kinds of analyses: correlations between attachment dimensions and the Big Five, regression equations predicting Attachment Anxiety and Avoidance from the Big Five, and correlations between the attachment dimensions and each BFI item, to gain a more detailed understanding of associations between attachment dimensions and detailed aspects of the personality traits.

2.1. Participants

Participants were 8318 students (5417 women, 2901 men) at a large West Coast research university, who were asked to complete a number of personality measures on the Internet in exchange for extra credit points in an introductory psychology class. The participants were ethnically diverse: 40% White/Caucasian, 38% Asian/Pacific Islander/Filipino, 6% Hispanic/Chicano/Latino, 1% Black/African American, 14% "other" or multicultural (identifying with more than one ethnic group). Less than 1% of the participants declined to answer the ethnicity question. About 43% of the participants were single (i.e., not currently dating, in a committed relationship, or married). Participants ranged in age from 18 to 24 years ($Mdn = 19$).[2]

2.2. Measures

2.2.1. Big Five

The 44-item Big Five Inventory (BFI; John et al., 1991; John & Srivastava, 1999) was used to measure the five broad personality traits. Coefficient α reliabilities for the five trait scales in the present study were .86 for Neuroticism, .76 for Extraversion, .80 for Openness, .81 for Agreeableness, and .78 for Conscientiousness.

2.2.2. Adult attachment

The 36-item Experiences in Close Relationships scale (ECR; Brennan et al., 1998) was used to assess the two major dimensions of adult attachment style, Attachment Anxiety (sample item: "I worry a fair amount about losing my partner") and Attachment Avoidance (sample item: "I don't feel comfortable opening up to romantic partners"). Participants were asked to complete the measures in terms of how they generally experience relationships, rather than their specific experience in a current relationship. In the present study the coefficient αs were .92 for Attachment Anxiety and .93 for Avoidance. The two scales were modestly correlated ($r = .22$).

[2] In this study and in Study 2, the number of participants differs slightly across analyses and variables because of missing data. The sample size involved in a specific analysis is always noted in the relevant table.

3. Results

3.1. Zero-order correlations

3.1.1. Demographic variables

Zero-order correlations among all the variables, including gender, age, and relationship status, are shown in Table 2. Most of the correlations, although statistically significant because of the large sample size, were small. It is perhaps worth noting that people who were not involved in a relationship at the time of the study were more avoidant than those who were involved in a relationship ($r = -.35$), and that men were less neurotic than women ($r = -.24$).

3.1.2. Attachment dimensions and the Big Five

Table 2 displays zero-order correlations between Attachment Anxiety and Avoidance and the Big Five. Each of the Big Five traits is significantly correlated with each attachment dimension, but the magnitude of the correlations varies, with some constructs being moderately related whereas others are only modestly related. As expected, Attachment Anxiety is most strongly correlated with Neuroticism ($r = .42$), whereas Avoidance is most strongly correlated with Agreeableness ($r = -.22$). Both attachment dimensions are correlated with Extraversion, Agreeableness, and Conscientiousness at about the same magnitude (rs range from $-.15$ to $-.23$), and both are only modestly correlated with Openness (rs $= -.07$ and $-.09$, respectively).

3.1.3. Attachment dimensions and BFI Items

We used a large sample of participants because we wanted to have sufficient statistical power to compute item-level correlations, to understand what aspects of

Table 2
Zero-order correlations among the variables in study 1

	1	2	3	4	5	6	7	8	9	10
Demographic Variables										
1. Gender										
2. Age	.06**									
3. Relationship Status	−.07**	.12**								
Attachment										
4. Anxiety	−.01	−.08**	−.13**							
5. Avoidance	.00	−.05**	−.35**	.22**						
Big Five (BFI)										
6. Neuroticism	−.24**	−.02*	−.02*	.42**	.14**					
7. Extraversion	−.08**	−.03*	.16**	−.15**	−.21**	−.26**				
8. Openness	.04**	.04**	.02	−.07**	−.09**	−.10**	.26**			
9. Agreeableness	−.11**	.01	.00	−.19**	−.22**	−.28**	.13**	.13**		
10. Conscientiousness	−.14**	.11**	.09**	−.23**	−.20**	−.18**	.18**	.10**	.30**	

Note. $N = 8136$–8318.

* $p < .05$

** $p < .01$.

each Big Five scale were most strongly correlated with each of the attachment dimensions. Although the BFI was not designed to measure facets explicitly, it does an adequate job of covering each of the Big Five trait domains (John & Srivastava, 1999).

Because we had an abundance of statistical power, most of the BFI items were significantly correlated with the attachment dimensions (only six out of the 88 correlations were not significant at the $p < .01$ level). One way to present the items is to examine the highest 10% of items correlating with each attachment dimension. This procedure yielded five items that were most highly correlated with Attachment Anxiety, of which all five were Neuroticism items (*r*s ranged from .25 to .37), all pertaining to the susceptibility and frequency of negative affect (being depressed, likely to be moody and nervous, excessively worrying, and not being emotionally stable). The five items that correlated most highly with Avoidance included three Agreeableness items ("Is generally trusting" and "Likes to cooperate with others" (which correlated negatively with Avoidance) and "Can be cold and aloof," which correlated positively), one Neuroticism item ("Is depressed, blue"), and one Extraversion item ("Is outgoing, sociable," which correlated negatively with Avoidance; all *r*s ranged from .16 to .21 in absolute value).

Another way to summarize the correlations is to designate $r = .20$ as a cut-off point. The Attachment Anxiety dimension correlated at or above .20 with seven of the eight Neuroticism items (*r*s ranging from .22 to .37), suggesting some conceptual overlap between the constructs. The only other item correlating at or above .20 with Attachment Anxiety was the low Conscientiousness item "Is easily distracted" ($r = .20$). The Avoidance dimension correlated with only two items at or above .20, the Neuroticism item "Is depressed, blue" and the low Agreeableness item "Can be cold and aloof."[3]

Therefore, Attachment Anxiety is related straightforwardly to several aspects of Neuroticism and to self-discipline aspects of Conscientiousness, whereas Avoidance is related to the low sociability and warmth of Introversion (low Extraversion), the distrustfulness and uncooperativeness of low Agreeableness, and the depression aspect of Neuroticism. These findings generally parallel the association between the facets of the NEO-PI and attachment styles found by Shaver and Brennan (1992).

3.2. Regression analyses predicting attachment dimensions from the Big Five traits

We also conducted regression analyses in which each of the attachment dimensions was predicted from the BFI scales, controlling for gender, age, and relationship status, which were related to both the attachment dimensions and the Big

[3] We also performed a regression analysis to determine how well the BFI items predict each attachment dimension. We found that regressing the Anxiety and Avoidance dimensions (in two regression equations) on all 44 BFI items yielded R^2 of .25 and .12, which means that the items account for 25 and 12% of the variance in the two constructs, respectively. Thus, although there is some overlap or association between the measures and constructs, the BFI should not be used as a proxy measure of attachment.

Table 3
Multiple regression of the attachment dimensions on the big five

	Attachment Anxiety			Attachment Avoidance		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1: Demographic Variables		.02**	.02**		.12**	.12**
Gender	−.01			−.02		
Age	−.07**			−.01		
Relationship Status	−.12**			−.35**		
Step 2: Big Five (BFI)		.22**	.20**		.20**	.08**
Gender	.07**			−.05**		
Age	−.05**			.00		
Relationship Status	−.10			−.33**		
Neuroticism	.40**			.01		
Extraversion	.00			−.11**		
Openness	−.01			−.02		
Agreeableness	−.04**			−.18**		
Conscientiousness	−.12**			−.10**		

Note. $N = 8133$–8135; β = standardized β coefficients; $R^2 = R$ square; ΔR^2 = change in R square. Attachment dimensions were measured using the ECR; the Big Five were measured using the BFI.
** $p < .01$.

Five scales. (See the standardized β coefficients in Table 3.) In Step 1, we found that age was a significant predictor of Attachment Anxiety and relationship status was a significant predictor of both attachment dimensions: older people are likely to be less anxious and those currently in close relationships tended to be more securely attached. In Step 2, regressing Attachment Anxiety on the Big Five, we found that Neuroticism was the strongest Big Five predictor ($\beta = .40$; $p < .01$), followed by Conscientiousness ($\beta = -.12$; $p < .01$). Regressing Avoidance on the Big Five, we found that Agreeableness was the strongest Big Five predictor ($\beta = -.18$; $p < .01$), followed by Extraversion and Conscientiousness (βs = −.11 and −.10, respectively; ps < .01). Notably, relationship status was a stronger predictor of Avoidance than any of the Big Five. The Big Five accounted for an additional 20% of the variance in Attachment Anxiety after the demographic variables were entered, and for an additional 8% of the variance in Avoidance, demonstrating that the two sets of constructs are related but are not simply redundant.

Overall, the results are largely in line with what we expected based on previous research. Attachment Anxiety was most strongly related to Neuroticism, Avoidance was related to both Agreeableness and Extraversion, and both attachment dimensions were relatively uncorrelated with Openness. There were moderate relations between both attachment dimensions and Conscientiousness, which we had not predicted, a finding to which we will return in our combined discussion of Studies 1 and 2. We turn now to Study 2, in which we examined associations between the attachment dimensions and Costa and McCrae's (1992) NEO-PI-R.

4. Study 2: Attachment and the NEO-PI-R

In Study 2, we used a more extensive measure of the Big Five traits, the NEO-PI-R. We were especially interested in the possibility that the facet scales would correlate with the attachment dimensions in ways that would help us understand associations between the two kinds of measures (and constructs). Based on Shaver and Brennan's (1992) findings and our item-level analyses using the BFI in Study 1, we expected Attachment Anxiety to be positively related to all facets of Neuroticism, but especially to the anxiety and depression facets. Attachment Avoidance, on the other hand, was expected to be related negatively to the trust facet of Agreeableness and the warmth and gregariousness facets of Extraversion, and related positively to the depression facet of Neuroticism.

Shaver and Brennan (1992) found that despite associations between attachment styles and the Big Five, attachment-style ratings out-performed the Big Five trait and facet scales in predicting relationship quality and outcomes. This was especially noteworthy given the presumed low reliability of the single-item measures of the three attachment styles. In the present study, we wanted to see if the two attachment *dimensions*, as a set, would once again predict relationship quality, measured by the PRQC, even after the Big Five traits or all of their facets were included as predictors in regression analyses. If so, this would suggest once again that attachment styles are not simply redundant with, or reducible to, the Big Five traits.

4.1. Participants

Participants were 285 (227 women, 58 men) students at a large West Coast research university, who completed a number of personality measures in exchange for extra-credit points. The participants were ethnically diverse: 41% White/Caucasian, 33% Asian/Pacific Islander/Filipino, 8% Hispanic/Chicano/Latino, 4% Black/African American, 13% "other" or multicultural (identifying with more than one ethnic group); 1% did not answer the ethnicity question. Participants ranged in age from 17 to 24 years ($Mdn = 20$) and completed relationship measures with reference to either their current romantic relationship ($N = 195$) or their most recent relationship if they were currently unpartnered ($N = 90$).

4.2. Measures

4.2.1. Big Five

The 240-item NEO-PI-R was used to measure the Big Five traits. The NEO-PI-R assesses 30 facets, six for each Big Five factors (Costa & McCrae, 1992). (The facets are listed in Table 5, along with results related to them.) The internal consistency reliability coefficients for the facets in the present study ranged from .47 to .82 ($M = .69$, $Mdn = .73$). The αs for the Big Five factor scales ranged from .85 to .91.

4.2.2. Adult attachment

The ECR (Brennan et al., 1998) was used in the same manner as in Study 1. In Study 2, the αs for these two scales were .89 and .92. The two scales were again correlated only modestly ($r = .15$).

4.2.3. Relationship quality

The 18-item Perceived Relationship Quality Components Inventory (PRQC; Fletcher et al., 2000) was used to assess six intercorrelated domains of relationship quality: satisfaction, commitment, intimacy, trust, passion, and love. In the present study, the six subscales were highly intercorrelated (with *r*s ranging from .38 to .79, *Mdn* $r = .58$), so we averaged all of the items to form a single global relationship quality index ($\alpha = .95$).

4.3. Procedure

The questionnaire was posted on the Internet and could be completed either in a computer laboratory room or at home. (Participants were randomly assigned to these conditions so we could determine whether location of administration mattered. It did not, so data from the two conditions were combined.) Participants completed the NEO-PI-R, then the ECR, then several other personality measures not included in the analyses reported here, and finally the PRQC. These measures took a little over an hour to complete.

5. Results

5.1. Zero-order correlations

5.1.1. Demographic variables

Zero-order correlations among all the variables, including gender, age, and relationship status, are shown in Table 4. Results were similar to those reported in Study 1. Age was not related substantially to any of the other variables in the study, so we eliminated it from subsequent analyses. Ethnicity also played no substantial role in the analyses, so we eliminated it from subsequent analyses.[4] People who were currently involved in a relationship (compared with those who were not) tended to be lower in Attachment Anxiety and Attachment Avoidance and rated their relationship quality higher. (Recall that participants who were not currently in a relationship reported on the quality of a relationship that had ended.)

[4] Separate analyses, not shown in the table, were conducted to compare the two largest ethnic groups, Caucasian ($N = 94$) and Asian ($N = 116$). Asians tended to be higher in Neuroticism and Attachment Anxiety, and lower in Extraversion and Conscientiousness. The ethnic groups did not differ significantly on either of the relationship outcome variables. Because they scored differently on some of the variables under study, we conducted a number of separate analyses, including only participants who identified themselves as Asian or Caucasian. The binary ethnicity variable was not a significant predictor of any of the dependent variables in any of the analyses. We also examined ethnicity as a moderator in analyses predicting relationship quality from attachment and Big Five variables and the attachment dimensions from the Big Five. The ethnicity interactions were never significant.

Table 4
Zero order correlations among the principal variables in study 2

	1	2	3	4	5	6	7	8	9	10	11
Demographic Variables											
1. Gender											
2. Age	.05										
Attachment											
3. Anxiety	−.06	−.05									
4. Avoidance	.05	−.01	.15*								
Big Five (NEO-PI-R)											
5. Neuroticism	−.31**	−.04	.52**	.17**							
6. Extraversion	−.05	−.09	−.14*	−.26**	.38**						
7. Openness	−.12*	−.13*	−.04	−.16**	−.10	.37**					
8. Agreeableness	−.08	.01	−.07	−.07	−.14*	.13*	.09				
9. Conscientiousness	−.08	−.04	−.34**	−.23**	.37**	.15*	−.05	−.06			
Relationship Variables											
10. Relationship Status	.01	−.08	.14*	.26**	.01	−.02	.04	.05	−.08		
11. Relationship Quality	−.22**	.08	−.22**	−.51**	−.08	.16**	.10	.04	.21**	.29**	

Note. $N = 285$ (some correlations are based on a slightly smaller sample because of missing data).
* $p < .05$.
** $p < .01$.

5.1.2. Attachment dimensions and the Big Five factors

Table 4 displays correlations among the attachment dimensions and the Big Five scales. The largest correlation was between Neuroticism and Attachment Anxiety ($r = .52$); Neuroticism was also modestly correlated with Avoidance ($r = .17$). Extraversion was correlated moderately negatively with Avoidance ($r = -.26$) and slightly negatively with Attachment Anxiety ($r = -.14$). Openness was modestly correlated with Avoidance ($r = -.16$) but not significantly with Attachment Anxiety. Surprisingly, neither Attachment Anxiety nor Avoidance was correlated significantly with Agreeableness. Both Attachment Anxiety and Avoidance correlated moderately negatively with Conscientiousness ($r = -.34$, $-.23$, respectively).

5.1.3. Attachment dimensions and the Big Five facets

Table 5 displays correlations between the attachment dimensions and the Big Five facet scales. Because of the large number of correlations considered, we will discuss only those significant at the $p < .01$ level, although correlations significant at the $p < .05$ level are also noted in the table. All six facets of Neuroticism were positively correlated with Attachment Anxiety, with *r*s ranging from .24 to .49 (the *r* for depression was the largest). Three of the six Neuroticism facets—depression, self-consciousness, and vulnerability—were positively correlated with Avoidance (*r*s ranged from .17 to .26). One facet of Extraversion, assertiveness, was negatively correlated with Attachment Anxiety ($r = -.22$). Avoidance was also negatively correlated with the assertiveness facet of Extraversion, as well as the warmth, gregariousness, and positive emotions facets (*r*s ranged from −.22 to

Table 5
Zero order correlations between the big five facets and the principal variables

	Gender	Age	Attachment Anxiety	Attachment Avoidance	Relationship Status	Relationship Quality
Neuroticism						
Anxiety (N1)	−.34**	.03	.39**	.01	−.10	.14*
Angry Hostility (N2)	−.14*	−.03	.31**	.09	.03	−.06
Depression (N3)	−.20**	−.05	.49**	.26**	.10	−.17**
Self-consciousness (N4)	−.19**	−.06	.37**	.17**	.05	−.12*
Impulsiveness (N5)	−.16**	−.02	.24**	−.03	−.03	−.03
Vulnerability (N6)	−.31**	−.04	.39**	.17**	−.01	−.10
Extraversion						
Warmth (E1)	−.09	−.12*	−.09	−.26**	−.07	.18**
Gregariousness (E2)	−.01	−.04	−.04	−.22**	−.02	.08
Assertiveness (E3)	.04	−.03	−.22**	−.22**	−.03	.17**
Activity (E4)	−.14*	−.05	−.09	−.14*	−.04	.09
Excitement-seeking (E5)	.05	−.09	.01	.01	.12*	−.01
Positive emotions (E6)	−.08	−.08	−.14*	−.23**	−.04	.15*
Openness						
Fantasy (O1)	−.05	−.20**	.08	−.08	.13	.01
Aesthetics (O2)	−.16**	−.06	−.01	−.09	.04	.09
Feelings (O3)	−.23**	−.15*	.10	−.25**	−.04	.17**
Actions (O4)	−.08	.00	−.13*	−.01	.04	−.02
Ideas (O5)	.20**	−.06	−.11	−.07	.00	.00
Values (O6)	−.20**	.00	−.07	−.09	−.07	.13*
Agreeableness						
Trust (A1)	.02	−.01	−.13*	−.26**	.03	.17**
Straightforwardness (A2)	−.16**	.08	−.12*	−.08	−.02	.06
Altruism (A3)	−.02	−.09	−.09	−.18**	−.03	.18**
Compliance (A4)	−.06	−.01	−.05	.05	.09	−.13*
Modesty (A5)	−.07	.01	.04	.16**	−.07	−.08
Tender-mindedness (A6)	.00	.01	.11	.04	.13*	−.01
Conscientiousness						
Competence (C1)	.04	−.03	−.29**	−.23**	−.04	.15*
Order (C2)	−.15*	.02	−.13*	−.17**	−.05	.10
Dutifulness (C3)	−.02	−.08	−.26**	−.12*	.03	.14*
Achievement-striving (C4)	−.06	−.08	−.21**	−.16**	−.06	.18**
Self-discipline (C5)	−.04	−.01	−.35**	−.21**	−.08	.18**
Deliberation (C6)	−.08	.02	−.24**	−.12	−.05	.14*

Note. $N = 285$; The letter-digit pairs in parentheses following each facet name are used to identify the facets and their factor placement in subsequent tables.

* $p < .05$.

** $p < .01$.

−.26). None of the Openness facets correlated with Attachment Anxiety at the $p < .01$ level. However, openness to feelings correlated negatively with Avoidance. None of the Agreeableness facets correlated with Attachment Anxiety at the $p < .01$ level. However, Avoidance correlated negatively with trust and altruism, and positively with modesty. Attachment Anxiety and Avoidance correlated negatively with most of the Conscientiousness facets. Attachment Anxiety correlated negatively with competence, dutifulness,

achievement striving, self-discipline, and deliberation; Avoidance correlated negatively with competence, order, achievement striving, and self-discipline.[5]

5.2. Predicting attachment dimensions from the Big Five scales

Given the extensive and sometimes sizable correlations between the Big Five facets and attachment dimensions, we regressed each of the two attachment dimensions on the Big Five factors in one set of analyses and on the 30 Big Five facet scales in another.[6] In each set of analyses, we wished to determine how well each attachment dimension could be predicted, or accounted for, by the Big Five scales when gender and relationship status were controlled[7] (see Table 6).

5.2.1. Attachment Anxiety

For Attachment Anxiety, the control variables in Step 1 accounted for a small but significant amount of variance ($R^2 = .02$; $p < .05$), with relationship status emerging as significant. People who were not in a romantic relationship scored higher on Attachment Anxiety. When the Big Five factor scales were entered in Step 2, there was a significant increase in variance accounted for ($\Delta R^2 = .30$, $p < .01$), and relationship status remained significant. Neuroticism ($\beta = .53$; $p < .01$) and Conscientiousness ($\beta = -.15$; $p < .01$) also emerged as significant predictors. When the Big Five facets were entered (in Step 2 of a separate analysis; see Table 7), there was a significant increase in predictive power ($\Delta R^2 = .38$; $p < .01$). The Big Five facets of depression (N) and gregariousness (E) were positive predictors of Attachment Anxiety, whereas deliberation (C) was a

[5] We conducted a principal components analysis (PCA) with the attachment dimensions and the 30 facets, in order to determine what factor(s) the attachment dimensions would load most highly on. Given that the attachment dimensions can be conceptualized as middle-level-traits, presumably at the same level as the NEO-PI-R facets, we wanted to see under what broad factor they might be hierarchically ordered. In the same manner that Costa and McCrae factor analyzed the NEO-PI-R, we conducted a PCA using Varimax rotation, which converged in six iterations. The scree plot clearly indicated that there were five factors, which accounted for 55% of the variance. Attachment anxiety loaded positively on the first factor (clearly a Neuroticism factor), along with Neuroticism facets of depression, anxiety, self-consciousness, and vulnerability. Attachment avoidance loaded negatively on the second factor (clearly an Extraversion factor) along with all six of the Extraversion facets, and impulsivity (N) and openness to feelings (O), all of which were positively loaded on the factor. The third factor was Conscientiousness, with its six facets. The fourth factor was Agreeableness, with its six facets, along with angry hostility (N), which loaded negatively. Finally, the fifth factor was Openness, with all six of its facets except openness to feelings.

[6] Since the facets of each of the Big Five factors tend to be moderately to strongly intercorrelated, we wanted to make sure multicollinearity was not a problem in our regression analyses. The tolerance statistics for the reported findings indicated that multicollinearity was not a problem. However, we also conducted parallel stepwise (i.e., instead of hierarchical) regressions for each regression equation reported in the paper. The results were highly similar to the ones reported here.

[7] We also ran all regression analyses controlling for socially desirable responding using the Balanced Inventory of Desirable Responding, which assesses self-deception and impression management (Paulhus, 1991). There was no substantive difference in the findings. Several researchers have recently argued that it is not necessary to control for response bias in studies in which participants are likely to respond honestly (Paulhus, 2002; Piedmont, McCrae, Riemann, & Angleitner, 2000), as they usually are in confidential Internet studies like ours (Gosling, Vazire, Srivastava, & John, 2004).

Table 6
Multiple regression of the attachment dimensions on the big five factors

	Attachment Anxiety			Attachment Avoidance		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1		.02*	.02*		.07**	.07**
Gender	−.06			.05		
Relationship Status	.14*			.25**		
Step 2		.32**	.30**		.17**	.11**
Gender	.10			.02		
Relationship Status	.13**			.25**		
Big Five						
Neuroticism	.53**			.02		
Extraversion	.10			−.17**		
Openness	−.03			−.11		
Agreeableness	−.01			−.06		
Conscientiousness	−.15**			−.19**		

Note. $N = 285$; β = standardized β coefficients; $R^2 = R$ square; ΔR^2 = change in R square.
* $p < .05$.
** $p < .01$.

negative predictor. These analyses again indicate that Attachment Anxiety is associated with various personality variables but not completely accounted for by them.

5.2.2. Avoidance

For Avoidance, the control variables in Step 1 accounted for a small but significant amount of variance ($R^2 = .07$; $p < .01$), with relationship status emerging as significant. When the Big Five factor scales were entered in Step 2, there was a significant increase in predictive power ($\Delta R^2 = .11$; $p < .01$), and relationship status remained significant. Extraversion ($\beta = -.17$; $p < .01$) and Conscientiousness ($\beta = -.19$; $p < .01$) also emerged as significant predictors. When the Big Five facets were entered (in Step 2 of a separate analysis; see Table 7), there was a significant increase in variance accounted for ($\Delta R^2 = .21$; $p < .05$). Relationship status remained in the equation as a significant predictor. The Big Five facet of modesty (A) was a positive predictor of Avoidance ($\beta = .15$; $p < .05$), whereas trust (A) was a negative predictor ($\beta = -.24$; $p < .01$). As with Attachment Anxiety, although to a lesser extent, part of the variance in Attachment Avoidance was accounted for by personality variables, but not most of it.

5.3. Correlations of relationship quality with the attachment dimensions and the Big Five scales

We next examined how the attachment dimensions and the Big Five scales related to relationship quality.[8] We began with zero-order correlations (see Tables 4 and 5).

[8] We conducted analyses of respect for partner (Frei & Shaver, 2002) parallel to those for relationship quality. Because the two quality constructs were highly correlated ($r = .65$), and the findings for respect were very similar to the findings for relationship quality, we chose not to discuss respect.

Table 7
Multiple regression of the two attachment dimensions on the big five facets

	Attachment Anxiety			Attachment Avoidance		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1		.02*	.02*		.07**	.07*
Gender	−.05			.04		
Relationship Status	.14*			.27**		
Step 2		.40**	.38**		.29**	.21**
Gender	.06			−.02		
Relationship Status	.11*			.23**		
Big Five facets						
Anxiety (N1)	.11			−.10		
Angry Hostility (N2)	.13			−.07		
Depression (N3)	.29**			.13		
Self-consciousness (N4)	.05			−.06		
Impulsiveness (N5)	.01			−.09		
Vulnerability (N6)	.04			.11		
Warmth (E1)	.01			−.04		
Gregariousness (E2)	.21**			−.09		
Assertiveness (E3)	−.09			−.10		
Activity (E4)	−.06			.05		
Excitement-seeking (E5)	−.10			.10		
Positive emotions (E6)	−.03			.05		
Fantasy (O1)	−.09			−.09		
Aesthetics (O2)	.03			−.13		
Feelings (O3)	.14			−.02		
Actions (O4)	−.07			.01		
Ideas (O5)	.09			.10		
Values (O6)	−.07			−.02		
Trust (A1)	−.03			−.24**		
Straightforwardness (A2)	−.04			−.02		
Altruism (A3)	.01			−.09		
Compliance (A4)	.05			.07		
Modesty (A5)	−.08			.15*		
Tender-mindedness (A6)	.07			.03		
Competence (C1)	.00			.03		
Order (C2)	−.01			−.04		
Dutifulness (C3)	−.10			−.01		
Achievement-striving (C4)	.03			−.02		
Self-discipline (C5)	−.04			−.06		
Deliberation (C6)	−.18*			−.09		

$N = 279$; β = standardized β coefficients; $R^2 = R$ square; ΔR^2 = change in R square. The letters in the letter-digit pairs in parentheses after each facet match the first initial of the associated Big Five Factor name.
* $p < .05$.
** $p < .01$.

As in the previous section, we report only the facet correlations that were significant at the $p < .01$ level because the facets are so numerous. Both Attachment Anxiety and Avoidance were negatively correlated with relationship quality (the rs were −.22 and −.51). Relationship quality was also positively correlated with both Extraversion

and Conscientiousness, and with the Big Five facets of warmth and assertiveness (E), feelings (O), trust and altruism (A), and achievement-striving and self-discipline (C). Furthermore, relationship quality was negatively related to depression (N). None of these correlations was larger in absolute value than .21.

5.4. Relative abilities of the attachment dimensions and the Big Five scales to predict relationship quality

To determine how the attachment dimensions and facets of the Big Five compare in predicting relationship quality, we performed four hierarchical regression analyses. (See Tables 8 and 9.) In all of these analyses, we controlled for gender because women tended to rate the quality of their relationships higher than men did. We also controlled for relationship status because, not surprisingly, people who were currently involved in a relationship tended to rate the quality of their relationship higher.[9]

First, we performed two hierarchical analyses regressing relationship quality on the Big Five factors and the attachment dimensions. For the first analysis, we entered the control variables in the first step, the Big Five factors second, and the attachment dimensions third to determine whether the attachment dimensions added anything beyond the Big Five. For the second analysis, we entered the control variables first, the attachment dimensions second, and the Big Five factors third to determine whether the Big Five added anything beyond the attachment dimensions. We found that both Attachment Anxiety ($\beta = -.15$; $p < .05$) and Avoidance ($\beta = -.43$; $p < .01$) made significant unique contributions to the analysis whether entered in Step 2 or in Step 3, but this was not true for any of the Big Five scales. Gender and relationship status were significant negative predictors in all three steps of the analyses. None of the Big Five factors individually made unique, significant contributions to accounting for variance, when they were entered in Step 3 of the analyses.

5.5. Relative abilities of the attachment dimensions and the Big Five facets to predict relationship quality

Given that the Big Five factor scales were unable to predict relationship quality at the factor level above and beyond the attachment dimensions, we conducted analyses using the facet scales as predictors. Analyses were conducted in the same way as with the Big Five factors. Unlike in the regression analyses with the Big Five scales, where the scales were not very highly correlated with each other, our main intent here was not to examine the specific significant facet-level predictors of relationship satisfaction. Most facets of any single Big Five factor are highly correlated with each other;

[9] We conducted a regression analysis to test for interaction effects between relationship status and the attachment and Big Five variables in predicting relationship quality. We entered gender and relationship status in step 1, the Big Five in step 2, the attachment dimensions in step 3, and finally the seven interaction variables in step 4. We found that gender, relationship status, and attachment anxiety were still significant predictors of relationship quality in step 4; attachment avoidance dropped out as a significant predictor; and none of the interaction variables was a significant predictor.

Table 8
Multiple regression of relationship quality on the big five factors and attachment dimensions

	Relationship Quality		
	β	R^2	ΔR^2
Step 1		.13**	.13**
Gender	−.21**		
Relationship Status	−.29**		
Step 2: Attachment Dimensions		.34**	.21**
Gender	−.20**		
Relationship Status	−.16**		
Anxiety	−.15**		
Avoidance	−.43**		
Step 2: Big Five Factors		.18**	.05**
Gender	−.21**		
Relationship Status	−.28**		
Neuroticism	−.05		
Extraversion	.08		
Openness	.05		
Agreeableness	.03		
Conscientiousness	.14*		
Step 3		.34**	.00/.16**,+
Gender	−.19**		
Relationship Status	−.16**		
Attachment Anxiety	−.15*		
Attachment Avoidance	−.42**		
Neuroticism	.03		
Extraversion	.02		
Openness	.00		
Agreeableness	.00		
Conscientiousness	.04		

Note. $N = 285$. β = standardized β coefficients; $R^2 = R$ square; ΔR^2 = change in R square. Attachment dimensions were measured using the ECR; the Big Five were measured using the NEO-PI-R. +The first value represents R^2 change when the Big Five were entered in Step 3; the second value represents R^2 change when the attachment dimensions were entered in Step 3.

* $p < .05$.

** $p < .01$.

therefore, any significant predictor has to make a unique contribution after all the other facets have been partialed out. We therefore care only about comparing the attachment dimensions and the Big Five facets as groups of potential predictors of relationship quality.

In the analyses using the 30 facet scales, all steps added significantly to the variance accounted for, regardless of the order of entry of the attachment and facet variables. As in the previous analyses, gender and relationship status were significant negative predictors in all three steps. The attachment dimensions were significant predictors regardless of their order of entry into the analysis. When the Big Five facets were entered in Step 2, anxiety (N), altruism (A), and trust (A) were significant positive predictors and depression (N), openness to ideas (O), and compliance (A) were

Table 9
Multiple regression of relationship quality on the big five facets and attachment dimensions

	Relationship Quality		
	β	R^2	ΔR^2
Step 1		.13**	.13**
Gender	−.21**		
Relationship Status	−.30**		
Step 2: Attachment Dimensions		.33**	.20**
Gender	−.21**		
Relationship Status	−.16**		
Anxiety	−.14**		
Avoidance	−.43**		
Step 2: Big Five facets		.33**	.20**
Gender	−.19**		
Relationship Status	−.25**		
Anxiety (N1)	.25**		
Angry Hostility (N2)	−.05		
Depression (N3)	−.19*		
Self-consciousness (N4)	−.04		
Impulsiveness (N5)	.04		
Vulnerability (N6)	−.11		
Warmth (E1)	.00		
Gregariousness (E2)	−.09		
Assertiveness (E3)	.07		
Activity (E4)	−.05		
Excitement-seeking (E5)	.04		
Positive emotions (E6)	−.06		
Fantasy (O1)	.03		
Aesthetics (O2)	.14		
Feelings (O3)	−.04		
Actions (O4)	−.05		
Ideas (O5)	−.18*		
Values (O6)	.05		
Trust (A1)	.20**		
Straightforwardness (A2)	−.01		
Altruism (A3)	.17*		
Compliance (A4)	−.24**		
Modesty (A5)	−.12		
Tender-mindedness (A6)	.05		
Competence (C1)	−.06		
Order (C2)	−.08		
Dutifulness (C3)	.05		
Achievement-striving (C4)	.08		
Self-discipline (C5)	.03		
Deliberation (C1)	.10		
Step 3		.44**	.10(ns)/.10**,+
Gender	−.19**		
Relationship Status	−.15**		
Anxiety	−.13*		
Avoidance	−.36**		
Anxiety (N1)	.23**		

Table 9 (*continued*)

	Relationship Quality		
	β	R^2	ΔR^2
Angry Hostility (N2)	−.06		
Depression (N3)	−.11		
Self-consciousness (N4)	−.05		
Impulsiveness (N5)	.01		
Vulnerability (N6)	−.06		
Warmth (E1)	−.01		
Gregariousness (E2)	−.10		
Assertiveness (E3)	.03		
Activity (E4)	−.05		
Excitement-seeking (E5)	.06		
Positive emotions (E6)	−.05		
Fantasy (O1)	−.01		
Aesthetics (O2)	.10		
Feelings (O3)	−.03		
Actions (O4)	−.05		
Ideas (O5)	−.13		
Values (O6)	.03		
Trust (A1)	.11		
Straightforwardness (A2)	−.02		
Altruism (A3)	.14*		
Compliance (A4)	−.21**		
Modesty (A5)	−.08		
Tender-mindedness (A6)	.07		
Competence (C1)	−.05		
Order (C2)	−.10		
Dutifulness (C3)	.04		
Achievement-striving (C4)	.07		
Self-discipline (C5)	.01		
Deliberation (C6)	.05		

Note. $N = 279$. β = standardized β coefficients; $R^2 = R$ square; ΔR^2 = change in R square; ns = not significant at the $p < .05$ level. Attachment dimensions were measured using the ECR and the Big Five were measured using the NEO-PI-R facets. The letters in the letter-digit pairs in parentheses after each facet match the first initial of the associated Big Five Factor name. [+]The first value represents R^2 change when the Big Five were entered in Step 3; the second value represents R^2 change when the attachment dimensions were entered in Step 3.

* $p < .05$.

** $p < .01$.

significant negative predictors of relationship quality. When the Big Five facets were entered in Step 3 of the equation, the anxiety facet of Neuroticism ($\beta = .23$; $p < .01$), and the altruism ($\beta = .14$; $p < .05$) and compliance ($\beta = -.21$; $p < .05$) facets of Agreeableness remained significant, but the other three facets did not. Notice that two of these predictors work in counterintuitive ways: the anxiety facet is associated with better relationship quality while compliance (an aspect of Agreeableness) is associated with worse relationship quality.

6. General discussion

6.1. Prediction of relationship quality from attachment dimensions and Big Five traits

The attachment dimensions consistently predicted relationship quality better than the Big Five factors or their facets did. Across the analyses of relationship quality, Avoidance was the strongest predictor. None of the Big Five scales was able to consistently predict relationship quality, and at the facet level only three of the 30 facets made significant contributions to predicting relationship quality above and beyond the attachment dimensions, and two of them (anxiety and compliance) ran in non-intuitive directions. Thus, for research on attachment style and close relationships, Big Five trait scales cannot substitute for attachment measures.

6.2. Relations between attachment dimensions and the Big Five traits

In comparing our findings with those obtained in previous studies of attachment style and the Big Five, we observe mostly similarities. Both Attachment Anxiety and Avoidance, but especially Anxiety, correlated positively with Neuroticism. These findings replicate Shaver and Brennan's (1992) original findings and make sense conceptually. Attachment Anxiety and Avoidance are forms of insecurity, and Neuroticism is also a form of insecurity. Attachment Anxiety is especially related to the depression, vulnerability, and anxiety facets of Neuroticism, which fits with previous findings suggesting that anxious attachment occurs when a person feels inadequately loved and insufficiently in control of interpersonal events. The literature on infant–parent attachment suggests that anxious attachment occurs when a parental caregiver is unreliable or unpredictable, which causes the infant to feel vulnerable and remain vigilant (Thompson, 1999). As found by Shaver and Brennan, Attachment Anxiety was correlated most highly with the depression facet of Neuroticism, which is compatible both with Bowlby's (1980) emphasis on depression in the third volume of his attachment trilogy and with Bartholomew's (1990) conceptualization of the attachment anxiety dimension as "negative model of self." In cognitive theories of depression (e.g., Beck, Steer, & Epstein, 1992), a negative self-image is a central aspect of depression.

The more avoidant people in our studies also showed signs of insecurity, including relatively high scores on the depression and vulnerability facets of Neuroticism. But they also scored especially low on Agreeableness (especially the trust and altruism facets) and extraversion (the positive emotion and warmth facets), which fits with evidence on infant–parent attachment showing a link between parental coolness and rejection and infant avoidance (Thompson, 1999). Interestingly, Attachment Avoidance, which research on both children and adults has shown to be related to suppression of emotion and emotional memories (e.g., Mikulincer & Arad, 1999; Mikulincer, Dolev, & Shaver, 2004), was significantly associated negatively with openness to feelings. Thus, the Big Five traits and facets help to flesh out some of the detailed nuances of the different forms of attachment insecurity.

Shaver and Brennan found that people with an anxious attachment style tended to be low on assertiveness, a finding replicated here. This result suggests that Attachment Anxiety is negatively related only to the dominance aspect of Extraversion, but not to the sociability aspect (for an explanation of this distinction, see Hogan & Hogan, 2002). Additionally, in Study 1, Attachment Anxiety was more strongly correlated with Extraversion items mentioning assertiveness, such as "Has an assertive personality" than items referring to gregariousness, such as "Is talkative." This is compatible with the theoretical idea that anxiously attached individuals can be highly interested in social relationships while not being confident of acceptance by relationship partners. Avoidance was also negatively related to assertiveness, which did not happen in Shaver and Brennan's study (although see Bartholomew & Horowitz, 1991). However, both we and Shaver and Brennan found that participants high on Avoidance tended to be lower on warmth, gregariousness, and positive emotions, which fits with the interpersonal problems commonly observed among those high on Avoidance (Bartholomew & Horowitz, 1991).

We found no significant relation between either of the attachment dimensions and NEO-PI-R Agreeableness, although both attachment dimensions were significantly correlated with BFI Agreeableness. Perhaps this difference is related to the specific contents of the two Big Five measures. Researchers conducting cross-measure comparisons using the NEO-PI-R and the BFI have found the lowest correlations for the Agreeableness trait (Gosling, Rentfrow, & Swann, 2003; Reynolds & Clark, 2001). At the item level, BFI Agreeableness appears to be limited mostly to the trusting and altruistic facets of Agreeableness whereas NEO-PI-R Agreeableness also includes modesty, straightforwardness, compliance, and tender-mindedness (Gosling et al., 2003).[10] In addition, we found that the strongest associations between the attachment dimensions and the facets of the NEO-PI-R were for the trust and altruism facets, which may explain why at the trait-scale level, BFI Agreeableness was a significant predictor of attachment dimensions whereas NEO-PI-R Agreeableness was not. These findings are especially interesting in light of recent research showing that avoidant attachment is fairly strongly related to not being compassionate and altruistic, both in real-life (e.g., with respect to community volunteer activities) and in the laboratory (Gillath, Shaver, & Mikulincer, 2005). Recent experimental studies have also shown that both subliminal and supraliminal augmentation of feelings of security increase empathy, forgiveness, and altruism (Gillath et al., 2005).

Interestingly, both attachment dimensions were related negatively to Conscientiousness in both studies, suggesting that attachment security (low scores on both

[10] Other measures of Big Five Agreeableness that have been correlated with attachment style (see Table 1), such as the Love scale of Trapnell and Wiggins' (1990) Revised Interpersonal Adjectives Scale-Big Five version (IASR-B5), also yield higher correlations with the trust and altruism facets of the NEO-PI-R than with other Agreeableness facets (Costa & McCrae, 1995).

Attachment Anxiety and Avoidance) is associated positively with conscientiousness (a finding that had in fact been obtained in some of the studies summarized in Table 1). Of the Conscientiousness facets, the ones most strongly related to the attachment dimensions were competence and self-discipline (the latter also supported by Study 1). Competence was measured by statements such as "I'm known for my prudence and common sense" (C1, item 1). Self-discipline was measured by statements such as "I'm pretty good about pacing myself so I get things done on time" (C5, item 1). Recent research on relationship satisfaction indicates that satisfaction is associated with self-control and responsibility (Engel, Olson, & Patrick, 2002; Roberts & Bogg, 2004; Robins, Caspi, & Moffitt, 2000; Watson, Hubbard, & Wiese, 2000), suggesting that self-controlled, responsible people may be both more satisfied and more securely attached. Stated in reverse, attachment insecurity seems to be associated with lack of careful decision-making and not following through on commitments. This may be relevant to some of the poor sexual decisions made by insecure adolescents and adults, as documented in several recent studies (e.g., Davis, Shaver, & Vernon, 2004; Schachner & Shaver, 2004; Tracy, Shaver, Albino, & Cooper, 2003).

Our findings from regression analyses indicate that, although there is some overlap or connection between attachment dimensions and the Big Five scales, the two sets of measures are not redundant. The Big Five account for less than half of the variance in each attachment dimension, which is similar to what has been found in previous studies (e.g., Griffin & Bartholomew, 1994).

6.3. Limitations

Our study has a number of limitations. We did not have partner ratings of our participants, so we do not know what the participants are actually like in their relationships, except by their own reports. Another limitation is that we used only self-report measures for all of the variables. We did, however, control for two forms of response bias, self-deception and impression management (see Footnote 7), and their control did not eliminate the predictive power of the attachment variables. We did not assess relationship length, which might have interacted with the predictors of relationship quality. We did, however, compare people who were reporting on a current relationship with those who reported on a past (presumably 'failed') relationship. Although this variable was definitely related to relationship quality ratings, controlling for it did not eliminate the predictive power of the attachment variables.

Another limitation is that there were more women than men in our sample, and gender was related to relationship quality. Nevertheless, controlling for gender did not eliminate the predictive power of the attachment variables. We did not assess the power of attachment-style dimensions and the Big Five traits as predictors of relationship quality over time, unlike Shaver and Brennan (1992) in their longitudinal study. Thus, we do not know how attachment style or the Big Five traits influence relationship quality over time. We administered the NEO-PI-R in its usual format in which participants use the items to describe

themselves in general, and did not ask participants to respond to the measure describing how they are in the context of their relationships. Perhaps using the measure in this latter way would increase its ability to predict relationship quality.[11]

6.4. Conclusion

At least for us, one of the most interesting outcomes of the studies reported here is that the Big Five measures, especially the NEO-PI-R facet scales, provide clues about the two major forms of attachment insecurity that are not necessarily evident in the literature on attachment per se. We still do not know how the common qualities emphasized in the two research traditions come about, and why there is cross-generational continuity in them. Given the empirical literature available so far, good cases can be made for both genetic and social transmission. Attachment researchers generally focus on social causes of attachment styles, whereas researchers in the Big Five tradition often focus on genetic, temperamental foundations or causes of personality traits. In the attachment literature, the fact that anxious mothers tend to have anxious offspring is viewed as "cross-generational transmission" of attachment proclivities (e.g., Benoit & Parker, 2000; Sagi et al., 1997), but in the literature on genes and temperament, the mechanism of transmission is thought to be heredity. Behavior genetic studies of the Big Five traits tend to support the hereditary transmission interpretation (e.g., Plomin & Caspi, 1999), but temperament and twin studies of attachment (Bokhorst et al., 2003; O'Connor & Croft, 2001; Vaughn & Bost, 1999) support a social, or shared environment interpretation, not a genetic one. Thus, future studies of links between genes, traits, and attachment patterns should examine how the associations between traits and attachment styles emerge developmentally.

The theoretical contexts of the two sets of constructs are quite different: attachment theory grew out of the psychoanalytic tradition, and attachment researchers are still interested primarily in desires, conflicts, defenses, working models, and continued movement toward a fuller, deeper psychodynamic model of the mind (Shaver & Mikulincer, 2005). The Big Five traits emerged from the descriptive and lexical approaches to personality, which were aimed mainly at characterizing how people's behavior is described in everyday language. Still, some of the issues touched upon in self-report attachment and personality measures are obviously shared. Looking more carefully at similarities and differences between the two kinds of constructs and measures, including in experimental settings, should provide a better understanding of links between personality, mental dynamics, and social behavior.

[11] It is notable that participants filled out the ECR in the context of their relationships in general and not in the context of the particular relationship they described with the PRQC, and yet the attachment dimensions still function as substantial predictors of relationship quality.

In his recent *Annual Review of Psychology* chapter on personality, Funder (2001) noted that many personality constructs can be mapped onto the Big Five, but not every personality construct can be derived from the Big Five. That is certainly the case here: the attachment constructs can not be fully subsumed by the Big Five traits or their facets as currently conceived. In the same way that relationship quality was predictable by attachment dimensions in our study even when all of the Big Five factors or facets were controlled, experimental research is beginning to show that predictions from attachment theory are upheld using the ECR attachment scales to measure individual differences, even when differences in self-esteem, general anxiety, or neuroticism are statistically controlled (e.g., Mikulincer, Gillath, & Shaver, 2002; Rholes, Simpson, Campbell, & Grich, 2001; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). We suspect that similar findings will be obtained when studies of empathy, compassion, and altruism are conducted with measures of avoidant attachment and Big Five agreeableness included (see the somewhat parallel studies by Gillath et al., 2005, and Jensen-Campbell & Graziano, 2001). These studies should eventually allow us to determine how attachment constructs and personality traits work together to affect behavior in social relationships.

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