The Adult Attachment Interview: coherence & validation in adolescents

Beijersbergen, M.D.

Chapter 3

Validity of the Adult Attachment Interview in Adolescents: Associations with Conflict Interactions, Emotional Investment, and Relational Support

Beijersbergen, M.D., Van IJzendoorn, M.H., Bakermans-Kranenburg, M.J., & Juffer, F.
Manuscript submitted for publication

Abstract

The present study investigated the validity of the Adult Attachment Interview (AAI; Main, Goldwyn, & Hesse, 2003) in a sample of adolescents. Participants were 156 14-year-old adolescents, who were internationally adopted before 6 months of age. Construct validity of the AAI was apparent from the following: (1) during a conflict interaction task secure adolescents displayed more autonomy than dismissing adolescents, while mothers of secure adolescents showed more relatedness than mothers of insecure participants, (2) dismissing individuals invested emotionally less in others than secure and preoccupied adolescents, and (3) secure adolescents reported more relational support than insecure adolescents. Intelligence and perceived temperament were unrelated to attachment classification, supporting the discriminant validity of the AAI. In conclusion, the AAI appears to be a valid instrument to measure attachment representation in (adopted) adolescents.

Introduction

The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996; Main, Goldwyn, & Hesse, 2003) is a widely applied instrument to measure current state of mind with respect to attachment. It has been used in clinical and non-clinical samples, and in adult as well as in adolescent samples (see for an overview Hesse, 1999). The validity and reliability of the AAI has been established extensively in adults (Bakermans-Kranenburg & Van IJzendoorn, 1993; Hesse, 1999; Van IJzendoorn, 1995). No systematic, psychometric study has yet focused on adolescents while an increasing number of studies using the AAI are conducted in this age group (e.g., Marsh, McFarland, Allen, Boykin-McElhaney, & Land, 2003[1]; Mayseless & Scharf, 2007; Roisman, Madsen, Henninghausen, Sroufe, & Collins, 2001; Zimmermann, 2004[1]). The present study investigates the validity of the AAI when administered to adolescents.

Attachment in Adolescence

An important developmental task for adolescents is to acquire independency of their parents (see Allen & Land, 1999, for an overview). Autonomy is suggested to be best developed in the context of a secure relationship with the adolescent's parents. Similar to infants, adolescents need to explore their environment while preserving relatedness with their attachment figures. Bowlby (1982) noted that the relationship between parents and older children becomes more complex in the sense that true collaboration as well as intractable conflict becomes possible. In a secure goal-corrected partnership parents and children constantly make adjustments to suit the other and at the same time make demands for themselves, resulting in a constant give and take (Bowlby, 1982, p. 355). Compared to younger children, adolescents have more cognitive capacities (Keating, 1990) and they are better able to differentiate between themselves and others (Bowlby, 1973). These capacities enable adolescents to reevaluate the relationship with their parents (Allen & Land, 1999). On the other hand, most adolescents are still living under their parents' roof and are financially dependent on their parents, which may interfere with the establishment of emotional autonomy and with objectively working through the relationship with their parents. Consequently, adolescents may react differently to the AAI compared to adults. Therefore, the validity of the AAI and the correlates of AAI classifications for adults may not be fully applicable to adolescents (Weinfield, Whaley, & Egeland, 2004).

[1] All studies in this chapter marked with "[1]" used Kobak's Q-sort to measure adolescent attachment.

The Adult Attachment Interview (AAI)

During the AAI participants are asked about their childhood experiences with their parents and how they think they were affected by them (Main et al., 2003). On basis of verbatim transcripts of the AAI, participants are judged as having a secure, dismissing, or preoccupied attachment representation. Secure individuals are characterized by coherent interview discourse. They are able to openly communicate about their childhood experiences and yet stay objective regardless of the nature of their experiences. Insecure persons significantly violate Grice's (1975) maxims of coherence without licensing these violations. Insecure dismissing individuals are typically unable to give evidence for the positive evaluations of their parents or they contradict themselves. Individuals with an insecure preoccupied mental representation are still confused and overwhelmed by their childhood experiences as indicated by angry or vague speech. If participants show a breakdown in strategy when talking about loss or trauma, they are classified unresolved on top of their main classification (Main et al., 2003).

Research Using the AAI with Adolescents

A substantive number of researchers have administered the AAI with adolescents (see for an overview Allen & Land, 1999). The normative distribution of attachment classifications in non-clinical adolescent samples appears to be 56% secure, 33% dismissing, and 11% preoccupied (Van IJzendoorn & Bakermans-Kranenburg, in press). This distribution differs only slightly from the distribution of non-clinical mothers, due to a marginal overrepresentation of dismissing classifications and an underrepresentation of preoccupied classifications.

Short-term stability of AAI classifications in adolescence has been examined with promising results. In a study on Italian adolescents, stability of the AAI classifications was considerable when 10-year olds were reassessed 4 years later (Ammaniti, Van IJzendoorn, Speranza, & Tambelli, 2000). Using Kobak's Q-sort (Kobak, Holland, Ferenz-Gillies, Fleming, & Gamble, 1993), Allen, Boykin-McElhaney, Kuperminc, and Jodl (2004) as well as Zimmermann and Becker-Stoll (2002) reported substantial stability of attachment representation from 16 to 18-years of age.

In several (but not all) longitudinal studies the attachment representations of adolescents have been found to be related to their attachment classifications in infancy and early childhood. The Berkeley longitudinal study of attachment was the first to relate infants' Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978) classifications to the AAI classifications at 19 years of age. Secure versus insecure infant attachment classifications predicted secure versus insecure AAI classifications. In cases where security status changed over the 19 year period, this

was related to intervening trauma (for an overview see Main, Hesse, & Kaplan, 2005). Hamilton (2000) found similar results. In a sample of 16-year old German adolescents, however, no direct relation was found between the SSP and the AAI as rated with Kobak's Q-sort methodology (Zimmermann, Fremmer-Bombik, Spangler, & Grossmann, 1997). In this study, continuity existed at the attachment behavior level from infancy to childhood (age 10) and at the representational level from childhood to adolescence. Three other studies (Lewis, Feiring, & Rosenthal, 2000[1,2]; Sagi-Schwartz & Aviezer, 2005; Weinfield et al., 2004) found no continuity between attachment in infancy and in adolescence. However, environmental influences were associated with (dis-)continuity of attachment. According to a recent meta-analysis continuity of attachment from infancy to adolescence seems to be the rule (Fraley, 2002) but lawful discontinuity exists as a consequence of developmental and environmental changes (Allen & Land, 1999).

Because attachment is transmitted from one generation to the next (Van IJzendoorn, 1995), maternal and adolescent attachment representations may be expected to show substantial concordance. Rosenstein and Horowitz (1996) indeed reported high similarities in attachment for the three-way classification in a clinical sample. Furthermore, parents with a secure mental representation have been documented to be more sensitive to their children than insecure parents (see Van IJzendoorn, 1995 for a meta-analysis) and sensitive parents more often have securely attached children (De Wolff & Van IJzendoorn, 1997). To our knowledge no study has tested the association between adolescents' attachment representations and their parents' sensitivity, although some studies involved constructs which are conceptually linked to sensitivity. These studies indicate a relation between adolescents' attachment representation and parent-adolescent interaction. For example, Allen and colleagues (2004) revealed that dyadic relatedness shown in conflict interactions between mothers and their 16-year-old children was related to adolescent attachment security as measured with Kobak's Q-sort at 16 and 18 years of age. Roisman et al. (2001) revealed that parent-child interactions at age 13 were associated with AAI classifications and AAI coherence at age 19.

The validity of the AAI for adolescents has been supported by studies relating adolescent attachment representation to developmental outcomes. For example, adolescents with a secure attachment representation display better personality functioning (Zimmermann & Grossmann, 1997[1]) and fewer behavior problems (Adam, Sheldon-Keller, & West, 1996; Lewis et al., 2000[1]). They also have more positive friendships (Mayseless & Scharf, 2007; Zimmermann, 2004[1]) and show better school adjustment (Bernier, Larose, Boivin, & Soucy, 2004).

[2] It should be noted that in this study a modified SSP was used to measure infant attachment.

Evidence for the construct validity of the AAI when applied to adolescents may also be found in the area of perceived support. Dismissing and preoccupied adolescents may report less support than secure adolescents because of the less satisfying relationships they have with significant others (Main, 1990). Evidence concerning the link between attachment and support is however inconclusive. For example, Kobak and Sceery (1988) found that dismissing adolescents reported perceiving less support than secure and preoccupied adolescents, whereas Zeanah et al. (1993) did not reveal a relation between (adult) attachment representation and perceived support.

More evidence for the construct validity of the AAI in adolescents may be found by examining the association between attachment representation and emotional investment in others versus in self. Because dismissing individuals emphasize their independence and dismiss the importance of attachment relationships (Hesse, 1999) they would be expected to emotionally invest less in others than non-dismissing individuals (see also Mikulincer & Shaver, 2007). Secure persons, in contrast, do value attachment relationships, and preoccupied individuals feel emotionally very dependent on others (Hesse, 1999) and may therefore invest more in others and less in themselves. No studies using the AAI have yet explored this issue.

Discriminant validity of the AAI in adolescent samples requires that AAI classifications are independent of intelligence and temperament. Three studies investigating the link with intelligence found no significant association (Rosenstein & Horowitz, 1996; Ward & Carlson, 1995; Zimmermann, Maier, Winter, & Grossmann, 2001[1]). De Haas, Bakermans-Kranenburg, and Van IJzendoorn (1994) showed that there was no association between AAI classification and temperament in an adult sample. However, this relation has not yet been investigated in an adolescent sample.

AAI and Adoptive Status

In the current study we administered the AAI with adopted adolescents. To date only three studies have reported on the AAI in adult adoptees, two of them with overlapping samples (Caspers, Cadoret, Langbehn, Yucius, & Troutman, 2005; Caspers, Yucuis, Troutman, Arndt, & Langbehn, 2007; Irhammar & Bengtsson, 2004). Irhammar and Bengtsson (2004) reported that the adoptees did not significantly differ from the norm group with respect to the distribution of attachment classifications. Secure attachment was related to adoption at a younger age. Furthermore, participants' self-esteem and mental health tended to be better in secure versus dismissing or preoccupied persons. The other two studies included more dismissing and fewer preoccupied individuals compared to the normative distribution, but this might (also) be due to the fact that they included adoptees who were originally

selected on the basis of the psychiatric status of their birth parents (Caspers et al., 2007). Biologically unrelated siblings showed 61% concordance of attachment, pointing at the importance of shared environment for attachment representation (Caspers et al., 2007).

The Present Study

This study is the first to systematically investigate the validity of the AAI in a group of adolescents. Construct validity of the AAI is tested by examining the associations with (1) maternal sensitivity, (2) mothers' and adolescents' autonomy-relatedness behaviors during conflict interaction, (3) adolescents' emotional investment in self versus others, and (4) adolescents' perceived support. We also investigate whether attachment is unrelated to temperament and intelligence, thereby examining the discriminant validity of the AAI.

Methods

Participants

Participants were 156 internationally adopted adolescents, who were involved in a study which started in infancy (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005; Beijersbergen, Bakermans-Kranenburg, Van IJzendoorn, & Juffer 2007; Jaffari-Bimmel, Juffer, Van IJzendoorn, Bakermans-Kranenburg, & Mooijaart, 2006). AAIs of two participants could not be coded due to technical problems. In addition, two AAIs were not classifiable because the adolescents were not able to understand the questions of the AAI as a consequence of (very) low IQ (IQs of 58 and 82, respectively). We therefore report on 152 adolescents.

Mean age of the adopted adolescents was 14.4 (*SD* = 0.53). Sixty-eight were male and 84 were female. They were adopted before the age of 6 months (*M* = 10.0 weeks; *SD* = 5.30) from Sri Lanka (*n* = 94), South Korea (*n* = 38), and Colombia (*n* = 20) to the Netherlands. The adoptive families predominantly belonged to middle-class or upper middle-class (Jaffari-Bimmel et al., 2006). At the time of birth of the children adoptive mothers were 33.1 years of age (*SD* = 3.55, *N* = 142), and fathers were 35.0 years old (*SD* = 3.55, *N* = 141).

Procedure

The adoptive families were randomly recruited through Dutch adoption organizations. When the children were 5, 6, 9, and 12 months old, the families were visited at home. At 12, 18, and 30 months the mothers and children came to the laboratory. At 7 years

of age, the families were again visited at home. The current study reports on the follow-up at 14 years of age. Adolescents participated in 3.5 hour home visits together with their mothers, except for four families where the fathers participated (because of divorce or death of the adoptive mother). Results were similar when these fathers were excluded from the analyses. During the home visits the AAI was administered with the adolescents, as well as an intelligence test and a test for emotional investment. Furthermore, the adolescents completed a support questionnaire and participated in a problem-solving and conflict interaction task with their mothers. The mothers were asked to complete a temperament questionnaire about their children. Informed consent was obtained from the adoptive parents at the start of the longitudinal study and again at each follow-up study. For the current study, the adoptive families were contacted first by letter and then by phone. At the start of the home visit, informed consent was obtained from the adoptive mother (or father, see above), and the adolescent was provided with an opportunity to assent or decline participating prior to the assessments. Procedures and measures of this study were reviewed and approved by the board of the Institute for the Study of Education and Human Development at Leiden University.

Measures

Adult Attachment Interview (AAI)

The Adult Attachment Interview (George et al., 1996; Hesse, 1999; Main et al., 2003) is an hour-long, semi-structured interview which assesses an individual's current state of mind with respect to attachment. In this interview respondents were asked about their childhood experiences with their adoptive parents and how they thought they were affected by them. Other questions concerned experiences of loss and trauma. Finally, respondents were invited to describe possible changes in the relationship with their adoptive parents since childhood and the current relationship with them.

Respondents' interview transcripts were classified as: secure (F), dismissing (Ds), or preoccupied (E). Secure individuals freely describe their experiences and yet stay objective regardless of the nature of their experiences. Dismissing individuals are typically unable to give evidence for the positive evaluations of their parents or they even contradict themselves. Individuals with a preoccupied representation use angry language when talking about their parents or their discourse is characterized by vague speech. The Unresolved classification may be given on top of a person's main classification when he or she shows lapses in the monitoring of reasoning or discourse (or reports extreme behavioral reactions) in reaction to loss or other traumatic events (Main et al., 2003). Participants also receive a score for *coherence of transcript*. This is a 9-point rating scale indicative of the consistency and collaboration

of the participant: adolescents with secure attachment representations have a score of 5 or higher while insecure adolescents have scores lower than 5 (Main et al., 2003). The AAIs were coded by the first author. For inter-rater reliability, 18 interviews were also classified by the third author. Inter-rater agreement was 78% (κ = .64) for three-way classifications (secure, dismissing, and preoccupied) and 83% (κ = .77) for four-way classifications (secure, dismissing, preoccupied, and unresolved). Intra-class correlation for the coherence scale was .71. Disagreements between coders were resolved by discussion.

Of the 152 adopted adolescents, 57 (37.5%) were secure, 62 (40.8%) dismissing, and 33 (21.7%) preoccupied. When the unresolved category was taken into account the following attachment distribution was found: 50 (32.9%) secure, 57 (37.5%) dismissing, 19 (12.5%) preoccupied, and 26 (17.1%) unresolved. The distribution of classifications of the current sample differed significantly from the normative distribution in non-clinical adolescent samples (Van IJzendoorn & Bakermans-Kranenburg, in press) for both the three-way distribution (χ^2 (2, N = 152) = 30.74, p < .01) and the four-way distribution (χ^2 (3, N = 152) = 15.36, p < .01). The adopted adolescents more often had an insecure attachment representation.

Maternal sensitive responsiveness

Mothers and adolescents were invited to participate in a 10-minute problem-solving task. The adolescents were asked to solve eight difficult puzzles (Tangram). The mothers were given the solutions of the puzzles and were asked to assist their children. The Erickson sensitivity scales (Egeland, Erickson, Clemenhagen-Moon, Hiester, & Korfmacher, 1990; Erickson, Sroufe, & Egeland, 1985) were used to measure maternal sensitive responsiveness. Mothers were rated on four 7-point rating scales: supportive presence, intrusiveness, sensitivity and timing, and clarity of instruction. The hostility scale was not included in the analyses because of low variance. One dyad was excluded from the analyses because the mother and adolescent misunderstood the task. The Erickson scales were originally developed for coding maternal sensitive responsiveness in early childhood. Stams, Juffer, and Van IJzendoorn (2002) adapted these scales for middle childhood. Test-retest reliability and convergent validity at this age were satisfactory (Stams et al., 2002). We adjusted the scales for use in adolescence by applying an age-adequate task and taking into account the more frequent verbal interaction between mothers and adolescents compared with the more frequent physical contact between mothers and children in (early) childhood.

Inter-coder reliability was tested on 30 cases. Intra-class correlations ranged from .91 (sensitivity and timing) to .95 (intrusiveness & clarity of instruction) (Jaffari-Bimmel et al., 2006). The four scales were highly correlated (range r .57 to .90, p < .01). A

principal component analysis pointed to a one-dimensional solution explaining 81% of the variance. The overall score for maternal sensitive responsiveness was computed by averaging the standardized scale scores (with intrusiveness reversed). Cronbach's alpha was .92.

Family Interaction Task (FIT)

Using a revealed differences task (Strodtbeck, 1951) we investigated the patterns of conflict interaction shown by the adolescents (see Allen et al., 2003; Kobak, Sudler, & Gamble, 1991). Mothers and adolescents were asked to discuss and try to reach consensus on an issue on which they disagreed. Examples of issues are money and grades. The interactions were coded using the autonomy and relatedness coding system of Allen and colleagues (1994). Mothers and adolescents each received scores ranging from 0 to 4 on four scales (derived from nine subscales): (a) *exhibiting autonomy* (states reasons clearly for disagreeing, confidence in stating thoughts and opinions) (b) *inhibiting autonomy* (recanting a position, overpersonalizing, pressures to agree) (c) *exhibiting relatedness* (validates/agrees/positively reacts to other person, engaged interaction), and (d) *inhibiting relatedness* (distracting/ignoring, hostile/devaluing statements). For both adolescents and mothers, the subscale 'recanting a position' was excluded from the inhibiting autonomy scale because it was not associated with the other subscale(s) due to lack of variance. Because the inhibiting autonomy and inhibiting relatedness scales were strongly correlated (adolescents $r = .72$, $p < .01$; mothers $r = .52$, $p < .01$), they were combined into one scale, *inhibiting autonomy-relatedness*. Internal consistencies of the final scales were moderate to high (range: .55 to .82). Mean inter-rater reliability between an expert and the two coders was .77 (range: .52 to .92, $n = 30$). Except for the reliability cases where scores from the coders were averaged, each mother-adolescent dyad interactive behavior was coded by one person.

In addition to the separate scales, principal component analysis was conducted deriving one factor from the six scales (three mother and three adolescent scales). The factor (explained variance 30%) was an index for *positive interaction* including the exhibiting autonomy and exhibiting relatedness scales of the mother and the adolescent (standardized before combined into one scale). Table 1 shows means and standard deviations for the FIT. Scale scores were missing for two dyads; in one case because no parent was present during the session, and in the other case as a consequence of technical recording problems of the procedure.

Table 1

Means and Standard Deviations of Indexes of Socio-Emotional Development, Temperament and Intelligence per AAI Classification

	F[a]	Ds[b]	E[c]	nonF[d]	Total[e]
Construct validity					
Maternal sensitivity	0.15 (0.88)	-0.15 (0.88)	0.02 (0.93)	-0.09 (0.90)	0.00 (0.90)
Adolescents					
Exhibiting autonomy	2.39 (0.69)	2.00 (0.75)	2.35 (0.84)	2.12 (0.79)	2.22 (0.76)
Exhibiting relatedness	1.65 (0.59)	1.64 (0.60)	1.67 (0.62)	1.65 (0.60)	1.65 (0.60)
Undermining autonomy-relatedness	1.07 (0.78)	0.86 (0.72)	1.03 (0.74)	0.92 (0.73)	0.98 (0.75)
Mothers					
Exhibiting autonomy	3.16 (0.64)	3.06 (0.57)	3.21 (0.65)	3.11 (0.60)	3.13 (0.61)
Exhibiting relatedness	2.18 (0.50)	1.93 (0.64)	2.00 (0.67)	1.95 (0.65)	2.04 (0.61)
Undermining autonomy-relatedness	0.93 (0.56)	0.91 (0.58)	1.06 (0.63)	0.96 (0.60)	0.95 (0.58)
Positive interaction	0.12 (0.59)	-0.15 (0.67)	0.07 (0.75)	-0.07 (0.70)	0.00 (0.67)
Emotional investment	.85 (.09)	.80 (.10)	.87 (.08)	.83 (.10)	.83 (.09)
Perceived support	0.16 (0.53)	-0.07 (0.62)	-0.12 (0.64)	-0.09 (0.62)	0.00 (0.60)
Discriminant validity					
Perceived temp	-0.05 (0.55)	0.04 (0.66)	-0.04 (0.65)	0.01 (0.65)	-0.01 (0.61)
Intelligence	100.8 (12.74)	100.4 (13.02)	100.5 (14.18)	100.5 (13.36)	100.6 (13.09)

Note. F = secure. Ds = dismissing. E = preoccupied. NonF = insecure. Temp = temperament.
[a]Range *n* = 53-57. [b]Range *n* = 55-62. [c]Range *n* = 31-33. [d]Range *n* = 86-95. [e]Range *n* = 140-152.

Relational Support Inventory (RSI)

The Relational Support Inventory (Scholte, Van Lieshout, & Van Aken, 2001) was used to measure relational support as perceived by the adolescents. The questionnaire consisted of 26 items constituting five scales: (a) emotional support (warmth versus hostility), (b) respect for autonomy (vs. limit setting), (c) quality of information (vs. withholding of information), (d) convergence of goals (vs. opposition of goals), and (e) acceptance. For each item adolescents gave separate scores for mother, father, sibling, and a close friend on a 5-point scale, ranging from *very untrue* to *very true*. If a participant had more siblings, they reported on the sibling closest in age. Principal component analysis revealed a one-dimensional solution (explained variance 38%). We therefore computed a total score for perceived relational support by averaging the standardized scores of all scales for all support providers. Internal consistency of this scale was high (α = .91).

Eggs in the basket

The *Eggs in the basket*-task (Topham, 1973; see also Burns & Dunlop, 2001) was used to measure emotional investment. The experimenter explained that each of the five baskets (equipped with nameplates) that were placed in front of the participant stood for a specific person: one for the self, one for the adoptive mother, one for the adoptive father, one for the sibling in the adoptive family (when there were more siblings, the one closest in age), and one for the birth mother. Eleven eggs were put into the self-basket. The adolescents were asked to distribute the eggs over the baskets: how much did they want to give to their adoptive mother, how much to their adoptive father, etc., and how much did they want to keep for themselves? We computed the proportion of eggs given to others as an indicator for emotional investment in others versus in self.

Perceived temperament

Mothers filled in the Dutch Temperament Questionnaire (Kohnstamm, 1984) for their children. This 19-item questionnaire is an adaptation of the Infant Characteristics Questionnaire (Bates, 1980; Bates, Freeland, & Lounsbury, 1979) and is scored on a 7-point scale. Items concern sociability, persistence, adaptability, and mood. For an age-adequate adaptation a few words were rephrased for the current sample of adolescents (Jaffari-Bimmel et al., 2006). An overall score for the adolescent's difficult temperament was calculated by averaging the standardized item-scores. Internal consistency of the overall scale was high (α = .91).

Intelligence
Intelligence was measured with three subtests of the Groningen Intelligence Test (GIT; Luteijn & Van der Ploeg, 1983), namely: cipher, enumerate words, and word matrices. Mean IQ score of the adopted adolescents was 100.6 (*SD* = 13.09; see Table 1).

Health condition at placement
Health condition at adoptive placement was an index for the health condition of the infant from birth to placement in the family (Stams et al., 2002). Information for this index was gathered in the first interview with the parents when the infants were 5 months old. Health condition at placement was calculated by the standardized summation of (a) birth weight, (b) incidence of prematurity, and (c) health problems at placement (reversely coded).

Socioeconomic status (SES)
Socioeconomic status of the adoptive families was assessed when the children were 7 years old, combining the educational and vocational background of both parents (for more details see Stams et al., 2002). Scores for SES correspond to socioeconomic strata as follows: 3 to 9 lower class, 9 to 12 middle class, and 12 to 16 upper-class. Mean SES of the families was 10.0 (*SD* = 2.65, *N* = 147).

Data-analyses

The security-insecurity distinction as well as the three-way and four-way attachment classifications were used in the analyses. In addition, the continuous AAI coherence scale was used. Adolescents who did not have a sibling, father or mother were excluded from the analyses for emotional investment. Following Keppel and Wickens' (2004) recommendation concerning extreme scores, we included outliers in the analyses. Results remained similar when outliers were changed into the next most extreme scores (Tabachnick & Fidell, 2001).

First, we investigated whether background variables such as gender and country of birth were unrelated to attachment classification and AAI coherence scores. Next, correlations between the autonomy-relatedness scales are reported. The associations between indexes of socio-emotional development, temperament, and intelligence were also examined. We then tested the construct validity of the AAI by examining the relations between attachment and sensitivity, autonomy-relatedness, perceived relational support, and emotional investment. Testing the associations with temperament and intelligence concerns the discriminant validity of the AAI. When overall analyses showed significant effects, post-hoc tests were used to examine how

groups differed from each other on the variable under investigation. In addition, when a multivariate analysis showed no significant effect while we held specific hypotheses, univariate analyses were conducted (see below).

Results

Preliminary Analyses

We examined whether attachment representation and AAI coherence were independent of gender, country of birth, SES, health condition or age at adoptive placement, and age at time of assessment. Attachment classifications and coherence scores were not associated with any of these variables.

Next, associations between the subscales of the FIT were investigated. Adolescents who displayed more relatedness displayed more autonomy (r = .30, p < .01) and less inhibiting autonomy-relatedness (r = -.24, p < .01). Adolescents who inhibited autonomy-relatedness more also displayed more exhibiting autonomy (r = .39, p < .01). The mother scales showed the same pattern of correlations (r = .19, p < .05; r = -.24, p < .01; r = .21, p < .05; respectively). Concerning the relations between the mother and adolescent scales, we found that: (1) adolescents who displayed more autonomy had mothers who displayed more relatedness (r = .27, p < .01) and more inhibition of autonomy-relatedness (r = .18, p < .05); (2) adolescents who showed more relatedness had mothers who showed more relatedness (r = .49, p < .01) and autonomy (r = .16, p < .05); and (3) adolescents who inhibited autonomy-relatedness had mothers who inhibited autonomy-relatedness as well (r = .33, p < .01).

Adolescents who experienced more support from others had more positive interactions during disagreements with their mothers (see Table 2). In addition, their mothers perceived them as having a less difficult temperament. Mothers who were more sensitive when their children were solving puzzles had more positive interactions during disagreements. Emotional investment in others and intelligence were not related to any of these variables.

Construct validity

Maternal sensitive responsiveness

Maternal sensitive responsiveness during the puzzles was not related to attachment classification (secure-insecure: t (148) = -1.56, p = .12; three-way classification: F (2, 147) = 1.56, p = .21; four-way classification: F (3, 146) = 0.37, p = .77). Maternal sensitive responsiveness was not associated with coherence of transcript either (r = .06, p = .45).

Table 2

Correlations between Indexes of Socio-Emotional Development, Temperament and Intelligence

	1.	2.	3.	4.	5.
1. Maternal sensitivity	-				
2. Positive interaction	.27**	-			
3. Emotional investment	.05	.12	-		
4. Perceived support	.01	.24**	.13	-	
5. Temperament	.15	-.08	-.06	-.34**	-
6. IQ	-.01	-.01	-.09	.07	-.09

Note. Range N = 129-151.

**p < .01.

Autonomy-relatedness

First, the relation between adolescents' autonomy-relatedness behavior and attachment representation was investigated. Using the secure-insecure distinction, a MANOVA showed no overall effect for adolescents' autonomy relatedness, F (3, 146) = 1.61, p = .19. However, we held a priori hypotheses regarding the different types of adolescents' interactive behaviors. Therefore, univariate analyses were conducted because they are more efficient in setting light on specific effects. In addition, univariate analyses have more power than multivariate analyses. If the sphericity assumption holds, which was the case in our analyses, ANOVA's may be preferred over MANOVA (Keppel & Wickens, 2004). Therefore, we also report results of univariate analyses. A significant effect was found for exhibiting autonomy, F (1, 148) = 4.35, p < .05, η^2 = .03. Secure adolescents displayed more autonomy than insecure adolescents (see Table 1). Further univariate analyses with the three and four-way classifications also revealed significant differences for the exhibiting autonomy scale (F (2, 147) = 4.56, p < .05, η^2 = .06; and F (3, 146) = 3.20, p < .05, η^2 = .06, respectively): secure adolescents showed more autonomy during interactions with their mothers than dismissing adolescents. Coherence was not related to adolescents' autonomy-relatedness behavior (exhibiting autonomy r = .13, p = .12; exhibiting relatedness r = .07, p = .38; inhibiting autonomy-relatedness r = .02, p = .82).

We also examined mothers' autonomy-relatedness behavior. Mothers of secure adolescents showed more relatedness during the conflict interaction task than mothers of insecure adolescents (t (138) = -2.36, p < .05; see Table 1). No differences were found on the exhibiting autonomy or inhibiting autonomy-relatedness scales (F (1, 148) = 0.22, p = .64; and F (1, 148) = 0.08, p = .78). Using the three and four-way classifications, no differences were found for mothers' behavior during the interaction with their adolescents (F (6, 290) = 1.27, p = .27; F (9, 351) = 1.07, p = .38). Mothers

who showed more relatedness tended to have adolescents with higher AAI coherence (r = .16, p = .06).

No significant differences in positive interaction appeared using the secure-insecure distinction (t (148) = -1.75, p = .08), three or four-way classifications (F (2, 147) = 2.73, p = .07; F (3, 146) = 1.97, p = .12). Adolescents with higher AAI coherence scores had more positive interactions with their mothers during disagreements (r = .16, p < .05).

Perceived relational support

Secure adolescents (M = 0.16, SD = 0.53) reported more relational support than insecure adolescents (M = -0.09, SD = 0.62; t (139) = -2.42, p < .05). No differences were found in relational support with the three- or four-way classifications (F (2, 138) = 2.96, p = .06; F (3, 137) = 2.48, p = .06). Coherence during the AAI was positively related to perceived support (r = .22, p < .01).

Emotional investment

Adolescents with secure or insecure attachment representations did not differ in emotional investment as expressed in the number of eggs they gave to others (t (138) = -1.14, p = .26). However, using the three-way classifications (F (2, 137) = 7.43, p < .01, η^2 = .10) we found that dismissing participants gave less eggs to others than secure or preoccupied participants (*mean difference* = -.05, SE = .02, p < .05; *mean difference* = -.07, SE = .02, p < .01; respectively). The four-way classification showed a similar significant difference between dismissing and preoccupied adolescents (*mean difference* = -.07, SE = .02, p < .05, η^2 = .08). Coherence was not related to emotional investment (r = .12, p = .16, N = 140).

Discriminant validity

Adolescents' attachment representation was unrelated to temperament (secure-insecure: t (150) = 0.65, p = .52; three-way: F (2, 149) = 0.41, p = .66; four-way: F (3, 148) = .67, p = .57). The correlation between coherence and temperament was not significant either (r = -.12, p = .13). Moreover, the attachment classifications were independent of intelligence for the secure-insecure split, three-way, and four-way classifications (t (149) = -.17, p = .87; F (2, 148) = .02, p = .99; F (3, 147) = .32, p = .81, respectively). Intelligence was not related to coherence either (r = .08, p = .33).

Discussion

The present study provides evidence for the construct validity of the AAI in adolescents. We found that during a conflict interaction task secure adolescents displayed more autonomy than dismissing adolescents, while mothers of secure adolescents showed more relatedness than mothers of insecure participants. With regard to emotional investment, it appeared that dismissing individuals invested less in others than secure and preoccupied adolescents. In addition, secure adolescents reported more relational support than insecure adolescents. Finally, perceived temperament and intelligence were unrelated to AAI classifications, supporting the AAI's discriminant validity.

As hypothesized, we found that dismissing adolescents invested emotionally less in others than secure and preoccupied adolescents. This finding supports the notion that dismissing individuals value relationships less than non-dismissing individuals. This may be a consequence of their experiences with rejection in the past when they turned to their parents for comfort (Main et al., 2003). Dismissing adolescents' attitude towards investment in relationships with important others may also be displayed in peer relationships and romantic relationships. Downey, Feldman, and Ayduk (2000) reported that romantic relationship investment was negatively related to avoidant attachment and positively related to ambivalent attachment as measured with the Adult Attachment Style Questionnaire (Levy & Davis, 1988).

The present study revealed that secure adolescents perceived more relational support than insecure adolescents. This is consistent with evidence that attachment security is usually related to more positive interactions with parents (e.g., Allen, Porter, McFarland, Marsh, & Boykin-McElhaney, 2005[1]; Allen, Porter, McFarland, Boykin-McElhaney, & Marsh, 2007[1]; Kobak et al., 1993[1]) and more positive relationships with friends (Mayseless & Scharf, 2007; Zimmermann, 2004[1]).

Contrary to our expectation, concurrent maternal sensitivity was not associated with adolescent attachment classification. The task we used to measure sensitivity might not have been ecologically valid for this age period. During adolescence solving difficult puzzles with your mother is not a regular situation. The conflict interaction task that was applied to measure autonomy-relatedness may be a more appropriate setting. As hypothesized, we did find differences in displayed relatedness between mothers of secure and insecure adolescents. Future research on mothers' sensitivity towards their adolescent children might include problem-solving situations which are regularly encountered by these dyads, for example helping with a difficult homework task.

Exhibiting autonomy and inhibiting autonomy-relatedness were related in our sample. Participants who tried to solve a disagreement with more positive strategies also used more negative ones. This rather unexpected outcome resembles Van Zeijl and colleagues' (2006) finding that mothers using more positive discipline strategies also used more negative discipline. These findings may indicate that participants who feel disappointed about the effects of one of the strategies tend to turn to the other.

The Adoptive Status of the Adolescents

The current sample is special because of the adoptive status of the adolescents. The distribution of attachment classifications in our sample differed from the normative adolescent distribution in that fewer participants had a secure attachment representation. This may (partly) be the consequence of the adoptive status of the adolescents. They experienced a separation from their birth parents and possibly also from other attachment figures. They may still experience the consequences of the loss of these persons even when they do not explicitly remember them. Additionally, their adoptive status may be an issue during adolescence in particular, because of the process of identity formation in this stage of life (Brodzinsky, 1990; Brodzinsky, Schechter, & Henig, 1992; but see Juffer & Van IJzendoorn, 2007). Caspers and colleagues (2007; Caspers et al., 2005) also found in their adoption sample a distribution which was significantly different from the norm distribution, although their sample included more dismissing and fewer preoccupied adopted adults.

The adopted adolescents in our sample may, nevertheless, not be too different from other adolescents. They were adopted at a very early age (before 6 months, at 10 weeks on average) and were not characterized by special needs. Their mean IQ score was not different from the norm for 14-15 year olds (t (150) = 0.57, p = .57). Finally, although they had less optimal scores for inhibiting autonomy-relatedness compared to a high school sample (Allen & Hauser, 1996), they exhibited more optimal autonomy behaviors compared to an academic low risk group (Boykin-McElhaney & Allen, 2001).

Interestingly, adolescents' AAI classifications were associated with mothers' relatedness during conflict situations, even though there was no genetic bond between the adoptive mothers and their children. This points to the importance of the environment for the development of attachment representations, which is supported by a study of Caspers and colleagues (2007) reporting 61% concordance in attachment representation of genetically unrelated siblings. In addition, Constantino et al. (2006) reported that for non-twin siblings the concordance in attachment representation was as strong as that for monozygotic twins.

Implications for Research, Policy, and Practice

In the last two decades, research has shown that insecure attachment representations as measured with the AAI are associated with psychiatric disorders (see for a meta-analysis Van IJzendoorn & Bakermans-Kranenburg, in press). Of the clinical individuals, fewer than 30% showed a secure attachment representation. Internalizing disorders seem to be associated with preoccupied and unresolved attachment classifications, whereas externalizing disorders tend to be related to dismissing and preoccupied attachments. The current study implies that the AAI may also be used with clinical adolescents (see for example Zegers, Schuengel, Van IJzendoorn, & Janssens, 2006). Administering the AAI with clinical adolescents who are followed over time (e.g., Allen, Hauser, & Borman-Spurell, 1996) may provide more insight in their development and may yield indications for successful interventions in this group.

Conclusion

In conclusion, the valid assessment of attachment representations with the AAI is not restricted to adults; our study showed the AAI's construct validity when used with (adopted) adolescents. A substantive next step would be to administer the AAI to adoptive parents. This would provide a unique opportunity to relate adopted children's attachment representation with their parents' attachment representation, and to test the intergenerational transmission hypothesis in a biologically unrelated sample of parent-adolescent dyads.