

Attachment representations in school-age children: the development of the child attachment interview (CAI)

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Abstract *This paper introduces a new measure of attachment in middle childhood (8–13 years), an interview extensively adapted from the AAI and with a new coding system. We report data from a series of studies with clinical and normal populations, in which the psychometric properties of reliability, stability and validity are tested and found to be satisfactory. Although work remains to be done, we see the Child Attachment Interview as a promising new attachment measure.*

Keywords Attachment; latency; middle childhood; child attachment interview.

Introduction

The development of attachment measures began with the assessment of infant behaviour in the Strange Situation Paradigm. This procedure and the establishment of its validity led to the ‘move to the level of representations’ (Main *et al.*, 1985), in the assessment of attachment patterns later in development. The greatest achievement here was the Adult Attachment Interview (AAI) (George *et al.*, 1985; Main, 1995). The measure described in this paper has drawn on both the infant and the adult paradigms and coding strategies, in an effort to produce an assessment of attachment in the middle school years.

Measures designed to assess attachment organization in infancy and adulthood have been widely applied and thus well established, but the study of attachment in early and middle childhood has proven more problematic. The measurement of attachment in infancy has been rightly restricted to the behavioural level whilst in adulthood it has been measured through language and representations. As Ainsworth (1990) argued, the chief concern in using a separation-reunion procedure comparable to the Strange Situation beyond infancy is that with increasing age, the degree of stress induced decreases as the child is gradually exposed to everyday separations of greater length.

In parallel, a plethora of instruments designed to elicit mental representations of attachment in early and middle childhood have been developed, all sharing the assumption that inferred mental representations reflect children's attachment organization. Semi-projective measures eliciting mental representations through drawings (Separation Anxiety Test SAT: Shouldice and Stevenson-Hinde, 1992; Slough and Greenberg, 1990), family photos and drawings (Main *et al.*, 1985), story stems (Bretherton *et al.*, 1990), and doll play (Solomon *et al.*, 1995) have also been employed with mixed results. Whilst these studies demonstrated associations between classifications derived behaviourally and representationally, the need to replicate such findings (Main, 1995), low test-retest reliability (Wright *et al.*, 1995), and questions of validity (Bowers *et al.*, 1994) highlight the need for further work.

Hence we were interested in trying to develop age appropriate measures for assessing how attachment patterns are manifested in middle childhood. Hitherto, there has been an assumption that children would not respond meaningfully when asked directly about attachment experiences. However, Ammaniti and his colleagues have extensive experience of administering a slightly modified version of the AAI protocol to early adolescents and pre-adolescents, and the interview material is coded using the usual AAI coding procedure (Ammaniti *et al.*, 1990, 2003). Similarly, Trowell has used the AAI in an important London study of sexually abused preadolescent girls, and found it acceptable (Trowell, personal communication). Adopting a representational approach, most measures have derived attachment classifications based solely upon an analysis of children's verbal responses. However, non-verbal communication, not limited to separation-reunion behaviour, may be a very useful source of information in identifying distinct attachment patterns, and would go some way towards integrating representational and behavioural approaches to the study of attachment.

The Child Attachment Interview (CAI) was thus developed in an attempt to complement existing attachment measures. Independently of the present authors, Dante Cicchetti and his colleagues developed a similar protocol, and have been administering it for a period of 10 years (Cicchetti, personal communication), but without a coding system. The present paper reports the development of our CAI protocol and coding and classification system and presents the major psychometric properties of the measure.

Participants

The total sample comprised a number of subgroups: 161 children aged 7–12, without known mental health problems, recruited from urban and rural schools. In addition there were 65 children referred for psychiatric assessment in specialist child mental health services. The demographics of these children, divided into referred and not referred, are shown in Table 1.

The mean age at interview was somewhat higher in the non-referred group, as was the proportion of girls, of middle class families, non-white children and those living in two-parent households. With the exception of age, which was significantly higher among the non-referred children because of the inclusion of a group of early adolescents, none of these differences approached statistical significance, that is, the referred children were comparable to those in the 'normal' group.

Table 1 Demographic characteristics of the two sample groups (not referred and referred)

	Psychiatric referrals vs. non-referred		
	Not referred (<i>n</i> = 161)	Referred (<i>n</i> = 65)	Statistic
Mean age (years) (SD)	11.1 (1.6)	10.2 (1.3)	$t = 4.1$, $df = 224$, $p < 0.001$
Mean verbal IQ (SD)	99.2 (18.8)	102.9 (18.3)	$t = 1.1$, $df = 156$, n.s.
% boys	50.3%	58.5%	$\chi^2 = 1.2$, $df = 1$, n.s.
% middle class	40.2%	33.9%	$\chi^2 = 0.65$, $df = 1$, n.s.
% white	70.0%	82.0%	$\chi^2 = 4.4$, $df = 2$, n.s.
% living with two parents	47.1%	44.4%	$\chi^2 = 0.50$, $df = 1$, n.s.

Procedure

Administration

Two interviewers with experience in the administration of the interview conducted the assessments. The CAI formed part of a larger battery of measures including, amongst others, measures of expressive language and IQ, administered over one to two sessions. The CAI was completed first and conducted in a private room with interviewer and child sitting face to face. Before the beginning of each assessment, the interviewer explained the nature of the study and ensured that the child felt at ease and consented to take part. The duration of the interview ranged from 20 min to 1 h, and the sessions were videotaped. For 28 children, all those recruited in the second phase of data collection, the AAI was also administered to the mother. All parents were asked to complete the Child Behaviour Checklist (CBCL) (Achenbach and Edelbrock, 1983). Following an interval of approximately 2 months, children recruited in the second phase were assessed again by the same interviewer, when only the CAI was completed, for evaluation of test-retest reliability.

Coding

There were three independent judges familiar with current attachment assessment methodologies, and involved in developing the current coding system. The first (YSG), then a doctoral student, coded the total sample, the second and third judges, final year Clinical Psychology trainees, each coded one half of the sample. Coding was based on the video-recorded interviews, to allow a behavioural as well as a linguistic analysis.

Measures

The CAI Protocol

The development of the interview protocol was conceptually based on the Adult Attachment Interview (George *et al.*, 1985) with several criteria in mind. First, akin to

the AAI, the CAI needed to activate the attachment system so as to elicit attachment-related information. Second, whilst the interview needed to be constructed so as to reveal structural variations in presentation, it also needed to be flexible enough to help children with the demands placed upon them, but without compromising validity. Third, in contrast to the AAI, we decided that the CAI should focus on recent attachment-related events and how the current relationships with each parent were represented.

Guided by the above criteria, the questions comprising the interview were initially taken from the Berkeley Autobiographical Interview (Main *et al.*, 1985) and the AAI, and adapted for use with children in the 7–12 years age range. The version of the interview reported on below (a second version, extensively modified following piloting) comprised 14 questions plus probes:

- (1) Who is in your family? (lives with you in your house).
- (2) Tell me three words that describe yourself (examples).
- (3) Can you tell me three words that describe what it's like to be with your mum (examples)?
- (4) What happens when mum gets upset with you?
- (5) Can you tell me three words that describe what it's like to be with your dad (examples)?
- (6) What happens when dad gets upset with you?
- (7) Can you tell me about a time when you were upset and wanted help?
- (8) What happens when you're ill?
- (9) What happens when you hurt yourself?
- (10) Has anyone close to you ever died?
- (11) Is there anyone that you cared about who isn't around anymore?
- (12) Have you ever been away from your parents for the night or for longer than a day?
- (13) Do your parents sometimes argue? Can you tell me about a time when that happened?
- (14) In what ways do you want/not want to be like your mum/dad?

The CAI coding and classification system

We adopted several principles in developing the CAI coding and classification system. First, we would not assume that the existing AAI coding system would be appropriate to the CAI. Second, we should assign attachment classifications separately for mother and father, and assess whether there were singular or multiple internal working models within this age range. Third, we segmented the interview into descriptions of interactions with parents, termed Relationship Episodes (REs). The concept of REs was informed by Luborsky's Core Conflictual Relationship Theme method, in which REs identified from psychotherapeutic sessions were studied (Luborsky and Crits-Christoph, 1990). Identifying REs revealed the richness of the information elicited and highlighted the importance of not only the linguistic content and form of the narrative, but also non-verbal communication as a key source of information.

The majority of the scales given below aimed to assess the child's overall current state of mind with respect to attachment, a state of mind which is assumed to be reflected in the narrative as a whole. However three of the scales, namely, Preoccupied Anger, Idealization and Dismissal were rated separately for mother and father and all ranged from 1, denoting a low score to 9, denoting a high score.

Emotional Openness

The Emotional Openness scale was developed in order to assess the child's ability to express and label emotions, and to ground them in descriptions of interactions with attachment figures. We were influenced by Sroufe's (Sroufe and Fleeson, 1986) affect-regulation model, and studies which have identified emotional openness as an important aspect of children's attachment-related narratives and a marker of security of attachment (Oppenheim, 1997; Slough and Greenberg, 1990; Wright *et al.*, 1995).

Preoccupied Anger

The CAI Preoccupied Anger scale was developed as an age-appropriate modified version of the Involving Anger scale of the AAI (Main and Goldwyn, 1994). We found that it was vital to underline the involving nature of the anger, and (in contrast to the AAI) to include involving denigration or contempt, as well as anger itself.

Idealization

The CAI Idealization scale was also conceptually based upon the AAI Idealization scale but was modified to reflect the responses given by children. It aimed to measure the extent to which the child attempted to present an unsupported picture of an 'ideal' parent.

Dismissal

This scale was used to assess active denial of attachment and the presentation of parents and attachment experiences as unimportant.

Self-organization

This scale attempted to capture the child's internal representation of self-efficacy, based on the presence of self-initiated and constructive conflict resolutions (Cassidy, 1988; Oppenheim, 1997; Sroufe *et al.*, 1983).

Balance of positive/negative references to attachment figures

This scale was based on the assumption that secure children would more readily recognize and integrate positive and negative aspects of parental figures, thus presenting a better-integrated and more balanced description of attachment figures.

Use of examples

Children's ability to provide relevant and elaborated examples was also considered a possible marker of security of attachment, as in the AAI where this is a key aspect of coherence.

Resolution of conflicts

Children's ability to describe constructive resolutions to conflicts has been closely linked to attachment security (Oppenheim, 1997) and was thus included in the CAI.

Overall coherence

Whilst no *a priori* assumptions were established concerning the centrality of the coherence of transcript in determining the child's attachment classification, it was considered an important dimension. The scale was rated on the basis of scores for 'Idealisation', 'Preoccupied Anger', 'Dismissal', and the 'Use of Examples', together with a consideration of the overall qualities of consistency, development and reflection.

Alongside the linguistic analysis, a simple behavioural analysis of children's responses to the interview situation and questions was included. Maintenance of eye contact, changes in tone of voice, marked anxiety, changes of posture in relation to the interviewer and contradictions between verbal and nonverbal expressions were considered when assessing emotional openness, coherence, idealization, preoccupied anger, etc.

Attachment classifications with respect to mother and to father, independently, were arrived at using an algorithm for combining the scale ratings. For instance, to obtain a Secure classification, the child must have been assigned a rating of approximately five or above on all CAI scales with the exception of the Idealization, Dismissal and Preoccupied Anger Scales where a score of three or less was expected. In our first coding scheme, the results of which are reported in the present paper, we further assigned a level of security: Secure/Very Secure/Insecure/Very Insecure, with respect to mother and father. Again, we specified algorithms for making this judgement. (Since the analyses reported below, and others, we have considerably developed the classification scheme, for example by incorporating qualitative differences within this basic framework).

A copy of the complete CAI Protocol, and Coding and Classification Manual, can be obtained from the first author.

Results

The results are presented in four main sections. The first question we looked at was whether coders could agree on their ratings, so first we report inter-rater reliabilities for scales and main and sub-classifications. Our next question was whether the secure-insecure types emerged from the scale scores. We address this by reporting the internal consistency of the coding system. Thirdly, we examined whether the child's interview behaviour would be consistent over time (the interview would be of little use as a

measure if the child said different things in different ways on each occasion): test-retest reliability over a 2-month period is presented, followed by an examination of AAI-CAI concordance for a sub-sample. Fourthly, we examined discriminant validity, to assess whether the child's attachment classification was significantly related to variables such as age, gender and IQ. Finally, we examined aspects of predictive validity: does the CAI relate in expected ways to mother's AAI? We report the results of these analyses below.

Internal consistency of CAI scales

Internal consistencies between three sets of scales were calculated: the five 'state of mind' scales (use of examples, balance, emotional openness, conflict resolution, and coherence) were highly intercorrelated, with a standardized item alpha of 0.92. This indicates statistically that the scales were tapping into a single construct. We also calculated the association between the four scales rated separately for mother and father (anger, dismissal, idealization and level of security). The standardized item alphas for these scales were moderate: in relation to mother 0.65, and father 0.55; this indicates that the three types of 'insecure' narrative, together with the overall level of security, when examined for representations of mother and father separately, did not cohere such that these scales seemed to be measuring a single entity. However, these three areas of our measurement of child attachment (state of mind, representations of mother and father) were very highly correlated: the standardized item alpha for these scales together was 0.94. Thus, a single variable summarizing security of attachment was created from these three sets of variables, and the measure was taken to be measuring a single construct (attachment).

Inter-rater reliability for CAI scales

Inter-rater reliability was computed twice, initially for three coders, and then with an improved coding system for two coders. Table 2 presents the intraclass correlations (ICCs) across three coders, and Pearson's correlations between pairs of coders. These statistics measure the extent to which a group of raters or a pair of raters, respectively, agree in their independent judgements. In the first attempt at establishing inter-rater reliability, only one scale (idealization of father) yielded unacceptable ICCs, with the confidence interval including a negative correlation. The median ICC was 0.88 which indicates very strong agreement between the three coders. The second assessment of inter-rater reliability, across 50 cases, also showed a high correlation between two raters, the median r being 0.87 with no unacceptably low agreements.

Inter-rater reliability for CAI main classifications

Main classifications, namely Secure or Insecure with respect to mother and father, were assigned. Agreement was assessed using the kappa statistic and Kendall's tau-b, which are standard measures of agreement between independent coders on a categorical judgement, e.g. secure vs. insecure. The relationships between classifications given by two and three coders are shown in Table 3; they are consistently high. For the three

Table 2 Inter-rater reliability of scale scores

	ICC for 3 coders (cases = 30)	Pearson <i>r</i> for 2 coders (cases = 50)
Emotional Openness	0.92 (0.85–0.96)	0.91 (0.85–0.95)
Balance	0.80 (0.63–0.90)	0.83 (0.72–0.90)
Use of Examples	0.87 (0.76–0.93)	0.87 (0.78–0.92)
Anger with Mother	0.82 (0.66–0.91)	0.94 (0.90–0.97)
Anger with Father	0.75 (0.52–0.88)	0.66 (0.47–0.79)
Idealization of Mother	0.71 (0.46–0.85)	0.89 (0.81–0.94)
Idealization of Father	0.38 (–0.15–0.69)	0.74 (0.58–0.84)
Dismissing of Mother	0.94 (0.89–0.97)	0.79 (0.66–0.88)
Dismissing of Father	0.94 (0.89–0.97)	0.79 (0.66–0.88)
Conflict Resolution	0.88 (0.79–0.94)	0.84 (0.73–0.91)
Coherence	0.90 (0.82–0.95)	0.90 (0.83–0.94)
Level of security: Mother	0.91 (0.83–0.95)	0.89 (0.81–0.94)
Level of security: Father	0.90 (0.81–0.95)	0.89 (0.81–0.94)

Table 3 Agreement on attachment classifications across 3 coders, and 2 coders

	3 coders (cases = 30)		2 coders (cases = 50)	
	median kappa (range)		Kappa	
	Mother	Father	Mother	Father
Secure/insecure	0.92 (0.84–0.92)	0.92 (0.85–0.92)	0.79	0.84
3-way	0.84 (0.84–0.85)	0.86 (0.78–0.93)	0.58	0.66
4-way	0.83 (0.74–0.89)	0.86 (0.77–0.89)	0.60	0.54
Disorganization	<i>n</i> too small to estimate		0.79	0.88
	Median Kendall's tau-b (range)		Kendall's tau-b	
Level of security	0.58 (0.52–0.59)	0.67 (0.56–0.74)	0.82	0.84

coders, the number of disorganized classifications was too small to estimate agreement, but with a larger group of cases yielded acceptable kappas, although they were somewhat low for three- and four-way categorization. The level of security rating was substantially improved.

Test-retest reliability (stability)

Forty-six children were retested 3 months after the first CAI (Tables 4 and 5) to find out whether their attachment representations were similar on the two occasions.

On the whole, stability coefficients were quite high, and the median is 0.63. There was considerable variability in the stability of the scales, for example while Anger with Mother appeared to be highly stable across 3 months, Anger with Father was far less so. Also, Idealization of both parents was somewhat unstable, but by contrast, Emotional Openness, the Use of Examples, and Coherence seemed highly consistent between

Table 4 Test-retest reliability (stability) of scale scores

	Test-retest: 3 months (<i>n</i> = 46)	Test-retest: 1 year (<i>n</i> = 33)
Pearson <i>r</i>		
Openness	0.70	0.63
Balance	0.55	0.35
Examples	0.66	0.57
Anger M	0.90	0.54
Anger F	0.29	0.25
Idealize M	0.52	0.25
Idealize F	0.42	0.08
Dismiss M	0.71	0.44
Dismiss F	0.63	0.39
Conflict Res	0.58	0.34
Coherence	0.68	0.75

Table 5 Test-retest reliability (stability), at 3 months and 1 year, of classifications of security with mother and father

	3 months (<i>n</i> = 46)		1 year (<i>n</i> = 33)	
	Mother	Father	Mother	Father
	Kappa			
Secure/insecure	0.74	0.68	0.73	0.68
3-way	0.77	0.64	0.79	0.71
4-way	0.78	0.67	0.78	0.66
Disorganization	1.00	1.00	0.72	0.52
Kendall's tau-b				
Level of security	0.79	0.75	0.65	0.60

testings. Of the parent-specific scales, only Dismissing was highly stable for both mother and father. The classification across 3 months was quite stable across 46 cases. The security classification for representation of mother was 0.75 or above, and for father was 0.65 or above. Interestingly, all the children who were coded disorganized on one occasion were coded the same 3 months later.

Thirty-three children were retested 1 year after their initial assessment (Tables 4 and 5). Not surprisingly, the stability of the scale scores was moderate across this longer interval, median correlation 0.40. Again, there was considerable spread: Emotional Openness, Use of Examples, and particularly Coherence, were quite stable, whereas the parent-specific scales particularly Idealization and Anger with Father, were quite variable. Nevertheless, the classification arrived at by coders was relatively stable, and only slightly below the coefficients obtained with a gap of 3 months between testings.

Table 6 Relationship between attachment classification with mother and father, and demographic variables and verbal IQ

	Mother			Father		
	Secure	Insecure	Statistic	Secure	Insecure	Statistic
Age: mean (SD)	11.3 (1.5)	10.8 (1.7)	F = 3.2, df = 1,184, n.s.	11.2 (1.5)	10.9 (1.7)	F = 2.1, df = 1,174, n.s.
Verbal IQ: mean (SD)	99.5 (18.9)	101.0 (18.6)	F = .20, df = 1,117, n.s.	99.6 (19.6)	99.9 (18.6)	F = 0.01, df = 1,109, n.s.
No. (%) boys	54 (46.2%)	38 (55.1%)	$\chi^2 = 1.1$, df = 1, n.s.	51 (48.1%)	36 (51.4%)	$\chi^2 < 1$, df = 1, n.s.
No. (%) middle class	35 (48.6%)	17 (35.4%)	$\chi^2 = 1.5$, df = 1, n.s.	32 (49.2%)	17 (34%)	$\chi^2 = 2.1$, df = 1, n.s.
No. (%) white black asian	86 (73.5%) 23 (19.7%) 8 (6.8%)	47 (70.1%) 13 (19.4%) 7 (10.4%)	$\chi^2 < 1$, df = 2, n.s.	77 (72.6%) 22 (20.8%) 7 (6.6%)	50 (72.5%) 12 (17.4%) 7 (10.1%)	$\chi^2 < 1$, df = 2, n.s.
No. (%) living with both parents	34 (46.6%)	31 (45.6%)	$\chi^2 < 1$, df = 1, n.s.	33 (53.2%)	32 (47.1%)	$\chi^2 < 1$, df = 1, n.s.

Overall, these test-retest reliability figures are encouraging, and suggest that generally speaking children's security classifications can be expected to be stable.

Discriminant validity

The vital question arises as to whether stability in manner of attachment representation is observed because of actual consistency in attachment status, or whether it reflects other stable aspects of the child, such as IQ, gender, socio-economic status, expressive language capacity, or ethnicity. This issue of discriminant validity is addressed, for the non-referred sample, in Table 6.

There was no statistically significant difference between the mean age of children classified as secure or insecure with each parent. There was a slight and non-significant tendency for children insecure with their mothers to be younger. Neither gender nor social class predicted security of attachment, and the prevalence of black or Asian children was comparable in the secure and insecure groups. In this non-clinical sample, the percentage of children living with both parents was no higher in the secure than in the insecure group. Importantly, Verbal IQ was almost identical among children with secure vs. insecure representations of attachment security with each parent. This is crucial given the weight attached to linguistic coherence in the coding of attachment representations. On a subsample of 88 children, expressive language scores were also collected. There was a slight but statistically non-significant superiority for children secure with their mothers in their expressive language at the time of the CAI administration ($F = 2.9$, $df = 1,86$, n.s.). Security with respect to father was associated with expressive language to a similar degree ($F = 2.7$, $df = 1,82$, n.s.).

Predictive validity

The relationship between mothers' current state of mind with respect to attachment as assessed by the AAI, and their children's attachment status as assessed by the CAI, was examined for 75 children. The correspondence between main attachment classifications for mother-child dyads was highly significant (64% agreement; $k = 0.29$, $p < 0.01$). Twenty-one of the 39 children rated as Secure as assessed by the CAI had Secure mothers as assessed by the AAI (54%). Twenty-seven of the 36 children classified as Insecure by the CAI had Insecure mothers as classified by the AAI (75%). Interestingly, none of the seven children classified as Preoccupied, and only one of the six children classified as Disorganized, had mothers with AAIs classified as Secure ($\chi^2 = 10.2$, $df = 3$, $p < 0.02$). The association was just as strong between mothers' AAIs and the child's attachment security with respect to father (65% agreement; $k = 0.29$, $p < 0.01$). Again, none of the eight children classified as Preoccupied with respect to Father, and only one of the six children classified as Disorganized, had mothers with AAIs classified as Secure ($\chi^2 = 11.4$, $df = 3$, $p < 0.01$). Exploring these associations from the point of view of mothers' attachment classification, it once again seemed that Preoccupied and Secure classifications were more predictive (in opposite directions) of the child's security: 20 of 29 (69%) of Secure/Autonomous mothers had children whose CAIs were secure with respect to mother, and 19 of 29 (66%) had children who were secure with respect to

father; 18 of 25 Preoccupied mothers had children with Insecure classifications with respect to mother (72%), and 82% were insecure with respect to father. Unresolved (U/d) classification on the AAI ($n = 36$) did not predict child insecurity in relation to either father or mother. Whilst U/d did not predict insecurity, Atypical (disorganized) CAI classifications with respect to both mother and father were only found in cases where the mother's AAI had been classified as Unresolved.

Discussion

In addressing the existing 'measurement gap' in measures of attachment for middle childhood, the series of studies reported here had three aims. First, to construct a developmentally sensitive interview protocol for the assessment of attachment in middle childhood, and to develop a coding and classification system. The second was to establish the psychometric properties of the newly developed system. The third was to suggest where these studies need to go next. The summary and discussion of findings will follow this logic used in developing the measure.

The CAI protocol and coding system

Underpinning the development of the CAI protocol was the assumption that children would be able to comprehend and thus respond to direct questions concerning attachment experiences and relationships, and that variations in the presentation of these experiences would reflect their internal attachment organization. Whilst piloting Version I of the CAI interview protocol clearly demonstrated that children could understand and respond coherently to direct questions concerning attachment-related themes, it also highlighted the need for refinements. Version II of the CAI protocol was subsequently devised and included more focused prompts used as 'scaffolding' to assist children in producing attachment related narratives.

We are still refining and experimenting with means of coding and classifying these interviews. The version reported here involved a set of nine-point scales adapted from the AAI for this age range, a binary secure-insecure distinction, four levels (subclassifications) of security-insecurity, and a four category qualitative coding which largely maps onto the AAI coding system. Our current priority is to improve the psychometric properties of the system as a whole by further defining the Preoccupied and Disorganized categories, by studying tapes of interviews with children from clinical samples, and developing a simpler coding scheme (using a procedure more often used in personality research, called a Q-Sort), requiring less inference and knowledge of attachment theory, for reliable use by less experienced coders. Our early results on this are promising.

Psychometric properties

Internal consistency of the scale scores was high, and supported the assumption that the measure was indeed tapping a coherent construct and quality in the children's responses. However, these results might reflect the measurement of a construct associated with

security of attachment such as intelligence, hence the need for further investigations as reported.

The next step was to establish the degree of agreement between raters. Agreement between judges for all CAI scales was high, and was improved to an excellent level by refining the coding manual. Inter-rater agreement for the secure-insecure distinction and for the overall level of security was in addition shown to be high for both mother and father, showing that the current CAI coding and classification system allows experienced raters consistently to distinguish between Secure and Insecure interview responses. Agreement for the four main classifications with respect to both mother and father was acceptable, with the Preoccupied category the least frequent and least reliable. This mirrors experience with the AAI, in which Preoccupied attachment status is relatively unusual and probably harder to recognize confidently than Secure and Dismissing patterns. We were encouraged that disorganization of attachment strategy, reflected at either a behavioural or a representational level, was easy to agree on for this sample.

Test-retest reliability (stability) across a 3-month or 1 year period, using a different coder for the two time points, produced somewhat mixed results. Consistency in scale scores was adequate at 3 months, but only found for certain scales after a gap of a year. However, the stable scales included the most important ones: Coherence, Use of Examples and Emotional Openness were all very stable, while Dismissing ratings were also reasonably consistent. Test-retest reliability for the Secure-Insecure distinction and for the four main attachment classifications and with respect to both mother and father were all remarkably high, even after an interval of 1 year. This stability of the Secure-Insecure distinction was comparable with reported infant and adult data (in adulthood, Bakermans-Kranenburg and van IJzendoorn (1993), reported stability across 1–15 months ranging from 77–90%; Lamb *et al.* (1985), found 77.1%; Waters (1978), found 96% stability in infants across a 6-months interval). Stability of scales has been scarcely reported with respect to other attachment measures. Waters (1978) reported that reliability of discrete behaviour variables in the Strange Situation was very low across a 6-month period. Wright *et al.* (1995) reported that test-retest reliability for the Separation Anxiety Test following a 4-week interval did not reach statistical significance. AAI stability data has not been presented, to our knowledge.

We had been apprehensive about whether we would find that the CAI showed discriminant validity. Would relatively 'secure' attachment narratives turn out to be simply a product of higher IQ or expressive language skills, of being older, middle class, a girl, or of any other extraneous variable? The evidence thus far is that, at least in normal samples, these concerns have not been borne out. It seems that the CAI is measuring something which is weakly related to but not accounted for by major demographic and cognitive variables.

Predictive validity for attachment within mother-child dyads (AAI-CAI) was shown to be high, and comparable to that reported for infant-mother concordance rates based on the Strange Situation. The prediction seemed to be strongest in cases where the child was insecure, whereas a relatively high proportion of secure children had insecure mothers. Preoccupation and Disorganization of attachment behaviour or narratives were

particularly likely to be associated with insecure attachment classification of the mother's AAI.

The findings presented here suggest that it is unnecessary to adopt a projective approach in assessing attachment status in middle childhood. Children can respond to direct questioning concerning attachment-related experiences and their responses appear to reflect their internal attachment organization.

There are many further refinements which we are working on, particularly to the coding procedure. We have space only to give one example. One of our aims in the development of the CAI coding and classification system was to integrate both linguistic and behavioural information. However, the attachment coding reported here was based primarily upon a linguistic analysis of the content and form of attachment-related narratives, and the integration of nonverbal information was, although guided by theory and by the behavioural coding of attachment behaviour in preschool children, still largely intuitive. The need to develop a coding system that incorporates detailed behavioural information is important, not only because such information will potentially illuminate differences in attachment organization that may otherwise not be detected, but also because such an approach would go some way to bridge the gap between the study of attachment in infancy and adulthood. The CAI could be a unique tool in that the child's behaviour during the interview forms the background against which the child's linguistic representation of attachment figures and relationships can be assessed. Since the presentation summarized here, we have begun to explore the use of some principles from facial-action coding and from mother-infant interaction studies (the work of Anstadt *et al.* (1997) and Beebe *et al.* (1997) respectively).

Although beyond the scope of the present report, we have undertaken qualitative analyses of the relationship between self-representation and attachment relationships. The self-concept question that opens the interview suggests that—as one might expect from the developmental and clinical literatures—secure children differ from their insecure counterparts in describing the self. Their self-descriptions are likely to be more mixed and better rooted in specific examples. It is also noticeable that secure children often introduce humorous, self-deprecating descriptions and examples (e.g. 'I think I'm funny, but my family don't laugh at my jokes . . .', 'Why do you think that is?' 'Probably because I've told them a thousand times before!'), which suggest more acceptance and liking of the self than do the idealized self-descriptions ('great at football', 'normal') sometimes offered by dismissing children, or the often troubled and troubling ones offered by preoccupied children ('always there to help my Mum', 'hidden'). There is a wealth of material to explore in these interviews, both quantitative and qualitative.

We believe that, taking the above findings and our continuing work together, we are on the track of a useful new assessment tool for research and theory in both the developmental and the clinical realms, and we look forward to offering further reports of the work as it proceeds.

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