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## Adolescent attachment insecurity and the influence of MBT

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### ABSTRACT

The aim of this study in a high-risk adolescent sample with personality disorders receiving intensive mentalisation-based treatment (MBT), was first, to examine deviations in insecure attachment distribution of the normative pattern, and in borderline personality disorder and other personality disorders; second, to explore whether MBT alters attachment representations and whether these alterations are related to changes in psychological distress. A total of 60 adolescents were investigated pre-treatment for both categorical and continuous measures of the Adult Attachment Interview (AAI). Pre- and post-AAI ( $N = 33$ ) data were compared with psychological distress measured by the Symptom Checklist-90. While the most disturbed category of insecure attachment, the “cannot classify” category, was overrepresented (46.7%) at pre-treatment, no differences were observed by type of personality disorder. At post-treatment, 48.5% of the participants showed positive change in the attachment representation, and their psychological distress lowered significantly ( $p = .002$ ). The whole sample demonstrated change towards increased secure attachment ( $z = -2.85, p = .004$ ). Attachment insecurity was found in all adolescent personality disorders which MBT seemed to be able to alter. However, as we included no control group, we cannot conclude that changes are due to the treatment itself.

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### KEYWORDS

Personality disorder; AAI; adolescents; MBT

## Introduction

Attachment insecurity is likely to influence the onset and treatment of personality disorders in adolescence (Steele, Bate, Nikitiades, & Buhl-Nielsen, 2015). Adolescence is a stage of life that is eminently characterised by change and instability (Kaltiala-Heino & Eronen, 2015). One can, therefore, question what psychotherapy contributes to this natural process of separation-individuation. In personality disorders, transference-focused psychotherapy, instead of dialectical behaviour therapy or psychodynamic supportive psychotherapy, is shown to change adult attachment representations (Levy et al., 2006). So far, however, it has not been demonstrated, by using the gold standard of attachment assessment, the Adult Attachment Interview (AAI) (Main, Goldwyn, & Hesse, 1998), that mentalisation-based

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 Supplemental data for this article can be accessed [here](#).

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treatment (MBT) (Bateman & Fonagy, 2006, 2012) is able to achieve such an impact. Hence, it is of clinical relevance to examine adolescent attachment insecurity and the influence of MBT on this problem among severely disordered adolescents. Therefore, the aim of this study was to assess attachment using the AAI in adolescents with a personality disorder before and after undergoing an intensive MBT programme (Bateman & Fonagy, 2006, 2012; Hauber, 2010), to relate possible changes in attachment to changes in psychological distress, and to examine if MBT alters attachment representations.

Considering the evolving state of personality disorder classifications and the difficulty to diagnose personality disorders in adolescence (Laurensen, Hutsebaut, Feenstra, Van Busschbach, & Luyten, 2013), the analysis of the differences between a sample of highly disturbed adolescents and a non-clinical sample could help advance the understanding of personality disorders in adolescence. It is now well established that adolescent attachment distribution in non-clinical groups is more likely to show dismissing attachments and lower preoccupation in comparison to normative adult attachment distributions (Bakermans-Kranenburg & van IJzendoorn, 2009). Also, the percentage of unresolved attachment representations in adolescents is found to be lower than in adults (18% compared to 11%). Whether this applies to the attachment distribution of clinical adolescents with personality disorders is unknown. This insight is potentially valuable for early detection and development of effective treatment for this group.

While studies on the outcome of psychotherapy on adult attachment are scarce, to our knowledge, no such studies have been conducted among adolescents. This is unfortunate, as adolescence is the period when personality disorders (Feenstra, Busschbach, Verheul, & Hutsebaut, 2011; Rossouw & Fonagy, 2012; Tyrer, Reed, & Crawford, 2015) and several major mental health disorders develop (Kessler, Chiu, Demler, & Walters, 2005). Since insecure attachment is known to contribute to the emergence of mental health disorders (M. Steele et al., 2015), specific information is needed on how to alleviate insecure attachment in adolescents. For this purpose, it is crucial to determine whether insecure attachment differs among different personality disorders (Allen, 2008; Bakermans-Kranenburg & van IJzendoorn, 2009; Levy, Johnson, Clouthier, Scala, & Temes, 2015; Venta, Shmueli-Goetz, & Sharp, 2013). The distinction between borderline personality disorder (BPD) and other personality disorders (OP) is potentially of particular interest, because the origins of BPD in particular have been related to factors such as early childhood environment, caregiving relationships, and traumatic life events (Fonagy et al., 1996; Steele et al., 2015). Therefore, part of the aim of this study was to compare pre-treatment insecure attachment representations between BPD and OP in a sample of adolescent inpatients with clinically diagnosed personality disorders and deviations in attachment distribution from the normative pattern.

Clinical theories and developmental models suggest that insecure attachment is central to the pathogenesis of the borderline psychopathology (Sharp et al., 2016). Existing research on BPD patients confirms such claims, as greater incidence of childhood maltreatment is reported in the said group compared to patients with other disorders (Cirasola, Hillman, Fonagy, & Chiesa, 2017; Courtney-Seidler, Klein, & Miller, 2013). Evidence also suggests a predominance of preoccupied attachment representations in both adult and adolescent BPD patients, often in addition to unresolved patterns of attachment (Agrawal, Gunderson, Holmes, & Lyons-Ruth, 2004; Barone, Fossati, & Guiducci, 2011; Rosenstein & Horowitz, 1996; M. Steele et al., 2015). This

group tends to report less love, more rejection, and more role reversal in their childhood relationships with caregivers (Barone, 2003). Recently, an association between adolescent attachment insecurity and BPD was found through its relation with emotion regulation and mentalising abilities (Kim, Sharp, & Carbone, 2014; Sharp et al., 2016). Mentalising refers to the ability to understand and differentiate the mental states of oneself and others, and to acknowledge the relation between underlying mental states and behaviour (Bateman & Fonagy, 2008, 2012). The few studies on associations between personality disorders other than BPD and insecure attachment have described connections between preoccupied attachment and histrionic, dependent, and avoidant personality disorder, and between dismissing attachment and paranoid, narcissistic, anti-social, and schizoid personality disorder (Levy et al., 2015). Hence, insecure attachment is likely to differ among different personality disorders in adolescence.

A meta-analysis of the AAI (George, Kaplan, & Main, 1985; Main, Hesse, & Goldwyn, 2008) yielded two main recommendations (Bakermans-Kranenburg & van IJzendoorn, 2009) for the purpose of studying attachment representations among clinical groups. The first recommendation is to use the underlying continuous AAI scales for both childhood experiences with the parents (i.e. loving, rejecting) and the current state of mind with respect to these experiences (i.e. devaluing, coherence of mind) (Bakermans-Kranenburg & van IJzendoorn, 2009). The second is to introduce the “cannot classify” (CC) category for scoring the respondents who cannot be placed in one of the organised categories of the AAI (secure, dismissing, and preoccupied) (Hesse, 2008). Thus far, the above recommendations have rarely been followed (Kouvo, Voeten, & Silvén, 2015; Scharf, Mayseless, & Kivenson-Baron, 2012). Therefore, this study investigated both the underlying continuous AAI scales and the CC category of the AAI with regard to personality disorders.

For the reasons mentioned above, the first and observational, cross-sectional part of this study examined insecure attachment in BPD as opposed to OP in a clinical adolescent population clinically diagnosed with personality disorders. First, deviations in attachment distribution of the normative adult and adolescent pattern (Bakermans-Kranenburg & van IJzendoorn, 2009) were inspected by comparing the whole sample with norm groups. Second, the sample was divided into three groups, namely, BPD, OP, and no personality disorder (NP), in which associations with insecure attachment representations including the CC category were analysed. Last, continuous scales for both childhood experiences with parents and current state of mind with respect to these experiences of the AAI were compared between BPD, OP, and NP. This approach was based on the study by Kim et al. (2014) conducted on BPD and non-BPD (OP and NP combined). Drawing on previous studies, it was expected that, first, insecure attachment, especially the more dismissive attachment, would be over presented at pre-treatment; second, that the sample would differ from the norm groups; and third, that attachment insecurity would differ across different personality disorders. The second and prospective part of this study aimed at examining changes in insecure attachment in the adolescent sample receiving intensive MBT, and the relationship between such changes and alterations in psychological distress. Based on previous studies it was assumed that, first, changes in attachment would be related to changes in psychological distress; and second, that intensive MBT would change an insecure attachment representation towards a more secure one.

## Methods

### Participants

The 60 participants comprised a subsample of 67 patients voluntarily admitted to a partial residential MBT facility of a youth psychiatry institution in the urban area of The Hague in The Netherlands. Referrals to this facility came unsystematically from the outpatient facilities of the same and other institutions and of urban and rural areas of the Netherlands. The total sample consisted of 67 adolescents with a personality disorder with a mean age at the start of treatment of 17.8 years ( $SD = 1.3$  range = 15–22), (females 82.1%) (see [Table 1](#)). The average duration of treatment was 348.5 days ( $SD = 164.4$ ; range = 17–549), with an average of 236.1 days ( $SD = 156.6$ ) hospitalised. Intelligence, estimated based on the level of education, was average to above average. All participants were fluent in the Dutch language and followed the treatment on a voluntary basis. Of 67 admissions from February 2008 until February 2012, 60 pre-AAI and 33 pre- and post-AAI were administered. Three out of the participants without a pre-AAI were considered as treatment dropouts because they either withdrew or were excluded, while the duration of their treatment did not exceed the diagnostic 2-month phase (61 days) (de Haan, Boon, de Jong, Hovee, & Vermeiren, 2013; Swift & Greenberg, 2014). Hence, at pre-treatment, 60 SCID-II interviews in combination with the AAI interview were conducted (see [Table 1](#)). The mean age of this pre-treatment sample was 17.8 years ( $SD = 1.12$ ; range = 15–22),

**Table 1.** Overview of study population on gender, DSM-IV Axis I classification and Axis II personality disorders according to the SCID-II ( $N = 60$ ).

|  | <i>n</i> | %    |
|--|----------|------|
| Gender                                   |          |      |
| Female                                   | 50       | 83.3 |
| Male                                     | 10       | 17.7 |
| Axis I disorders                         |          |      |
| Mood disorders                           | 41       | 61.0 |
| Anxiety disorders                        | 25       | 37.0 |
| Identity disorder                        | 11       | 16.0 |
| Eating disorders                         | 8        | 12.0 |
| Substance dependence                     | 5        | 7.0  |
| Dissociative disorders                   | 2        | 3.0  |
| Obsessive compulsive disorder            | 1        | 2.0  |
| Attention deficit hyperactivity disorder | 5        | 8.0  |
| Axis II disorders                        |          |      |
| No PD                                    | 10       | 16.7 |
| One PD                                   | 19       | 31.7 |
| Two PD's                                 | 14       | 23.3 |
| Three PD's                               | 11       | 18.3 |
| Four PD's                                | 1        | 1.7  |
| Five PD's                                | 5        | 8.3  |
| Paranoid PD                              | 16       | 26.7 |
| Schizoid PD                              | 3        | 5.0  |
| Borderline PD                            | 20       | 33.3 |
| Avoidant PD                              | 28       | 46.7 |
| Dependant PD                             | 3        | 5.0  |
| Obsessive compulsive PD                  | 8        | 13.3 |
| Depressive PD                            | 29       | 48.3 |
| Passive Aggressive PD                    | 3        | 5.0  |
| PD NOS                                   | 1        | 1.7  |

PD: personality disorder

(83.3 % females). The post-treatment sample consisted of 33 adolescents between the ages of 16 and 22 ( $M = 17.9$ ,  $SD = 1.3$ ), including 31 females (93.9%) and 2 males (6.1%). The excluded 27 patients without a post-AAI did not differ significantly from the others in age, gender, severity of symptoms, or personality disorders. The duration of treatment of these patients, however, deviated significantly ( $M = 256.9$  days,  $SD = 129.4$ ) from the rest of the sample ( $M = 445.4$  days,  $SD = 113.9$ ).

### Setting

The studied facility offers a 5 days a week MBT programme, manualised and adapted for adolescents (Bateman & Fonagy, 2006, 2012; Hauber, 2010), which commonly starts as residential treatment and transitions into a day treatment halfway through the treatment process. The programme differs from the MBT programme for adolescents in England (Rossouw & Fonagy, 2012) in the psychodynamic group psychotherapy approach. The structured and integrated psychodynamic MBT milieu and group programme is provided to adolescents between the ages of 16 and 23 who are clinically diagnosed as having personality disorders in combination with other non-psychotic disorders by a multidisciplinary team. Sufficient motivation for treatment is a prerequisite. The programme offers weekly large group meetings, sociotherapy, group psychotherapy, art therapy, psychodrama therapy, psychomotor therapy, in combination with individual and family psychotherapy. These different therapies have a mentalising focus on the adolescents' subjective experience of themselves and others, and on the relationships with the group members and the therapists. The patients are not only taught to regulate their emotions better in contact with another person yet also to question and adjust presuppositions about what someone might think about them. Especially situations in which it was no longer possible to mentalise are extensively discussed. In this manner, a safe therapeutic community is established, in which is aimed not only to improve the mentalising capacity of the adolescents yet also to diminish insecure attachment. As the therapy programme progresses, each group member gets more responsibilities towards participation in society, other group members, and group psychotherapy culture. Medication is prescribed if necessary and according to protocol by a psychiatrist involved in the therapy programme.

### Measures

Patients completed a set of web-based questionnaires at the beginning and end of treatment including the Dutch Questionnaire for Personality Characteristics, or Vragenlijst voor Kenmerken van de Persoonlijkheid (VKP) (Duijsens, Eurelings-Bontekoe, & Diekstra, 1996). Subjects were assessed by the Structured Clinical Interview for DSM personality disorders (SCID-II) (Spitzer, Williams, Gibbon, & First, 1990) and the AAI (Main et al., 1998).

#### VKP

The VKP is a questionnaire comprising 197 questions with two categories of answers, "true" or "false." The purpose of the VKP is to screen for personality disorders according to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV). The test-retest reliability (Cohen's Kappa) of the VKP on categorical diagnoses was moderate ( $k = .40$ ) (Duijsens et al., 1996). Seeing that the VKP is known for its high sensitivity and low

specificity (Duijsens et al., 1996), it is the recommended screening instrument for the Dutch version of the SCID-II (Dingemans & Sno, 2004; Verheul, Van der Brink, & Spinhoven, 2000). The presumable and certain outcome of the VKP indicates which SCID-II personality disorder sections should be used.

### SCID-II

The SCID-II is a structured interview consisting of 134 questions. The purpose of this interview is to establish all ten DSM-IV personality disorders, as well as depressive and passive-aggressive personality disorder. The language and diagnostic coverage make the SCID-II the most appropriate tool for adults (aged 18 or older). With slight modification, however, it can also be used with younger adolescents (Spitzer et al., 1990). Only the sections that were identified as potentially relevant based on the VKP were applied in the clinical interview. In line with the SCID-II, the depressive personality disorder and the passive aggressive personality disorder were determined. Following the DSM-IV categorisation, these diagnoses were classified as personality disorder not otherwise specified. Trained psychologists with clinical experience administered the SCID-II. These raters underwent extensive training. After the theoretical training, the interviews were repeated together with a supervisor with the aim of optimising the inter-rater reliability. The level of inter-rater reliability of the SCID-II for categorical diagnoses was reasonable to good ( $k = .61-1.00$ ) (Seqal, Hersen, & Van Hasselt, 1994), and the test-retest reliability was also reasonable to good ( $k = .63$ ) (Weertman, Arntz, & Kerkhofs, 2000).

### AAI

The AAI (George et al., 1985) is a semi-structured interview of 20 questions with accompanying follow-up probes that address recollections of early attachment relationships and any experiences of separation, loss, or trauma. In an approximately hour-long interview, the general descriptions of relationships with each parent and eventual other important attachment childhood figures are evoked, as are the specific supporting memories. Coding of the AAI generates one of the three main adult attachment classifications: Secure-Autonomous (F), Insecure-Dismissing (Ds), and Insecure-Preoccupied (E) (three-way distribution), and two secondary ones, namely, CC and unresolved/disorganised category (U) (five-way distribution). If problems arise with classifying subjects into one of the three main categories, the so-called CC category is applied. This category represents contradictions and anomalies observed throughout the transcript. If the interview reveals signs of unresolved experiences of trauma or loss of attachment figures, the unresolved/disorganised (U) category is applied. The U category differs from the CC category in that it is identified via local breakdowns in discourse strategy during the discussion of loss or other potential trauma. The unresolved/disorganised category is superimposed on the three main attachment classifications. Furthermore, subjects categorised under U and/or CC can be forced in one of the three main attachment classifications by using the most apparent category (three-way distribution) and the second-best classification chosen by the scorer.

The interviews were conducted by the first author and another experienced psychologist following the protocol described by George, Kaplan, and Main (George et al., 1985). Both interviewers were trained to apply the AAI by experienced coders at the Dutch Psychoanalytic Institute in Amsterdam, The Netherlands. Interviews were audio-taped and transcribed for coding. A trained external coder, S. den Hollander, who is reliable

since 2001 and trained by D. Pederson & D. Jacobvitz, rated the transcripts using the AAI Scoring and Classification System (Main et al., 1998). The AAI meets stringent psychometric criteria in terms of reliability, discriminant, and predictive validity, and it can be used with adolescents (Bakermans-Kranenburg & Van IJzendoorn, 1993a; 2009; Cassidy & Shaver, 2008; Hesse, 2008; H. Steele & Steele, 2008; van IJzendoorn, 1995). The inter-rater reliability of the Dutch version of the AAI ( $k = .61$ ) (Bakermans-Kranenburg & Van IJzendoorn, 1993b) qualified as fair (Landis & Koch, 1977). For the purpose of statistical analyses, a continuous scale ranging from one to nine was constructed for both the state-of-mind AAI scales and the experiences toward parents AAI scales.

### **Procedures**

All 67 of the newly admitted adolescents were asked to participate in the study during a 4-year period (2008–2012). Following a verbal explanation of the treatment protocol to the subjects, written informed consent was obtained according to legislation, the institution's policy, and Dutch law (Eurec, 2017). All patients ( $N = 60$ ) agreed to participate, and, in concordance with the institutional policy, they participated without receiving any incentives or rewards. All procedures in this study were aligned with the 1964 Helsinki declaration and its later amendments, or with comparable ethical guidelines. According to the treatment protocol, the patients completed a set of web-based questionnaires in the first and last weeks of treatment, after which they participated in the SCID-II interview, and, finally, in the AAI interview. This order in the treatment protocol resulted in many missing AAI assessments, mainly because adolescents were not easily committed to a long diagnostic process. In addition, the research process was sometimes obstructed by patient crises. Altogether 60 SCID-II interviews were conducted with patients in combination with the AAI interview, and 33 post-AAI interviews.

### **Statistical analysis**

All analyses were performed using the Statistical Package for the Social Sciences (SPSS), version 23.0 (IBM Corp, Armonk, NY, 2011). In the first and observational, cross-sectional part of this study, chi-square tests were performed to compare the categorical variables of the AAI in the sample to norm groups. Next, based on the SCID-II, three groups were formed based on the type of a personality disorder: BPD, OP, and NP. Fisher's exact test was performed between these three SCID-II groups on the categorical variables of the AAI. The analysis of variance (ANOVA) was carried out to compare the continuous variables of the AAI between the three SCID-II groups. The BPD group was further also compared (t-test) with the two other groups (OP and NP) combined (non-BPD). Subsequently, a binary logistic regression analysis was performed (BPD versus non-BPD group) on the continuous scales of the AAI that differed significantly as independent variables on the t-test. The Nagelkerke R-square of the model was used as an effect size measure.

In the second and prospective part of this study, a Wilcoxon signed-rank test was performed to compare the pre-treatment and the post-treatment (forced) AAI classification distributions. Continuous AAI-scales ranging from one to nine of both the state-of-mind scales and the experiences towards parents scales were constructed. A paired t-test was carried out to compare these continuous variables at pre- and post-treatment. For the purpose of forming



groups based on the differences between the attachment classifications at the beginning and the end of treatment, the severity of the AAI categories was assessed on a scale ranging from the most insecure category (CC/U = 1) to the most secure category ( $F = 8$ ) (pre  $M = 3.81$ , post  $M = 5.63$ ) which corresponds to the prototype-based model of attachment (Mauder & Hunter, 2012). This resulted in the following quasi-dimensional AAI scale: CC/U-CC-E/U-E-Ds/U-Ds-F/U-F. Outcome groups were formed based on the differences between the five-way attachment classifications at the beginning and the end of treatment on the dimensional AAI scale, namely the AAI-Improved, the AAI-Unchanged, and the AAI-Deteriorated. The continuous variables and Symptom Checklist-90 (SCL-90) scores of the AAI-outcome groups were compared using paired t-tests. Finally, the AAI Improved group was compared with the AAI-Unchanged and the AAI-Deteriorated groups combined using a t-test.

## Results

### Observational, cross-sectional part of this study

#### Attachment distribution and comparison with the norm groups at t-1

The attachment classifications of the adolescents in the sample were compared to norm groups of non-clinical mothers, non-clinical adolescents, and clinical adolescents. The latter group consisted of suicidal adolescents with a range of DSM diagnoses (Allen, Hauser, & Borman-Spurrell, 1996; Bakermans-Kranenburg & van IJzendoorn, 2009) (See Table 2).

In the current study, the most disturbed category of insecure attachment, the CC category, was overrepresented (46.7%). There was a significant difference in the proportion of participants with U/CC between our sample when compared to non-clinical mothers<sup>1</sup> ( $\chi^2(1, N = 808) = 64.53, p < .001$ ) and non-clinical adolescents<sup>1</sup> ( $\chi^2(1, N = 667) = 122.66, p < .001$ ). For two norm groups, the CC group could be directly compared with our sample. The non-clinical adolescents<sup>2</sup> ( $\chi^2(2, N = 136) = 29.32, p < .001$ ) and the hospitalised adolescents<sup>2</sup> ( $\chi^2(2, N = 126) = 5.98, p < .01$ ) differed significantly from our sample in that they included a smaller proportion of participants within the CC category.

**Table 2.** Overview of AAI attachment classifications in relation to other norm groups in  $N$  and %.

|                                   | Total sample<br>$N = 60$ |      | Non-clinical mothers <sup>a</sup><br>$N = 700/748$ |      | Non-clinical adolescents <sup>a</sup><br>$N = 503/617$ |      | Non-clinical adolescents <sup>2</sup><br>$N = 76/64$ |      | Hospitalised adolescents <sup>2</sup><br>$N = 66/40$ |      |
|-----------------------------------|--------------------------|------|--|------|--|------|--|------|--|------|
|                                   | $N$                      | %    | $N$  | %    | $N$  | %    | $N$  | %    | $N$  | %    |
| F                                 | 9                        | 15.0 | 399  | 56.0 | 222  | 44.0 | 34   | 44.7 | 5  | 7.6  |
| Ds                                | 10                       | 16.7 | 112  | 16.0 | 171  | 34.0 | 12   | 15.8 | 12   | 18.2 |
| E                                 | 5                        | 8.3  | 63   | 9.0  | 55   | 11.0 | 13   | 17.1 | 13   | 19.7 |
| U/CC                              | 36                       | 60.0 | 126  | 18.0 | 55   | 11.0 |  |      |  |      |
| U                                 | 8                        | 13.3 |  |      |  |      | 12   | 15.8 | 19   | 28.8 |
| CC                                | 28                       | 46.7 |  |      |  |      | 5  | 6.6  | 17   | 25.8 |
| Forced attachment classifications |                          |      |  |      |  |      |  |      |  |      |
| F*                                | 13                       | 21.7 | 434  | 58.0 | 321  | 52.0 | 40   | 56.3 | 7  | 16.3 |
| Ds*                               | 16                       | 26.7 | 172  | 23.0 | 216  | 35.0 | 15   | 22.5 | 17   | 44.2 |
| E*                                | 31                       | 51.7 | 142  | 19.0 | 80   | 13.0 | 9  | 21.1 | 16   | 39.5 |

AAI: Adult Attachment Interview; F: free, autonomous; Ds: dismissive; E: entangled, preoccupied; U: unresolved for loss or abuse; CC: cannot classify.

\* Three-way attachment classifications (i.e. regardless U/CC).

<sup>a</sup> Bakermans-Kranenburg, 2009 <sup>2</sup> Allen, Hauser and Spurrell, 1996: In this study transcripts with U in combination with CC were excluded from forced classifications data.

### *Subgroups at t-1*

The sample was divided into three subgroups: participants with BPD ( $N = 20$ ), those with OP ( $N = 30$ ), and a group without a personality disorder (NP) ( $N = 10$ ). When BPD was detected in combination with any other personality disorder, the participant was assigned to the BPD group. The ratio of females in the respective groups was: BPD = 85% females, OP = 86.7%, and NP = 70%. Supplementary material 1 gives an overview of the three-way and five-way attachment classifications distribution (AAI) over the whole sample and over the three SCID-II personality disorder groups.

No relation was found between BPD, OP, and NP and the (forced) attachment classification (Fisher's exact test 1.24,  $p = .921$ ). The comparison between the CC category in the five-way attachment classifications distribution and BPD and OP showed no significant difference ( $p = 1.0$ ). Also, the E category in the forced classifications distribution of the BPD as opposed to the OP group was not significant ( $p = .569$ ).

### *Subgroups and the AAI scales at t-1*

Next, differences between BPD, OP, and NP on the paternal and maternal attachment were examined. The BPD group scored significantly higher on the "Devaluing father" scale ( $F(2, 59) = 5.69$ ,  $p = .006$ ) in comparison with both other groups. Next, when comparing the BPD group (t-test) with the two other groups combined (non-BPD), differences were found for: "Loving father" (BPD  $M = 0.90$ ,  $SD = 1.37$ ; Non-BPD  $M = 1.64$ ,  $SD = 1.25$ ,  $t = 2.09$ ,  $p = .041$ ) and "Devaluing father" (BPD  $M = 2.65$ ,  $SD = 1.81$ ; Non-BPD  $M = 1.46$ ,  $SD = 1.06$ ,  $t = -2.71$ ,  $p = .012$ ).

To test the predictive value of the two variables ("Loving father" and "Devaluing father") of the AAI that significantly differed between the (dichotomous dependent variable) BPD and the non-BPD group, a binary regression was performed. This model was statistically significant ( $\chi^2(2, N = 60) = 6.75$ ,  $p = .034$ ), explaining 14.8% (Nagelkerke R square) of the variance in the personality disorders groups, and correctly identifying 71.7% of cases (Loving father  $OR = 0.908$  95% CI 0.462–1.279; Devaluing Father  $OR = 1.660$  95% CI 1.052–2.484).

Finally, information on whether the adolescents had a residential father (63%) or mother (93%) or not was compared with the paternal and maternal attachment scales. A significant difference was identified on the "Devaluing father" ( $p = .005$ ) and "Idealising father" ( $p = .005$ ) scale in the group with a non-residential father.

## *Prospective part of this study*

### *Changes in categorical (forced) attachment distribution at t-2*

In Table 3a, the distribution is shown of the five-way attachment classifications at pre- and post-treatment, while in supplementary material 2, a cross-tabulation report summarises the changes between pre- and post-treatment. When comparing the pre- and post-treatment AAI classifications, a significant transition towards secure attachment was found ( $z = -2.85$ ,  $p = .004$ ). Sixteen of the 33 patients (48.5%) showed an increase in secure attachment, 12 (36.4%) remained the same, and 5 (15.2%) showed a decrease in secure attachment. Furthermore, the number of securely attached adolescents increased by 24.2% ( $t_1: n = 5$ ,  $t_2: n = 13$ ) at the end of treatment.

**Table 3.** Distribution in number and percentages of AAI attachment classifications by five- (a) and three-way\* (b) at the beginning and the end of the treatment ( $N = 33$ ).

|    | a) Attachment classifications |      |          |      | b) Forced attachment classifications* |      |          |      |
|----|-------------------------------|------|----------|------|---------------------------------------|------|----------|------|
|    | Pre                           |      | Post     |      | Pre                                   |      | Post     |      |
|    | <i>N</i>                      | %    | <i>N</i> | %    | <i>N</i>                              | %    | <i>N</i> | %    |
| F  | 5                             | 15.2 | 13       | 39.4 | 6                                     | 18.2 | 16       | 48.5 |
| Ds | 5                             | 15.2 | 6        | 18.2 | 8                                     | 24.2 | 7        | 21.2 |
| E  | 4                             | 12.1 | 0        | 0.0  | 19                                    | 57.6 | 10       | 30.3 |
| U  | 3                             | 9.1  | 5        | 15.2 |                                       |      |          |      |
| CC | 16                            | 48.5 | 9        | 27.3 |                                       |      |          |      |

AAI = Adult Attachment Interview; F: free, autonomous; Ds: dismissive; E: entangled, preoccupied; U: unresolved for loss or abuse; CC: cannot classify.

\* Three-way attachment classifications (i.e. regardless U/CC).

Table 3b shows the distribution of the three-way or forced attachment classifications, which included forcing the unresolved and CC cases into an organised attachment classification (secure, dismissing, or preoccupied). Comparing the pre- and post-forced attachment classifications distribution, a significant difference towards increased secure attachment was found ( $z = -2.80, p = .005$ )

### Changes on the continuous AAI scales at t-2

On 13 of the 24 AAI scales, a significant change occurred ( $p < .05$ ), namely, "Rejecting mother" ( $p = .027$ ), "Pressured to achieve from mother" ( $p = .012$ ), "Neglecting mother" ( $p = .013$ ), "Loving mother" ( $p = .031$ ), "Idealizing mother" ( $p = .019$ ), "Preoccupied anger mother" ( $p = .003$ ), "Loving father" ( $p = .028$ ), "Preoccupied anger father" ( $p = .002$ ), "Unresolved loss" ( $p = .048$ ), "Unresolved trauma" ( $p = .040$ ), "Coherence of transcript" ( $p = .009$ ), and "Coherence of mind" ( $p = .009$ ).

### Relating changes in attachment to changes in psychological distress at t-2

In the next step, treatment outcome groups were formed based on the assessment of severity differences between the five-way attachment classifications at the start and the end of treatment (see statistical analysis for more details). Either the pre- or post-total SCL-90 score was missing for three patients of the AAI-Unchanged, who were excluded from this outcome group. Of the three AAI outcome groups, the AAI-Improved ( $N = 16$ ) differed significantly ( $p < .05$ ) from the AAI-Unchanged ( $N = 9$ ) and AAI-Deteriorated ( $N = 5$ ) in changes on the "Rejecting mother" ( $t = 3.620, p = .003, d = 3.979$ ), "Rejecting father" ( $t = 4.571, p = .000, d = 4.039$ ), "Loving mother" ( $t = -2.423, p = .029, d = 4.095$ ), "Preoccupied anger father" ( $t = 2.138, p = .049, d = 1.338$ ), "Coherence of transcript" ( $t = -4.656, p = .000, d = 1.93$ ), and "Coherence of mind" scale ( $t = -3.982, p = .001, d = 1.799$ ). Reciprocally, the AAI-Unchanged group differed significantly ( $p < .05$ ) from the AAI-Improved group and the AAI-Deteriorated group in changes on the "Loving mother" ( $t = -2.530, p = .028, d = 1.931$ ), "Loving father" ( $t = -2.347, p = .035$ ), and "Preoccupied anger mother" scale ( $t = 2.569, p = .026, d = 1.384$ ). Finally, the AAI-Deteriorated group differed significantly from the two other AAI-outcome groups in changes on the "Metacognitive monitoring" ( $t = 3.62, p = .034, d = 4.186$ ) and "Involving/role reversing

**Table 4.** Comparison of the attachment classifications with the total SCL-90 scores at pre-treatment and at post-treatment.

|               | Pre-SCL-90 |           | Post-SCL-90 |           | <i>Df</i> | <i>t</i> | <i>p</i> |
|---------------|------------|-----------|-------------|-----------|-----------|----------|----------|
|               | Mean       | <i>SD</i> | Mean        | <i>SD</i> |           |          |          |
| AAI improved  | 233.50     | 58.71     | 162.79      | 49.45     | 13        | 3.78     | .002     |
| AAI unchanged | 245.08     | 66.67     | 192.00      | 57.25     | 11        | 3.52     | .005     |

AAI = Adult Attachment Interview

mother" scale ( $t = -3.873$ ,  $p = .018$ ,  $d = 1.171$ ). These groups were compared to each other on the basis of the total SCL-90 scores at the beginning and the end of treatment. While no significant differences were found on the pre-SCL-90 scores ( $F = .214$ ,  $p = .808$ ), the total SCL-90 scores decreased significantly for both AAI-groups at the end of treatment (Table 4). The AAI-Improved group showed a medium symptom reduction according to the SCL-90 ( $N = 16$ ,  $M = 72.75$ ,  $SD = 68.01$ ,  $t = 4.28$ ,  $p = .001$ ,  $d = .56$ ). The AAI-Unchanged group also showed symptom reduction, although not as strong ( $N = 9$ ,  $M = 48.11$ ,  $SD = 56.10$ ,  $t = 2.57$ ,  $p = .033$ ,  $d = 0.37$ ). The AAI-Deteriorated group on the other hand, showed small symptom reduction ( $N = 5$ ,  $M = 21.20$ ,  $SD = 75.75$ ,  $t = .63$ ,  $p = .565$ ,  $d = 0.14$ ). Comparing the AAI-Improved group ( $N = 16$ ,  $M = 72.75$ ,  $SD = 68.01$ ,  $t = 4.28$ ,  $p = .001$ ,  $d = .56$ ) with the AAI-Unchanged combined with the AAI-Deteriorated group named the AAI-Non-improved group ( $N = 14$ ,  $M = 38.50$ ,  $SD = 62.30$ ,  $t = 2.31$ ,  $p = .038$ ,  $d = .28$ ) revealed that the changes toward increased secure attachment in the AAI-Improved group were associated with stronger reduction of psychological distress in comparison to the AAI-Non-improved group.

## Discussion

### *Observational, cross-sectional part of the study*

The aim here was to compare pre-treatment insecure attachment representations to attachment distribution of norm groups and between BPD and OP in a sample of adolescent inpatients clinically diagnosed with a personality disorder. First, in comparison to norm groups, our group was characterised by disturbed attachment classifications. Almost half of the group was categorised under the most disturbed category, i.e. the CCcategory. Second, no differences in attachment classifications were found between personality disorder groups. With regard to dimensional measures, those adolescents who described their fathers in a devaluing way were more likely ( $OR\ 1.7$ ) to be diagnosed with BPD. However, due to the small sample size, replication is necessary to establish how generalisable these results are.

It is worth noting that half of the adolescents in this high-risk sample were categorised under CC at pre-treatment and, when forced into one of the main attachment categories, were subsequently placed in the preoccupied category. Compared to the norm groups, more preoccupied attachments and especially CC classifications were found in the sample (Bakermans-Kranenburg & van IJzendoorn, 2009). This result is quite unique as clinical adolescents in other studies differ from the adult clinical samples by evidencing more dismissive and less preoccupied attachment (Bakermans-Kranenburg & van IJzendoorn, 2009). This is usually explained by the fact that adolescents, who are still in the separation-individuation phase, have had less time to work through their childhood attachment experiences (Bakermans-Kranenburg & van IJzendoorn, 2009; van IJzendoorn & Bakermans-

Kranenburg, 2008). Attempts to gain autonomy may lead to higher proportions of dismissing attachments during this developmental period (Warmuth & Cummings, 2015). The same explanation is applicable to our results, although not concerning the high number of CC adolescents. The overrepresentation of the preoccupied in our sample may be indicative of severe problems experienced during the separation-individuation phase.

As no relation is found between the type of personality disorder and the (forced) attachment classification, the high number of CC adolescents in our study is difficult to explain. A tentative hypothesis is that there is an association between high-risk adolescents and CC category in general. Most inpatient adolescents with personality pathology are high risk, and characterised by a combination of severe As-I and As-II psychopathology and suicidal thoughts and behaviours. Interestingly, the few clinical adolescent AAI studies that introduced the CC category also identified high ratios of CC adolescents in comparison to non-clinical adolescents (Allen et al., 1996; van Hoof, van Lang, Speekenbrink, van IJzendoorn, & Vermeiren, 2015). However, the sample in this study is too small to draw firm conclusions. Thus far, the CC category is grouped together with U-trauma and U-loss responses (Bakermans-Kranenburg & van IJzendoorn, 2009). The CC category needs further study to validate its role in the development of (adolescent) personality disorders, and especially in high-risk adolescent samples.

With regard to implications for prevention programmes and clinical practice, our findings suggest with great caution that the relationship with the father during the transition from childhood to adolescence requires further attention. Adolescents who described their fathers in a devaluing way were more likely (*OR* 1.7) to be diagnosed with BPD. Furthermore, adolescents who spoke in an idealising or devaluing way about their father were significantly associated with the odds of having a non-residential father. Future research is needed to examine whether BPD is likely to develop in adolescence in the absence of paternal positive attachment behaviour in combination with the devaluation state of mind towards the father. Secure paternal attachment seemed to protect an adolescent against BPD by helping develop ego-resiliency, which is important in adjusting to the challenges of adolescence (Kim et al., 2014). Furthermore, one may wonder whether there is a “sensitive period” in the relationship with the father during transition from childhood to adolescence that is comparable to the sensitive period in early childhood in the relationship with the mother (Kouvo et al., 2015; Portu-Zapirain, 2013).

### ***Prospective part of this study***

During intensive MBT, significant changes were observed in categorical and dimensional adolescent attachment representations as well as in symptoms of distress. As assumed, at post-treatment, the number of securely attached adolescents increased by 24.2%. Additionally, the sample as a whole demonstrated significant changes towards increased secure attachment in relation to reduced symptomatology. However, since this cohort study was not randomised, we cannot draw conclusions about a direct effect of the treatment itself on attachment. Nevertheless, this study suggests that insecure attachment in adolescents is likely to diminish during MBT.

The results of this study provide hope concerning treatment and the future prospects of adolescents with insecure attachment. Our study showed that attachment insecurity is malleable, which is of substantial clinical relevance in a high-risk sample of

adolescents with personality disorders and comorbidity. Changes towards secure attachment were accompanied by symptom reduction. Therefore, with regard to implications for prevention programmes and clinical practice, our findings suggest that fostering attachment security may also improve outcomes as assessed by symptoms, or vice versa. On the other hand, the symptoms of the group that did not change in attachment also improved, although less so than of the group whose attachment became more secure.

The question is what has influenced the change in attachment representations. The influence of social support of family and friends (van Harmelen et al., 2016) or age-related development may have played a role, since normal emotional maturation in adolescence is characterised by an interplay between progression and regression (Kaltiala-Heino & Eronen, 2015). If the treatment was of influence as well, the first hypothesis is that mentalisation, as the process in group therapies in the programme focusing on the adolescents' subjective experience of themselves and others, and on the relationships with the group members and the therapists, stimulated a positive outcome (Bateman & Fonagy, 2008; Borelli, Compare, Snavely, & Decio, 2015; Rossouw & Fonagy, 2012). Mentalisation was previously found to relate positively to secure attachment (Borelli et al., 2015; Fonagy et al., 1996; Reiner, Bakermans-Kranenburg, Van IJzendoorn, Fremmer-Bombik, & Beutel, 2016). Also, the continuous availability of MBT-trained nursing staff in this intensive psychotherapy programme may have positively influenced the attachment of the participants (Reiner et al., 2016). The second hypothesis is that psychotherapy in a group with a group psychodynamic approach was especially relevant for adolescents possessing an insecure attachment (Yalom & Leszcz, 2005).

On the other hand, it cannot be ignored that attachment security in 15.2% of the patients deteriorated, and that about one-third of the group did not show a change. This is not surprising given the complexity of adolescence, the treatment context that requires the commitment of patients and their families, and that of the treatment team, and possible untoward life events occurring during treatment. The rates of deterioration as an outcome of psychotherapy range from 5% to 14% among adult patients and are thought to be even higher among children (Lambert, 2013). Moreover, we may consider whether a different kind of treatment would be more suited for this group of patients and whether personalised care could offer a solution. Further work is needed to fully understand the implications of the potential prolonged effects.

## AAI

Despite the fact that we did not experience any problems conducting AAI in clinical practice, its distinctiveness and developmental fit for adolescents and a high-risk clinical sample in general may be questioned. Furthermore, Warmuth and Cummings (Warmuth & Cummings, 2015) encourage researchers to use the AAI as a measure of adult – and not adolescent attachment representations – and especially of parents caregiving capacity and ability to nurture secure infants. Introducing an AAI scoring and classification system especially designed for adolescents should be considered. Notwithstanding, this study showed that investigating both the underlying continuous AAI scales and the CC category of the AAI and personality disorders may be beneficial. With the use of the continuous AAI scales, the possible relationship between paternal attachment and BPS in adolescents was found. The AAI scales and five-way AAI classifications (F, E, D, U, CC)

better covered the complexity of personality disorders and insecure attachment than the three-way (F, E, D) or four-way AAI classifications (F, E, D, U/CC combined).

The use of a quasi-dimensional attachment scale could be useful for the purpose of treatment evaluation, although this type of assessment of the severity of AAI attachment classifications requires further investigation. The main questions concerning this assessment are, first, whether different categories actually represent the severity of attachment insecurity and fit a quasi-dimensional scale; second, whether the dismissive category should be regarded as a less insecure attachment category compared to the preoccupied category (Strauss, Mestel, & Kirchmann, 2011); and third, how the unresolved/disorganised category, which is superimposed on the three main attachment classifications, fits within the order. Notwithstanding, this AAI study showed that attachment insecurity is prone to change, particularly in patients with personality disorders.

### *Strengths and limitations*

Three limitations of this study should be mentioned. First, the differences in Axis I disorders were not accounted for since it is difficult to motivate adolescents to participate in extensive research protocols. Furthermore, given the diversity in our small sample, we were unable to examine Axis I disorders, especially in combination with the AAI. Second, our results are limited in their generalisability due to the sample size, as well as the lack of a control group. In the non-randomised evaluation of an inpatient programme, external validity was used to obtain generalisable knowledge of the patient group and treatment evaluation. Further, there are ethical and practical objections to randomisation in a high-risk adolescent group, such as the one here, whose results had been insufficient in outpatient or usual treatment. Third, the AAI coder was aware of the nature of the group, which may have affected her scoring. Notwithstanding these limitations, this study offers unique insights because little research has been done on personality disorders among adolescents (Courtney-Seidler et al., 2013; Hutsebaut, Feenstra, & Luyten, 2013; Sharp et al., 2016), and on the role that the father–child and the father–adolescent relationship plays in psychopathology (Phares, Fields, Kamboukos, & Lopez, 2005; Verhoeven, Bögels, & van der Bruggen, 2012), and even less on the combination of personality disorders and insecure attachment (Bakermans-Kranenburg & van IJzendoorn, 2009; van IJzendoorn & Bakermans-Kranenburg, 2008). Furthermore, the use of the AAI as an outcome measure, due to it being a labour-intensive tool, is exceptional (Diamond et al., 2014; Fonagy et al., 1996; Levy et al., 2006; Travis, Bliwise, Binder, & Horne-Moyer, 2001).

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