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RESEARCH ARTICLE

THE CHILD ATTACHMENT INTERVIEW:

A PSYCHOMETRIC STUDY OF RELIABILITY AND VALIDITY.

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Abstract

Whilst well-established attachment measures have been developed for infancy, early childhood and adulthood, a ‘measurement gap’ has been identified in middle childhood, where behavioral or representational measures are not yet sufficiently robust. This paper documents the development of a new measure – the Child Attachment Interview (CAI) – which seeks to bridge this gap. The CAI is a semi-structured interview, in which children are invited to describe their relationships with their primary caregivers. The coding system is informed by the Adult Attachment Interview (AAI) and the Strange Situation Procedure (SSP), and produces four attachment categories along with a continuous measure of attachment security based on ratings of attachment-related dimensions. The main psychometric properties are presented, including inter-rater reliability, test-retest reliability, concurrent and discriminant validity, both for normally developing children and for those referred for mental health treatment. The CAI correlates as expected with other attachment measures, and predicts independently collected ratings of social functioning. The findings suggest that the CAI is reliable, valid and a promising measure of child-parent attachment in middle childhood. Directions for improvements to the coding system are discussed.

Key Words: Attachment, Middle Childhood, Psychometric Properties.

Introduction

The nature of attachment relationships has been the subject of empirical investigation for half a century and has given rise to an impressive body of literature. The quality of parent-child relationships during infancy and early childhood has been considered to constitute a significant factor in later personality and the development of psychopathology (Dozier, Stovall, & Albus, 1999; Green & Goldwyn, 2002; Greenberg, 1999; Weinfield, Whaley, & Egeland, 2004). Several studies have demonstrated associations between insecure attachment with the primary caregiver(s) in infancy and poor social competence and peer relations, increased hostility and aggression, and lower ego resilience in the preschool and preadolescent years (Lyons-Ruth, Connell, Zoll, & Stahl, 1987; Shaw & Vondra, 1995; Sroufe, 1983; Sroufe, Egeland, & Kreutzer, 1990; Stams, Juffer, & van IJzendoorn, 2002; Urban, Carlson, Egeland, & Sroufe, 1991). Recent research has clarified that social context critically moderates the strength of such predictions and interacts with specific classes of attachment. Belsky and Fearon (Belsky & Fearon, , 2004) have analyzed the National Institute of Child Health and Human Development (NICHD) dataset to clarify the relationships between attachment insecurity and poor developmental outcomes. Social contextual risk factors helped to predict some preschool outcomes (e.g. cognitive development indexed by readiness for school) and moderate the direct influence of attachment for others (e.g. social competence and expressive language). While all children were affected by high contextual risk, those who had been avoidant as infants showed impaired social-emotional and language development at intermediate levels of environmental risk. This helps us to understand why the relationship between early attachment and adult attachment may be more readily observed in high-risk samples relative to low-risk ones (Hamilton, 2000; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; Weinfield, Sroufe, & Egeland, 2000). Moreover,

attachment insecurity in infancy and early childhood has been shown to predict various forms of psychopathology in adolescence and adulthood (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Warren, Huston, Egeland, & Sroufe, 1997). What has been somewhat lacking is a better understanding of the way in which the attachment system interfaces with personality development (e.g. Allen et al., 2003; Larose & Bernier, 2001; Marsh, McFarland, Allen, McElhaney, & Land, 2003; Ziv, Oppenheim, & Sagi-Schwartz, 2004) and the emergence of psychopathology in middle childhood (e.g. Bar-Haim et al., 2002; Easterbrooks, Biesecker, & Lyons-Ruth, 2000). One reason for this lack may be the absence of appropriate measurement instruments for assessing attachment in the school years.

Two measurement approaches have dominated attachment research. Prototypical of the first, the Strange Situation Procedure (SSP) (Ainsworth, Blehar, Waters, & Wall, 1978) was developed to examine infants' and toddlers' behavioral strategies for maintaining proximity to their attachment figures. The publication of Main, Kaplan and Cassidy's seminal paper (Main, Kaplan, & Cassidy, 1985) describing the development of an interview-based method, the Adult Attachment Interview (AAI) (George, Kaplan, & Main, 1985), marked an important turning point in the study of attachment beyond infancy and represents the second dominant measurement approach. Described by Main et al. (Main et al., 1985) as the "move to the level of representations," the AAI was conceived as a way of predicting infants' Strange Situation attachment patterns and was conceptualized as requiring individuals to recount and reflect upon early attachment-related relationships and experiences whilst maintaining coherent and collaborative discourse. The strongest predictor of infant security of attachment was the coherence of the transcript. Coherence was conceptualized in part as the consistency between semantic and episodic memory and illustrated in terms of adherence to – and violations of – Grice's (1975) maxims of discourse, including quality, quantity, relation and manner. Numerous studies have

established the reliability and validity of both the SSP (Bar-Haim, Sutton, Fox, & Marvin, 2000; Fonagy, Steele, & Steele, 1991; Pederson & Moran, 1996; Vaughn, Lefever, Seifer, & Barglow, 1989) and the AAI (Bakermans-Kranenburg & van IJzendoorn, 1993; Benoit & Parker, 1994; Crowell, Waters, Treboux, & O'Connor, 1996; Hamilton, 2000; Scharf, Mayseless, & Kivenson-Baron, 2004; van IJzendoorn, 1995; van IJzendoorn & Bakermans-Kranenburg, 1997), and have led to an exponential growth in the study of attachment relationships.

Whilst measures designed to assess attachment organization in infancy and adulthood are well established, the study of attachment in early and middle childhood continues to prove a challenge. In recent years, many new measures have appeared, including modifications of the behavioral approach of the SSP and representational instruments. In the preschool years, separation-reunion procedures akin to the SSP have yielded analogous attachment classifications for 2.5- to 4.5-year olds (Ainsworth et al., 1978) and for 6-year olds (Main & Cassidy, 1988). However, the absence of a sequence of critical moments in the behavioral assessment of separations and reunions comparable to those provided in the SSP, coupled with children's growing verbal abilities, poses difficulties in developing reliable behaviorally-derived classification systems for these age groups. While some studies employing separation-reunion procedures have reported clear associations between children's responses and attachment representations (George et al., 1985), others have demonstrated only weak associations and moderate-to-low stability over time (e.g., Main & Cassidy, 1988; Shouldice & Stevenson-Hinde, 1992; Slough & Greenberg, 1990). SSP studies examining the stability of attachment patterns from infancy to preschool have produced mixed results, with stability ranging from 38% to 72% (Bar-Haim et al., 2000; NICHD Early Child Care Research Network, 2001).

Many researchers have developed semi-projective procedures for early and middle childhood, driven by the supposition that inferred mental representations would

reflect/represent children's attachment organization in the same way that behavior patterns do. An infant or child showing behaviors considered to reflect an insecure attachment is thus assumed to hold a set of expectations that he/she is unloved, and will not receive comfort and support, captured in his/her projective response to an attachment–related drawing or story. Mental representations have been elicited through a variety of procedures: the Separation Anxiety Test (SAT) (Cassidy, Marvin, & The MacArthur Working Group on Attachment, 1989; Crittenden, 1992; Moss, Bureau, Cyr, Mongeau, & St-Laurent, 2004), family photos (Main & Cassidy, 1988), family drawings (e.g. Madigan, Goldberg, Moran, & Pederson, 2004), and a number of attachment-focused doll play procedures (e.g., Main & Cassidy, 1988; Shouldice & Stevenson-Hinde, 1992; Slough & Greenberg, 1990). Most studies have used behavioral and representational instruments, together with, on occasion, longitudinal prediction from parent-infant attachment and/or assessment of maternal attachment status, in an attempt to validate these measures. These have demonstrated the expected associations between classifications derived behaviorally and representationally, and to an extent between the attachment representations of child and mother (Gloger-Tippelt, Gomille, Koenig, & Vetter, 2002; Goldwyn, Stanley, Smith, & Green, 1999; Green, Stanley, Smith, & Goldwyn, 1999). However, for school-age children, the available assessments, mainly the SAT, have not attained the rigorous validation of the SSP and the AAI, and there is concern about low test-retest reliability (e.g., Wright, Binney, & Smith, 1995) and validity (e.g., Bowers, Smith, & Binney, 1994; Madigan, Ladd, & Goldberg, 2003; Resnick, 1997). Additionally, representational measures assume that children apply knowledge of their own family to the standard drawings, failing to consider that elicited representations may reflect other (e.g. cultural) ideal representations, or representations that are not veridical/which contain distortions of the child's own subjective experiences. Semantic knowledge of cultural stereotypes, wishful thinking, or episodes witnessed second-hand, do not necessarily tell us anything helpful about the child's expectations of his or her own attachment figures'

emotional availability. This paper aims to explore the possibilities of more direct personal assessment.

The predominance of indirect projective approaches to the study of attachment in the preschool and middle childhood years is due to the premise that attachment organization cannot be captured through direct questioning. Nevertheless, some investigators have used a version of the AAI (Ammaniti et al., 1990; Slough & Greenberg, 1990) to ask 10-16-year olds directly about attachment relationships and experiences. It seems likely that, at least in the younger age range, these interviews under-represent disorganized attachment representations and over-represent dismissing attachment strategy (Ammaniti, van IJzendoorn, Speranza, & Tambelli, 2000), because of developmental differences. Children may show attachment disorganization through many aspects of behavior not tapped by the AAI coding, e.g., silly or regressive behavior with the interviewer, slipping into talking about fantasy events, adopting a stylized manner copied from an action hero, becoming suddenly inappropriately intimate with the interviewer, and making grimaces while continuing to speak fairly coherently. For example, in the Trowell study of known sexual abuse, none of the girls was classified as showing disorganization of attachment (Personal Communication). While it might be that the girls had 'rehearsed' their abuse histories in earlier interviews such that disorganization of abuse narratives was not seen, it is worth considering whether there were non-verbal signs not captured by the adult coding system.

More recently, several questionnaires have been developed (Kerns, Schlegelmilch, Morgan, & Abraham, 2005), asking children to rate statements that refer to their expectations, affect and behavior in relation to a specific attachment figure. Statements are rated along a security continuum and for Avoidant and Preoccupied coping. These scales show adequate internal consistency and two-week test-retest reliability. Whilst the Security and Avoidant scales have proven to be correlated with other measures of

attachment, the Preoccupied scale did not show a consistent pattern of associations with other attachment measures (Kerns, Tomich, Aspelmeier, & Contreras, 2000).

We have attempted to find a better compromise between indirect assessment of representations and simply using an adult interview and coding system. In this way we hoped to help overcome what has been called the 'measurement roadblock' in attachment (Greenberg, 1999) by developing a new interview to assess children's internal models of attachment relationships based on questioning them directly about their experiences with, and perceptions of, their primary caregivers.

Several central conceptual and methodological considerations guided the development of the CAI. First, the 'set goal' of the attachment system during the middle childhood years is no longer considered to be physical proximity, but rather the availability of the attachment figure (Bowlby, 1987, cited in Ainsworth, 1990). As such, any measure should attempt to assess the degree to which children perceive their parents as available and accessible should the need for help arise (Kerns et al., 2005). Second, , we cannot assume that an integrated 'state of mind' with respect to attachment has been achieved in middle childhood (Bretherton, 1985), although this is expected to have happened by adulthood, and there is evidence that it does happen in ⅔ of cases by college age (Furman & Simon, 2004). In infancy, children seem to have independent working models of attachment in relation to their caregivers; this may still be the case for the school-age child. Third, in light of evidence that young children tend to describe themselves in terms of the immediate present (Damon & Hart, 1982), and that this tendency is also shown in children's memory and recall capacity (with younger children demonstrating a memory bias towards recent events) (Fitzgerald, 1981),, it may be more appropriate to ask children about current rather than past relationships as in the AAI. Fourth, special consideration should be given to the way in which narratives are elicited, highlighting the need for a developmentally appropriate interviewer stance. Such an approach would allow us to

distinguish a developmental limitation (expressed through an impoverished narrative) from a dismissing strategy. Furthermore, the lack of "narrative diachronicity" (Bruner, 1994) of child and adolescent narratives has to be distinguished from a preoccupied or disorganized attachment strategy. . Nor does lack of coherence necessarily reflect attachment insecurity; it might simply reflect child's "linguistic egocentricity" (Piaget, 1923).

These considerations indicate the need for an age-specific interview and coding system when assessing attachment status through narratives. The interviewer needs to provide 'scaffolding' (appropriate cues) to help children to remember attachment experiences (see Nelson, 1993). While purely behavioral measures of attachment (separation and reunion) are no longer appropriate in the school years, children cannot yet fully mask or control behaviors that indicate anxiety or other emotions. Coding of non-verbal behavior is therefore available as an additional helpful indicator of attachment strategies.

There is a controversy within attachment research over whether attachment behaviors or representations should be described using continuous or categorical variables (see *Developmental Psychology*'s special section in May 2003). Whilst linear scales have often been constructed as complementary to the classification systems, relatively few studies have adopted a dimensional approach in establishing attachment organization. The coding and classification system of both the CAI and AAI represents a compromise between the two. The traditional categorical approach and the identification of fairly broad categories does not allow for a fine-tuned analysis of distinct attachment dimensions and their possible interaction, which may have predictive value in this still-formative period of development. Recently, conclusive evidence has emerged from a taxometric study that secure versus dismissing discourse on the AAI is a continuously distributed dimension (Roisman, Fraley, & Belsky, in press), and that some of the categories such as 'earned secure' are difficult to identify in such investigations. In

developing the CAI, we have pursued both strategies, and anticipate that further research will clarify whether a continuous measure of insecurity or a categorical system will provide greater powers of prediction.

A general problem in the development of attachment instruments has been that they have been standardized on relatively small samples of the normal population and then applied to clinical and high risk groups (e.g. Wallis & Steele, 2001). We felt that the CAI should be developed using a sufficiently large group, including clinical as well as normative samples. In addition, the stability of attachment classification across time is a vital aspect of validity, and yet has rarely been considered.

For the above reasons, the CAI seeks to assess children's perceptions of their attachment figures' current availability, elicits separate representation of attachment figures, includes developmentally appropriate scaffolding, relies upon non-verbal as well as verbal communication in the analysis of narratives, and is piloted and validated on both normative and clinical samples.

This paper presents some of the findings relating to the CAI's psychometric properties for both clinical and non-clinical samples of adequate size, focusing on aspects of reliability and discriminant validity. Inter-rater reliabilities with expert as well as naïve coders are reported, followed by test-retest reliability across a 3-month and a 12-month interval. The discriminant validity of the CAI is examined by testing the relationship between attachment classifications and age, gender, and socioeconomic status. The CAI is a narrative-based assessment that relies upon a level of linguistic competence; therefore the relationship between expressive language competence, IQ and attachment is explored. The construct validity of the CAI is examined in three domains: the overlap with other narrative-based measures of attachment and the SAT (Wright et al., 1995); the correspondence between attachment classification of parent and child based on the AAI and previous robust findings of intergenerational consistency of attachment classifications

(van IJzendoorn & Bakermans-Kranenburg, 1996); and a multi-domain measure of adaptation, the Hampstead Child Adaptation Measure (Target, Fonagy, Schneider, Ensink, & Janes, 2000), a caregiver interview coded on fourteen dimensions. As per Belsky and Fearon (Belsky & Fearon, 2002), we predict that some of these domains are related to attachment (e.g. impulse control and parent-child relationships), whilst others, theoretically unrelated to attachment, are not (e.g. psychosexual development and physical self-care).

Method

Participants

227 children took part in at least one CAI to evaluate its psychometric properties. 161 of these children, aged 7-12, without known mental health problems, were recruited from urban and rural schools. The representative sample consisted of 301 children whose parents were approached for permission for their children to participate in a study of social and emotional development in childhood. Ten of these children met one of a small number of exclusion criteria (the child or main carer not speaking English to the level of an average seven-year old, the child being the subject of current family court proceedings, or the child the child having previously established learning disability, significant sensory loss or severe mental health problems). The final sample where both parents and child gave informed consent represented 55% of those eligible. A clinical sample was drawn from 100 children aged 7-12, consecutively referred for psychiatric assessment to three London specialist child mental health clinics. Eleven of these met exclusion criteria. The remaining 89 were approached to participate in the study. The exclusion criteria here were the same except that among mental health problems, only psychosis and autistic spectrum disorders were excluded. Approximately 55% (161) of the schools sample approached agreed to participate, as did 73% (65) of the clinic sample. The demographics of these children, divided into referred and not referred, are shown in Table 1.

[Table 1 about here]

The mean age at interview was significantly higher in the non-referred group. No other differences approached statistical significance. A subsample of 46 was drawn for a three-month test-retest. An independent subsample of a further 33 children was identified to take part in the one-year follow-up.

Measures

The CAI Protocol. The interview protocol was developed according to three assessment models: the AAI (in which narrative is analyzed); the SSP (focusing on behavior in current attachment relationships); and Luborsky's division of narrative about relationships into 'relationship episodes' (REs) (Luborsky & Crits-Christoph, 1990). The protocol of questions was closest in content to the AAI, as the CAI also needed to activate the attachment system to elicit attachment-related information. However, the style was considerably different: the interview needed to be consistent enough to reveal structural variations in response and flexible enough to help children with its demands without compromising validity. A further important difference was that the CAI focused on recent attachment-related events and current attachment relationships rather than the memory of relationships in earlier childhood. The interview needed on average to be about half the length of the AAI, owing to the restricted attentional capacity of younger children. Guided by the above criteria, the questions comprising the Berkeley Autobiographical Interview (Main et al., 1985) and the AAI (George et al., 1985) were reviewed and, where possible, adapted for use with 7-12-year olds. A number of pertinent issues concerning the child's experience of conflict with caregivers, often described in the pilot interviews, required new questions about arguments with and between parents. A further important difference from

the AAI was the inclusion of a set of questions about the child's perception of him/herself as a person at the beginning of the interview, partly to help the child get used to talking with a stranger about personal matters, but also to investigate possible meaningful links between self-descriptions and attachment representations.

The current version of the CAI [see Appendix] comprises 15 questions. The interview opens with a warm-up question eliciting information relating to family composition. This is followed by a series of questions tapping the child's self representation, representations of his/her primary caregivers, times of conflict, distress, illness, hurt, separation and loss. Throughout the interview, additional probes are used to elicit relevant instances or episodic detail; the main probes are indicated in the protocol [see Appendix]. The interviewer also provides 'scaffolding' to assist the child in telling the story; typically, this means giving non-specific, interested comments such as 'is that what usually happens?.... did you?.. is there anything else you remember? … that is a good example, can you tell me more about it? … Was it after school? Who was there?'

The CAI Coding and Classification System. The coding and classification system was also partly modelled on the AAI (Main & Goldwyn, 1994), but it also incorporated elements of behavioral coding based on videotapes, and segmented narratives into 'relationship episodes' (Luborsky & Crits-Christoph, 1990). As for the SSP, separate classifications were derived for the child's relationship with each caregiver, and the interview was scored from videotape rather than transcript, allowing for the inclusion of nonverbal and paralinguistic behavior. The procedure differed from AAI and SSP coding in that it rested on coding of the videotaped narrative in terms of relationship episodes, which, with the help of the interviewer, were elaborated into as full a narrative as the child could manage. A global interview score was then assigned for each scale.

Nine scales were coded, all aiming to assess the child's overall current state of mind with respect to attachment, as reflected in both the narrative and nonverbal behavior.

Three scales (Involving Anger, Idealization and Dismissal) were rated separately for mother and father. All scales were coded from 1 to 9, with the anchor points at odd values illustrated with examples . Where relevant, scales were adapted from the AAI coding system, recalibrated and illustrated specifically for children's videotaped narratives. Thus, the scales of Involving Anger, Idealization, Dismissal, and Overall Coherence, were based on AAI scales, but adapted to reflect developmentally appropriate responses. For instance, it was vital to describe the ways in which 'involving anger' was shown by children; in contrast to the AAI, this was found frequently to include not only anger, but also denigration and contempt. Furthermore there were many non-verbal markers in the videotaped interviews that could not have been noted in AAI transcripts.

The remaining four scales were Emotional Openness, Use of Examples, Balance of Positive and Negative References to Attachment Figures, and Resolution of Conflict.

The Use of Examples scale was partially based on the AAI scale Insistence on Lack of Recall, but the CAI scale also reflected children's ability to provide relevant and elaborated examples. At the low end of this scale, children provided either no examples or very impoverished descriptions. At the high end, children gave detailed, clear examples that vividly illustrated the adjectives or general description given in answer to a question.

The Emotional Openness scale was developed to assess children's ability to express and label emotions, and to ground them in descriptions of interactions with attachment figures. We were influenced by Sroufe's (1996) affect-regulation model, and studies that have identified the importance of emotional openness in children's attachment-related narratives and as a marker of security of attachment (Oppenheim, 1997; Slough & Greenberg, 1990; Wright et al., 1995). At the low end of the scale, children showed a very limited range of emotional expression, and made few references to emotional states even when encouraged to do so. At the high end, children used a range of appropriate emotional terms, showed different emotional states in relation to different

subjects and situations, and an understanding that different people have different feelings that may change over time.

Balance of Positive/Negative References to Attachment Figures was based on the assumption that secure children would more readily recognize and integrate positive and negative aspects of parental figures, thus presenting more balanced descriptions. At the low end of the scale, children were heavily biased towards either positive or negativeAt the high end of the scale, the child presented a picture containing both positive and negative descriptions, so that the overall impression was of a balanced view of the relationships being described.

Children's ability to describe constructive resolutions to conflict has been closely linked to attachment security (Oppenheim, 1997) and was conceptualized in the CAI as Resolution of Conflict. At the low end of this scale, children described situations that seemed to have no resolution. At the high end, the child described situations in which he or she actively sought to resolve a conflict.

Alongside the linguistic analysis, a simple behavioral analysis was included of children's responses to the interview situation and questions. 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 during assessment.

Overall Coherence was rated similarly to the AAI's Coherence scale: on the basis of scores on the state of mind scales, together with a consideration of the overall consistency, development and reflection. A low score would be given to children showing marked idealization, poor use of examples, and strong Involving Anger. A high score would involve an absence of these distortions, together with positive qualities of emotional openness, use of examples, balance of representations and conflict resolution.

Three 'State of Mind' scales were designed to capture aspects of attachment

narratives: Coherence, Use of Examples and Balance. These indicated the degree of realism and integration of the representations of relationships with each parent. We class Involving Anger and Conflict Resolution as 'Active Conflict' scales, and Emotional Openness, Idealization and Dismissing as 'Avoidance' scales.

Attachment classifications were arrived at independently for each parent using an algorithm for combining the scale ratings. To obtain a Secure classification, the child must have been assigned a rating of approximately 5 or above on all scales except Idealization, Dismissal and Involving Anger, where a score of 3 or less was expected. In our first coding scheme, we further assigned a level of security with regard to each parent: Very Secure/Secure/Insecure/Very Insecure. Again, we specified algorithms for making this judgement. Based on an extensive and systematic qualitative analysis of a large number of pilot interviews not included in the present report, the coding and classification scheme was further developed by categorizing interviews into clusters of predominant attachment themes (see Shmueli-Goetz, 2001). Based on this qualitative analysis, criteria were developed to enable the coders to assign interviews to three-way and four-way attachment classifications. Although the clustering of interviews did not start with the intention of replicating the adult attachment classification prototypes, the emerging categories showed considerable overlap with those prototypically observed in infancy and adulthood. We therefore gave them the same names as used for the three main categories of adult attachment: Dismissing, Secure and Preoccupied, together with the Disorganized category of infant attachment. The main difference from the AAI classification concerned the Preoccupied category. As in AAI narratives, some children displaying Involving Anger were also derogating towards the relevant parent(s). In the AAI, this would result in a 'Cannot Classify' category, because the speaker would be regarded as showing strong features of both preoccupation and dismissal of attachment. However, these child narratives made it clear that while the children were denigrating of the attachment

relationship, they were also absorbed and entangled by their memories of episodes with the attachment figure.

Disorganization of attachment was coded categorically for presence versus absence of certain markers of disorganization informed by two major sources: behavioral manifestations, including those identified as characteristic of disorganized attachment in the Strange Situation (Main & Solomon, 1990), but with some additional markers appropriate for the behavior of older children; and disruptions of narrative used in classifying certain AAI transcripts as Unresolved. In addition, clear contradictions between verbal and nonverbal behavior (e.g. giggling about the death of an attachment figure) were considered, along with other markers such as inappropriately familiar behavior toward the interviewer, as suggesting disorganization of the attachment system.

A copy of the CAI Protocol, and details of training in the Coding and Classification Manual, can be obtained from the corresponding author.

Wechsler Intelligence Test for School Children – III (WISC-III UK; (Wechsler, 1992). The WISC-III UK is a well-established and validated measure of the intellectual abilities of children aged 6-16. The WISC-III UK comprises 13 sub-tests from which 3 composite scores can be derived: Verbal, Performance, and Full Scale IQ. For the purposes of the current study, a shortened WISC-III UK was used, including the following four sub-tests: (1) Similarities; (2) Vocabulary; (3) Picture Arrangement; and (4) Block Design. Prorated scores were derived for Verbal, Performance and Full Scale IQ scores from the above sub-tests.

Clinical Evaluation of Language Fundamentals-Revised (CELF-R: Semel, Wiig, & W., 1987). The CELF-R is an established and widely used, standardized language measure designed to assess receptive and expressive language skills in children aged 5-16. For this study, only sub-tests of the CELF-R (UK version) developed to assess expressive language for children of 8 years and above were employed. Three sub-tests were used:

Formulated Sentences, Recalling Sentences, and Sentence Assembly. Raw scores for each sub-test were converted into norm-referenced standard scores. An expressive language standard score was then derived by adding the standard scores for each sub-test and converting the sum.

Separation Anxiety Test (SAT: Wright et al., 1995). The SAT (Klagsbrun & Bowlby, 1976; Slough & Greenberg, 1990; Wright et al., 1995) is a semi-projective test designed to assess children's narrative responses to representations of separations from parents. Following Wright et al. (1995), 9 SAT photographs were used in the current study and were labelled as 'mild' or 'severe' based on existing scoring systems (Shouldice & Stevenson-Hinde, 1992; Slough & Greenberg, 1990). The child's responses to the SAT were audiotaped and transcribed verbatim. The transcripts were coded using Resnick's (1993) revised rating scales, which gave rise to an overall classification (Secure or Insecure) and sub-classifications based upon five types of security (*F1* = Some setting aside of attachment, *F2* = Secure but restricted, *F3* = Secure: Free valuing of attachment, *F4* = Some preoccupation with attachment, *F5* = Some preoccupation with attachment figures) and four types of insecurity (*DS1* = Dismissing of attachment, *DS2* = Devaluing of attachment, *E1* = Passive, *E2* = Angry/Conflicted). SATs were rated by AD, YSG and a clinical psychologist colleague. AD had received formal training in coding the SAT from Dr Resnick and had achieved satisfactory reliability (86% agreement, kappa = .70 for 15 reliability transcripts). AD trained the other two coders to good reliability (82% agreement, kappa = .67 for 15 reliability transcripts). Ratings of the SAT were undertaken whilst judges were blind to CAI classifications.

Adult Attachment Interview (George et al., 1985). The AAI was developed as a way of predicting infants' Strange Situation attachment classifications. It requires individuals to recount and reflect upon early attachment related experiences whilst maintaining coherent and collaborative discourse (Main, 1995). The AAI is a semi-structured interview

comprising 25 questions covering early childhood, adolescence and adulthood. The AAI attempts to capture the participant's current state of mind with respect to attachment, rather than their actual/probable experiences, although these are also considered when assigning a classification. The classification system yields categories that are parallel to the Strange Situation patterns.

Hampstead Child Adaptation Measure (Target et al., 2000). The caregiver interviews for HCAM were coded on a global scale and 16 dimensions. Each of these is a carefully-anchored, developmentally-sensitive 100-point scale, with separate sets of anchor definitions for each dimension, appropriate to each of four age bands (Target et al., 2000). The anchor-points correspond as closely as possible to those of the CGAS scale (Shaffer et al., 1983), and thus cover the full range of possible childhood adaptation, with a score of 70 being the boundary between normal and clinically-impaired adaptation. Good reliability and validity data have been reported by Schneider (Schneider, 1997). Coding of the HCAM interviews was carried out blind to CAI coding by a separate group, MT and five Masters'-level graduates in psychology.

Seven of the HCAM dimensions code the quality of interpersonal relationship (with mother, father, step-mother, step-father, siblings, peers and adults). Since in this sample some children did not have siblings and many had no step-parents, these three dimensions were eliminated. A number of dimensions concerned psychological processes believed by some to be related to the quality of attachment relationships. These are: impulse control, effortful control, emotion and its regulation, resilience in the face of adversity, and confidence and self-esteem. Four dimensions would not be predicted to be linked to attachment. These are: physical self-care, psychosexual development, exploration/play, and conformity/compliance. In order to reduce the chances of Type I error, the three sets of dimensions were combined into three scales: Quality of

Relationship, Cronbach's alpha = .79; Attachment-Related Processes, Cronbach's alpha = .88; and Non-Attachment-Related Processes, Cronbach's alpha = .81.

Procedure

Administration. Two interviewers with experience in the administration of the CAI conducted the battery of assessment measures, including the CAI. One interviewer administered the AAI and HCAM interviews to the main caregiver, while the second interviewer carried out the child assessments. During the CAI, the interviewer initially explained the study and ensured that the child felt at ease and was willing to take part; the CAI was conducted in a private room; the duration of the CAI ranged from 20 minutes to 1 hour and 20 minutes; the sessions were videotaped. Following an interval of 3 or 12 months, two randomly selected sub-samples of families were contacted and asked to participate in the second phase of the study. A second CAI was then administered by the same interviewer for the evaluation of test-retest reliability.

Coding and Inter-Rater Reliability of the CAI. There were three independent coders of CAI interview videotapes, each with postgraduate degrees, familiar with current attachment assessment methodologies, and involved in developing the coding system described above. The first author coded the total sample; the second and third judges each coded one half of the sample.

Inter-rater reliabilities were computed in three phases. In Phase 1 (training phase), the three judges jointly coded 30 cases, which led to further refinement of the CAI Coding and Classification System (subsequently renamed version II). The second and third coders then received training from the first coder, who was familiar with many more child cases and had been certified as reliable in coding the AAI. The CAI reliability training entails 3 days of coding relatively difficult cases and discussion where discrepancies and ambiguities arise. Following training, a further 30 interviews, randomly drawn from 226,

were independently coded by each judge. Interclass correlations between the three coders were computed, and are shown in Table 2. In Phase 2, a further 50 randomly selected interviews were coded by a further two Masters'-level coders with limited knowledge of attachment theory, who had not been involved in the development of the measure, but who had received training as above. As a further test of the robustness of the system, in Phase 3 undergraduate ('naïve') students with no previous knowledge of attachment theory were given the 3 days' training, and subsequently asked to code an additional 68 interviews and their agreement with the experienced coders was computed. Table 2 presents the intraclass correlations (ICCs) and Pearson's correlations for the three phases of the reliability test. In the first attempt to establish inter-rater reliability, only one scale (idealization of father) yielded unacceptable ICCs, with the confidence interval including a negative correlation. The median ICC for all scales was .88, which indicated very strong agreement between the three coders. The low ICC observed in relation to the idealization of father may reflect the absence of information about fathers that typified many of the CAI narratives (idealization is difficult to assess if there is little information against which to measure the child's descriptions). The second assessment of inter-rater reliability, across 50 cases, also showed a high correlation between two raters, the median *r* being .87 with no unacceptably low agreements. Assessment of inter-rater reliability using naïve coders also produced high agreement, median *r* being .81 with the exception of two scales, namely, anger and idealization with respect to father.

[Table 2 about here]

Inter-rater agreement for the main classifications, i.e., secure versus insecure, and levels of security, i.e., very secure, secure, insecure and very insecure, were assessed using the kappa statistic and Spearman rho respectively, which are standard measures of

agreement between independent coders on a categorical judgement. The relationships between classifications given by two, three, and naïve coders are shown in Table 3, and were shown overall to be consistently high. For the three coders and naïve coders, the number of disorganized classifications was too small to estimate agreement.

[Table 3 about here]

Results

This section first reports on the non-referred sample, including the distribution of attachment classifications, correlations between CAI scales, the internal consistency of the CAI, test-retest reliability and discriminant validity. In order to establish the psychometric properties of the instrument for a clinical population, we repeated these tests on the referred sample, and made statistical comparisons between the two samples. Coding was carried out blind regarding whether children came from the referred or non-referred sample. A sub-sample of the referred and non-referred samples was then assessed to examine construct validity, using the SAT, AAI and HCAM.

Non-referred Sample

The distribution of attachment classifications, shown in Table 4, was broadly in line with distributions reported in other studies. Thus, a high proportion of children were classified Secure with respect to both mother and father (66% and 64% respectively, 61% when combined as above); there was a predominance of the Dismissing classification within the Insecure group (30% for both mother and father). The frequency of Preoccupied attachment was low at 4% for mother, 6% for father and 7% combined. Children classified

as Disorganized were not included in later calculations because of the small number of cases in this sample.

[Table 4 about here]

The concordance between three-way classifications of interviews based on attachment to mother and father was very high (92%, kappa = 0.84). The discrepancies were mainly accounted for by the eight interviews of children who were coded as secure with mother but not father (5%). Only 4 children were coded secure with father but not mother (3%). All children disorganized with one parent were also disorganized with the other.

As shown in Table 5, observed means were fairly high on the scales that are considered to reflect a secure strategy (ranging from 5.17 to 5.90), with low means shown for those scales considered as possible indices of insecurity of attachment (ranging from 1.25 to 2.84). Scales expected to be characteristic of particular attachment classes are marked after the name of each scale in square brackets. Separate analyses of variance were carried out on each of the scales, which showed significant differences in mean ratings between interviews falling within the three classifications. Tukey's post-hoc tests were performed to identify significant group differences, and these are displayed in Table 5. Our expectations concerning characteristics of narratives by children from the three attachment groups were broadly confirmed by these analyses. Secure children were rated significantly higher on the following scales: Balance between positive and negative, Emotional Openness, Coherence, Conflict Resolution, and overall ratings of level of security. Scales that were expected to differentiate Dismissing children by and large separated them from those with Preoccupied or Secure classifications: Dismissing of Mother, Idealization of Mother, Dismissing of Father (but not Idealization of Father), were

higher in the Dismissing group than in the Preoccupied group. Low Use of Examples was also characteristic of the Dismissing children. Involving Anger with Mother and Father were specific to Preoccupied children. The Combined Insecurity rating distinguished all three groups, with interviews coded Disming being least secure and Preoccupied significantly more insecure than those in the Secure group.

[Table 5 about here]

Table 6 presents the correlations between CAI scales, with those below the diagonal representing the non-referred sample and those above it the referred sample. Most correlations were expected, although Idealization and Dismissing appear to intercorrelate highly. There is a strikingly low correlation between the Involving Anger scores for mother and father. It seems that most children did not show this form of 'involving' anger with either of their parents, and those that did tended to be angry with one parent while the other was seen positively. The highest correlation with Combined Security was with Coherence (as is found in the AAI).

[Table 6 about here]

The internal consistency of the three groups of CAI scales was assessed using Cronbach's alpha. The set of scales labelled 'State of Mind' yielded a Cronbach alpha of .87. The set of 'Avoidance' scales also showed high internal consistency (alpha = .82). For 'Active Conflict' there was low consistency (alpha = .32), which was not surprising, because on the rare occasions that Involving Anger was manifest, it only emerged in relation to one parent. The mean scores on these scales are displayed in Table 5, and, as expected, the interviews classified as Dismissing are also rated highest on Avoidance

scales, with those classified as Preoccupied rated highest on Involving Anger scales. On the State of Mind scales, interviews with insecure classifications rated significantly lower than those given secure classification.

To evaluate the test-retest reliability of the CAI, 67 non-referred children were approached after a three-month intervail on the basis of geographical proximity to a research centre. Forty six agreed to take part (22 girls, 24 boys), representing 70% of those asked to participate. The mean age was 9.8 years, with a range of 7-12.5 years. Their mean Verbal IQ was 108.5 (SD = 18.8; range 78-154) and their mean Expressive Language score was 101.0 (SD = 13.7; range 76-128). Thirty one children (13 girls, 18 boys) drawn from the larger sample agreed to take part in the one-year follow up phase. This represented 50% of those invited. The mean age was 9.0 years with a range of 6.7-11.6 years. Their mean Verbal IQ was 106.4 (SD = 18.5; range 73-155) and their mean Full IQ was 102.4 (SD = 17.9; range 77-146). First test interviews were all coded by the first author, with all retest interviews coded by one of the two other experienced coders. Pearson *r* correlations between the two test periods were computed for each of the CAI scales along with stability for main attachment classifications as assessed by the kappa statistic; these are reported in Tables 7 and 8. Most stability coefficients for CAI scales were quite high over three months: the median was .69 (range from .29 to .90). There was considerable variability in the stability of the scales. For example, while Involving Anger with respect to mother appeared to be highly stable across three months, Involving Anger with respect to father was far less so. However, as it was rare for a child to score above one (the lowest rating) on this scale with respect to either parent, it is difficult to attribute too much significance to low stability. In addition, Idealization of both parents was somewhat unstable, but, by contrast, Emotional Openness, the Use of Examples, and Coherence seemed highly consistent at the two testings. Of the parent-specific scales, Dismissing and Level of Security were highly stable for both mother and father. The

aggregate scales of State of Mind, Active Conflict and Avoidance were all reasonably stable, with correlations between .69 and .78 over three months.

As shown in Table 8, classifications over three months were stable, somewhat more so for mother than for father. The kappas compared favourably with the inter-rater reliability of .80. For the two-way secure-insecure split with respect to mother, the percentage agreement was 85%, and for three-way it was 89%, four-way 83%. For classifications of the relationship to father, the figures were 82%, 75% and 69%.

[Table 7 about here]

Table 7 suggests that the stability of the scale scores across a one-year interval was more moderate, with a median correlation of .54 (ranging from .08 to .75). Again, there was considerable spread: Coherence, Emotional Openness and Use of Examples were relatively stable, whereas the parent-specific scales had low stability, particularly Idealization and Involving Anger with respect to father, which were both poor. Of the aggregate scales, State of Mind had the highest stability and Active Conflict the lowest. The Level of Security ratings were relatively stable, between .57 and .67.

As shown in Table 8, attachment classifications were relatively stable, although somewhat below the coefficients obtained with an interval of three months between test periods. For the two-way secure-insecure split with respect to mother, the percentage agreement was 85, for three-way it was 85, and for four-way 76. The stability of the classification of the interviews in relation to father was noticeably below that in relation to mother: for the two-way secure-insecure split it was 79%, for three-way 76%, and for four-way 69%. Overall, these test-retest reliability figures are encouraging and generally suggest that children's security classifications can expect to be reasonably stable in a low-risk sample.

[Table 8 about here]

In examining the discriminant validity of the CAI, the relationship between demographic variables and attachment classifications with respect to both parents were explored. A series of one-way ANOVAs and χ^2 tests were computed and, as shown in Table 9, none of the variables including age, gender, socioeconomic status (SES), ethnicity and one- or two-parent household approached statistical significance. There was a non-significant tendency for those insecure with mother to be slightly younger. The findings suggest however that the assignment of overall attachment classifications was not related to the above variables. In establishing the relationship between verbal IQ, expressive language and attachment classifications, one-way ANOVAS did not reveal statistically significant differences between secure and insecure children (see Table 9).

[Table 9 about here]

Referred Sample

As per Table 4, the distribution of attachment patterns for the referred sample revealed a high prevalence of Insecure classifications with respect to both mother and father (77% for each), with a predominance of the Dismissing strategy (56% and 62% respectively). Just over a quarter were rated as secure with both parents, and just under 10% were coded as Disorganized with at least one parent. The distribution for both mother and father and for the combined coding for the Secure/Insecure split was found to differ significantly from the distribution of attachment patterns observed for the non-referred sample [$\chi^2(1, N=227) = 23.4$, $p < .001$; $\chi^2(1, N = 214) = 27.4$, $p < .001$; $\chi^2(1, N =227) = 22.5$, $p < .001$ for Secure/Insecure split for mother, father and combined parents,

respectively]. This result was replicated when considering three-way attachment classifications [$\chi^2(2, N = 227) = 25.0$, $p < .001$; χ^2 (2, $N = 214$) = 28.2, $p < .001$; χ^2 (2, $N = 227$) = 23.3, $p < .001$ respectively, for mother, father and the two parents combined].

Table 10 contrasts the mean CAI scale scores for the non-referred and the referred samples. Consistently, the referred sample scored significantly lower on the scales associated with attachment security: Emotional Openness, Balance, Use of Examples and Coherence. The referred sample scored higher on scales expected to be associated with insecurity of attachment—strikingly so for Dismissing, somewhat so for Idealization and Involving Anger. The table also lists the effect size of each difference, calculated as the difference in the means divided by the pooled standard deviation. The most substantial effect sizes were associated with Coherence and the overall rating of Insecurity, and medium effect sizes were seen for the aggregated scales for State of Mind, Avoidance and Active Conflict.

[Table 10 about here]

The correlations between CAI scales for the referred sample are presented in Table 6. While observed correlations were in the expected directions, the scales of Involving Anger with respect to both parents correlated very weakly with the remaining CAI scales. In addition, the scales of Dismissal and Levels of Security with respect to both parents emerged as highly correlated.

For internal consistency with respect to the referred sample, State of Mind and Avoidance yielded high level of consistency with a Cronbach alpha of .86 and .83 respectively. Similar to the findings reported for the non-referred sample, Active Conflict yielded lower consistency (Cronbach alpha of .49). For the sample as a whole, internal

consistency for State of Mind and Avoidance was .87 and .84 respectively, and .43 for Active Conflict.[4]

Exploring further the discriminant validity of the CAI (Table 11), with the exception of gender, none of the remaining demographic variables including age, SES, ethnicity and one- or two-parent household approached statistical significance. The findings suggest that whilst boys were more likely to be assigned an Insecure classification, attachment classifications were being assigned independently of the remaining variables. Exploring the relationship between verbal IQ, expressive language and attachment classifications for the referred sample, children did not significantly differ on verbal IQ and expressive language as a function of their attachment security.

[Table 11 about here]

SAT protocols were obtained from 67 (40%) of the sample. The SAT does not have a Disorganized category, so the association between CAI and SAT involved a three-way classification of D, E and F. Coefficient kappa was calculated as an estimate of agreement, kappa = 0.36 (approximate $t = 3.72$, $p < 0.005$). This reflects a 64% agreement between these independently coded measures of attachment.

Eighty-eight mothers were administered the AAI, which was coded independently of the CAI coding. As the CAI does not have a Cannot Classify (CC) code, the AAI CC code was combined with the Unresolved code, as is customary (van IJzendoorn & Bakermans-Kranenburg, 1996). The association between CAI and AAI on the four-way categorization was highly significant: χ^2 (9, $N = 88$) = 23.9, $p < .004$. The kappa coefficient computed for

[4] We attempted to confirm that these hypothesized categories of attachment could be identified as latent classes by trying to fit a latent class model to the scale scores (Vermunt & Magidson, 2003). While the majority of the 222 participants fitted into one of three classes with a profile of scores that was consistent with a secure, dismissing and preoccupied characterization, three additional classes (each with n smaller than 10) were all required for a non-significant fit, and these were harder to interpret. Probably a larger sample size is required before a readily interpretable model can be satisfactorily fitted to these scale scores. The relevant data are available on request from the corresponding author.

this contingency table was 0.16, $t \approx 3.1$, $p < 0.002$. It is noteworthy that 83% of the 12 children classified as Disorganized in this sub-sample had mothers whose interviews were coded Unresolved or CC.

The primary caregivers of 86 children provided interviews for HCAM ratings. Because of the restricted sample, only a three-way analysis was possible. There were 50 Dismissing, 10 Preoccupied and 26 Secure. Figure 1 displays the means and standard errors of the three groups on the Global and the three scales of the HCAM. As predicted, there was a difference between the three groups on the Global scores, F (2,83) = 3.93, $p < 0.03$, with the Secure children having the highest scores. One-way analysis of variance yielded significant F ratios for two of the three scales, as expected: Quality of Relationships: F (2,83) = 6.00, $p < 0.04$; Attachment-Related Processes, F (2,83) = 3.90, $p < 0.03$. Non-Attachment-Related Processes was not significantly related to security: F (2,83) = 1.80, *ns.*

Discussion

The aim of this study has been to develop a new assessment of child-parent attachment in middle childhood, addressing the 'measurement gap' in the study of attachment relationships in this age group. Informed by the AAI, the CAI was conceived and adapted to offer a developmentally appropriate interview protocol and coding system.

This study initially investigated whether children in middle childhood could comply with the demands of an interview about attachment relationships. We sought systematically to test the new measure and to evaluate it as a viable alternative to semi-projective techniques such as the ASCT, MCAST and SAT, and as a potentially useful clinical instrument. .

Following extensive interviews with both non-referred and referred children, we found compelling evidence that children aged 8-12 can respond to direct questions about

their attachment relationships, and that observed structural and behavioral variations appear to reflect individual differences in their attachment organization. As with the AAI, the CAI calls upon the child to relate memories of interactions with their parents, which potentially causes stress in a way that triggers the attachment system. We assume that the specific questions of the CAI—asked by an unfamiliar adult—activate the child's attachment system. We assume that the child's style of discourse and quality of responses may be seen as enacting their attachment strategy. The CAI elicits bothrepresentations of attachment with respect to the parents and nonverbal evidence of emotional and cognitive responses to attachment issues. In this sense, it is both representational and behavioral, the latter being potentially important in the assessment of disorganization of attachment, which will be the subject of a future communication.

Is the CAI reliable? We began by examining inter-rater reliability, showing that 'naïve' raters could (with three days' training) reliably code the interview. Encouraging findings emerged with regard to stability of attachment classification over a three-month and over a one-year period: this stood at 85% for the secure-insecure distinction with respect to mother at both three months and one year; 83 % for four-way classifications at three months and 76% at one year. These figures suggest reasonable stability of attachment classifications over one year, at least in relation to mothers (figures with respect to father were slightly lower), even though different interviewers and coders were involved. Studies examining stability in middle childhood using diverse methodologies have generally reported variable rates of agreement over somewhat shorter periods. Our results fall at the higher end of this range. Main and Cassidy (Main & Cassidy, 1988) reported 62% across one month using their separation-reunion procedure. Ammaniti et al (Ammaniti et al., 2000) reported 71% from 10-14 years using the AICA. Granot and Mayseless (Granot & Mayseless, 2001) reported 94% across three months using a doll

story completion task; Kerns et al (Kerns et al., 2005) reported 50% across a three-month period using the same procedure.

As well as the stability of attachment categories, we wanted to establish the stability of the CAI as a continuous measure of attachment security. Recent findings suggest that the AAI taps into a continuous dimension of security rather than ideal types (Roisman et al., in press). The stability of our combined security rating is therefore encouraging. Over a three month period, the lower end of the 95% confidence interval range for the stability coefficient remains above 0.7. Over one year, test-retest reliability reduces to 0.62, (95% CI 0.35-0.79). The observed reliability was limited by the considerable variability in the stability of scale scores contributing to this coefficient, with several important scales such as Emotional Openness, Coherence and Dismissal showing high stability whilst others showed moderate to low stability after one year, raising questions about whether the continuous measure of security is stable only for these scales. The discovery of lower stability rates for the parent-specific scales, particularly with respect to father, was of some concern. Perhaps children found it more difficult to recount interactions with their fathers in detail and therefore tended to provide fewer and less elaborated descriptions (often characterized by descriptions of activities or outings/'doing stuff'). Several factors may explain the lower stability observed with respect to some of the other CAI scales: (1) a strong test of stability was applied by using different interviewers and coders on different occasions, and it is possible that different adults (in the absence of considerable training) elicit different responses; (2) children are probably affected quite considerably by their day to day experiences, which would potentially affect specific scales such as Involving Anger or Dismissal towards a parent, and the emotional tone of particular episodes recounted in relation to particular questions; (3) some apparent changes in attachment status may reflect actual changes in attachment security linked, for example, to parental separation or emerging domestic conflict. There is evidence to suggest that, at least in preschool,

changes in attachment status are linked to changes in the quality of caregiving and in life circumstances, which may account for the greater stability found in lower-risk samples (Howes & Hamilton, 1992; Main & Cassidy, 1988) than in high-risk ones (Cicchetti & Barnett, 1991; Seifer et al., 2004).

Promisingly, the CAI seems a valid measure of the attachment construct. The distribution of attachment classifications broadly conformed to the distributions reported in other studies of different age groups on other attachment measures, for both the non-referred and referred samples (DeKlyen, 1996; van IJzendoorn & Bakermans-Kranenburg, 1996; van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992). The construct validity of the instrument is partly supported by the predictable pattern of associations between scales and attachment categories, and by the internal consistency of two out of three of the theoretically-derived groups of scales (State of Mind and Avoidance). Internal consistency for Active Conflict was lower probably due to the restricted range of Involving Anger scores in our sample**.**

The CAI appears to have sound discriminant validity, since neither demographic variables (age, SES, ethnicity) nor cognitive variables (IQ and expressive language) appeared to predict attachment classification in either the referred or the non-referred sample. Criterion validity was strongly supported by the predominance of insecure classifications in the referred sample. Without suggesting that attachment and psychological disorder are coterminous, it would be surprising not to find a higher rate of insecurity in a clinical group. Finding about a quarter of the referred sample to be coded as secure could reflect either insensitivity in the instrument or an indication of heterogeneity in the clinical sample. Closer scrutiny of the secure clinical interviews suggests that most of these were coherent accounts of disturbed parent-child relationships. Within the classification currently based on coherent State of Mind, such interviews were coded as Secure. Coherence was in fact the best predictor of overall

security, irrespective of specific experience. From a developmental perspective, we might argue that attachment security may be most effectively coded on two separate bases: (a) on coherence of narrative, and (b) as the representation of the parents' responses to the child's expressed attachment needs. The first, as in the AAI, corresponds to the level of security as assessed by the State of Mind. The second might reflect something closer to the observed interactions, as in preschool assessments of attachment. Narratives that have high narrative coherence but which describe negative interactions might be a source of difficulty in achieving inter-rater reliability. They resemble the "earned-secure" adult attachment narrative pattern (unambiguously secure responses that reflect upon experience 'after the event'); but in children *currently* experiencing, say, rejection, the classification of security could be qualified in a way that permits future study of the correlates of childhood coping strategies. The child's coherence might reflect its effort to maintain a good relationship with its parents despite current negative interactions. This may be achieved at the cost of impairment in other domains of functioning—as suggested by the clinical status of many of these children (frequently referred by their school). Distinguishing State of Mind and Current Experience aspects of narratives in the coding system might improve reliability and the CAI's capacity to predict other aspects of the child's functioning.

The level of agreement between the SAT and the CAI three-way classifications suggests convergent/concurrent validity. Of current measures of middle childhood attachment, the SAT is closest to the CAI , although future studies will need to clarify whether their differences in approach tap different aspects of the construct. The highly significant transgenerational association, observed in a substantial sub-sample, between the AAI classifications of the mothers and their children's CAI codes also indicates convergent validity, although the coefficient of agreement was modest compared with infant transgenerational studies (van IJzendoorn, 1992). The correspondence between

adult Unresolved/Cannot Classify codes and the Disorganized classification of CAI narratives deserves further exploration—as also suggested by measures of attachment among infants (Hughes, Turton, Hopper, McGauley, & Fonagy, 2001) and preschool children (Goldwyn et al., 1999; Green, 2000), and by studies concerning adopted children and their adoptive families (Steele, Hodges, Kaniuk, Hillman, & Henderson, 2003). In our sample, whilst Disorganized children almost invariably had mothers with unresolved loss or trauma, most mothers with Unresolved classifications had children who were not coded as Disorganized. This could suggest a lack of sensitivity in the CAI's current coding of disorganization.

The coding of disorganization of attachment was partly validated by the difference in rates of disorganization and organization between clinical and non-clinical groups. The 4% rate of disorganization in this study's non-clinical sample corresponds with the approximate 5% rate in previous studies. However, our referred children were coded disorganized in less than 10% of cases—compared to 50% in other high-risk, clinical samples. This may be explained by the relatively mild reasons for clinical referrals, and often without a background of significant trauma. The coding criteria were also intentionally conservative to avoid over-coding of disorganization, although this is currently being addressed. In collaboration with the Romanian Follow-Up Team, we developed a Q-Sort coding for disorganization, the preliminary findings of which suggest that the interview is sensitive to unusual phenomena commonly observed in neglected Romanian adoptees some years after adoption. In terms of future work, we and collaborators have recruited several high-risk samples from various communities, mainly in the USA. This will allow us further to refine the coding of disorganization.

Predictive validity of the CAI was supported by the association between the measuring the child's current functioning and its attachment classification. Children with secure attachment relationships seemingly have superior social adaptation (e.g. Sroufe,

2005). It was particularly encouraging, in terms of the CAI's discriminant validity, that attachment security was associated theoretically with attachment-related aspects of functioning, such as ratings of the quality of the child's relationships, and measures of psychological capacities that are often attachment-related (e.g. emotion regulation, effortful control).

We found high concordance between classifications of attachment to mother and father. Only eight children showed discordant classifications. Few studies have assessed this concordance, and findings suggest a moderate-to-high concordance rate (Kerns et al., 2005; Verschueren & Marcoen, 1999), which raises the issue of whether children in middle childhood hold separate internal working models with respect to mother and father, as shown in infant behavioral assessments, or have come to integrate these representations into a unitary, overarching current 'state of mind,' as conceptualised within the AAI. Given the very high concordance between attachment classifications with mother and father, it currently seems most efficient to use a single index of security based on the continuous measure derived from the rating scales. Admittedly, the measure has a non-significant positive skew in the non-referred sample, and a slightly negative skew in the referred sample; but as an ordinal scale, it would provide a reliable and valid indicator of the degree of individual security. In the light of the psychometric analysis of Roisman and colleagues, this index may currently be preferable to the overall classification for each caregiver.

Although many of the findings are encouraging, there are also causes for concern about the CAI's validity. Firstly, the low representation of Preoccupied classification in both the non-clinical and clinical samples reflects the difficulties of previous studies in identifying Preoccupation. Using behaviorally-derived classifications, Main and Cassidy (Main & Cassidy, 1988) and Wartner (1994) were, due to inadequate numbers, unable to include children considered ambivalent-dependent. The Preoccupied scale of Kerns et al (Kerns et al., 2005) also showed an inconsistent pattern of associations with other

attachment measures. Within the CAI, a small group of children were neither angry, confused, nor fearfully absorbed in intrusive traumatic memories (as in some adult AAIs); rather, preoccupation was expressed in negative, absorbing, repetitive and often depressing memories (similar to the 'inchoate negativity' of 'Preoccupied' interviews in the AAI). These children might currently be miscoded as Secure because of their extensive examples, emotional openness and relatively coherent descriptions. We intend to add a new scale to our coding system, which captures this excessively absorbed style of preoccupation, and thus to address, at least in part, the difficulties in identifying more clearly those who show a Preoccupied strategy.

We could also refine the coding of the child's non-verbal behavior; there now exist extensive studies of children's emotional expressions, eye contact, self-soothing gestures, and gross motor behaviours, which appear strongly linked to the content of the narrative. The current coding system has only broad guidelines for capturing these non-verbal indicators, such as flattening of affect, drumming of the fingers, looking away from the camera, etc.

The relationship with the interviewer is also under-explored. The CAI requires the child to talk to a stranger about their relationship with each parent. Thus, it brings together stimulation of attachment feelings and memories and the presence of a sympathetic stranger (analogous to the Strange Situation). This is in itself a stressful task, let alone producing relatively coherent responses to unfamiliar personal questions, for which the child is unlikely to have been prepared. A Secure child should cope better with this task, but the Insecure child might struggle to perform the task and manage the interpersonal stress; his/her narrative would thus possibly be impoverished or confused. The extent to which the child is physiologically or behaviourally stressed by the interview situation should therefore reveal stable attachment strategies.

The CAI is potentially a clinically-relevant research tool and a systematic and consistent assessment of the child's experience of the family situation. The interview does not replace parental and teacher report, but gives a window on to the child's own experience of family relationships and parental availability. As such, the CAI could be applied in the evaluation of the outcome of therapy or as part of an assessment for placement of children in foster-care or being considered for adoption.

References

Ainsworth, M. D. S. (1990). Epilogue: Some considerations regarding theory and assessment relevant to attachment beyond infancy. In M. T. Greenberg, D. Cicchetti & E. M. Cummings (Eds.), *Attachment in the pre-school years: Theory, research and intervention* (pp. 463-488). Chicago: University of Chicago Press.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.

Allen, J. P., McElhaney, K. B., Land, D. J., Kuperminc, G. P., Moore, C. W., O'Beirne-Kelly, H., et al. (2003). A secure base in adolescence: markers of attachment security in the mother-adolescent relationship. *Child Dev, 74*(1), 292-307.

Ammaniti, M., Candelori, C., Dazzi, N., De Coro, A., Muscetta, S., Ortu, F., et al. (1990). Intervista sull'attaccamento nella latenza: Unpublished.

Ammaniti, M., van IJzendoorn, M., Speranza, A. M., & Tambelli, R. (2000). Internal working models of attachment during late childhood and early adolescence: an exploration of stability and change. *Attachment and Human Development, 2*(3), 328-346.

Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (1993). A psychometric study of the Adult Attachment Interview: reliability and discriminant validity. *Developmental Psychology, 29*, 870-879.

Bar-Haim, Y., Pérez-Edgar, K., Fox, N. A., Beck, J. M., West, G. M., Bhangoo, R. K., et al. (2002). The emergence of childhood bipolar disorder: A prospective study from 4 months to 7 years of age. *Journal of Applied Developmental Psychology, 23*(4), 431-450.

Bar-Haim, Y., Sutton, D. B., Fox, N. A., & Marvin, R. S. (2000). Stability and change of attachment at 14, 24, and 58 months of age: Behaviour, representation, and life events. *Journal of Child Psychology and Psychiatry, 41*(3), 381-388.

Belsky, J., & Fearon, R. M. (2002). Infant-mother attachment security, contextual risk, and early development: A moderational analysis. *Development and Psychopathology, 14*, 293-310.

Benoit, D., & Parker, K. (1994). Stability and transmission of attachment across three generations. *Child Development, 65*, 1444-1457.

Bowers, L., Smith, P. K., & Binney, V. (1994). Perceived family relationships of bullies, victims and bully/victims in middle childhood. *Journal of Social and Personal Relationships, 11*, 215-232.

Bretherton, I. (1985). Attachment theory: Retrospect and prospect. *Monographs of the Society for Research in Child Development, 50*(1-2), 3-35.

Bruner, J. (1994). The narrative construction of reality. In M. Ammaniti & D. N. Stern (Eds.), *Psychoanalysis and development. Representations and narratives*. New York: New York University Press.

Cassidy, J., Marvin, R. S., & The MacArthur Working Group on Attachment. (1989). *Attachment Organization in Three and Four Year Olds: Coding Guidelines.* Unpublished Unpublished scoring manual, University of Illinois.

Cicchetti, D., & Barnett, D. (1991). Attachment organisation in preschool aged maltreated children. *Development and Psychopathology, 3*, 397-411.

Crittenden, P. M. (1992). *Preschool Assessment of Attachment.* Unpublished manuscript, Family Relations Institute, Miami, FL.

Crowell, J. A., Waters, E., Treboux, D., & O'Connor, E. (1996). Discriminant validity of the Adult Attachment Interview. *Child Development, 67*, 2584-2599.

Damon, W., & Hart, D. (1982). The development of self-understanding from infancy through adolescence. *Child Development, 53*, 841-864.

DeKlyen, M. (1996). Disruptive behavior disorders and intergenerational attachment patterns: A comparison of normal and clinic-referred preschoolers and their mothers. *Journal of Consulting and Clinical Psychology, 64*, 357-365.

Dozier, M., Stovall, K. C., & Albus, K. E. (1999). Attachment and psychopathology in adulthood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 497-519). New York: Guilford.

Easterbrooks, M. A., Biesecker, G., & Lyons-Ruth, K. (2000). Infancy predictors of emotional availability in middle childhood: the roles of attachment security and maternal depressive symptomatology. *Attach Hum Dev, 2*(2), 170-187.

Fitzgerald, J. M. (1981). Autobiographical memory: Reports in adolescence. *Canadian Journal of Psychology, 35*(1), 69-73.

Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development, 62*, 891-905.

Furman, W., & Simon, V. A. (2004). Concordance in attachment states of mind and styles with respect to fathers and mothers. *Dev Psychol, 40*(6), 1239-1247.

George, C., Kaplan, N., & Main, M. (1985). The Adult Attachment Interview. Unpublished manuscript, Department of Psychology, University of California at Berkeley.

Gloger-Tippelt, G., Gomille, B., Koenig, L., & Vetter, J. (2002). Attachment representations in 6-year-olds: Related longitudinally to the quality of attachment in infancy and mother's attachment representations. *Attachment and Human Development, 4*(3), 318-339.

Goldwyn, R., Stanley, C., Smith, V., & Green, J. (1999). The Manchester Child Attachment Story Task: relationship with parental AAI, SAT, and child behaviour. *Attachment and Human Development,, 2*(1), 71-84.

Granot, D., & Mayseless, O. (2001). Attachment security and adjustment to school in middle childhood. *International Journal of Behavioral Development, 25*, 530-541.

Green, J. (2000). A new method of evaluating attachment representations in young school-age children: The Manchester Child Evaluation Story Task. *Attachment and Human Development, 2*(1), 48-70.

Green, J., & Goldwyn, R. (2002). Annotation: attachment disorganisation and psychopathology: new findings in attachment research and their potential implications for developmental psychopathology in childhood. *J Child Psychol Psychiatry, 43*(7), 835-846.

Green, J., Stanley, C., Smith, V., & Goldwyn, R. (1999). A new method of evaluating attachment representations in young school-age children: The Manchester Child Attachment Story Task. *Attachment and Human Development, 2*(1), 48-70.

Greenberg, M. T. (1999). Attachment and psychopathology in childhood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 469-496). New York: Guilford.

Grice, H. P. (1975). Logic and conversation. In R.Cole & J.Morgan (Eds.), *Syntax and Semantics: Speech Acts* (pp. 41-58). New York &I Academic Press.

Hamilton, C. E. (2000). Continuity and discontinuity of attachment from infancy through adolescence. *Child Development, 71*(3), 690-694.

Howes, C., & Hamilton, C. E. (1992). Children's relationships with caregivers: Mothers and child care teachers. *Child Development, 63*(4), 859-866.

Hughes, P., Turton, P., Hopper, E., McGauley, G. A., & Fonagy, P. (2001). Disorganised attachment behaviour among infants born subsequent to stillbirth. *J Child Psychol Psychiatry, 42*(6), 791-801.

Kerns, K. A., Schlegelmilch, A., Morgan, T. A., & Abraham, M. M. (2005). Assessing attachment in middle childhood. In K. A. Kerns & R. A. Richardson (Eds.), *Attachment in Middle Childhood* (pp. 46-70). New York: Guilford.

Kerns, K. A., Tomich, P. L., Aspelmeier, J. E., & Contreras, J. M. (2000). Attachment based assessments of parent-child relationships in middle childhood. *Developmental Psychology, 36*, 614-626.

Klagsbrun, M., & Bowlby, J. (1976). Response to separation from parents: A clinical test for young children. *British Journal of Projective Psychology and Personality Study, 21*, 7-26.

Larose, S., & Bernier, A. (2001). Social support processes: mediators of attachment state of mind and adjustment in late adolescence. *Attach Hum Dev, 3*(1), 96-120.

Luborsky, L., & Crits-Christoph, P. (1990). *Understanding transference: The CCRT method*. New York: Basic Books.

Lyons-Ruth, K., Connell, D., Zoll, D., & Stahl, J. (1987). Infants at social risk: Relationships among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology, 23*, 223-232.

Madigan, S., Goldberg, S., Moran, G., & Pederson, D. R. (2004). Naïve observers' perceptions of family drawings by 7-year-olds with disorganized attachment histories. *Attachment & Human Development, 6*(3), 223-241.

Madigan, S., Ladd, M., & Goldberg, S. (2003). A picture is worth a thousand words: Children's representations of family as indicators of early attachment. *Attachment and Human Development, 5*(1), 19-37.

Main, M. (1995). Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir & J. Kerr (Eds.), *Attachment Theory: Social, developmental, and clinical perspectives.* (pp. 407-474). Hillsdale, NJ: Analytic Press, Inc.

Main, M., & Cassidy, J. (1988). Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology, 24*, 415-426.

Main, M., & Goldwyn, R. (1994). *Adult Attachment Rating and Classification System, Manual in Draft, Version 6.0*. Unpublished manuscript: University of California at Berkeley.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), *Growing Points of Attachment Theory and Research. Monographs of the Society for Research in Child Development* (Vol. 50, pp. 66-104). Chicago: Chicago University Press.

Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. Greenberg, D. Cicchetti & E. M. Cummings (Eds.), *Attachment during the preschool years: Theory, research and intervention* (pp. 121-160). Chicago: University of Chicago Press.

Marsh, P., McFarland, F. C., Allen, J. P., McElhaney, K. B., & Land, D. (2003). Attachment, autonomy, and multifinality in adolescent internalizing and risky behavioral symptoms. *Dev Psychopathol, 15*(2), 451-467.

Moss, E., Bureau, J. F., Cyr, C., Mongeau, C., & St-Laurent, D. (2004). Correlates of attachment at age 3: construct validity of the preschool attachment classification system. *Dev Psychol, 40*(3), 323-334.

Nelson, K. (1993). The psychological and social origins of autobiographical memory. *Psychological Science, 4*, 7-14.

NICHD Early Child Care Research Network. (2001). Child care and family predictors of MacArthur preschool attachment and stability from infancy. *Developmental Psychology, 37*, 847-862.

Ogawa, J. R., Sroufe, L. A., Weinfield, N. S., Carlson, E. A., & Egeland, B. (1997). Development and the fragmented self: Longitudinal study of dissociative

symptomatology in a nonclinical sample. *Development and Psychopathology, 9*, 855-879.
Oppenheim, D. (1997). The Attachment Doll-play Interview for preschoolers. *International Journal of Behavioral Development, 20*, 681-697.
Pederson, D. R., & Moran, G. (1996). Expressions of the attachment relationship outside of the Strange Situation. *Child Development, 67*, 915-927.
Piaget, J. (1923). *Le langage et la pensee chez l'enfant.* Delachaux & Niestle, Neuchatel.
Resnick, G. (1993). *Measuring attachment in early adolesecnce: A manual for the administration, coding, and interpretation of the Separation Anxiety Test for 11 to 14 year olds.* .Unpublished manuscript, Unpublished manuscript, Rockville, MD.
Resnick, G. (1997). *The correspondence between the Strange Situation at 12 months and the Separation Anxiety test at 11 years in an Israeli kibbutz sample.* Paper presented at the Biennial meeting of the Society for Research in Child Development,, Washington, DC, April.
Roisman, G. I., Fraley, R. C., & Belsky, J. (in press). A taxometric study of the adult attachment interview. *Developmental Psychology*.
Scharf, M., Mayseless, O., & Kivenson-Baron, I. (2004). Adolescents' attachment representations and developmental tasks in emerging adulthood. *Dev Psychol, 40*(3), 430-444.
Schneider, T. (1997). *Measuring adaptriation in middle childhood: The development of the Hampstead Child Adaptation Measure.* Unpublished PhD, University of London, London.
Seifer, R., LaGasse, L. L., Barry, L., Bauer, C. R., Shankaran, S., & Bada, H. S. (2004). Attachment status in children prenatally exposed to cocaine and other substances. *Child Development, 75*, 850-868.
Semel, E. M., Wiig, E. H., & W., S. (1987). *Clinical evaluation of language fundamentals - revised (CELF-R)*. San Antonio, TX: The Psychological Corporation.
Shaffer, D., Gould, M. S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H., et al. (1983). A children's global assessment scale (CGAS). *Archives of General Psychiatry, 40*, 1228-1231.
Shaw, D. S., & Vondra, J. I. (1995). Infant attachment security and maternal predictors of early behavior problems: A longitudinal study of low-income families. *Journal of Abnormal Child Psychology, 23*, 335-357.
Shmueli-Goetz, Y. (2001). *The Child Attachment Interview: Development and Validation (doctoral thesis).* University College London, London.
Shouldice, A., & Stevenson-Hinde, J. (1992). Coping with security distress: The separation anxiety test and attachment classification at 4.5 years. *Journal of Child Psychology and Psychiatry, 33*, 331-348.
Slough, N. M., & Greenberg, M. T. (1990). 5-year-olds' representations of separations from parents: Responses from the perspective of self and other. *New Directions for Child Development, 48*, 67-84.
Sroufe, L. A. (1983). *Infant-caregiver attachment and patterns of adaptation in preschool: The roots of maladaption and competence* (Vol. 16). Hillsdale, NJ: Erlbaum.
Sroufe, L. A. (1996). *Emotional development: The organization of emotional life in the early years*. New York: Cambridge University Press.
Sroufe, L. A. (2005). Attachment and development: a prospective, longitudinal study from birth to adulthood. *Attach Hum Dev, 7*(4), 349-367.
Sroufe, L. A., Egeland, B., & Kreutzer, T. (1990). The fate of early experience following developmental change: Longitudinal approaches to individual adaptation in childhood. *Child Development, 61*, 1363-1373.
Stams, G. J. M., Juffer, F., & van IJzendoorn, M. H. (2002). Maternal sensitivity, infant attachment, and temperament in early childhood predict adjustment in middle

childhood: The case of adopted children and their biologically unrelated parents. *Developmental Psychology, 38*(5), 806-821.
Steele, M., Hodges, J., Kaniuk, J., Hillman, S., & Henderson, K. (2003). Attachment representations and adoption: Associations between maternal states of mind and emotion narratives in previously maltreated children. *Journal of Child Psychotherapy, 29*, 187-205.
Target, M., Fonagy, P., Schneider, T., Ensink, K., & Janes, K. (2000). *Raters' Manual for the Hampstead Child Adaptation Measure (HCAM)*. London: University College London and the Anna Freud Centre.
Urban, J., Carlson, E., Egeland, B., & Sroufe, L. A. (1991). Patterns of individual adaptation across childhood. *Development and Psychopathology, 3*, 445-560.
van IJzendoorn, M. H. (1992). Intergenerational transmission of parenting: A review of studies in non-clinical populations. *Developmental Review, 12*, 76-99.
van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin, 117*, 387-403.
van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (1996). Attachment representations in mothers, fathers, adolescents, and clinical groups: A meta-analytic search for normative data. *Journal of Consulting and Clinical Psychology, 64*, 8-21.
van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (1997). Intergenerational transmission of attachment: A move to the contextual level. In L. Atkinson & K. J. Zucker (Eds.), *Attachment and psychopathology* (pp. 135-170). New York: Guilford Press.
van IJzendoorn, M. H., Goldberg, S., Kroonenberg, P. M., & Frenkel, O. J. (1992). The relative effects of maternal and child problems on the quality of attachment: A meta-analysis of attachment in clinical samples. *Child Development, 59*, 147-156.
Vaughn, B. E., Lefever, G. B., Seifer, R., & Barglow, P. (1989). Attachment behaviour, attachment security, and temperament during infancy. *Child Development, 60*, 728-737.
Vermunt, J., & Magidson, J. (2003). Latent Gold (Version, 3.0.1). Belmont, MA: Statistical Innovations, Inc.
Verschueren, K., & Marcoen, A. (1999). Representation of self and socioemotional competence in kindergartners: Differential and combined effects of attachment to mother and father. *Child Development, 70*(1), 183-201.
Wallis, P., & Steele, H. (2001). Attachment representations in adolescence: further evidence from psychiatric residential settings. *Attach Hum Dev, 3*(3), 259-268.
Warren, S. L., Huston, L., Egeland, B., & Sroufe, L. A. (1997). Child and adolescent anxiety disorders and early attachment. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 637-644.
Wartner, U. G., Grossman, K., Fremmer-Bombrik, E., & Suess, G. (1994). Attachment patterns at age six in South Germany: Predictability from infancy and implications for pre-school behaviour. *Child Development, 65*, 1014-1027.
Waters, E., Merrick, S. K., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security from infancy to early adulthood: a 20 year longitudinal study. *Child Development, 71*(3), 684-689.
Wechsler, D. (1992). *Weschler Intelligence Scale for Children Third Edition UK*: The Psychological Corporation.
Weinfield, N., Sroufe, L. A., & Egeland, B. (2000). Attachment from infancy to early adulthood in a high risk sample: Continuity, discontinuity and their correlates. *Child Development, 71*(3), 695-702.

Weinfield, N. S., Whaley, G. J., & Egeland, B. (2004). Continuity, discontinuity, and coherence in attachment from infancy to late adolescence: sequelae of organization and disorganization. *Attach Hum Dev, 6*(1), 73-97.

Wright, J. C., Binney, V., & Smith, P. K. (1995). Security of attachment in 8-12 year olds: A revised version of the Separation Anxiety Test, its psychometric properties and clinical interpretation. *Journal of Child Psychology and Psychiatry, 36*, 757-774.

Ziv, Y., Oppenheim, D., & Sagi-Schwartz, A. (2004). Social information processing in middle childhood: relations to infant-mother attachment. *Attach Hum Dev, 6*(3), 327-348.

Tables

Psychiatric referrals vs non-referred

	Non referred (*n* = 161)	Referred (*n* = 65)	Statistic
Mean age in years (*s.d.*)	10.9 (1.9)	10.4 (1.2)	$t = 2.21$, $df = 224$, $p<.05$
Mean verbal IQ (*s.d.*)	99.2 (18.8)	102.9 (18.3)	$t = 1.1$, $df = 156$, *ns*
% boys	50.3	58.5	χ^2 (1,N=226)= 1.2, *ns*
% middle class	40.2	33.9	χ^2 (1,N=226)= .65, *ns*
% white	70.0	82.0	χ^2 (1,N=226)= 4.4, *ns*.
% living with 2 parents	47.1	44.4	χ^2 (1,N=226)= .50, *ns*

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

	ICC for 3 expert coders (cases = 30) ICC (95% CI)	Pearson r for 2 expert coders (cases = 50) *r* (95% CI)	Pearson r for naïve coders with expert codes (cases = 68) *r* (95% CI)
Emotional Openness	.92 (.85 - .96)	.91 (.85 - .95)	.83 (.74 - .89)
Balance	.80 (.63 - .90)	.83 (.72 - .90)	.68 (.53 - .79)
Use of Examples	.87 (.76 - .93)	.87 (.78 - .92)	.77 (.65 - .85)
Anger with Mother	.82 (.66 - .91)	.94 (.90 - .97)	.68 (.53 - .79)
Anger with Father	.75 (.52 - .88)	.66 (.47 - .79)	.47 (.25 - .64)[1]
Idealization of Mother	.71 (.46 - .85)	.89 (.81 - .94)	.70 (.55 - .80)
Idealization of Father	.38 (-.15 - .69)	.74 (.58 - .84)	.58 (.39 - .72)[1]
Dismissing of Mother	.94 (.89 - .97)	.79 (.66 - .88)	.85 (.77 - .91)
Dismissing of Father	.94 (.89 - .97)	.79 (.66 - .88)	.86 (.78 - .91)[1]
Conflict Resolution	.88 (.79 - .94)	.84 (.73 - .91)	.82 (.72 - .89)
Coherence	.90 (.82 - .95)	.90 (.83 - .94)	.86 (.78 - .91)
Level of security with Mother	.91 (.83 - .95)	.89 (.81 - .94)	.81 (.70 - .88)
Level of security with Father	.90 (.81 - .95)	.89 (.81 - .94)	.78 (.65 - .86)[2]
Combined security rating	.90 (.81 - .95)	.89 (.81 - .94)	.82 (.70 - .89)[2]

[1] *n* = 62

[2] *n* = 57

Table 2. Inter-rater reliability of scale scores

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	3 coders (cases = 30)			2 coders (cases = 50)			Naïve coders (cases = 68)		
	Mother	Father	Combined	Mother	Father	Combined	Mother	Father	Combined
	Median kappa (range)			kappa			Kappa		
Secure/insecure	.92 (.84-.92)	.92 (.85-.92)	.86 (.81-.87)	.79	.83	.81	.88	.90	.87
Three-way	.84 (.84-.85)	.86 (.78-.93)	.80 (.78-.87)	.58	.66	.67	.80	.84	.81
Four-way	.83 (.74-.89)	.86 (.77-.89)	.80 (.77-.80)	.60	.58	.69	.76	.84	.78
Disorganization	*n* too small to estimate			.78	.78	.78	.85	*n* too small to estimate	.87

Table 3. Inter-rater reliability of classifications and levels of security

	Secure	Insecure	Dismissing	Preoccupied	Disorganized
Non-Referred					
Mother (*n*)	107(106)	54 (49)	48 (45)	7 (5)	6
(%)	66 (66)	33 (30)	30 (28)	4 (3)	4
Father	98 (97)	56 (51)	46 (43)	10 (8)	6
(*n*)					
(%)	64 (63)	36 (33)	30 (28)	6 (5)	4
Combined	98 (97)	47 (42)	52 (49)	11 (9)	6
(*n*)					
(%)	61 (60)	29 (26)	32 (30)	7 (6)	4
Referred					
Mother (*n*)	20 (20)	46 (40)	37 (33)	9 (7)	6
(%)	30 (30)	70 (61)	56 (50)	14 (11)	9
Father	14 (14)	46 (41)	37 (33)	9 (8)	5

(*n*)					
(%)	23 (23)	77 (68)	62 (55)	15 (13)	8
Combined	17 (17)	49 (43)	39 (35)	10 (8)	6
(*n*)					
(%)	26 (26)	74 (65)	59 (53)	15 (12)	9

Table 4. The distribution of attachment classifications for the non-referred and referred samples. Numbers in parentheses indicate figures when disorganized interviews were classified separately.

	Dismissing *(SD)*	Preoccupied (*SD*)	Secure (*SD*)	ANOVA
	N = 52	*N* = 11	*N* = 98	*df* = 2,158
Emotional Openness [*S*]	4.41 (1.36)[a]	5.72 (1.5) [a]	6.47 (1.18) [b]	45.11
Balance [*S*]	4.24 (1.28) [a]	4.54 (1.55) [a]	5.72 (1.6) [b]	17.70
Use of Examples [*D*]	4.64 (1.09) [a]	5.86 (1.26) [b]	6.56 (1.08) [b]	51.91
Involving Anger with Mother [*P*]	1.28 (0.87) [a]	2.27 (2.24) [b]	1.12 (0.46) [a]	9.51
Involving Anger with Father [*P*]	1.26 (0.81) [a]	3.36 (2.41) [b]	1.15 (0.51) [a]	31.84
Idealization of Mother [*D*]	3.41 (1.81) [a]	2.45 (1.76) [b]	1.82 (1.05) [b]	22.19
Idealization of Father [*D*]	3.12 (1.69) [a b]	2.45 (1.85) [b c]	1.88 (1.03) [c]	13.72
Dismissing of Mother [*D*]	4.32 (1.94) [a]	3.0 (2.06) [b]	2.02 (1.07) [b]	41.14
Dismissing of Father [*D*]	4.32 (1.99) [a]	2.4 (1.42) [b]	2.09 (1.14) [b]	36.90

Conflict Resolution [*S*]	4.38 (1.25) [a]	4.22 (2.09) [a]	6.07 (1.17) [b]	34.51
Coherence [*S*]	4.24 (1.1) [a]	4.77 (1.08) [a]	6.54 (1.12) [b]	76.25
Level of Security: Mother [*S*]	1.92 (0.58) [a]	2.36 (0.5) [b]	3.26 (0.46) [c]	120.69
Level of Security: Father [*S*]	1.91 (0.53) [a]	2.09 (0.3) [a]	3.25 (0.43) [b]	145.78
Combined Insecurity rating [*S*]	4.39 (0.77) [a]	3.91 (0.6) [b]	2.67 (0.65) [c]	108.18
State of Mind Scale [*S*]	4.37 (0.98) [a]	5.06 (1.04) [a]	6.27 (1.07) [b]	57.71
Active Conflict [*P*]	2.76 (0.58) [a]	3.8 (1.38) [b]	2.08 (0.49) [c]	49.0
Avoidance [*D*]	4.15 (1.16) [a]	2.91 (0.85) [b]	2.28 (0.76) [c]	70.31

Key - Means with same superscript are not significantly different to Tukey's test contrasting three groups

Table 5. Means and Standard Deviations for CAI Scales and Levels of Security for Non-referred Sample. The attachment category predicted to be linked to each scale is given in square brackets (*S*=Secure; *D*=Dismissing; *P*=Preoccupied).

	EO	BAL	UoE	PA-M	PA-F	ID-M	ID-F	DS-M	DS-F	RES	COH	MSEC	FSEC	CSEC
EO		0.64**	0.7**	0.12	-0.04	-0.44**	-0.42*	-0.76**	-0.75**	0.6**	0.73**	-0.69**	-0.64**	-0.84**
BAL	0.57**		0.57**	0.02	-0.06	-0.43**	-0.36*	-0.59**	-0.65**	0.59**	0.68**	-0.6**	-0.63**	-0.75**
UoE	0.81**	0.61**		0.18	0.17	-0.49**	-0.38*	-0.56**	-0.52**	0.64**	0.75**	-0.67**	-0.6**	-0.73**
PA-M	-0.12	-0.07	-0.11		0.51**	-0.16	-0.09	-0.04	-0.05	-0.18	-0.09	0.1	0.05	0.09
PA-F	0.06	-0.02	0.05	0.03		-0.32	-0.24	0.08	0.07	-0.11	-0.03	0.06	0.1	0.11
ID-M	-0.35**	-0.46**	-0.46**	0.05	0.00		0.65**	0.24	0.25	-0.52**	-0.53**	0.49**	0.45**	0.58**
ID-F	-0.33**	-0.43**	-0.42**	0.01	-0.23*	0.57**		0.25	0.26	-0.35*	-0.42*	0.37*	0.4*	0.53**
DS-M	-	-	-	0.21*	-0.16	0.32**	0.33**		0.94**	-	-0.7**	0.65**	0.6**	0.82**

	0.75**	0.37**	0.62**							0.59**				
DS-F	-0.68**	-0.29**	-0.55**	0.09	-0.01	0.29**	0.25*	0.81**		-0.55**	-0.67**	0.63**	0.65**	0.81**
RES	0.69**	0.42**	0.66**	-0.16	-0.2	-0.33**	-0.22*	-0.55**	-0.52**		0.83**	-0.77**	-0.69**	-0.84**
COH	0.85**	0.6**	0.86**	-0.21*	-0.03	-0.48**	-0.41**	-0.7**	-0.61**	0.73**		-0.9**	-0.82**	-0.92**
MSEC	0.8**	0.6**	0.81**	-0.19	0.01	-0.54**	-0.43**	-0.69**	-0.56**	0.64**	0.89**		0.91**	0.87**
FSEC	0.75**	0.56**	0.77**	-0.08	-0.17	-0.49**	-0.44**	-0.61**	-0.56**	0.64**	0.86**	0.92**		0.84**
CSEC	0.87**	0.67**	0.86**	-0.22*	-0.06	-0.6**	-0.53**	-0.79**	-0.73**	0.75**	0.93**	0.91**	0.89**	

Key: *$p < .01$

** $p < .001$

[1]Key to scale abbreviations. EO – Emotional Openness; Bal – Balance of Positive/Negative References to Attachment Figures; UoE – Use of Examples; PA-M/F – Preoccupied Anger with respect to Mother/Father; ID-M/F – Idealization with respect to Mother/Father; DS-M/F – Dismissal with respect to Mother/Father; RES – Resolution of Conflicts; COH – Overall Coherence; MSEC – Mother Level of Security; FSEC - Father Level of Security, CSEC – Combined security rating.

Table 6. Correlation Matrix for CAI Scales for Non-referred Sample below the diagonal (*n* = 161) and referred sample above the diagonal (*n* = 66).

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	Test-retest: three months *n* = 46 (95% CI)	Test-Retest: one year *n* = 33 (95% Cl)
Emotional Openness	.70 (.51 - .82)	.63 (.37 - .80)
Balance	.55 (.31 - .72)	.35 (.00 - .63)
Use of Examples	.66 (.46 - .80)	.57 (.28 - .76)
Involving Anger with Mother	.90 (.83 - .94)	.54 (.24 - .75)
Involving Anger with Father	.29 (.00 - .54)	.25 (-.13 - .56)
Idealization of Mother	.52 (.27 - .70)	.25 (-.11 - .56)
Idealization of Father	.42 (.15 - .63)	.08 (-.29 - .46)
Dismissing of Mother	.71 (.53 - .83)	.44 (.11 - .68)
Dismissing of Father	.63 (.42 - .78)	.39 (.00 - .68)
Conflict Resolution	.58 (.35 - .74)	.34 (.00 - .62)
Coherence	.68 (.49 - .81)	.75 (.55 - .87)
Level of security: Mother	.83 (.71 - .90)	.67 (.42 - .82)
Level of security: Father	.80 (.66 - .89)	.57 (.24 - .77)
Combined Insecurity rating	.83 (.71 - .90)	.62 (.35 - .79)
State of Mind Scale	.78 (.63 - .87)	.71 (.48 - .85)
Active Conflict	.69 (.50 - .82)	.35 (.00 - .62)
Avoidance	.73 (.56 – 84)	.54 (.24 - .75)

Table 7. Test-Retest Reliability of CAI scales over three months and one year.

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	Three months (*n* = 46)		One year (*n* = 33)	
	Mother	Father	Mother	Father
Secure/insecure	.69	.64	.67	.52
Three-way	.81	.52	.74	.56
Four-way	.71	.67	..64	.53
Disorganization	1.00	1.00	.67	.42

Table 8. Test-retest reliability (Cohen's kappa), at three months and one year of attachment classifications with mother and father.

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	Mother			Father		
	Secure	Insecure	Statistic	Secure	Insecure	Statistic
Age: mean (*sd*)	11.16 (1.37)	10.73 (1.62)	F = 3.20, df = 1,159, p=.08	11.13 (1.38)	10.76 (1.61)	F = 2.33, df = 1,152, *ns*
Verbal IQ: mean (*sd*)	99.12 (18.83)	99.50 (18.97)	F = .01, df = 1,110, *ns*	99.28 (19.50)	98.7 (18.60)	F = 0.02, df = 1,104, *ns*
Exp lang.: mean (*sd*)	98.90 (12.29)	101.53 (15.77)	F = 0.48, df = 1,56, *ns*	98.66 (12.36)	101.85 (15.41)	F = 0.74, df = 1,56, *ns*
No. (%) boys	51 (47.7%)	30 (55.6%)	χ^2(1, N = 161) < 1, *ns*	49 (49.5%)	29 (52.7%)	χ^2(1, N = 154) < 1, *ns*
No. (%) middle	28 (45.2%)	11 (31.4%)	χ^2(1, N = 157) = 1.76, *ns*	27 (46.6%)	11 (30.6%)	χ^2(1, N = 153) = 2.36, *ns*

class						
No. (%) white	76 (71.0%)	37 (68.5%)	$\chi^2(2, N = 161)$ < 1, *ns*	70 (70.7%)	39 (70.9%)	$\chi^2(2, N = 153)$ < 1, *ns*
black	23 (21.5%)	12 (22.2%)		22 (22.2%)	11 (20.0%)	
Asian	8 (7.5%)	5 (9.3%)		7 (7.1%)	5 (9.1%)	
No. (%) living with both parents	48 (48.3%)	26 (45.6%)	$\chi^2(1, N = 157)$ < 1, *ns*	46 (53.2%)	32 (47.1%)	χ^2 (1, $N = 151$) < 1, *ns*

Table 9. Relationship between attachment classification with mother and father, and demographic variables, verbal IQ and expressive language for non referred sample.

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	Total (*sd*) *n* = 227	Non-Referred (*sd*) *n* = 161	Referred (*sd*) *n* = 66	ANCOVA *df* = 1, 225	Effect size (*d*)
Emotional Openness	5.48 (1.7)	5.75 (1.57)	4.84 (1.82)	14.03***	0.55
Balance	4.97 (1.7)	5.15 (1.65)	4.54 (1.73)	6.20**	0.36
Use of Examples	5.66 (1.54)	5.87 (1.4)	5.14 (1.7)	10.94***	0.49
Involving Anger with Mother	1.35 (1.04)	1.25 (0.87)	1.63 (1.34)	6.08*	0.36
Involving Anger with Father	1.45 (1.14)	1.34 (1.03)	1.76 (1.36)	5.77*	0.35
Idealization of Mother	2.55 (1.68)	2.39 (1.56)	2.98 (1.87)	5.91*	0.36
Idealization of Father	2.42 (1.63)	2.34 (1.44)	2.63 (2.03)	1.30	0.17
Dismissing of Mother	3.12 (2.05)	2.84 (1.81)	3.81 (2.43)	10.65***	0.48
Dismissing of Father	3.19 (2.1)	2.84 (1.8)	4.11 (2.51)	16.76***	0.60

Conflict Resolution	5.14 (1.66)	5.38 (1.52)	4.59 (1.83)	11.00***	0.49
Coherence	5.27 (1.75)	5.66 (1.55)	4.33 (1.83)	30.27***	0.81
Level of insecurity: Mother	2.45 (0.88)	2.24 (0.8)	2.99 (0.83)	38.73***	0.91
Level of insecurity: Father	2.5 (0.88)	2.26 (0.78)	3.11 (0.81)	48.26***	1.02
Combined Insecurity rating	3.58 (1.19)	3.33 (1.06)	4.21 (1.25)	28.92***	0.79
State of Mind Scale	5.3 (1.48)	5.56 (1.36)	4.67 (1.55)	18.11***	0.62
Avoidance	3.18 (1.43)	2.94 (1.25)	3.76 (1.65)	16.00***	0.58
Active Conflict	2.59 (0.92)	2.43 (0.78)	2.98 (1.11)	17.98***	0.62

Key - * p <.05

** p <.01

*** p <.001

Table 10. Means and Standard Deviations for CAI Scales and Levels of Security for Non-referred and referred samples. Effect size is calculated as the difference between means divided by the pooled standard deviation

Shmueli-Goetz, Y; Target, M; Fonagy, P; Datta, A; (2008) The child attachment interview: A psychometric study of reliability and discriminant validity. **Developmental Psychology** , 44 (4) 939 - 956. 10.1037/0012-1649.44.4.939.

	Mother			Father		
	secure	insecure	Statistic	secure	Insecure	statistic
Age: mean (*sd*)	10.54 (1.42)	10.10 (1.22)	$F = 2.61$, $df = 1,63$, *ns*	10.55 (1.40)	10.15 (1.25)	$F = 1.04$, $df = 1,57$, *ns*
Verbal IQ: mean (*sd*)	109.77 (20.55)	100.80 (17.34)	$F = 2.05$, $df = 1,44$, *ns*	110.75 (23.86)	100.64 (17.68)	$F = 1.84$, $df = 1,39$, *ns*
Exp lang.: mean (*sd*)	89.43 (9.20)	85.27 (13.24)	$F = 0.59$, $df = 1,27$, *ns*	89.80(11.10)	84.00 (13.22)	$F = 0.81$, $df = 1,23$, *ns*
No. (%) boys	7 (35.0%)	31 (68.9%)	$\chi^2(1, N = 66) = 6.55$, $p < 0.02$.	5 (35.7%)	29 (64.4%)	$\chi^2(1, N = 60) = 3.61$, *ns*
No. (%) middle class	9 (45.0%)	12 (28.6%)	$\chi^2(1, N = 64) = 1.63$, *ns*	6 (42.9%)	13 (30.2%)	$\chi^2(1, N = 58) < 1$, *ns*
No. (%) white	17 (85.0%)	34 (81.1%)	$\chi^2(2, N = 62) < 1$, *ns*	12 (85.7%)	36 (83.7%)	$\chi^2(2, N = 57) = 1.95$, *ns*
black	1	5		0	4	

	(5.0%)	(11.9%)		(0%)	(9.3%)	
asian	2	3		2	3	
	(10.0%)	(7.1%)		(14.3%)	(7.0%)	
No (%) living with both parents	9 (46.6%)	21 (45.6%)	χ^2 (1, N = 56) < 1, *ns*	7 (53.2%)	22 (47.1%)	χ^2(1, N = 51) < 1, *ns*

Table 11. Relationship between attachment classification with mother and father, and demographic variables and verbal IQ, among children who had been referred for treatment.

Appendix A

THE CHILD ATTACHMENT INTERVIEW (CAI) PROTOCOL

Introduction – interview not a test, want to know what things are like in your family, your point of view.

1) Can you tell me about the people in your family?

- the people living together in your house (then ask about extended family)

2) Tell me three words that describe yourself, that is what sort of person you are?

- examples

3) Can you tell me three words to describe your relationship with your mum, that is, what it's like to be with your Mum?

- examples for each

4) What happens when your Mum gets cross with you or tells you off?

- story

[3 & 4 repeated for Dad, or other main caregivers]

5) Can you tell me about a time when you were really upset and wanted help?

- story

6) Do you ever feel that your parents don't really love you?

- when? Do they know you feel that?

7) What happens when you're ill?

- example

8) What happens when you get hurt?

- example

9) Have you ever been hit or hurt by an older child or a grown up in your family?

- story

- Have you been badly hurt by someone outside your family?

10) (Elementary school aged children:) Have you ever been touched in the private parts of your body by someone much older than you? (For older children:) Have you ever been touched sexually by someone, when you didn't want them to do it?

-story

11) Has anything [else] really big happened to you that upset, scared or confused you?

- story

12) Has anyone important to you ever died? Has a pet you cared about died?

- story, what did you feel and others feel?

13) Is there anyone that you cared about who isn't around anymore?

14) Have you been away from your parents for longer than a day? [If child not living with parents, e.g. foster care, ask about time when they left parents]

- story, how did you and parents feel, what was it like when you saw them again?

15) Do your parents sometimes argue?

- story, how do you feel?

16) In what ways would you like/not like to be like your mum/dad?

17) If you could make three wishes when you are older what would they be?