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# A General Dimension of Adult Attachment?

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A biproportional scaling method developed by Hofstee and Ten Berge to overcome the problem of information loss by score transformation has been used to reanalyze two samples containing measures of adult attachment, the (Dutch) Attachment Styles Questionnaire (ASQ,  $N = 3,382$ ) and the Experiences in Close Relationships scale (ECR,  $N = 12,771$ ), to extract a general component of attachment security. In both questionnaires, a large first component of Discomfort versus Comfort was found. In a third study, the restructured ASQ was applied to a clinical sample ( $N = 223$ ). Clients in the Comfort category were significantly more extraverted, emotionally stable, autonomous, and self-aware, and they showed better functioning, whereas Discomfort client types suffered more symptoms and distorted self-representations, but profit more from therapy.

## Key Messages:

- Raw scores principal component analysis of biproportionally scaled questionnaire items leads to an altered structure of the questionnaire.
- The large first component covers a general dimension of normality. Therefore no norms or reference groups are necessary.
- In the ASQ and ECR attachment questionnaires the dominant component of normality is reflected by a dimension of Discomfort versus Comfort in close relationships.
- Clinical validation of the restructured ASQ demonstrate good internal and external validities.
- Clients in the Comfort category were significantly more extraverted, emotionally stable, autonomous, and self-aware, whereas Discomfort client types suffered more symptoms and distorted self-representations.

**Keywords:** Adult Attachment, General Dimension, Biproportional Scaling, Discomfort, Clinical Validation

## 1. Introduction

*“Meanwhile, we note that the dimension security-insecurity makes much sense to a clinician” (Bowlby, 1969/1982, p. 340).*

A vast amount of research based on Bowlby’s attachment theory has led to an increased knowledge of the prominent role of adult attachment in clinical contexts. Attachment theory has guided interventions and treatments, such as interpersonal psychotherapy (IPT; Klerman, Weissman, Rounsaville, & Chevron, 1984), emotion-focused therapy (EFT; Greenberg, 2004; Johnson, 2004), mentalization-based treatment (Bateman & Fonagy, 2004), and attachment-based psychotherapy (Costello, 2013).

Attachment has proven to be related to therapeutic alliance (e.g., Diener, & Monroe, 2011), therapeutic process and therapeutic outcome (e.g., Levy, Meehan, Temes, & Yeomans, 2012; Mikulincer, Shaver & Berant, 2013). Furthermore, attachment problems are associated with psychopathology: insecure attachment representations have been found among people suffering from a wide variety of mental disorders (for overviews, see, e.g., Mikulincer & Shaver, 2007; Dozier, Stovall-McClough, & Albus, 2008; Ein-Dor & Doron, 2015). Thus, assessment of attachment may enhance therapeutic work and is of importance in identifying individuals who are at greater risk of psychopathology.

Despite the obvious advantages of applying attachment knowledge in clinical practice, there are serious obstacles to overcome, such as how adult attachment can be best screened in a daily routine, which measurement method should be chosen, and how results of self-report questionnaires should be interpreted.

Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) reviewed adult attachment measures

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over a 25-year period. They described 8 interviewer-assessed instruments and 21 self-report questionnaires. All instruments were found differentiating patterns of secure attachment and subtypes of insecure attachment. Before an assessment method is chosen, Ravitz et al. (2010) recommend that investigators consider not only reliability and validity but also attachment constructs such as self-report evaluation versus coding of observed data. Self-reports may be distorted by defenses or biased by socially desirable, extreme or acquiescent responding. Interviews such as the Adult Attachment Interview (AAI, George, Kaplan, & Main, 1985) are very time consuming and require specialized training and scoring. Another consideration that Ravitz et al. (2010) mention is the relationship focus. The focus may be on memories of attachment to parents, general attitudes on adult romantic relationships, or an adult's parenting attitudes. Clearly, attachment patterns may differ for the same individual in different foci. In addition, the choice between categorical (types) and dimensional (the degree to which an attachment style is present) data has to be made. In relation to the categories versus dimensions, Ravitz and colleagues (2010) noted considerable confusion with regard to the nomenclature and number of categories used in the measurement of adult attachment. Differing names for similar or overlapping constructs and similar names for differing categories or dimensions were found. The concept of attachment does not appear to be univocal, which may lead to a wide range of diverging instruments: attachment seems to be what the test measures. It is not surprising that the careless mixing of behavioral constructs (such as avoidance) with emotions (anxiety) results in orthogonal dimensions of insecurity. However, what does it signify? The most remarkable finding is that, as far as we know, no attachment instrument could be found that simply 1) is able to separate the secure from the insecure types and 2) provides a measure of the degree of the person's security or insecurity.

The purpose of the present studies is to demonstrate a method for restructuring existing questionnaires into a one-dimensional attachment security scale, with a clear turning point at which secure turns into insecure, separating the insecurely attached types from the securely attached types.

### *1.1 Attachment as a Normative System*

Bowlby's original theory was explicitly a normative one, which explained the way all normal human infants are predisposed to develop strong and enduring emotional ties to adult caregivers. This developmental norm is innate and evident in all people (e.g., Mikulincer & Shaver, 2007; Grossman & Grossman, 2005; Hazan and Selcuk 2015). The

core feature of the developmental norm is proximity to a caregiver, foremost as a way to survive but also as a way to regulate arousal and emotions. Hazan and Selcuk (2015) emphasized that the attachment behavioral system is operative across the entire life span. They note that infant-caregiver attachments differ from adult romantic attachments because the latter are reciprocal and inherently sexual in nature. The core function of attachment bonds in both childhood and adulthood continues to be emotion regulation.

Due to the normative nature, it follows that secure attachment should be the norm, that is to say, should be normal. Normality can be defined as the most common behavior in a population or in society; deviations from the norm cover insecure attachment patterns and are called abnormal. The distribution of normal versus abnormal adult attachment patterns in society is unknown because no epidemiological research on attachment (in)security has been conducted. Estimates based on a simple self-report questionnaire such as the Attachment Questionnaire (Hazan & Shaver, 1987) or by means of the well-established AAI (George et al., 1985) do not diverge much. Mickelson, Kessler, and Shaver (1997) found that 59% of a large nationally representative sample of American adults have a secure attachment style, as measured with the Attachment Questionnaire, whereas Bakermans-Kranenburg and Van IJzendoorn (2009), in their meta-analysis of over 10,500 AAI's in more than 200 adult attachment representation studies, observed that 56% of the non-clinical and not at-risk samples have a secure attachment classification. Deviating distributions were found in at-risk samples, those having a low socioeconomic background, with 41% having secure attachment classifications, as well as in the clinical samples, showing only 27% secure classifications. A remarkable fact of the latter study is that the percentages of secure attachment categories decreased when the forced three-way distribution (secure-autonomous, insecure-dismissing, and insecure-preoccupied) was replaced by a four-way distribution, including a category "unresolved/cannot classify". This category is used for unresolved experiences of trauma, usually involving the loss of attachment figures. Of the 56% of securely attached persons in the three-way distribution, 50% appeared to be securely attached in the four-way distribution. This implies that the definition of attachment security depends on the methodological approach.

### *1.2 Wisdom of the Crowd*

In his paper "Who should own the definition of personality?", Hofstee (1994) stated that "[t]he averaged judgment of knowledgeable others would provide the best available point of reference both

for the definition of personality structure in general and for assessing someone's personality in particular" (p. 149). Without any problem, "personality" can be replaced by any other social construct. Most people will be normal by definition, and according to a tacit social norm, most people will know exactly what is right or wrong and hence what is normal or abnormal. For instance, an attachment-related statement such as *As a child I used to seek reassurance and comfort from my mother when frightened or distressed* will be judged as "right" by most persons, whereas *I am comfortable without close emotional relationships* will mostly be labeled as "wrong". Deviating answers can be viewed as abnormal. The more agreement on "rights" and "wrongs" that is found, the stronger the statement or the construct is supposed to be. It is the principle of aggregation that enhances reliability. Just as the reliability of a test is a function of its length in number of variables, the reliability of a construct is a function of the number of judgments, thus taking the judges as variables (Hofstee, 1994). The possibilities can be extended by the addition of more answer categories, for instance, the 5-point Likert scale: *strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree*.

The construct validity depends on the content of the statements. Of the aforementioned examples, the first one clearly refers to attachment behavior in childhood, while the second example shows less obvious attachment-related content. Thus, well-defined and unambiguous statements or questions need to be presented to the grouped judges, or "the crowd". If so, the crowd knows exactly what is socially desirable, not as a response bias but as a true trait or characteristic. That individuals' self-judgments may be more affected by biases than informant judgments, as was demonstrated by Mosterman & Hendriks (2011), does not actually influence the crowd's opinions.

### 1.3 Biproportional Scaling

A methodological issue involving all questionnaires using Likert scales is that a scale's sample mean does not necessarily equal the absolute scale mean (the midpoint of the Likert scale). For instance, an imaginary secure attachment scale of  $N$  items with a 5-point answering format applied to a sample of  $N$  individuals revealed a mean score of 3.94 ( $SD = 0.57$ ). Thus, a person with, say, a score of 3.36 on this scale will be labeled as below average securely attached compared to the sample mean. However, if we keep a 5-point Likert scale in mind, ranging from 1 = *strongly disagree* (= not secure) to 5 = *strongly agree* (= secure), the score of 3.35 is on the securely attached side, as 3 (= *neutral*) is the scale midpoint and is also the turning point of the

characteristic into its opposite. In individual cases, this will not cause difficulties, as it will suffice to inspect the raw score to nuance interpretation. However, trait structures resulting from assessments on Likert scales are affected by the additive and multiplicative transformations implied in interval scaling and correlational analysis: the mean of the population (3.94 in the above example) is the reference point, in which approximately half of the scores become negative. The effect is that a portion of the securely attached people will be labeled as (relatively) not securely attached (including our example person with a score of 3.35). Hofstee and Ten Berge (2004) proposed an alternative method of analyzing questionnaire data based on a bipolar proportional (biproportional) scale, ranging from  $-1$  to  $+1$ . The original 5-point Likert scale's format, therefore, should be recoded into  $-1, -0.5, 0, +0.5, +1$ . By doing so, the scale score of our model will become  $+0.18$ , instead of the previous 3.35. The sample mean of 0.47 (was 3.94) is irrelevant to individual stances, as biproportional scores are sample-independent. An advantage of this non-comparative method is that, except for epidemiological research, no representative samples are requested: score values remain stable. It provides an opportunity to compare samples.

The pivot of Hofstee and Ten Berge's assessment model is the natural zero point. Taking the midpoint zero as a mean, additive transformations (e.g., into  $z$  scores) are ruled out, implying that relative, transformation-based association coefficients, such as the Pearson correlation, are not applicable. As an alternative coefficient, Hofstee (2002, 2009) proposed the use of the most elementary measure of likeness ( $L$ ), namely, the averaged cross-product between absolute (raw) scores, with which raw scores principal component analysis can be conducted.

The main finding is that this method appears to alter the trait structure of personality, as Hofstee and Ten Berge (2004) demonstrated with data of the Five-Factor Personality Inventory (FFPI; Hendriks, Hofstee, & De Raad, 1999) in a normal sample: a large first component was found, reflecting a dimension they called social desirability. They found that most people have positive scores on this dimension. These results were replicated with different instruments in other studies (Hofstee, Barelds, & Ten Berge, 2006; Mosterman, 2013). This research shows that, contrary to traditional relative statistics, when people are not compared with others, they may be characterized by the extent to which they are supposed to be socially desirable or "normal". In the case of the FFPI, Conscientiousness and Agreeableness appeared to be the most desirable characteristics.

### 1.4 Aims of the Present Research

In two studies, the biproportional method (Hofstee & Ten Berge, 2004) will be applied to the original data of two attachment questionnaires: the (Dutch) Attachment Styles Questionnaire (ASQ, Hofstra, 2009) and the (American) Experiences in Close Relationships Scale (Brennan, Clark, & Shaver, 1998, 2013). A large general component is expected to be found in both questionnaires. Because of the attachment-related content, it is hypothesized that this large component will represent a dimension of security versus insecurity in close relationships. Subsequent components may add nuances to this dimension. To establish the method's clinical value, in a third study the psychometric properties of the biproportionally restructured ASQ are investigated in a clinical sample, hypothesizing that a general factor of attachment security would be helpful in screening clients for possible attachment problems.

## 2. Study 1: The Attachment Styles Questionnaire

In 1991, Bartholomew and Horowitz described a model of attachment styles in adulthood, based on the notion that in early childhood, as a result of internalized patterns of affectional and attachment experiences with caregivers, internal working models of self and others are developed (Bowlby, 1969). Bartholomew and Horowitz (1991; see also Griffin & Bartholomew, 1994) proposed four prototypic attachment patterns by combining a person's self-image and image of others. The four attachment styles are secure (positive self-image and other-image), preoccupied (negative self-image and positive other-image), fearful (negative self-image and other-image), and dismissing (positive self-image and negative other-image). These internal working models shape attachment-related behavior throughout the lifespan.

The ASQ is based on Bartholomew and Horowitz' theoretical model. The 24-item inventory (see Appendix A) was developed by Van Oudenhoven and colleagues (Van Oudenhoven, Hofstra, & Bakker, 2003; Van Oudenhoven, & Hofstra, 2005; Hofstra, Van Oudenhoven, & Buunk, 2005; Hofstra, 2009). The questionnaire was constructed to reliably measure non-relationship-specific attachment styles of adults. It provides individual measures on each of the four attachment styles: secure, fearful, dismissing and preoccupied. The ASQ has been validated in heterogeneous samples of adult Dutch respondents (Hofstra, 2009). Exploratory factor analysis (oblimin principal components analyses) with a forced 4-factor solution showed four factors with eigenvalues above 1.2, which corresponded to the

four attachment styles, explaining almost 50% of the total variance. Psychometric qualities were reasonable to good, with the exception of the somewhat weaker reliability of the dismissing style (Hofstra, 2009, chapter 2). It was found that ASQ attachment styles are related to, for instance, the attitude towards integration of immigrants (Hofstra, Van Oudenhoven, & Buunk, 2005), psychological and socio-cultural adjustment in a foreign country (Bakker, Van Oudenhoven, & Van der Zee, 2004), well-being (Karreman, & Vingerhoets, 2012), psychological health in immigrants (Polek, Van Oudenhoven, & Ten Berge, 2011), social absorption (De Schutter, Van Geel, Lodewijckx, & Verboon, 2009), and vulnerability to developing embitterment (Blom, Van Middendorp, & Geenen, 2012).

As a result of adopting four one-dimensional scales the original two-dimensional structure of the Bartholomew & Horowitz' (1991) model, the dimensions of self versus other and positive versus negative became less clear in the ASQ. Furthermore, although the ASQ is a valid instrument that can differentiate between groups of persons and can process research questions concerning samples, the ASQ is difficult to interpret in individual assessments because respondents are not classified into one attachment category but receive scores on all four attachment scales. Thus, it can be possible to find high (or low) scores on all four scales, characterizing the respondent, for instance, as both securely and insecurely attached. The advantages of measures on each of the four attachment styles for research purposes turn into a disadvantage in determining a person's dominant attachment style for designing treatment in clinical practice.

### 2.1 Method of Study I

#### 2.1.1 Respondents

The original ASQ data of Hofstra (2009, chapter 2) were used. The heterogeneous Dutch sample ( $N = 3,382$ ) of students, emigrants and adults from the general population consisted of 2,264 women (64%) and 1,269 men (36%), ranging in age from 16 to 90 years, with a mean age of 35 ( $SD = 19$ ).

#### 2.1.2 Instrument

The *Attachment Style Questionnaire* (ASQ, Hofstra, 2009) refers to attachment to others in general. The questionnaire consists of 24 items, formulated based on the four vignettes as described by Bartholomew and Horowitz (1991) and the Relationship Scales Questionnaire by Griffin and Bartholomew (1994). The ASQ assesses four attachment styles: Secure (7 items), Preoccupied (7 items), Fearful (5 items), and Dismissing (5 items). The item's 5-point rating scale ranges from *strongly*

*disagree* to *strongly agree*. The internal consistencies (Cronbach's alpha) were .75 for the Secure style, .80 for the Preoccupied style, .79 for the Fearful style, and .62 for the Dismissing style.

### 2.1.3 Analyses

The answer format of the ASQ was translated into a biproportional scale, resulting in a  $[-1, -0.5, 0, +0.5, +1]$  scale. Based on the biproportional scores, the likeness coefficients ( $L = \sum XY/N$  of  $N$  raw scores on variables  $X$  (items) and  $Y$  (raters), i.e., the average of the raw scores cross products), were calculated. Subsequently, the matrix of  $L$ -coefficients was factor analyzed (i.e., raw scores principal component analysis, PCA). This analysis is not available in SPSS. However, an easily applicable macro to conduct a biproportional analysis using the SPSS software was developed by Timmerman, Hofstee, and Ten Berge (2008) and can be freely downloaded from the Groningen University web site. The macro can be copied and pasted into the SPSS syntax editor.

## 2.2 Results of Study 1

The PCA using the biproportional raw scores matrix of the number of ASQ items (columns) by raters (rows) was conducted. Instead of eigenvalues, which are not calculated in the biproportional PCA, an indicator of component strength is the mean of the squared component loadings. For the first 5 principal components, the sizes were .0407, .0030, .0016, .0003, and .0003<sup>1</sup>. As shown, the first component size is more than 13 times as high as the second one, indicating a large first component. Subsequently, the item loadings were inspected. Eighteen items were found with the highest absolute loading on the first principal component, 4 items with the highest absolute loading on the second component, and 2 items with the highest absolute loading on the third component. None of the item loadings of the fourth or fifth principal components exceeded these loadings. The items and component loadings are listed in Appendix A.

The item content of the first principal component, representing the major dimension, can be interpreted as Discomfort (versus Comfort) in close relationships. Items are, for instance, *I avoid close ties* (component loading 0.28) and *I feel uncomfortable when relationships with other people become close* (0.26) on the positive side, and *I feel at ease in intimate relationships* (-0.29) and *I think it is important that people can rely on each*

*other* (-0.34) on the negative side of the dimension. The very weak second component appears to reflect the extent to which someone worries about social contact in general. Only three items have substantial loadings, one positive and two negative: *I don't worry whether people like me or not* (0.09), *I often wonder whether people like me* (-0.11), and *I find it important to know whether other people like me* (-0.10); all three items are from the original Preoccupation scale. This dimension was labeled as Worry (versus Indifference). In Appendix A, it can be seen that the Discomfort pole predominantly contains items of the original Fearful and Preoccupation scales, while Secure items constitute the Comfort side of the dimension. The Dismissing items do not cluster on one pole of this dimension. Based on the foregoing information, I excluded three items from the ASQ because of their low or insufficiently differentiating loadings: *I don't worry about being alone: I don't need other people that strongly* (item 19); *I usually find other people more interesting than myself* (item 21); and *I prefer that others are independent of me, and that I am independent of others* (item 6). With the remaining 21 items, two new bipolar scales were created: a Discomfort scale of the 18 highest loading first-component items (items 2, 3, 4, 5, 8, 9, 11, 13, 20, 23, and reversed items 1, 10, 12, 14, 15, 16, 18, 22) and a Worry scale of the 3 highest loading second-component items (items 7, 24, and the reversed item 17). Scale scores have been formed by the means of the biproportional item scores and can be either positive or negative<sup>2</sup>. In the current sample, Discomfort scores ranged from -1 to +.56, with a sample mean of -.40 ( $SD$  .25). Worry scores had a range of -1 to +1 and a sample mean of .05 ( $SD$  .45). The midpoint (turning point) in both scales clearly remained 0. Cronbach's alphas were .83 for Discomfort and .71 for Worry. The Discomfort and Worry scales were found to correlate significantly:  $r = .26, p < .001$ .

Individuals can be typed by their combined scores on the two dimensions Discomfort and Worry, resulting in four styles: the combination of negative scores on both Discomfort and Worry (D-W-) is hypothesized to reflect a secure style; the combination of positive scores on both dimensions (D+W+) is hypothesized to represent an insecure or fearful style. The two mixed styles might be interpreted as a preoccupied style (D-W+) and as a dismissing style (D+W-). The distribution of the attachment styles is given in Figure 1a.

<sup>1</sup> "The averaged cross-product  $L_{XY} = \sum XY/N$ . With scores between -1 and +1,  $L_{XY}$  is conveniently bounded within those same limits. As a consequence,  $L_{XX} = \sum X^2/N$ , the extent to which  $X$  is like itself, is generally not unity, but  $\leq 1$ ;  $L_{XX} = 1$  only if all ratings are at the extreme scale ends." (Hofstee & Ten Berge, 2004, p. 122).

<sup>2</sup> It is possible to create a more precise scale score by weighting the items. A weight matrix is calculated in the Timmerman, Hofstee, & Ten Berge (2008) macro.

Figure 1 Two-dimensional Distribution of Respondents

	Figure 1a ASQ General Sample		Figure 1b ECR General Sample		Figure 1c ASQ Clinical Sample	
	Worry		Worry		Worry	
	-	+	-	+	-	+
Discomfort +	Type D+W- dismissing <i>n</i> =79 (2%)	Type D+W+ fearful <i>n</i> =160 (5%)	Type D+W- dismissing <i>n</i> =1836 (14%)	Type D+W+ fearful-avoidant <i>n</i> =1929 (15%)	Type D+W- dismissing T1 <i>n</i> =9 (4%) T2 <i>n</i> =7 (5%)	Type D+W+ fearful T1 <i>n</i> =36(16%) T2 <i>n</i> =12 (9%)
Discomfort -	Type D-W- secure <i>n</i> =1244 (37%)	Type D-W+ preoccupied <i>n</i> =1899 (56%)	Type D-W- secure <i>n</i> =3841 (30%)	Type D-W+ preoccupied <i>n</i> =5165 (40%)	Type D-W- secure T1 <i>n</i> =58 (26%) T2 <i>n</i> =51 (38%)	Type D-W+ preoccupied T1 <i>n</i> =120 (54%) T2 <i>n</i> =64 (48%)

### 3. Study 2: The Experiences in Close Relationships Scale

The theoretical bipolar working models of Bartholomew and Horowitz (1991) were also embraced by other researchers, and several of them found two underlying dimensions, which can be summarized as Comfort with closeness and Anxiety over relationships (Feeney, 1999). The ECR (Brennan, Clark, & Shaver, 1998; Conradi, Gerlsma, Van Duijn, & De Jonge, 2006) is an example of a questionnaire structured by these two factors. Instead of attachment in general, as measured by the ASQ, however, the ECR is aimed to measure adult romantic attachment in couple relationships, although the wording of the ECR items and the instructions can be altered slightly to apply to a particular relationship, to one's general orientation in romantic relationships, or to one's general attachment style in various types of relationships (Mikulincer & Shaver, 2007).

Brennan and colleagues (1998) factor-analyzed the data of a large sample that incorporated 60 attachment-related constructs computed from 323 nonredundant items. They found two independent factors, which were common to most of the measures corresponding to the Avoidance and Anxiety dimensions. The combination of the two dimensions revealed groups that fit Bartholomew's four types of attachment style. Based on these results, Brennan et al. (1998) computed two internally consistent 18-item scales covering the both dimensions: Avoidance of intimacy and Anxiety about rejection or abandonment. Together, these scales form the 36-item ECR. The scores on the two dimensions can be combined, resulting in a position on one of the four attachment styles: low avoidance and low anxiety in a secure style, low avoidance and high anxiety in a preoccupied style, high anxiety and high

avoidance in the fearful style, and high avoidance and low anxiety in the dismissing style.

The validity of the ECR has been demonstrated in numerous studies. However, as Mikulincer and Shaver (2007) state, by focusing so intently on anxiety and avoidance, the ECR "may be deficient in assessing security, except as the vague absence of avoidance and anxiety" (p. 92).

#### 3.1 Method of Study 2

##### 3.1.1 Respondents and Procedure

The data were collected from an interactive version of the ECR (Brennan, Clark, & Shaver, 2013). A total of 17,386 individuals submitted this online ECR. It is unknown how their attention was drawn to the web site (<http://personality-testing.info/tests/ECR.php>). After completing the questionnaire, the respondents were asked to fill out their sex and age. They were also asked if their answers were accurate and could be used for research. Only those who answered yes were included in the web version sample. The country that the user connected from (based on IP address) was coded. The respondents received their results by a combined Avoidance and Anxiety score being plotted in a four category chart.

Notwithstanding the accuracy question, the data sample still contained many incomplete tests as well as faulty data. All cases showing missing or invalid data were eliminated (approximately one-quarter of the total sample), resulting in a cleared sample of  $N = 12,771$  cases from 139 countries. Seven countries counted for 83% of the respondents: the United States 58%, the United Kingdom 9%, Canada 6%, Australia 5%, India 3%, Philippines 1% and Germany 1%; all other countries, all over the world, each provided less than one percent of the respondents. The sample consisted of 33% males, 66% females, and 1%

“others”, ranging in age from 18 to 99 years, with a mean age of 28 ( $SD = 11$ ).

### 3.1.2 Instrument

The *Experiences in Close Relationships Scale* (ECR, Brennan, Clark, & Shaver, 1998) contains two 18-item scales, one to assess attachment Anxiety and the other to assess Avoidant attachment. The two scales can be combined into four attachment styles: secure attachment (Anxiety low and Avoidance low), preoccupied attachment (Anxiety high, Avoidance low), dismissing attachment (Anxiety low, Avoidance high), and fearful-avoidant attachment (Anxiety high and Avoidance high). The 36-item online version of the ECR, listed in Appendix B, had to be rated on a five-point scale instead of the original seven-point rating scale. The labels were *strongly disagree*, *disagree*, *neither agree nor disagree*, *agree*, and *strongly agree*. The internal consistencies (Cronbach’s alpha) in the sample were .94 for Avoidance and .92 for Anxiety.

### 3.1.3 Analyses

A traditional PCA was conducted on the original relative scores (1 to 5) for reason of comparison. Next, the answer format of the ECR was translated into a biproportional scale. The likeness coefficients were calculated, and subsequently, the raw scores PCA was applied, as described in Study 1.

## 3.2 Results of Study 2

The traditional PCA’s eigenvalues were 9.27, 7.51, 1.60, 1.42, and 1.33 for the first five factors, which corresponded to the two-factor structure of the ECR. The factor loadings ranged from 0.48 to 0.75. The original factor loadings are displayed in Appendix B (second column).

The PCA using the biproportional raw scores matrix was conducted. The mean of the squared component loadings was taken as an indicator of component strength. For the first 5 principal components, the sizes were .0192, .0083, .0020, .0003, and .0003. The first component size is approximately 2.3 times as high as the second one, indicating a large first component. As shown in Appendix B, 21 items with the highest absolute loading on the first principal component were found, 13 items with the highest absolute loading on the second component, and 2 items with the highest absolute loading on the third component. None of the item loadings of the fourth or fifth principal component exceeded these loadings.

The item content of the first principal component, representing the major dimension, can be interpreted as Discomfort (versus Comfort) in close relationships. Items are, for instance, *I prefer not to be too close to romantic partners* (component

loading 0.21) and *I get uncomfortable when a romantic partner wants to be very close* (0.20) on the positive side, and *I turn to my partner for many things, including comfort and reassurance* (−0.21) and *I am very comfortable being close to romantic partners* (−0.21) on the negative side of the dimension. The second component appeared to reflect the extent to which someone worries about social contact in general. Eleven items have substantial loadings, 10 positive and 1 negative. Positive items are *I worry that romantic partners won’t care about me as much as I care about them* (0.15) and *I worry about being alone* (0.14), whereas the negative item is *I do not often worry about being abandoned* (−0.13). In line with the terminology of Study 1, this dimension has been labeled as Worry (versus Indifference). The third component comprised two positive items, *My desire to come become very close sometimes scares people away* (component loading 0.10) and *I often want two merge completely with romantic partners, and this sometimes scares them away* (0.11). These items seemed to represent clinging behavior. As shown in Appendix B, both items showed almost identical loadings on the second component. For this reason and because of the number of items is too small to form a dimension, it was decided not to retain the third component, although this type of behavior preeminently reflects insecure attachment behavior.

Inspection of the component loadings displayed in Appendix B’s last three columns leads to the conclusion that the first and second components almost exactly match the original two-factor structure of the ECR (see first column). The two deviating items, 30 and 32, show only slightly lower loadings on the second component. Therefore, the decision was made not to compute the new dimensions but to recode the scores in a biproportional answer format and to relabel the dimension Avoidance as Discomfort and the dimension Anxiety as Worry. The Discomfort and Worry scales did not appear to be uncorrelated,  $r = -.07$ ,  $p < .001$ . Scale scores have been formed by the means of the biproportional item scores and thus can be either positive or negative. In the present sample, Discomfort scores ranged from −1 to +1, with a mean of −0.21 ( $SD .42$ ). Worry scores had a range of −1 to +1 and a mean of .06 ( $SD .40$ ). The distribution of the attachment styles, based on the combination of the two dimensions is given in Figure 1b.

## 3.3 Discussion of studies 1 and 2

As expected, a large first component was demonstrated in both studies. In the ASQ study, the first component was thirteen times as high as the second component. The ECR, of which the original structure remained almost unchanged, showed a



considerably more moderate result, with the first component being more than two times higher. Previous research using this method with personality questionnaires showed first-to-second component ratios of approximately 14:1, 19:1, and 9:1 (Mosterman, 2013). Ratio differences can be explained by the unequivocality of the item content: the more homogenous the items are and the more unambiguous their content is, the higher the ratio will be. The relatively small ratio of the ECR (2.3:1) might be interpreted as the result of two distinct constructs that are combined in this inventory, Discomfort (Avoidance) as a more censure prone and observable behavior component, and Worry (Anxiety) as an apparently more socially acceptable emotional component. The biproportional method structure corresponds to the original ECR's higher order factor structure, indicating the presence of two different constructs, which together are assumed to represent the attachment concept.

There may be still another explanation for the reduced first-to-second component ratio, namely, the possibility that the sample is biased. One has to keep in mind that the biproportionality scaling method appeals to the social component of a construct. The fact that this method is not subject to statistical transformations based on deviations from the sample mean implies that score values are not sample dependent. Of course, individuals in a sample will differ in their values, but in data analysis without transformations related to the sample mean, they do not infect or influence the score values of other respondents. From the biproportional analyses emerges what ought to be normal in general: biproportional PCA separates normal from abnormal in absolute sense, not according to a sample mean. This provides an opportunity to compare populations. For instance, in clinical populations, in which abnormal behavior is supposed to be more the norm, the first component loadings are expected to be lower. Hofstee et al. (2006) proved this by comparing personality scores of a sample of psychiatric clients with scores of a normative sample and found first-to-second component ratios of 2.5:1 and 5.8:1, respectively. The first-to-second ratio of the psychiatric clients conforms to the ECR study ratio.

A tentative confirmation of this possible explanation may be found in the distributions of attachment types. Although the distributions follow the same order in both studies, with the largest groups containing the preoccupied types and the smallest groups representing the dismissing types, the ECR sample seemed to include more individuals experiencing discomfort than the ASQ sample. This might make sense when one tries to imagine sample characteristics: perhaps most of the ECR respondents are unhappy (ex-)lovers all over the world surfing on the internet, searching for

causes of their unhappiness and seeking comfort through explanations: the results would reflect a biased sample, but not biased results! In fact, in their reliability generalization meta-analysis of self-report measures of adult attachment, Graham and Unterschute (2015) confirmed the strong reliabilities of the ECR scales, but they also remarked that the reliability appeared to be highly suspect to sample characteristics: more reliable scores were found in early-stage, unmarried relationships. Verification of this interpretation should be easy by comparing the results to other samples.

From the item loadings displayed in Appendices A and B, it can be seen that the components are not orthogonal. Discomfort and Worry proved to be intertwined, in which the highest component loading is more or less colored by the next highest loading. The combination of scores on the two components may provide useful information, for instance, in diagnostics and choice of treatment.

#### **4. Study 3: Clinical validation of the biproportionally restructured ASQ**

Attachment theory is a theory of both normal life-span development as well as psychopathology (Sroufe, Carlson, Levy, & Egeland, 1999; Sroufe, 2005; Crittenden, 2002, 2006; Egeland & Carlson, 2004). A vast body of research has demonstrated the association between attachment and psychopathology (for overviews, see, e.g., Dozier, Stovall, & Albus, 1999; Shorey, & Snyder, 2006; Mikulincer & Shaver, 2007, 2012). The reduced resilience in coping with stressful life events as a result of insecure early attachment experiences predisposes a person to breakdown psychologically in times of crisis. Hence, insecure attachment can be viewed as a vulnerability to mental illness. However, no consistency has been found in differentiating a more specific vulnerability style of attachment, such as an anxious or preoccupied attachment style, to specific mental illnesses (Bifulco, Moran, Ball, & Bernazzini, 2002).

Because of its relationship with psychopathology, attachment and psychotherapy are interwoven as well. The therapeutic relationship exhibits essential elements of attachment bonds and therefore may be used to regulate a client's attachment pattern and serve as a corrective emotional experience (Mallinckrodt, 2010). Levy et al. (2012) mentioned four ways in which attachment and psychotherapy may intersect, namely, as a framework for choosing interventions, as a moderator or prognostic indicator of therapy outcome, as a measure of outcome, and as a guiding principle in the psychotherapeutic process. The therapist's provision of a secure base and safe haven is likely to facilitate the client-therapist

working alliance (Mikulincer, Shaver, & Berant, 2013). If therapists fail to consider how clients are likely to respond to therapy, given their specific attachment styles, ill-advised interventions may be applied. Accordingly, Shorey and Snyder (2006) recommend an assessment of clients' attachment styles as a standard procedure in intakes.

In the current study, the Discomfort and Worry scales are calculated using data of a client sample from the author's psychotherapy practice. Both the clients and the therapist were blind to the research questions and to the Discomfort and Worry scales because they had not been developed at that time.

#### 4.1 Method of Study 3

##### 4.1.1 Participants

The participants of Study 3 included 223 clients referred by their primary health care physicians to the first author's secondary care psychotherapy practice between 2009 and 2013. The sample was composed of 65 men (29%) and 158 women (71%), ranging in age from 18 to 71 years, with a mean age of 38 ( $SD = 12$ ). The clients provided self-ratings on a number of questionnaires (here, those relevant for the research questions are reported). Outcome measures (T2) were collected from 134 clients (60%): 38 males (28%) and 96 females (72%), with a mean age of 38 ( $SD = 12$ ).

##### 4.1.2 Measures

The *Attachment Styles Questionnaire* (ASQ; see description in Study 2). The Restructured ASQ biproportional scales Discomfort and Worry were conducted following the format described in Study 1. The internal consistencies in the current sample as measured with Cronbach's alpha were .77 for the Secure style, .83 for the Preoccupied style, .85 for the Fearful style, and .54 for the Dismissing style. The alphas for the restructured scales Discomfort and Worry in the present sample were .87 and .73, respectively.

The *Autonomy-Connectedness Scale-30* (ACS-30; Bekker & Van Assen, 2006) consists of 30 items, with a 5-point rating scale answering format ranging from *strongly disagree* to *strongly agree*. The ACS-30 distinguishes three scales: Self-Awareness (SA, 7 items; e.g., *Usually it is very clear to me what I like most*), Sensitivity to Others (SO, 17 items; e.g., *I often go deeply into others feelings*), and Capacity for Managing New Situations (CMNS, 10 items; e.g., *I quickly feel at ease in new situations*). The reliabilities (Cronbach's alpha) of the three scales in the present sample were .81, .78, and .81 for SA, SO, and CMNS, respectively.

The *Symptom Check List-90* (SCL-90; Arrindell & Ettema, 1986) is an inventory of physical and emotional symptoms. The

questionnaire is composed of 90 descriptions comprised by eight scales: Anxiety, Agoraphobia, Depression, Somatic Complaints, Insufficiency of Cognition and Action, Suspiciousness and Interpersonal Sensitivity, Hostility, and Sleep Problems. The sum across all items, labeled Psychoneuroticism, indicates the overall level of emotional and physical dysfunction. In the present sample, the alphas ranged from .80 for Hostility to .97 for Psychoneuroticism.

The *Five-Factor Personality Inventory* (FFPI; Hendriks, Hofstee, & De Raad, 1999) assesses the Dutch psycho-lexically based big five personality dimensions Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and (intellectual) Autonomy. The FFPI consists of 100 items. The response scale runs from *not at all applicable* to *entirely applicable*. The instrument is suitable for self and other ratings. Clients obtained ratings from three well-acquainted informants. The percentage of discrepancy between self-reports and averaged informant reports was determined (see also Mosterman & Hendriks, 2011). In the present study, the mean overall discrepancy percentage was 9.4% ( $SD = 4.0$ ). Cronbach's alphas were .93 for Extraversion, .86 for Agreeableness, .90 for Conscientiousness, .92 for Emotional Stability, and .88 for Autonomy. The informant alphas ranged from .87 to .92.

Diagnoses were classified according to the *Diagnostic and Statistical Manual of Mental Disorders 4<sup>th</sup> edition (DSM-IV-TR)* (Dutch translation: Koster van Groos, 2001) multi-axial coding system. For the current study, Axes I and V were used. Because in 53% of the cases, comorbidity of disorders has been found, Axis I diagnoses were grouped into three clusters of the most prominent psychopathology: mood disorders (38%), anxiety disorders (31%), and other disorders (31%). For Axis V, a Global Assessment of Functioning (GAF) scale, ranging from 1 to 100, was used and the GAF score was registered.

##### 4.1.3 Procedure

Prior to the first appointment, the clients completed a short questionnaire about sociodemographic characteristics, perceived problems and symptoms, as well as the requested help. The manifesting problems and symptoms were assessed in detail during the first interview. At the end of this session, the clients were handed the self-report questionnaires to be completed at home. The completed questionnaires (T1) were collected during the client's second interview session. The diagnostic procedure was continued by assessing the client's developmental history and personal biography. After the second interview, the questionnaires were scored according to the manuals' instructions. Discomfort and Worry scales were not available at that time.

Table 1  
Descriptive Statistics of Original and Biproportional ASQ Scales

Scale	T1			T2			T1-T2		<i>p</i>
	min/max	<i>M</i>	( <i>SD</i> )	min/max	<i>M</i>	( <i>SD</i> )	<i>t</i>	<i>df</i>	
Secure	1.57/5.00	3.78	(0.79)	1.86/5.00	3.81	(0.71)	-2.13	133	.035
Fearful	1.00/5.00	2.61	(1.07)	1.00/5.00	2.44	(0.98)	3.00	133	.003
Dismissing	1.20/5.00	3.18	(0.66)	1.40/4.80	3.28	(0.69)	-0.78	133	ns
Preoccupied	1.00/5.00	3.16	(0.95)	1.00/4.86	2.75	(0.85)	6.06	133	<.001
Discomfort	-1.00/+0.47	-0.29	(0.33)	-1.00/+0.44	-0.37	(0.33)	3.35	133	.001
Worry	-1.00/+1.00	0.22	(0.52)	-1.00/+1.00	0.02	(0.47)	5.64	133	<.001

Note. T1 *N* = 223. T2 *n* = 134. Original ASQ scales are Secure, Fearful, Dismissing and Preoccupied; Restructured biproportional ASQ scales are Discomfort and Worry.

A short psychological report was written summarizing the results of the assessment procedure, including the questionnaire interpretation, DSM-IV classification, and treatment design. The third session was feedback session, during which the report was discussed with the client and informed consent for treatment was requested. Subsequently, therapy took place, predominantly according to psychodynamic principles. If possible, outcome measures (T2) were collected at the end of therapy. Approximately 60% completed the T2 measures. Reasons for non-participation were referral for tertiary care (6%), dropout (16%), or ongoing therapy (1%). Of the remaining 17%, most clients did not return the questionnaires or refused to participate. The total number of sessions ranged from 2 to 120, with a mean of 16 (*SD* = 15).

#### 4.2 Results of Study 3

##### 4.2.1 Raw Scores PCA

The PCA using the biproportional raw scores revealed component strengths (i.e., the mean of the squared component loadings) for the first 5 principle components of .0395, .0109, .0025, .0010, and .0006, respectively. The first component size is approximately 3.6 times as high as the second one. Conforming with expectations, the first-to-second component ratio of 3.6:1 in this clinical sample is substantially smaller than the 13:1 ratio in the Study 1 sample. In a slightly different order, the items follow the same structure as described in Study 1.

##### 4.2.2 Attachment Scales

Table 1 presents the original ASQ scale means and standard deviations at T1 and T2 as well as the results of paired-samples *t*-tests. The sample means on Discomfort and Worry show that, on average, the clients did not feel uncomfortable in close relationships (negative value) but did report worries

about it (positive value). *T*-tests revealed significant changes between T1 and T2 for all scales except the dismissing style.

Because of the limited sample size at T2, I checked for a possible selection bias by comparing the 134 clients with the 89 clients for whom only T1 data were available. No significant differences were found in gender, age, marital status, educational level, questionnaire scores or DSM-IV classifications. However, a significant difference in duration of therapy was found: clients completing both T1 and T2 measures had more sessions than the T1-only clients (*M* = 22 (*SD* = 16) versus *M* = 7 (*SD* = 3), *t* = 10.19, *df* = 147.47, *p* < .001).

The association between Discomfort and Worry was *r* = .42, *p* < .001. Both the Discomfort and Worry scales showed a significant positive relation with symptoms and a significant negative association with self-awareness, the capacity to manage new situations, emotional stability, and autonomy. Discomfort was also negatively related to the level of functioning and extraversion. Worry showed a strong positive association with sensitivity to others. The results are presented in Table 2. As shown in this Table, the original Security scale and the biproportional Discomfort scale appeared to be almost opposites. In fact, their correlation was *r* = -.85. It should be noted that the Security scale consists of 7 items, all of them incorporated into the 18-item Discomfort scale, which is the case as well for the 5 items of the original Fearful scale (*r* = .90). Additionally, the 7-item original Preoccupied scale demonstrated a strong overlap with the biproportional Worry scale, consisting of only items also represented in the Preoccupied scale. The association between those two was *r* = 0.90. With the exception of a significant, negative association with Sensitivity to others, the Dismissing scale did not show significant relations to any other construct.

Table 2

*Pearson Correlations between Original and Biproportional Attachment Style Scales, Symptoms, Autonomy-Connectedness, Personality Factors, and Functioning*

	Original scales				Biproportional scales	
	Secure	Fearful	Dismissing	Preoccupied	Discomfort	Worry
<u>SCL-90:</u>						
Anxiety	<b>-.31</b>	<b>.24</b>	.11	<b>.21</b>	<b>.32</b>	.15
Agoraphobia	<b>-.29</b>	.16	.09	.09	<b>.24</b>	.06
Depression	<b>-.37</b>	<b>.32</b>	.02	<b>.37</b>	<b>.42</b>	<b>.30</b>
Somatic complaints	<b>-.28</b>	<b>.27</b>	.14	<b>.23</b>	<b>.32</b>	<b>.18</b>
Insufficiency	<b>-.35</b>	<b>.31</b>	.11	<b>.32</b>	<b>.39</b>	<b>.25</b>
Interpersonal sensitivity	<b>-.41</b>	<b>.48</b>	.03	<b>.52</b>	<b>.56</b>	<b>.43</b>
Hostility	<b>-.27</b>	<b>.24</b>	-.00	<b>.29</b>	<b>.32</b>	<b>.24</b>
Sleep problems	<b>-.27</b>	<b>.26</b>	.08	.13	<b>.27</b>	.09
Overall symptoms	<b>-.43</b>	<b>.40</b>	.09	<b>.41</b>	<b>.50</b>	<b>.32</b>
<u>AGS-30:</u>						
Self-awareness	<b>.33</b>	<b>-.30</b>	.04	<b>-.46</b>	<b>-.43</b>	<b>-.39</b>
Sensitivity to others	.08	.13	<b>-.38</b>	<b>.50</b>	.14	<b>.52</b>
Managing new situations	<b>.21</b>	<b>-.18</b>	.06	<b>-.31</b>	<b>-.28</b>	<b>-.26</b>
<u>FFPI:</u>						
Extraversion	<b>.59</b>	<b>-.47</b>	-.11	<b>-.29</b>	<b>-.57</b>	-.20
Agreeableness	.14	-.00	-.20	-.06	-.08	-.07
Conscientiousness	-.01	-.04	-.05	.15	.01	.20
Emotional stability	<b>.34</b>	<b>-.28</b>	.13	<b>-.43</b>	<b>-.45</b>	<b>-.33</b>
Autonomy	<b>.38</b>	<b>-.33</b>	.08	<b>-.54</b>	<b>-.52</b>	<b>-.44</b>
Self-informant discrepancy	-.27	.17	.24	.04	.21	-.03
<u>DSM-IV:</u>						
Axis V (GAF)	<b>.35</b>	<b>-.21</b>	-.13	<b>-.20</b>	<b>-.33</b>	-.15

Note.  $N = 223$ . (FFPI  $N = 88$ ). **Bold:**  $p < 0.01$ . Original ASQ scales are Secure, Fearful, Dismissing and Preoccupied; Biproportional scales are Discomfort and Worry.

#### 4.2.3 From Four to Two Categories

Forty-five clients had positive scores on Discomfort; 156 clients scored positively on Worry. A combination of the scores on both scales revealed four client type categories, distributed as follows: D–W–,  $n = 58$  (26%); D–W+,  $n = 120$  (54%); D+W+,  $n = 36$  (16%); and D+W–,  $n = 9$  (4%) (see also Figure 3). Because Worry proved to be rather “normal”, considering its presence in 70% of all cases, as well as its poor scale content (only three almost identical items), the decision was made to exclude the Worry scale as a base for classifying clients.

To test the hypothesis of whether the Discomfort scale could serve as a general dimension of security-insecurity and as an instrument to screen for the presence or absence of attachment problems, the sample was split at the base of the Discomfort scale’s zero point. At this point, the characteristic turns into its opposite (the presumed secure into the insecure pole of the dimension), which revealed two subsamples

comprising the D– client types ( $n = 178$ ) and the D+ client types ( $n = 45$ ).

The types differed with regard to their marital status ( $\chi^2 = 4.1$ ,  $df = 1$ ,  $p = .044$ ): singles were overrepresented in the D+ category. No further differences concerning sociodemographic variables were found. A significant difference was demonstrated regarding dropout ( $\chi^2 = 7.4$ ,  $df = 1$ ,  $p = .006$ ): in the total sample, 16% dropouts were found; in the D–category 12%, and in the D+ category 29%. The client types also significantly differed in Axis I diagnoses ( $\chi^2 = 9.9$ ,  $df = 2$ ,  $p = .007$ ). Mood disorders predominantly were found in D+, anxiety disorders were equally distributed over D+ and D–, while the remaining diagnoses mainly were found more often in D–.

Independent samples  $t$ -tests demonstrated significant differences between the two categories. D– client types appeared to suffer significantly fewer symptoms, were more self-aware, and were more extraverted, emotionally stable and autonomous.

Table 3

Comparison of the two Client Types Categories with regard to Symptoms, Autonomy-Connectedness, Personality Factors, and Functioning

	D-		D+		$M_{(\text{diff})}$	$d$	$t$	$df$	$p$
	$M$	$(SD)$	$M$	$(SD)$					
<u>SCL-90:</u>									
Anxiety	18	(7)	22	(8)	3.85	.53	-3.29	221	.001
Agoraphobia	9	(4)	11	(6)	1.92	.40	-2.69	55.24	.034
Depression	34	(12)	44	(13)	9.90	.78	-4.93	221	<.001
Somatic complaints	20	(7)	24	(8)	4.07	.56	-3.47	221	.001
Insufficiency	19	(7)	24	(7)	5.21	.80	-4.76	221	<.001
Interpersonal sensitivity	30	(10)	41	(13)	10.76	.94	-5.97	221	<.001
Hostility	9	(3)	11	(4)	2.39	.65	-4.04	221	<.001
Sleep problems	7	(3)	8	(4)	1.46	.40	-2.50	221	.013
Total of symptoms	159	(45)	202	(50)	43.29	.91	-5.67	221	<.001
<u>AGS-30:</u>									
Self-awareness	24	(6)	22	(6)	2.66	.30	2.65	221	.009
Sensitivity to others	63	(9)	65	(10)	1.52	.16	-0.99	221	ns
Managing new situations	18	(6)	16	(5)	1.76	.32	1.85	221	ns
<u>FFPI:</u>									
Extraversion	.27	(.32)	-.06	(.30)	.33	1.05	4.24	86	<.001
Agreeableness	.45	(.23)	.48	(.28)	.03	.14	-.58	86	ns
Conscientiousness	.19	(.30)	.15	(.26)	.04	.14	.55	86	ns
Emotional stability	.17	(.31)	-.09	(.31)	.27	.87	3.51	86	.001
Autonomy	.29	(.24)	.06	(.29)	.23	.88	3.77	86	<.001
Self-informant %	8	(4)	11	(4)	2.44	.61	-2.49	83	.015
<u>DSM-IV:</u>									
Axis V (GAF)	61	(6)	57	(5)	4.39	.75	4.29	221	<.001

Note.  $N = 223$ . D-:  $n = 178$ . D+:  $n = 45$ . (FFPI  $N = 88$ ). Self-informant: percentage of overall FFPI discrepancy between self and informant ratings. Cohen's effect size  $d = M_{(\text{diff})} / ((SD_1 + SD_2)/2)$ .

There was less self-informant disagreement on personality, meaning that distorted self-perceptions are less likely in this category of client types. In addition, their daily functioning proved to be better. Effect sizes (Cohen's  $d$ ) were shown to be medium to large. The client types did not significantly differ, however, with regard to sensitivity to others, capacity to manage new situations, agreeableness and conscientiousness. The results are displayed in Table 3.

#### 4.2.4 Therapy Outcomes

The main measures to determine the effect of therapy are the reduction of symptoms and the improvement of daily functioning. Thus, the total SCL-90 score as well as the GAF score were taken as outcome variables, both for the total sample and for selections of D- versus D+ client types categories. In addition, changes in the ACS-30 scales and the restructured ASQ scales were investigated. The results of these changes are shown in Table 4.

Paired samples  $t$ -tests demonstrated that, at the group level, significant changes in symptoms and functioning took place between T1 and T2. The effect sizes for the decrease in SCL-90 symptoms and the increase of level of functioning were large. All the ACS-30 and restructured ASQ scales changed: self-awareness and capacity to manage new situations increased, while sensitivity to others, discomfort and worry decreased. Although these changes were shown to be statistically significant, the effect sizes were rather small. The last three columns of Table 4 list the percentages of clients for whom there was a clinically significant increase or decrease per scale according to the Reliant Change Index (RCI, Jacobson & Truax, 1991:  $RCI \leq -1.96$  c.q.  $RCI \geq 1.96$ ) and those for whom change was not clinically significant. It can be seen that, for most clients, there was a clinically significant decrease in symptoms during therapy. For the majority of clients, therapy did not result in a clinically significant change in ACS-30 or ASQ characteristics.

Table 4  
Therapy Outcomes

	T1		T2		$M_{(\text{diff})}$	$d$	$r_{xx}$	RCI (in %)		
	$M$	( $SD$ )	$M$	( $SD$ )				-	0	+
SCL-90 total	170	(49)	127	(30)	<b>-42.99</b>	1.08	.57	74	23	3
GAF	60	(6)	75	(8)	<b>14.79</b>	2.12	.43	--	--	--
ACS-30 SA	23	(6)	15	(5)	<b>1.93</b>	.34	.61	2	89	9
ACS-30 SO	63	(9)	59	(9)	<b>-3.59</b>	.41	.61	11	88	1
ACS-30 CMNS	18	(6)	19	(6)	<b>1.34</b>	.23	.73	2	92	6
HSL Discomfort	-.29	(.33)	-.37	(.33)	<b>-.08</b>	.25	.64	21	71	8
HSL Worry	.25	(.52)	.02	(.48)	<b>-.20</b>	.47	.54	16	81	3
<u>Selection D- (n = 108):</u>										
SCL-90 total	163	(47)	123	(26)	<b>-39.44</b>	1.08	.48	71	26	3
GAF	60	(6)	75	(8)	<b>14.60</b>	2.13	.45	--	--	--
HSL Worry	.18	(.52)	-.02	(.47)	<b>-.20</b>	.40	.54	13	83	4
<u>Selection D+ (n = 26):</u>										
SCL-90 total	199	(41)	142	(42)	<b>-57.69</b>	1.29	.74	92	8	0
GAF	57	(6)	73	(9)	<b>15.58</b>	2.17	.31	--	--	--
HSL Worry	.55	(.37)	.16	(.49)	<b>-.39</b>	.91	.47	30	70	0

Note.  $n = 134$ . **Bold:**  $p < 0.001$ . Cohen's effect size  $d = M_{(\text{diff})} / ((SD_1 + SD_2)/2)$ .  $r_{xx}$  = test-retest correlation. RCI = Jacobson & Truax' Reliable Change Index (- = reliable decrease, + = reliable increase, 0 = no reliable clinical effect).

Figure 1 shows that at T1, 20% of the clients exhibited a D+ profile, and at T2, the percentage had decreased to 14%. With regard to symptom reduction, D+ client types appeared to profit more from therapy than D- client types, as shown in Table 4. In the D+ group, 92% improved and none of them deteriorated versus 71% and 3%, respectively, in the D- category. Moreover, considerably more D+ clients exhibited clinically significant improvements on Worry (30% versus 13% for B- client types). Although Discomfort scores at T1 were significantly associated with T2 symptoms (SCL-90:  $r = .31$ ,  $p < .001$ ) and functioning (GAF:  $r = -.26$ ,  $p = .001$ ), and a significant difference was found with respect to the D+ and D- client types (SCL-90:  $t = -2.31$ ,  $p = .027$ ; GAF:  $t = 3.15$ ,  $p = .002$ ), this significance disappeared after controlling for symptoms and functioning at T1 ( $r = .08$ , n.s. and  $r = -.09$ , n.s.). This means that outcome could not be directly predicted from the Discomfort scores at the start.

#### 4.3 Discussion of Study 3

In Study 3, the restructured ASQ scale's Discomfort and Worry dimensions and the derived client types were further explored in a clinical sample. It can be concluded that Discomfort and Worry are meaningful tools in assessing clients, not only in a dimensional approach but also in differentiating client categories. However, despite its sufficient reliability, Worry is hardly worth being mentioned as a scale, as its three items all cover the

same subject: worries about being liked or not. Worry, therefore, may only have a function in coloring the respondents' D position. D- client types, with or without worries, turned out to have more "good" personality traits and capacities than the D+ client types. This largely corresponds the findings of Nofle and Shaver (2006; see also Roisman et al., 2007) in their overview of the relationship between big five personality traits and adult attachment measures. D- clients showed the lowest dropout percentage, and most of them did not suffer mood or anxiety disorders. The D+ clients, in contrast, were more introverted, emotionally unstable and dependent, were highly sensitive to others and showed the least self-awareness. They mostly suffered from depressive disorders, a finding that corresponds with the evidence of the link between depressive symptoms and adult attachment insecurity (e.g., Bifulco, Moran, Ball, & Bernazzani, 2002; Besser, & Priel, 2003; Wei, Mallinckrodt, Larson, & Zakalik, 2005).

D+ client types appeared to profit more from therapy, which is in accordance with the findings of Fonagy et al. (1996), applying the AAI in a sample of more severely disturbed patients. They found that individuals rated as dismissing on the AAI were more likely to show improvements in psychotherapy. However, they remarked that the extreme interpersonal state of the dismissive patients at therapy start may have regressed to the mean at the end of therapy, a possibility that might

stand in the present study as well. In contrast, the present findings are contradicted by the results of a meta-analysis of 14 clinical samples' self-reports by Levy, Ellison, Scott, and Bernecker (2011). They found attachment security to be positively related to therapy outcome, attachment anxiety to show a negative relation, and attachment avoidance to be uncorrelated with outcome.

The internal validity of the Discomfort scale was good, as demonstrated by its .87 alpha. The main advantage of the scale is that it represents two poles of the same dimension, in contrast to the unipolar original dimensions of Secure, Preoccupied, Fearful and Dismissing. In addition, the external validity shows reasonable and expected associations with attachment-related measures such as interpersonal sensitivity, self-awareness, sensitivity to others, and autonomy.

## 5. General discussion

In the studies presented, an application of an alternative methodological approach developed by Hofstee and Ten Berge (2004) to overcome the problem of information loss by score transformation was demonstrated. A core feature of this method is the zero-point of absolute biproportional scores taken as the mean. This method has proved to alter the structure of the questionnaire, in which, dependent on the item content of the questionnaire, a dominant dimension of normality emerges. It was hypothesized that, due to its normative conceptualization, a large first component in the presented research would cover the attachment security dimension. This large first component, labeled Discomfort, has been found in all three studies, confirming the hypothesis.

As demonstrated previously by Hofstee et al. (2006), the clinical ASQ sample showed a less dominant first component than the general ASQ sample. The reason for this is twofold: on the one hand, mental health clients are supposed to score lower on normality almost by definition, through which the first component becomes less dominant; on the other hand, due to the character of clinical symptoms, subsequent components may be more differentiated or more strongly loaded (e.g., worrying will be more common among clients). An advantage of the method, therefore, is that it may detect at-risk samples. Because of the fixed turning point of the construct and the absence of transformations based on the sample mean, outliers will not influence the results. The zero point as a constant resolves the types versus dimensions debate (Fraley & Waller, 1998) because it naturally separates normal and abnormal types, while retaining its dimensional qualities.

The second hypothesis, stating that the general component would be of clinical value, has also been confirmed, as demonstrated in Study 3.

Internal and external validities were good. The main finding was that separating clients into Comfort (D-) and a Discomfort (D+) categories illuminated group differences with regard to symptoms, personality and outcome. This possibility of identifying individual at-risk clients offers promising opportunities to design attachment theory based therapeutic interventions. According to Levy et al. (2012), attachment representations may guide psychotherapy by selecting appropriate interventions, moderating therapy processes, and indicating outcomes. Mallinckrodt (2010) described a conceptual model of how therapists can regulate therapeutic distance to create the conditions best suited for clients with a hyperactivating versus deactivating attachment pattern.

### 5.1 Construct Validity

Notwithstanding the good psychometric qualities of the restructured ASQ, a particularly important question remains unanswered: Does Discomfort actually cover the attachment concept or does it point to some other construct? Put in a different way, is attachment best represented by the item contents of the questionnaire?

A way to address the question of construct validity is to compare the current ASQ and ECR results to prevalence studies of attachment. Although no prevalence data on attachment are available, the distribution found in the large Bakermans-Kranenburg and Van IJzendoorn AAI study (2009) might have been of help, if it were not another concept: the AAI determines the current attachment representations (i.e., not the behavior) of childhood attachment experiences, while the self-report questionnaires appeared to be more focused on the current behavior and feelings in close relationships. This distinction is underlined by the distribution results. The Bakermans-Kranenburg and Van IJzendoorn distribution deviates widely from the ASQ and ECR distribution found in the present studies. The trivial to small overlap between AAI security versus insecurity was also found in a meta-analytic review of Roisman et al. (2007). Stein et al. (2002), contrary to the findings of Mickelson et al. (1997), examining different measures, found modest agreement among classifications as well. This confirms the conclusion that, at least with regard to the categorical approach, attachment measures are insufficiently reliable in catching the underlying construct. Stein et al. (2002) therefore argued for rethinking the conceptual bases of attachment and choosing a dimensional rather than categorical approach to the measurement of adult attachment. However, this is not to say that by doing so, the problem regarding the underlying construct would be solved.

To approach this issue of construct validity in another way, a limited qualitative post-hoc study

was conducted. In this study, the most explicit client types' biographies were inspected. Thus, the highest and lowest Discomfort scorers in combination with positive or negative Worry dispositions were taken, resulting in four client type vignettes:

*Client type D+W+* (A), a 24-year-old single female (D+0.47,W+0.33; SCL:294; FFPI:E-,A+,C+,ES-,Au-; AGS:SA-,SO+,Au-; GAF:45), sought therapy for her depressive symptoms. She felt numb, which she attributed to an abusive relationship that endured for 6 years and ended up in her hospitalization after being seriously assaulted by her boyfriend. However, he kept stalking her and most of the time she could not resist his pressures. She was raised in a middle-class family with two younger brothers. She described her father as extraverted and warm and her mother as very caring but somewhat uncertain. As a child, she had many friends, but at school, she was bullied because of her overweight and poor school results. She started dating at age 14, had several boyfriends, but after the assaults, she noticed that she felt uncomfortable and could not open up.

*Client type D+W-* (B), a 40-year-old single female (D+0.22,W-0.50; SCL:121; FFPI:E-,A-,C+,ES-,Au+; AGS:SO-; GAF:60), sought help for her feelings of guilt after having had, as a supervisor, an affair with a 15-year-old American girl during a summer camp 18 years ago. A recent nightmare had brought this forgotten memory back into her consciousness and had made her feel upset and panicked. This client was raised in a middle-class family with two younger brothers. The bond with mother and brothers was very close, but father was ignored and excluded from family life because mother held him responsible for a negative atmosphere. The parents eventually divorced, and the client broke off contact with father. She did not even want to keep his name and formally took her mother's last name. She was a bright medical student but did not succeed completing her bachelor's degree. She found work below her intellectual capacities. Although she occasionally had short affairs, with both men and women, she never experienced an enduring relationship.

*Client type D-W+(C)*, a 68-year-old married female (D:-1.00,W:+0.33; SCL:110; FFPI:E+,A+,C+,ES+,Au+; AGS:SA+,SO+,CMNS+; GAF:50), suffered from symptoms of exhaustion. Having partial paraplegia due to a fall down the stairs 14 years ago, she was unable to walk and used a wheelchair. Nevertheless, she continued her societal commitments and administrative duties. The pain, fatigue and physical constraints, however, increased, and it was hard for her to accept her diminishing activities. She was the eldest of seven siblings, born during the Second World War, and raised in poverty. All children were expected to do their part. The parents were hard workers and were not affectionate to their children. Although intelligent, this client had no opportunity to attend college. However, she was sociable and succeeded in finding good jobs. She married a man who had suffered severe childhood war trauma. She had two children. The marriage

ended in a divorce, after which she soon met her current partner.

*Client type D-W-* (D), a 42-year-old male (D:-.94,W:-.50; SCL:106; FFPI:E+,A+,C+,ES+,Au+; AGS:SA+,CMNS+; GAF:75), was involved in an initially harmonious but gradually more conflictive divorce. The marriage had been dominated by his lack of assertiveness, his tendency to please and to avoid problems. Falling in love with another woman helped him to make the choice for a divorce, but his wife's increasing anger made him feel uncertain. Client D was his parents' only child, and he lived with them aboard a ship. His parents were professional shippers. When he had to attend school at age 6, he and his mother moved into a house, while his father joined them every second week. His grandparents lived around the corner, and he had a pleasant youth, with many friends and no problems in school. When he was 16 years old, his father died. At age 18, he met his (ex-)wife. She had familial conflicts, and after eviction by her parents, she moved in with the client and his mother. They married and had two daughters.

These client type vignettes clearly illustrate that Discomfort appears to be a measure of attachment (in)security that may or may not go along with Worry. They also demonstrate that attachment representations are the result of not only secure or insecure parental bonding but also the presence or absence of resilience and personality characteristics such as extraversion, emotional stability and autonomy, as well as that of life events such as traumatic experiences.

These examples underscore the entanglement of attachment and psychopathology but also show that early anxious attachment "by no means leads inevitably to psychopathology. Change remains possible at numerous points in development" (Sroufe et al., 1999, p 11). Thus, attachment appears to be an ongoing developmental process that, either negatively or positively, may be influenced by life experiences and traumata, corrective or destructive emotional experiences, relationships, personality traits, and so on. According to Fraley, Vicary, Brumbaugh and Roisman (2011), a person's attachment orientation is not simply a state or trait but may fluctuate by contextual influences. It can also serve as a self-fulfilling prophecy, eliciting schema-congruent behavior of others, reinforcing the existing working model (Shorey & Snyder, 2006). Where clients C and D seem to profit from resilience and protective personality traits, being socially engaged and succeeding in managing their problems, clients A and B, more introverted and emotionally unstable, remained stuck in rigid self-other working models and lost social engagement. The most disturbed, client A, seemed to have started with a secure base but repeated negative interpersonal experiences served as re-enactment and retraumatization.

## 5.2 Item Content



Still, the base of a questionnaire is not its structure but its item content. In the presented research, the presumption of restructuring the questionnaires by means of biproportional scaling is the concept of attachment's normality. If correct construct descriptions are given, this method will very precisely filter normal (secure) from abnormal (insecure). Discomfort, at best, may be conceptualized as a derived attachment approach; however, is Discomfort also the best or only representative of such an approach?

Attachment is a behavioral system, which is activated not only by environmental threats that endanger a person's survival but also by stimuli that "increase the likelihood of danger [...], as well as by attachment-related threats such as impending or actual separation from, or loss of, an attachment figure. In [Bowlby's (1973)] view, a combination of attachment unrelated sources of threat and lack of access to an attachment figure compounds distress and triggers the highest level of attachment-system activation." (Mikulincer & Shaver, 2007, p. 12-13). In other words, negative feelings or emotions (i.e., distress) elicited by threats activate attachment behavior (i.e., approaching an attachment figure for comfort and reassurance). Abnormal attachment behavior, such as avoiding the need to be comforted, or clinging too much to be reassured, whether due to anxiety, embarrassment or confusion by early childhood experiences, has to be detected. Thus, the core feature of the developmental norm is proximity seeking, not only as a way to survive but also as a way to regulate arousal and emotions.

Attachment questionnaires should address both components of the activation system: on the one hand, the distress and emotional turmoil, and on the other hand, the behavioral reaction to regulate arousal and emotions. Items should describe the behavior in reaction to threats and distress, and questionnaires should fulfill the need to learn more about the respondent's attachment behavior style: avoid, approach or enmeshed. An item such as *I am very comfortable being close to romantic partners* (ECR, highest first loading) does not fulfill these requests because the attachment behavior related to this feeling is not mentioned: follow-ups such as *...and I can't stand being without him/her* (reflects too little autonomy, which may refer to an insecure style) or *...but I prefer being on my own* (which may both reflect an autonomous, secure style as well as a dismissing, insecure style) may change the picture completely. The combination of an attachment-activating trigger and the following behavior is missing in the investigated questionnaires: they either address the approach/avoidance behavior or the emotion/feeling that should elicit the behavior, not the two combined into one description. Doing so confines

the test results: you cannot get out what you have not put in.

Precision in formulation is a function of the observability and the appropriateness of the behavior described in the items. Emotions and feelings are less observable but often more socially accepted than actual behavior. *I avoid close ties* (ASQ, highest first loading) is observable but inappropriate social behavior, whereas *I think it is important that people can rely on each other* (ASQ, lowest first loading), though not observable behavior, is a socially acceptable statement. Not observable but nevertheless inappropriate is *I prefer not to be too close to romantic partners* (ECR, highest first loading). *My desire to become very close sometimes scares people away* (ECR, loading zero) and *I don't worry whether people like me or not* (ASQ, loading around zero) are neutral statements in that respect.

Another remark denotes the fact that the developers of both tests claim to have followed Bartholomew's dimensions of self and others (Bartholomew & Horowitz, 1991). It is hard to link the discomfort and worry dimensions directly to the self and other dimensions, the latter resulting in the four categories of combinations of positive or negative self-evaluation (worthiness) and positive or negative evaluation of others (responsiveness). Discomfort or avoidance, for instance, may be the result of distrusting others but also of feelings of unworthiness, or both. Worrying and anxiety, on the other hand, may also reflect doubts about the self as well as worries about others.

Hence, overviewing these remarks on the questionnaire's item content, it may be stated that the Discomfort construct perhaps might be the next-best available approach for separating secure from insecure attachment as well as its dimensional values.

In conclusion, a number of directions for future research are recommended. First, following the basic work of Hofstee et al. (2004, 2006), the benefits of the biproportional scaling method should be exploited and elaborated more thoroughly, inviting researchers to enter this new pathway of investigation and its challenging opportunities. Second, better items following the format *When... (distressed), then... (behavior tendency)* should be developed, bringing about a more cohesive integration in attachment conceptualization, as Shorey and Snyder (2006) mentioned. Third, in line with Mikulincer and Shaver's remarks (2007), more research should be focused on attachment security, which should not be defined as merely the absence of insecurity but may, just like its insecure counterpart, be a characteristic covering several strategies.

After Bowlby (1969/1982, p. 340), we still note: *"Meanwhile, [...] the dimension security-insecurity makes much sense to a clinician."*

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## Appendix A

### Items and factor loadings of the (Dutch) Attachment Styles Questionnaire (English translation)

S	-0.61	I avoid close ties (8)	<u>0.28</u>	0.02	0.03
F	0.54	I feel uncomfortable when relationships with other people become close (3)	<u>0.26</u>	0.01	0.03
D	0.55	I feel comfortable without having close relationships with other people (4)	<u>0.25</u>	0.05	0.04
F	0.72	I am wary to get engaged in close relationships because I'm afraid to get hurt (23)	<u>0.24</u>	-0.04	0.03
F	0.76	I'm afraid that my hopes will be deceived when I get too closely related to others (20)	<u>0.24</u>	-0.04	0.04
P	0.80	I am often afraid that other people don't like me (11)	<u>0.19</u>	-0.09	-0.01
P	0.61	I have the impression that usually I like others better than they like me (9)	<u>0.19</u>	-0.06	0.01
P	0.58	I fear to be left alone (13)	<u>0.19</u>	-0.08	-0.01
F	0.80	I would like to have close relationships with other people, but I find it difficult to fully trust them (5)	<u>0.15</u>	-0.04	0.05
F	0.75	I would like to be open to others, but I feel I can't trust other people (2)	<u>0.13</u>	-0.03	0.04
P	0.82	I often wonder whether people like me (7)	0.07	<u>-0.11</u>	-0.00
P	0.51	I usually find other people more interesting than myself (21)	0.06	<u>-0.06</u>	0.02
D	0.60	I don't worry about being alone: I don't need other people that strongly (19)	0.05	0.06	<u>0.06</u>
P	-0.65	I don't worry whether people like me or not (17)	-0.01	<u>0.09</u>	0.03
D	0.61	I prefer that others are independent of me, and that I am independent of others (6)	-0.01	0.01	<u>0.09</u>
P	0.70	I find it important to know whether other people like me (24)	-0.07	<u>-0.10</u>	-0.00
S	0.56	I find it easy to get engaged in close relationships with other people (14)	<u>-0.13</u>	0.01	-0.02
D	0.64	It is important to me to be independent (12)	<u>-0.19</u>	-0.01	0.09
S	0.53	I trust that others will be there for me when I need them (22)	<u>-0.21</u>	-0.02	0.00
S	0.61	I feel at ease in emotional relationships (1)	<u>-0.23</u>	-0.03	0.00
D	0.61	I like to be self-sufficient (16)	<u>-0.26</u>	-0.02	0.07
S	0.61	I trust other people and I like it when other people can rely on me (10)	<u>-0.27</u>	-0.03	0.01
S	0.61	I feel at ease in intimate relationships (15)	<u>-0.29</u>	-0.03	0.02
S	0.60	I think it is important that people can rely on each other (18)	<u>-0.34</u>	-0.05	0.05

*Note.* In the first column the original scales: S = Secure, P = Preoccupied, F = Fearful, D = Dismissing; in the second column the original factor loadings. Between brackets the item number. In the last three columns the loadings on the first, second and third component of biproportional PCA. Primary loadings are underscored.

## Appendix B

### Items and factor loadings of the Experiences in Close Relationships Scale

Av	-0.75	I prefer not to be too close to romantic partners (23)	<u>0.21</u>	0.03	0.01
Av	-0.72	I get uncomfortable when a romantic partner wants to be very close (7)	<u>0.20</u>	0.05	-0.02
Av	-0.73	I don't feel comfortable opening up to romantic partners (9)	<u>0.19</u>	0.07	-0.02
Av	-0.70	I try to avoid getting too close to my partner (17)	<u>0.18</u>	0.07	-0.01
Av	-0.69	I am nervous when partners get too close to me (13)	<u>0.18</u>	0.07	-0.02
Av	-0.66	Just when my partner starts to get close to me I find myself pulling away (5)	<u>0.17</u>	0.08	-0.03
Av	-0.64	I prefer not to show a partner how I feel deep down (1)	<u>0.16</u>	0.05	-0.03
Av	-0.58	I want to get close to my partner, but I keep pulling back (11)	<u>0.15</u>	0.09	-0.03

Av	-0.59	I find it difficult to allow myself to depend on romantic partners (21)	<u>0.09</u>	0.05	-0.08
Anx	-0.65	I do not often worry about being abandoned (22)	0.08	<u>-0.13</u>	0.03
Anx	0.56	I resent it when my partner spends time away from me (36)	0.00	<u>0.10</u>	0.08
Anx	0.59	I find that my partner(s) don't want to get as close as I would like (26)	0.00	<u>0.11</u>	0.07
Anx	0.52	My desire to become very close sometimes scares people away (16)	-0.00	0.10	<u>0.10</u>
Anx	0.53	I often want to merge completely with romantic partners, and this sometimes scares them away (12)	-0.00	0.10	<u>0.11</u>
Anx	0.48	When I'm not involved in a relationship, I feel somewhat anxious and insecure (28)	-0.03	<u>0.10</u>	0.07
Anx	0.54	Sometimes I feel that I force my partners to show more feeling, more commitment (20)	-0.05	<u>0.11</u>	0.06
Anx	0.68	I often wish that my partner's feelings for me were as strong as my feelings for him/her (10)	-0.07	<u>0.14</u>	-0.00
Anx	0.72	I worry a fair amount about losing my partner (8)	-0.07	<u>0.14</u>	-0.02
Anx	0.59	If I can't get my partner to show interest in me, I get upset or angry (24)	-0.08	<u>0.11</u>	0.01
Anx	0.69	I worry a lot about my relationships (4)	-0.08	<u>0.13</u>	-0.04
Anx	0.63	I worry about being alone (14)	-0.09	<u>0.14</u>	-0.01
Anx	0.72	I worry that romantic partners won't care about me as much as I care about them (6)	-0.09	<u>0.15</u>	-0.05
Anx	0.48	I get frustrated if romantic partners are not available when I need them (32)	<u>-0.11</u>	0.08	-0.00
Anx	0.72	I worry about being abandoned (2)	<u>-0.11</u>	<u>0.14</u>	-0.06
Anx	0.51	I get frustrated when my partner is not around as much as I would like (30)	<u>-0.11</u>	0.09	0.02
Anx	0.68	I need a lot of reassurance that I am loved by my partner (18)	-0.11	<u>0.13</u>	-0.02
Av	0.62	I feel comfortable depending on romantic partners (29)	<u>-0.12</u>	-0.03	0.05
Anx	0.50	When romantic partners disapprove of me, I feel really bad about myself (34)	<u>-0.13</u>	0.09	-0.05
Av	0.65	I find it relatively easy to get close to my partner (19)	<u>-0.15</u>	-0.06	0.01
Av	0.70	I tell my partner just about everything (25)	<u>-0.18</u>	-0.03	0.02
Av	0.66	I feel comfortable sharing my private thoughts and feelings with my partner (15)	<u>-0.19</u>	-0.04	-0.00
Av	0.66	I don't mind asking romantic partners for comfort, advice or help (31)	<u>-0.19</u>	-0.04	-0.03
Av	0.69	I usually discuss my problems and concerns with my partner (27)	<u>-0.20</u>	-0.04	-0.03
Av	0.70	It helps to turn to my romantic partner in times of need (33)	<u>-0.02</u>	-0.02	-0.05
Av	0.70	I turn to my partner for many things, including comfort and reassurance (35)	<u>-0.21</u>	0.00	-0.03
Av	0.71	I am very comfortable being close to romantic partners (3)	<u>-0.21</u>	-0.04	-0.00

*Note.* In the first column the original scales: Av = Avoidance, Anx = Anxiety; in the second column the original factor loadings. Between brackets the item number. In the last three columns the loadings on the first, second and third component of bi-proportional PCA. Primary loadings are underscored.