

SELF-REPORTED ATTACHMENT, INTERPERSONAL AGGRESSION, AND PERSONALITY DISORDER IN A PROSPECTIVE COMMUNITY SAMPLE OF ADOLESCENTS AND ADULTS

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Anxious and avoidant attachment were assessed in the Children in the Community (CIC) Study during adolescence and adulthood using self-report scales developed for this prospective study. The convergent and discriminant validity of the new CIC attachment scales were evaluated and their stability was assessed across a 17-year interval. Attachment scales predicted DSM-IV personality disorders in theoretically coherent and clinically meaningful ways, especially when supplemented with a separate measure of interpersonal aggression. Cluster B and C personality disorder symptoms were associated with elevated anxious attachment. Avoidant attachment was positively associated with Cluster A symptoms and inversely associated with Cluster B and C symptoms. Interpersonal aggression was higher in Cluster B symptoms and lower in Cluster C symptoms, thus differentiating between these symptom clusters.

During the past 15 years there has been accumulating evidence that clinically meaningful personality disorders (PDs) occur during adolescence. These Axis II disorders are associated with significant impairment and distress (Bernstein et al., 1993), maladaptive defense styles (Johnson, Bornstein, & Krukonis, 1992; Westen, Shedler, Glass, & Martens, 2003), and high rates of interpersonal aggression and suicide (Brent et al., 1993; Johnson et al., 1999). Furthermore, prospective research has shown that adolescent PDs reliably predict later Axis I and Axis II disturbances and psychosocial impairment in adulthood (Johnson et al., 1999; Johnson,

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Cohen, Kasen et al., 2000; Kasen, Cohen, Skodol, Johnson, & Brook, 1999). The literature on adolescent PDs is important because it addresses large gaps in our knowledge about developmental precursors of PD in adults. However, it has been difficult to advance a developmental model of PD because research on Axis II disorders has lacked a coherent theoretical framework. In this context, Bowlby's (1969, 1973, 1980) attachment theory is a well-established theory that could help to explain how PDs emerge in adolescence and then persist into adulthood (Bartholomew, Kwong, & Hart, 2001; Livesley, Schroeder, & Jackson, 1990; Lyddon & Sherry, 2001; Meyer & Pilkonis, 2005; Nakash-Eisikovits, Dutra, & Westen, 2002).

Attachment theory was originally investigated in infants using the Strange Situation to study how insecure attachment affects psychosocial adjustment, early personality development, and psychopathology (Ainsworth, Blehar, Waters, & Wall, 1978; Weinfield, Sroufe, Egeland, & Carlson, 1999). The Strange Situation is a laboratory procedure used to observe infants and caregivers during a fixed series of separations and reunions to determine if infants are secure, anxious-ambivalent, or avoidant in their attachment to caregivers. An additional category called disorganized attachment (Solomon & George, 1999) has been established for children who lack a coherent pattern of responses to these separations and reunions. In adolescents and adults insecure attachment can be measured with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985), which assesses how individuals remember and describe early attachment experiences with primary caregivers and yields classifications analogous to those used in the Strange Situation. When infants assessed with the Strange Situation have been followed up in adulthood with the AAI, there appears to be continuity over time between corresponding attachment classifications (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). However, risk factors such as trauma and loss have been shown to be associated with changes from secure to insecure attachment.

Insecure attachment can also be assessed with self-report questionnaires focusing on close relationships between adults instead of relationships between children and parents. Self-reported attachment styles are often assessed with the Experiences in Close Relationships Inventory (Brennan, Clark, & Shaver, 1998), which measures separate dimensions of anxious and avoidant attachment that are analogous to similar dimensions investigated in infants by Ainsworth et al. (1978). High scores on the anxiety dimension reflect elevated fears of separation and abandonment, and high scores on the avoidance dimension reflect discomfort both with emotional intimacy and dependence on relationship partners. Bartholomew and Horowitz (1991) used these essentially orthogonal dimensions to define four major attachment styles: *preoccupied attachment* (high anxiety and low avoidance), *fearful attachment* (high anxiety and high avoidance), *dismissing attachment* (high avoidance and low anxiety), and *secure attachment* (low anxiety and low avoidance). Although researchers often use categorical labels for these four styles, people are actually distributed in

a roughly bivariate normal way in the two-dimensional space defined by attachment anxiety and avoidance. There are no real categories or types within this conceptual space (Fraley & Waller, 1998). Also, even though the attachment relationships assessed with questionnaires differ from the parent-child relationships investigated with the AAI (Bartholomew & Shaver, 1998; Shaver, Belsky, & Brennan, 2000), a large body of research has shown that self-report measures are able to predict outcomes hypothesized in attachment theory (Shaver & Mikulincer, 2004). For instance, defensive strategies and unconscious processes expected in attachment theory have been associated with self-reported attachment styles in recent experimental studies (e.g., Mikulincer, Dolev, & Shaver, 2004; Mikulincer, Gillath, & Shaver, 2002; Shaver & Mikulincer, 2002).

At present there are few empirical data on PDs and attachment. Most research has investigated associations between insecure attachment and borderline PD in small clinical samples (e.g., Patrick, Hobson, Castle, Howard, & Maughan, 1994; Stalker & Davies, 1995), thus leaving many unanswered questions about how insecure attachment pertains to other PDs. When Brennan and Shaver (1998) investigated the eleven PDs in DSM-III-R in a college sample of adolescents and young adults, they found robust cross-sectional associations with insecure attachment. Once classified into Bartholomew's four attachment categories, participants in the preoccupied and fearful groups both had higher self-reported symptoms than the secure group for all eleven PDs. The dismissing group had higher symptoms than the secure group for all PDs except histrionic and dependent PDs. Using clinician-reported measures of attachment and PD, Nakash-Eisikovits et al. (2002) found that secure attachment was inversely associated with all ten PDs in DSM-IV in a clinical sample of adolescents. This robust outcome could indicate that earlier disturbances in attachment have a pervasive predisposing effect on the development of PDs. Alternatively, it could be that PDs cause interpersonal problems that generate insecurity about close relationships with friends, romantic partners, and parents. It also could be that trait anxiety or some other variable accounts for the association between insecure attachment and PD. Because the available studies are cross-sectional, it has been impossible to determine if attachment styles were causes, consequences, or merely concomitants of psychopathology. Longitudinal data are needed to begin building a more detailed developmental model of the relationship between insecure attachment and PD.

In an initial effort to address these questions, the present study investigates how self-reported attachment styles are related to DSM-IV PDs in the Children in the Community (CIC) study, an ongoing prospective investigation of childhood psychiatric disorders and their trajectories into adulthood. The CIC study has been a rich source of information about the development of PDs in adolescence and adulthood (see Cohen, Crawford, Johnson, & Kasen, 2005, for a comprehensive review). The present study introduces the CIC attachment scales, a new self-report measure of anx-

ious and avoidant attachment developed specifically for prospective data from the CIC study. This paper assesses the convergent and discriminant validity of the new scales and documents theoretically coherent and clinically useful associations between attachment and PD constructs.

Although anxious and avoidant attachment offer a promising way to explore the developmental origins of PD, they are not sufficient by themselves to distinguish between certain Axis II disorders in the DSM-IV. Borderline and dependent PDs, for instance, are both defined by heightened abandonment fears that are the hallmark of anxious attachment, thus making it difficult to differentiate between two very different PDs based on attachment constructs alone. These disorders are more clearly distinguished by interpersonal aggression, which is elevated in borderline PD (Critchfield, Levy, & Clarkin, 2004) and suppressed in dependent PD (Zidanik, 2002). Other investigators have similarly observed that attachment styles do not account for the interpersonal aggression that characterizes specific PDs. Brennan and Shaver (1998) showed how such behaviors vary on a dimension of PD that is orthogonal to self-reported attachment styles. The interpersonal aggression hypothesized in the present study may roughly correspond to low agreeableness in the Five Factor Model of personality. Low agreeableness is commonly associated with PD (Costa & Widiger, 2002) and its descriptors emphasize its interpersonal nature (e.g., low cooperation, lack of empathy, or not getting along with others). Interpersonal aggression thus offers a useful *a priori* way to distinguish between PDs that otherwise are associated with the same attachment style.

In this report we explore how insecure attachment and interpersonal aggression were associated with PDs at three cross-sectional intervals in adolescence and adulthood. Rather than investigate all ten DSM-IV PDs at multiple data intervals (which would inflate the risk for Type I errors), we aggregated them for this initial study into the three familiar PD symptom clusters. Based on the available data (Nakash-Eisikovits et al., 2002), we expected that Cluster A symptoms (paranoid, schizoid, schizotypal PDs) would be positively associated with avoidant attachment. It was less clear whether attachment avoidance associated with Cluster A symptoms would be combined with high anxiety (fearful attachment) or low anxiety (dismissing attachment) (Lyddon & Sherry, 2001). We expected that anxious attachment would be associated with Cluster B symptoms (antisocial, borderline, histrionic, and narcissistic PDs) largely based on the salience of abandonment fears in borderline and histrionic PDs (Bartholomew et al., 2001; Gunderson, 1996). Links between anxious attachment and antisocial and narcissistic PDs were expected to be present but less pronounced. Cluster C symptoms (avoidant, dependent, and obsessive-compulsive PDs) were expected to be most clearly associated with attachment anxiety (Bartholomew et al., 2001). The relationship between attachment avoidance and Cluster C was less clear, especially given suggestions that avoidant PD sometimes manifests in fearful attachment (high avoidance) and other times in preoccupied attachment (low avoidance) (Lyddon & Sherry, 2001).

As a way to distinguish between Cluster B and C symptoms, interpersonal aggression was expected to be positively associated with Cluster B and inversely associated with Cluster C symptoms. Cluster A symptoms, especially paranoid and schizotypal PDs, were expected to correlate positively with interpersonal aggression.

METHOD

PARTICIPANTS

The Children in the Community (CIC) sample is a cohort of approximately 800 now grown children who were randomly sampled based on residence in two counties in upstate New York. This youth cohort was broadly representative of the U.S. population, with approximately 25% living in rural or small town settings, 21% having family incomes below the poverty line at some time in childhood, and 25% having upper middle class educational and income backgrounds. The cohort is 50% female and about 91% white and 8% African American, thus making it proportionally representative of the region sampled (for a more complete description see the CIC web site: nypisys.cpmc.columbia.edu/childcom/). The present study is based on data provided by 729 participants in adolescence (mean age = 16 years, $SD = 2.8$), 716 participants in early adulthood (mean age = 22 years, $SD = 2.8$), and 678 participants in adulthood (mean age = 33 years, $SD = 2.9$). Youths and mothers provided data about psychopathology, youth personality traits, family relationships, peer and dating relationships, and demographic information at mean ages 16 and 22. At mean age 33 participants were assessed with self-report questionnaires and a semi-structured clinical interview. Mothers, however, were no longer surveyed at mean age 33. At all three assessments, participants were interviewed in their homes by trained lay interviewers. Qualified clinicians conducted clinical interviews by telephone at mean age 33. Informed consent was obtained according to Institutional Review Board Standards prior to all interviews, and a National Institutes of Health Certificate of Confidentiality exists for these data.

After maintaining a youth retention rate of 93% from mean ages 16 to 22, participation dropped to about 84% at mean age 33. This change probably reflects increased participant burden that occurs along with other responsibilities at this life stage, a problem shared with virtually all other recent longitudinal studies of community and clinical samples (e.g., Boys, 2003; Hansen, Tobler, & Graham, 1990). Attrition analyses indicated that men surveyed at mean age 16 or 22 were less likely than women to follow up at age 33. Once gender was taken into account, there were no differential effects of attrition on avoidant attachment, aggression, or PD symptom clusters. Interestingly, participants who had higher scores on attachment anxiety at mean age 22 (i.e., people who are anxious about abandonment) were more likely to follow up at mean age 33.

INSTRUMENTS

DSM-IV Personality Disorders. Axis II symptoms and diagnoses at mean age 16 were assessed in 1986 long before any instrument existed to measure adolescent PDs. Accordingly, PDs were measured with relevant parent- and youth-reported items from the study's longitudinal protocol that were selected to correspond with DSM criteria for Axis II disorders. Some additional items from the Personality Diagnostic Questionnaire (PDQ; Hyler, Tobler, & Graham, 1982) and the Structured Clinical Interview for Personality Disorders (SCID-II; Spitzer & Williams, 1986) were used and adapted when necessary to make them age appropriate. Following publication of the DSM-IV, diagnostic algorithms and symptom scales were modified to maximize correspondence with the updated diagnostic criteria and produce consistent repeated measures of PD at mean ages 16 and 22. The stability of DSM-IV symptoms measured with these scales in adolescence was similar to stability observed in adults across similar test-retest intervals (Johnson, Cohen, Kasen et al., 2000). At mean age 16 alpha coefficients for internal consistency of Cluster A, B, and C symptoms were .66, .72, and .68, respectively, and differed little from those at mean ages 22 and 33. Numerous studies have supported the concurrent and predictive validity of these scales and algorithms (Bernstein et al., 1993; Johnson et al., 1999; Johnson, Cohen, Smailes et al., 2000; Kasen et al., 1999).

PDs at mean age 33 were measured with essentially the same pool of self-report items assessed earlier in the CIC protocol (Crawford et al., 2005). Since parents were no longer interviewed at age 33, CIC scales and algorithms were augmented with additional self-report items to replace parent-reported data. Parallel items were available at mean ages 22 and 33, thus permitting the creation of a repeated self-report measure spanning this 11-year interval. Diagnostic agreement between these self-report scales and the Structured Clinical Interview for the DSM-IV Personality Disorders (SCID-II; First, Spitzer, Gibbon, & Williams, 1995) was high when compared with other self-report measures. Concordance for any Cluster A diagnosis ($\kappa = .41$) and any Cluster B diagnosis ($\kappa = .60$) surpassed findings in 12 out of 13 comparable studies (Modestin, Ern, & Oberson, 1998). Concordance for Cluster C diagnoses ($\kappa = .29$) was closer to the published average. At age 33 correlations between symptom criteria on the CIC and the SCID-II-Personality Questionnaire (First et al., 1995) for Clusters A, B, and C were .61, .74, and .51, respectively.

Anxious and Avoidant Attachment. New attachment scales were needed for this study because adolescent participants were assessed in 1986 before any self-report measures of attachment existed, and because no established attachment scales were included in any follow-up assessments. Drawing on self-report items in the longitudinal protocol, attachment scales were designed to be analogous to those in the Experiences in Close Relationships Inventory (ECR; Brennan et al., 1998). A pool of items was selected based on correspondence with ECR items (Table 1 compares some of these corresponding items). These were supplemented with items using

TABLE 1. Sample Comparisons Between in ECR and CIC Anxious and Avoidant Attachment Items

ECR Anxious Attachment Scale	CIC Anxious Attachment Scale
I worry about being abandoned.	I worry about being left alone without anyone to take care of me.
I need a lot of reassurance that I am loved by my partner.	I don't know if I'm doing right unless others tell me.
If I can't get my partner to show interest in me, I get upset or angry.	I am emotional and make a big deal out of things.
I get frustrated when my partner is not around as much as I would like.	Feeling lonely. Easily annoyed or irritated (2 items)
ECR Avoidant Attachment Scale	CIC Avoidant Attachment Scale
I don't feel comfortable opening up to romantic partners.	When troubled I talk it over with others (reverse scored)
I prefer not to show a partner how I feel deep down.	I always try to share my problems with someone who can help me (reverse scored)
I don't mind asking romantic partners for comfort, advice, or help. (reverse scored)	We give each other information, guidance, and suggestions (reverse scored)
I turn to my partner for many things, including comfort and reassurance. (reverse scored)	We comfort each other when we have troubles. (reverse scored)

self-descriptive adjectives or phrases (e.g., lonely, needs attention, fearful, and affectionate) judged elsewhere by independent experts in attachment theory to be representative of different attachment styles (Klohnen & John, 1998). Principal components analyses were used to confirm correct assignment of individual items to anxious and avoidant dimensions. These prototype scales were then assessed along with the ECR in a college sample, thereby permitting final selection of items for CIC scales based on correlations with the appropriate ECR scale. The final CIC anxious attachment scale uses 13 items ($\alpha = .87$) with Likert scales that mostly ranged from 1 to 4 to measure anxiety about close relationships. The CIC avoidant attachment scale is a 14 item index ($\alpha = .87$) that uses similar Likert scales to measure emotional distance and avoidance of intimacy. Although some items specifically ask participants about their closest relationships, the CIC anxious and avoidant scales do not explicitly measure insecure attachment in romantic relationships normally assessed with the ECR.

Convergent and Discriminant Validity. Table 2 reports correlations between CIC and ECR attachment scales based on a college validation sample ($N = 307$). As expected, associations between anxious attachment scales ($r = .70$) and avoidant attachment scales ($r = .71$) were reasonably high across measures, thus supporting the convergent validity of the CIC scales. Associations between anxious and avoidant dimensions were similar on the ECR and CIC scales ($r = .26$ and $.20$, respectively). CIC and ECR scales showed reasonably similar correlations with gender.

Table 2 also reports correlations between attachment scales and self-reported personality traits from the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) to evaluate the discriminant validity of CIC attachment scales. The BFI is a 44 item instrument measuring higher order personal-

TABLE 2. Convergence Between ECR and CIC Measures of Attachment, Gender, and Normal Personality Traits in a Sample of Young Adults

	Alpha	Anxious Attachment ^a		Avoidant Attachment ^a		Gender ^a	BFI Personality Traits ^b					
		ECR	CIC	ECR	CIC		N	E	O	C	A	
Anxious Attachment												
ECR	.93	—				-.07	.50***	-.13*	.05	-.19***	-.24***	
CIC	.87	.70***	—			-.15*	.59***	-.20***	-.10	-.27***	-.26***	
Avoidant Attachment												
ECR	.93	.26***	.25***	—		.16**	.19**	-.29***	-.08	-.26***	-.26***	
CIC	.87	.14**	.20***	.71***	—	.27***	.15*	-.36***	-.20***	-.30***	-.30***	

Note. ECR = Experience in Close Relationship Inventory; CIC = Children in the Community Attachment Scales; BFI = Big Five Inventory; N = Neuroticism; E = Extraversion; O = Openness; C = Conscientiousness; A = Agreeableness; Gender, 0 = female, 1 = male.

* $p < .05$. ** $p < .01$. *** $p < .001$.

^a $N = 307$; ^b $N = 286$.

ity dimensions hypothesized in the five-factor model of personality. Personality scales on the BFI have good internal consistency (mean alpha > .80) and high convergent validity with other Big Five instruments designed by Costa and McCrae (1992) and Goldberg (1992) (mean $r = .75$ and $.80$, respectively) (Benet-Martinez & John, 1998). The ECR and CIC scales produced notably parallel patterns of associations with personality dimensions on the BFI (for coefficients in Table 2, $r = .98$). The CIC anxious attachment scale appears more associated with neuroticism than the corresponding ECR scale ($r = .59$ vs. $.50$, respectively). As expected, however, the CIC anxious attachment scale was more correlated with the corresponding ECR scale ($r = .70$) than with neuroticism. Otherwise, correlations between anxious and avoidant attachment scales and personality dimensions were much lower (mean absolute $r = .21$, range = $.05$ to $.36$), thus supporting the discriminant validity of CIC scales.

Interpersonal Aggression. The interpersonal aggression scale is a 5-item measure (alpha = $.68$) based on Likert scales. It was created for the present study to assess how often participants feel hot-headed, lose their temper, quarrel with others, make people angry by teasing them, or initiate aggression toward others. Conceptually, this measure corresponds roughly to low agreeableness hypothesized in the Five Factor Model of personality.

Control for Overlapping Items. The CIC scales used to measure DSM-IV PDs were designed so that there were no overlapping items (Crawford et al., 2005); however, attachment and aggression scales used items that did sometimes overlap with those in specific PD symptom scales. For anxious attachment, four out of 13 items overlapped with Cluster B scales and eight separate items overlapped with Cluster C symptoms. For avoidant attachment, 6 of 14 items overlapped with Cluster A symptoms. For interpersonal aggression, 1 of 5 items overlapped with Cluster A scales and two other items overlapped with Cluster B scales. Similar issues of item-over-

lap and measurement confounding are frequently encountered in developmental research on temperament and psychopathology (Lemery, Essex, & Smider, 2002). To avoid artificially inflating correlations between variables, the specific overlapping items from attachment and aggression scales were deleted before calculating their association with corresponding PD clusters. This strategy to eliminate item overlap resulted in little change in internal consistency for the attachment scales (mean reduction in $\alpha = .08$). Alphas for aggression scales were more susceptible to adjustment (mean reduction in $\alpha = .13$) due to the small number of items in the full scale. Despite these changes, adjusted scales correlated highly with the corresponding complete attachment and aggression scales (mean $r = .93$). Also, analyses that controlled for item overlap were compared with analyses using complete scales. As reported below, item overlap typically increased the effect size but did not otherwise affect substantive findings in this study. Similar outcomes have been reported when item overlap and measurement confounding are controlled in temperament and psychopathology research (Lemery et al., 2002). Adopting a conservative approach, we report coefficients based on scales without overlapping items to avoid overstating the magnitude of our findings.

Additional Control Measures. Standardized measures of maternal and paternal education, income, and occupational status were summed and then standardized again to measure parental socioeconomic status (SES). To determine if the effects of anxious attachment were independent from those attributable to anxiety symptoms, a self-report symptom scale assessing overanxious disorder was added to regression models. This 17-item scale ($\alpha = .73$) from the Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, Dulcan, Kalas, & Klaric, 1984) measured heightened social anxieties, worries about academic and athletic performance, and concerns about health. Over-anxiety was assessed at ages 16 and 22 but not at age 33. To further assess the discriminant validity of CIC attachment scales, their association with intelligence was assessed using the Quick Test (Ammons & Ammons, 1979), a widely used brief IQ test. Based on findings reported elsewhere (van IJzendoorn, 1995; Rosenstein & Horowitz, 1996), attachment and intelligence were not expected to be related.

DATA ANALYSIS

Prior to all substantive analyses, each Axis II symptom cluster was adjusted statistically to remove variance shared with the other two clusters. Otherwise, high rates of co-occurrence across symptom clusters (e.g., Stuart et al., 1998) were expected to obscure effects unique to each individual cluster. Adjusted PD cluster scores were then used as dependent variables to be regressed on anxious attachment, avoidant attachment, and interpersonal aggression. Separate cross-sectional regression models were investigated at mean ages 16, 22, and 33. Combined youth and parent re-

ports were used to assess adolescent symptoms at mean age 16. Self-report scales were used at mean ages 22 and 33 because more is known about their concordance with standard Axis II instruments (Crawford et al., 2005). Age, sex, race, and SES were included as demographic controls. The over-anxious scale was added in a separate step when available to test whether the effects of attachment anxiety were independent of anxiety symptoms.

RESULTS

Cross-sectional and longitudinal associations between attachment dimensions and interpersonal aggression were assessed before evaluating hypotheses about their relationship with PD. As reported in Table 3, the stability of anxious attachment was .44 across 6 years from adolescence to early adulthood and then .50 across the following 11 years. The stability of anxious attachment was .39 across the 17 years from adolescence to adulthood. The stability of avoidant attachment was .50 from adolescence to early adulthood and .51 across the next 11 years; its stability across the full 17 years was .38. In the CIC sample, the essentially orthogonal relationship expected between anxious and avoidant dimensions was stable when assessed at three cross-sectional intervals (mean $r = .12$). As expected, CIC attachment scales were uncorrelated with IQ (mean $r = .02$). Stability coefficients for interpersonal aggression ranged from .35 to .55 and differed little from stability coefficients for anxious and avoidant attachment. Cross-sectional associations between aggression and anxious attachment appeared to strengthen over time (from .32 to .46 at mean ages

TABLE 3. Cross-Sectional and Prospective Associations Between CIC Anxious and Avoidant Attachment and Aggression Scales ($N = 604$)

	Adolescence <i>M</i> = 16 yrs, <i>SD</i> = 2.8			Early Adulthood <i>M</i> = 22 yrs, <i>SD</i> = 2.8			Adulthood <i>M</i> = 33 yrs, <i>SD</i> = 2.9			
	1	2	3	4	5	6	7	8	9	10
Adolescence										
1 Anxious attachment	—									
2 Avoidant attachment	-.00	—								
3 Interpersonal aggression	.32	.24	—							
Early adulthood										
4 Anxious attachment	.44	.03	.19	—						
5 Avoidant attachment	.08	.50	.21	.18	—					
6 Interpersonal aggression	.21	.26	.50	.35	.34	—				
Adulthood										
7 Anxious attachment	.39	.05	.14	.50	.10	.26	—			
8 Avoidant attachment	.08	.38	.12	.09	.51	.22	.17	—		
9 Interpersonal aggression	.20	.19	.35	.27	.29	.55	.46	.25	—	
10 IQ	-.07	.04	-.08	.06	.09	-.04	-.03	.04	-.07	—
Mean	26.6	26.3	10.2	26.5	25.5	9.4	23.7	27.8	7.8	100.4
<i>SD</i>	5.9	6.2	2.8	6.3	6.2	2.7	6.4	6.5	2.3	13.2

Note. All Pearson r coefficients $> .08$, $p < .05$. Cross-sectional correlations are reported in **boldface**; prospective correlations between corresponding measures are *italicized*.

16 and 33, respectively). Associations between aggression and avoidant attachment were lower and ranged between .24 and .34.

To document the presence of Axis II psychopathology in this community sample, Table 4 presents prevalence rates for Cluster A, B, and C diagnoses and mean symptom levels at three different assessments. Table 4 also reports zero-order correlations between PD symptoms and attachment dimensions and interpersonal aggression. Unadjusted correlations refer to Pearson r coefficients before co-occurring symptoms were statistically removed from PD clusters, and “adjusted” coefficients (in parenthesis in Table 4) refer to correlations after their removal. Unadjusted PD symptoms from all three clusters were associated with anxious attachment (mean $r = .36$, range = .23 to .51). After co-occurring PD symptoms were removed, anxious attachment remained positively associated with Cluster B and C symptoms. In contrast, adjusted Cluster A symptoms and attachment anxiety were inversely associated with at mean age 22 and unrelated at mean ages 16 and 33. Cluster A symptoms remained consistently associated with avoidant attachment before and after adjustment for co-occurring symptoms. Although unadjusted Cluster B symptoms were modestly associated with avoidant attachment, these variables were unrelated when adjusted coefficients were used. Cluster C symptoms and avoidance were unrelated before co-occurring symptoms were removed but inversely associated after this adjustment. Interpersonal aggression was associated with all three symptom clusters prior to adjusting for co-occurring symptoms.

TABLE 4. DSM-IV Axis II Symptoms and Correlations with Attachment and Interpersonal Aggression Scales in a Longitudinal Community Sample

	Axis II Disorders and Symptom Levels		Correlations Between PD Symptoms and		
			Anxious Attachment Unadjusted (Adjusted)	Avoidant Attachment Unadjusted (Adjusted)	Interpersonal Aggression Unadjusted (Adjusted)
	Cases Percent (n/N)	Symptoms Mean (SD)			
Cluster A PD					
Mean age 16	9.1 (66/729)	4.5 (2.3)	.26 (.02)	.13 (.14)	.34 (.10)
Mean age 22	5.4 (39/716)	2.6 (2.5)	.25 (-.12)	.25 (.22)	.35 (.12)
Mean age 33	4.9 (33/678)	2.4 (2.5)	.37 (-.04)	.30 (.28)	.41 (.13)
Cluster B PD					
Mean age 16	8.0 (58/729)	6.0 (3.8)	.33 (.16)	.13 (.08)	.42 (.29)
Mean age 22	7.8 (56/716)	4.2 (4.1)	.43 (.21)	.14 (-.03)	.44 (.32)
Mean age 33	5.9 (40/678)	3.1 (3.7)	.50 (.19)	.14 (-.06)	.44 (.22)
Cluster C PD					
Mean age 16	2.7 (20/729)	2.6 (2.1)	.23 (.09)	-.07 (-.19)	.20 (-.07)
Mean age 22	6.4 (46/716)	2.6 (2.6)	.38 (.22)	.04 (-.14)	.17 (-.17)
Mean age 33	4.3 (29/678)	2.1 (2.3)	.47 (.22)	.05 (-.14)	.30 (-.04)

Note. “Adjusted” Pearson r coefficients (in parenthesis) measure each variable’s relationship with symptoms from specific PD clusters after other covarying Axis II symptoms were statistically removed. All Pearson r coefficients $> .07$, $p < .05$. For consistency across assessments, Cluster B symptoms combine antisocial, borderline, histrionic, and narcissistic symptoms. Cluster B disorders during adolescence, however, do not include antisocial PD based on DSM-IV specifications that it cannot be diagnosed before age 18.

Once other PD symptoms were removed, Cluster C symptoms were negatively associated with interpersonal aggression.

Table 5 reports results from cross-sectional regression models that controlled for potential confounds of age, gender, race, and SES. As expected, adjusted Cluster A symptoms were consistently associated with avoidant attachment. Once avoidance and aggression were taken into account, adjusted Cluster A symptoms were significantly associated with lower anxious attachment at mean ages 22 and 33. In regression models after adolescence, Cluster A symptoms thus appeared to be linked with a dismissing attachment style (low anxiety and high avoidance). Starting at mean age 22, there was a modest but statistically significant association between interpersonal aggression and Cluster A symptoms. These effects all remained significant even when overanxiety symptoms were added to the model. Also, substantive findings did not change when avoidance and aggression scales used items overlapping with Cluster A scales. Inclusion of these items, however, did increase standardized β coefficients on average by .08 for avoidant attachment and .03 for interpersonal aggression. Scales for Cluster A symptoms and anxious attachment had no overlapping items.

By mean age 22, adjusted Cluster B symptoms were associated with high anxiety and low avoidance, thus reflecting a preoccupied attachment style. This effect was not evident at mean age 16, however. At that time avoidant attachment and Cluster B symptoms were unrelated and anxious attachment lost significance when overanxiety was added to the model. Interpersonal aggression was strongly associated with adjusted Cluster B

TABLE 5. Insecure Attachment and Aggression as Predictors of Adjusted Axis II Symptoms: Cross-Sectional Regression Models in Adolescence (Mean Age 16), Early Adulthood (Mean Age 22), and Adulthood (Mean Age 33)

	Concurrent Predictor Variables								
	Anxious Attachment			Avoidant Attachment			Interpersonal Aggression		
	Beta	(SE)	β	Beta	(SE)	β	Beta	(SE)	β
Cluster A PD Criteria									
Mean age 16	.005	(.072)	.00	.216	(.071)**	.12	.075	(.074)	.04
Mean age 22	-.280	(.071)***	-.15	.355	(.073)***	.19	.176	(.074)*	.09
Mean age 33	-.245	(.079)**	-.13	.488	(.071)***	.27	.156	(.078)*	.09
Cluster B PD Criteria									
Mean age 16	.307	(.117)* ^a	.10	-.020	(.121)	-.01	.779	(.122)***	.25
Mean age 22	.419	(.111)***	.15	-.460	(.119)***	-.15	.860	(.116)***	.29
Mean age 33	.378	(.108)***	.15	-.422	(.108)***	-.16	.510	(.112)***	.20
Cluster C PD Criteria									
Mean age 16	.245	(.071)*** ^a	.14	-.285	(.071)***	-.16	-.187	(.074)*	-.10
Mean age 22	.609	(.080)***	.30	-.139	(.084) [†]	-.07	-.498	(.086)***	-.24
Mean age 33	.513	(.078)***	.29	-.199	(.072)**	-.11	-.237	(.081)**	-.14

Note. Adjusted Axis II symptom clusters refer to DSM-IV criteria for a diagnostic cluster after covariance with other PD clusters has been removed statistically. [†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

^aAnxious attachment lost significant when overanxious symptoms were added to the model.

symptoms across all three waves of data. When complete scales were used, standardized β coefficients increased on average by .05 for interpersonal aggression but stayed essentially the same for the two attachment scales.

Adjusted Cluster C symptoms were associated with anxious attachment at each cross-sectional assessment. When overanxiety was added to the model, the association lost significance at mean age 16, but not at mean age 22. Avoidant attachment was inversely associated with adjusted Cluster C symptoms at mean ages 16 and 33 and approached significance ($p < .10$) at mean age 22. In other words, adjusted Cluster C symptoms appeared to be associated with a preoccupied attachment style (high anxiety and low avoidance). As predicted, interpersonal aggression was inversely associated with adjusted Cluster C symptoms. When complete attachment and aggression scales were used to predict Cluster C symptoms, standardized β coefficients increased on average by .09 for attachment anxiety. Otherwise, substantive findings and effect sizes did not change.

Figure 1 depicts these results by placing each PD cluster in the familiar two-dimensional space defined by attachment anxiety and avoidance but also locating them in a third dimension defined by interpersonal aggression. (Although attachment and aggression dimensions are not completely orthogonal, they are depicted here using perpendicular axes to simplify presentation.) Standardized beta coefficients from regression analyses in

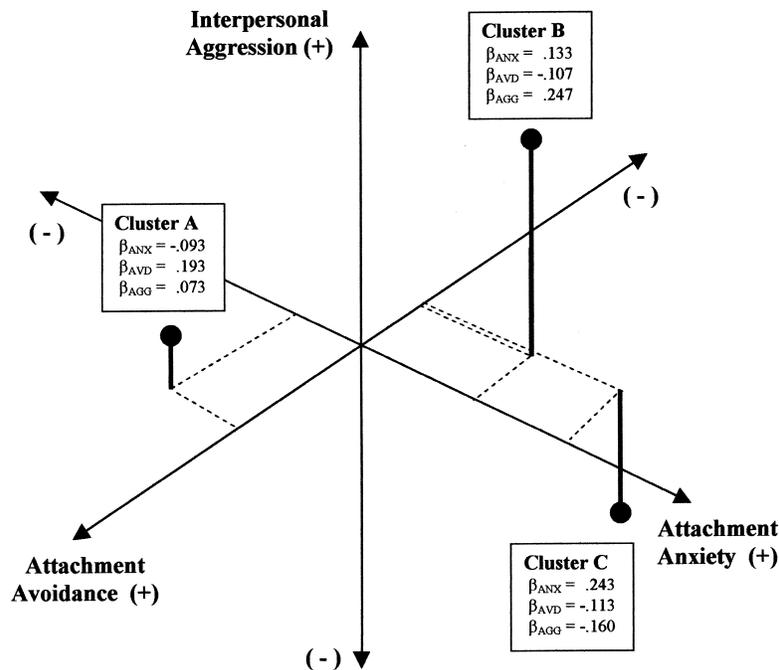


FIGURE 1. Locating personality disorder clusters in a three-dimensional conceptual space defined by attachment anxiety, attachment avoidance, and interpersonal aggression

Table 5 (averaged across three time points) were used to specify coordinates for each PD cluster. Adjusted Cluster A symptoms, for example, were inversely associated with anxiety (mean $\beta_{\text{ANX}} = -.093$) and positively associated with avoidance (mean $\beta_{\text{AVD}} = .193$) and aggression (mean $\beta_{\text{AGG}} = .073$), thus suggesting a dismissing attachment style (low anxiety and high avoidance) that may be further reinforced by interpersonal aggression. Adjusted Cluster B symptoms fell in the space associated with preoccupied attachment (high anxiety and low avoidance) and were characterized by interpersonal aggression (mean $\beta_{\text{AGG}} = .247$). Adjusted Cluster C symptoms similarly reflected preoccupied attachment but were inversely associated with interpersonal aggression (mean $\beta_{\text{AGG}} = -.160$). When compared with Clusters A and B symptoms, attachment anxiety was most salient in Cluster C symptoms (mean $\beta_{\text{ANX}} = .243$).

DISCUSSION

This study assessed anxious and avoidant attachment with new scales developed for the Children in the Community Study to track attachment styles across a 17-year interval from adolescence to adulthood. In addition to evaluating the construct validity of the new scales, this study documents cross-sectional associations between anxious and avoidant attachment and PD symptoms from the three main clusters in the DSM-IV. As indicated above, anxious and avoidant attachment dimensions distinguished between PD clusters best when supplemented with a simple measure of interpersonal aggression.

CONSTRUCT VALIDITY

The CIC anxious and avoidant attachment scales are internally consistent measures (mean $\alpha = .87$) that have reasonably high associations with corresponding dimensions on the standard ECR (mean $r = .71$), thus indicating convergent validity. These correlations are similar in magnitude to those found between other self-report measures of attachment (Brennan et al., 1998). Correlations between corresponding attachment scales were much higher than separate correlations between attachment dimensions and Big Five personality traits (mean absolute $r = .24$), thus showing discriminant validity. Correlations between unadjusted PD symptoms and anxious attachment (mean $r = .36$, range = .23 to .50) and avoidant attachment (mean $r = .12$, range = $-.07$ to .30) similarly indicate discriminant validity. Given little overlap between attachment avoidance and personality constructs, the avoidance dimension appears to capture differences in relational styles more than any underlying personality trait. Some might argue that associations between anxious attachment and neuroticism were too high for them to be separate constructs ($r = .59$ and $.50$ on the CIC and ECR scales, respectively). However, correlations between these variables in most studies generally converge on $.50$ (Shaver & Mikulincer,

2004), thus indicating that no more than 25% of the variance of one variable can be explained by the other. Moreover, theoretically important effects of attachment anxiety are obtained even when measures of neuroticism are statistically controlled (e.g., Mikulincer et al., 2002; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). For instance, anxious attachment is a better predictor of relationship quality and relationship outcomes than neuroticism when both predictors are included in regression models (Nofle & Shaver, 2006).

CIC scales provide information not available elsewhere on the stability of anxious and avoidant attachment across 17 years from adolescence to adulthood. Stability coefficients for attachment dimensions in the CIC sample were similar to those obtained previously for attachment styles from the four category model. When Klohnen and John (1998) assessed secure, preoccupied, fearful, and dismissing attachment styles in women from the Mills longitudinal study, they created scales from preexisting self-descriptive data gathered at mean ages 27, 43, and 52. Although these scales differ from the anxious and avoidant dimensions studied here, stability estimates from mean age 22 to 33 in the CIC study (mean $r = .51$) were similar to those from ages 27 to 43 in the Mills study (mean $r = .58$). Continuity from ages 16 to 33 in the CIC Study (mean $r = .39$) was lower than continuity across ages 27 to 52 in the Mills study (mean $r = .55$), perhaps indicating that attachment styles become more stable once people emerge from adolescence and settle into adulthood. Other studies spanning 1 to 2 years using different attachment scales produced similar results (Davila & Cobb, 2003; Davila, Karney, & Bradbury, 1999; Fuller & Fincham, 1995) after allowing for somewhat higher stability estimates across shorter time intervals.

ATTACHMENT, AGGRESSION, AND PERSONALITY DISORDER

Anxious attachment was moderately associated with all three PD symptom clusters before removing the effects of co-occurring PD symptoms. After this statistical adjustment, elevations in anxious attachment remained significantly associated with Clusters B and C symptoms. This outcome makes sense clinically insofar as borderline, histrionic, dependent, and avoidant PDs all manifest in elevated anxiety about abandonment, separations, and rejection (Bartholomew et al., 2001; Bornstein, 1992; Gunderson, 1996; Sheldon & West, 1990). Although attachment anxiety at mean age 16 lost significance as a predictor of Cluster B and C symptoms when overanxiety was taken into account, attachment anxiety at mean age 22 retained significance when overanxiety was added to the model. These different outcomes, however, were confounded by changes in how PDs were assessed (parent reports were included in adolescence but not afterwards), thus leaving it unclear if our findings reflect substantive changes or artifacts of measurement.

Adjusted Cluster A symptoms were associated with lower scores on anx-

ious attachment, especially in cross-sectional regression models taking avoidant attachment and aggression into account. Consistent with attachment theory, avoidant attachment may be one way to reduce unwanted anxiety or distress about relationships. Cluster A symptoms were also modestly associated with interpersonal aggression, which might also provide a defense against anxious attachment, especially when anxiety about others is transformed into suspicion and projected hostility instead. (See Mikulincer & Horesh, 1999, for experimental studies of attachment style and projection.) One might conclude that Cluster A symptoms reflect a dismissing style (high avoidance and low anxiety). However, this interpretation should be made with caution, especially since this effect was observed only after the effects of co-occurring PD symptoms were removed. While this adjustment can easily be made in statistical analyses, those same co-occurring symptoms will be fully present in individuals with elevated Cluster symptoms in the community.

Adjusted Cluster B symptoms were associated with high anxiety and low avoidance, a combination indicating preoccupied attachment. Adjusted Cluster C PDs were predicted by the same combination of high anxiety and low avoidance. Within Cluster C it is reasonable to ask why avoidant PD symptoms would be associated with low avoidance instead of high avoidance. Despite similarities in name, avoidant PD and avoidant attachment differ in important ways. As a psychiatric diagnosis, avoidant PD defines a broad pattern of avoidance in social and occupational contexts. Avoidant attachment, more narrowly defined, reflects an interpersonal style that helps people suppress unwanted feelings that might threaten important attachment relationships. Bartholomew et al. (2001) argue that people with avoidant PD may have initial difficulties getting close to others, but once they do establish a close connection they are often extremely reluctant to let it go. Once they become attached, in other words, people with avoidant PD often cling to relationships in preoccupied ways (i.e., high anxiety and low avoidance). In this context, it is no accident that avoidant PD correlates highly with dependent PD (Stuart et al., 1998).

As expected, it was difficult to distinguish between Cluster B and C symptoms insofar as both were associated with preoccupied attachment. These two symptom clusters were much more clearly distinguished by individual differences in interpersonal aggression. Given explicit diagnostic criteria for hostility and aggression in antisocial, borderline, and narcissistic PD, it is not surprising that Cluster B symptoms were linked with elevated aggression. Cluster C symptoms, in contrast, were negatively associated with interpersonal aggression. This is more noteworthy because diagnostic criteria for Cluster C do not specify any explicit avoidance of aggressive behavior. This finding is clinically relevant insofar as patients with Cluster A and B disturbances may need help modulating aggression and those with Cluster C disturbances may need help asserting themselves by expressing it instead.

This finding also invites questions about how attachment theory ac-

counts for individual differences in aggression. Bowlby (1973) conceptualized aggression as secondary to separation or loss. More recently, prospective associations have been found between disorganized attachment in children and later elevations in aggression (e.g., Lyons-Ruth, Easterbrooks, & Cibelli, 1997), perhaps reflecting how early disturbances in affect regulation can lead to later difficulties in modulating aggressive impulses in relationships (Fonagy, 2001). It may also be that deficits in conscience and empathy in Cluster B disorders (especially antisocial and narcissistic PDs) permit more aggression toward others, whereas overconscientiousness or abandonment fears in Cluster C disorders act to inhibit it instead. Cluster A disturbances, on the other hand, may involve entirely separate mechanisms that link aggression with psychotic spectrum disorders (Nestor, 2002). These mechanisms may be partly due to genetically mediated differences in personality rather than attachment relationships. Clearly, more research is needed to understand how aggression, insecure attachment, and PD are related.

SIGNIFICANCE AND LIMITATIONS

CIC attachment scales were convergent with standard ECR scales and consistently exhibited discriminant validity. As reliable and reasonably valid measures of anxious and avoidant attachment, the CIC scales contribute useful information not available elsewhere about the long-term stability of self-reported attachment in adolescence and adulthood. Furthermore, scales measuring attachment were related to PD in theoretically coherent and clinically useful ways. This study also showed how interpersonal aggression helps differentiate between overlapping attachment styles and PD clusters. Demographic controls in regression models suggest that these effects are unlikely to be attributable to age, gender, race, or SES.

Although attachment and PD scales sometimes included overlapping items, control measures ensured that this measurement artifact did not inflate any of the effects reported here. Overlapping items, however, may represent more than the specific limits to the item pool available in the CIC protocol. For instance, it is no accident that item overlap often occurred between dependent PD and anxious attachment insofar as both are fundamentally defined by abandonment fears. The two constructs are not redundant, however, because dependent PD is associated with low scores on avoidant attachment whereas anxious attachment is not.

This study may be limited by the use of single informants at mean ages 22 and 33. Although reliance on single informants may inflate self-reported associations between attachment, aggression, and PD symptoms, it should not influence the direction of these coefficients (+ or -) or the broader pattern of associations. This study may be further limited by some measurement variance in repeated measures of PD (Axis II scales included parent reports during adolescence but not at subsequent assessments). However, most self-report items in PD scales were used at all three assessments,

thereby lessening this potential threat to the validity of our findings. Because PDs were aggregated into symptom clusters, some specific patterns of association between individual PDs and attachment and interpersonal aggression may have been obscured. For instance, the relationship between anxious attachment and borderline and histrionic PD may have been diluted when these symptoms were combined with antisocial and narcissistic symptoms which may have more modest associations with attachment anxiety (Lyddon & Sherry, 2001). Similarly, interpersonal aggression probably manifests more in paranoid and schizotypal PDs than in schizoid PD, but this likely difference is not evident when Cluster A symptoms are aggregated.

Overall, our findings establish a foundation for ongoing investigations into developmental processes linking insecure attachment, interpersonal aggression, and PD. Now that associations between these variables have been established in PDs at the cluster level, more fine-grained research is needed at the level of individual PDs. Given longitudinal data in the CIC sample, future research is planned to investigate whether insecure attachment and interpersonal aggression have any unidirectional causal effects on subsequent PDs and vice versa. Data are available to test separate hypotheses that link insecure attachment, sexual abuse, and developmental pathways leading to PD in adulthood (Alexander, 1992). The CIC sample also has relevant parent-reported data that may help to show how disturbances in attachment relationships are transmitted across generations. In these and other ways, prospective data on attachment and aggression are expected to help clarify how personality disturbances emerge during development and evolve into PDs over time.

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