International Journal of Personality Psychology
2022, Vol. 8, 8-32
https://doi.org/10.21827/ijpp.8.38297

Assessment of adult attachment: Construction and validation of a hybrid self-report measure

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The factorial structure of a combined set of items originating from two frequently used adult attachment measures in the field of psychopathology was examined. By employing exploratory and confirmatory factor analysis in a nonclinical sample (N = 1,533), an eight-factor model emerged covering four (higher-order) dimensions: (I) avoidance vs. security (avoidance of intimacy, distrust in others, confidence in self and others) (II) anxiety (preoccupation with others, the need for approval and separation anxiety); (III) relationships as secondary; and (IV) independency. In two validation studies, the interpersonal and affective meaning of these newly formed attachment scales were examined by using instruments that accentuate agentic and communal interpersonal orientations in human contact. Multiple regression analyses indicated that almost 40% of variance in depression and 15% of variance in dissociation could be explained by the hybrid attachment scales. The results show that distrust, preoccupation, and separation anxiety may increase the risk for depression, while confidence seems to diminish it. Distrust and relationships as secondary emerged as the only two significant predictors of dissociation. Notably, close inspection of the eight-factor model challenges the original composition of several subscales of the original questionnaires involved. Possibilities to further improve and extend the multi-dimensional assessment of adult attachment are being discussed in detail.

Keywords: adult attachment styles, depression, dissociation, self-confrontation method, circumplex of interpersonal values

Contemporary research on adult attachment suggests that *attachment anxiety* and *attachment avoidance* are two crucial higher-order dimensions, which underlie four basic attachment prototypes (Bartholomew, 1990, Brennan et al., 1998; Mikulincer & Shaver, 2007). The anxiety dimension refers to oversensitivity to clues about abandonment, separation, and rejection, and an exaggerated need for reassurance, attention, and support. The avoidance dimension covers discomfort with closeness and dependency, distancing from others, and denial of attachment needs. These dimensions were distinguished in a discriminant analysis of data obtained in the 'strange situation procedure', in which infants were observed when briefly being separated and reunited with their mothers (Ainsworth et al., 1978). Brennan et al. (1998) extracted two comparable (higher-order) dimensions from data of 60 self-report attachment measures used in research on close romantic relationships of adolescents and adults.

Attachment researchers have been developing a rich variety of self-report attachment measures, including those based on forced choice of attachment prototypes, ratings of fit with attachment prototypes, and various dimensional 'multi-item' measures. Ravitz et al. (2010) reviewed several self-report instruments, with a focus on their relevance for psychosomatic research. Overall, the review was quite positive (i.e., not very critical) about the psychometric properties of most of the self-report instruments, and labeled nine well-known questionnaires as having "strong psychometric properties" (p. 419), even though in the more detailed descriptions of their review Ravitz et al. clearly referred to psychometric weaknesses for some of them. Recently, Jewell et al. (2019) meticulously reviewed the psychometric properties of several self-report attachment measures used in childhood and adolescence. They qualified most of them as "inadequate", and concluded, that there is "currently (…) limited evidence for the adequacy of their psychometric properties" (p. 72). Sochos (2013) noted conceptual omissions in most of the well-known self-report adult attachment measures. He claims that various important attachment components are underrepresented in the item pools, such as the mutual stimulation of autonomy in close partner relationships and the reciprocal support for one another (i.e., not only requesting/receiving but also providing care). So, in Sochos' view, (in)secure attachment (and its measurement) is intrinsically connected to 'exploration' and to 'caregiving' (cf., Bowlby, 1969/1982), and attachment security can only be attained by balancing the desire for intimacy with that for autonomy (cf. Blatt, 2004). Two decades ago, Brennan et al. (1998) expressed the need for a common method encouraging researchers "(..) to move on to more substantive issues rather than remaining hung up on psychometric ones" (p. 68). Since then, many researchers have been working with Brennan et al.'s two-dimensional hybrid self-report measure (ECR), but it has not been accepted as the 'golden

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standard' by everyone—and new instruments are still being developed. In our view, additional psychometric studies are still valuable, because of the ongoing debate about the defining constituents of adult attachment (e.g., Sochos, 2013) and new statistical benchmarks that are being set (e.g., Jewell et al., 2019).

In the present study we focus on the (first-order) factorial structure of the item pool of two self-report measures assessing adult attachment (HSL and ASQ). Below, we first discuss attachment theory, highlighting Bartholomew's (1990) four-category model of adult attachment styles, refer to the circumplex structure of attachment scales, and review some of the self-report measures in the field (including the HSL and ASQ). We then present some empirical findings regarding the critical insecure attachment factors that make people more susceptible to depression and dissociation. The main objective of this study is to identify sub(factors) that emerge from the analysis of a combined set of items about adult attachment of the HSL and ASQ. For the purpose of construct validation, the relationships of interpersonal variables (CSIV circumplex) and affect scales (SOPN) with the derived (sub)factors are examined. In addition, a path model predicting dissociation and depression is considered. Implications for assessment and possible subscale revisions are discussed.

Attachment theory and attachment scales

According to attachment theory, based on experiences with their parents or primary caregivers (positive or negative), children develop mental representations of themselves and others, which, at a later age, are being manifested in the affective relationships with others (Ainsworth & Bowlby, 1991; Bowlby, 1973; 1980. For a historical review, see Bretherton, 1992). The theory implies that children who are lovingly raised and comforted in times of stress get the message that they are worthy of attention and love (which results in a 'positive self-image') and, at the same time, that others are trustworthy and available for help and comfort (which creates a 'positive image of others') (Bartholomew, 1990). In effect, in these circumstances, a child learns that the primary attachment strategy of seeking closeness and comfort is an effective way to deal with stress (Mikulincer & Shaver, 2007). Attachment theory adds that children growing up in a less caring environment—where parents are scarcely or inconsistently available and children are often being neglected, or even abused—develop negative mental representations of themselves or others. Because the primary strategy of proximity seeking and support seeking does not work (well), neglected children use alternative—so-called secondary—strategies to regulate stress: the seeking of proximity is intensified (cf., hyperactivating strategy) or the seeking of proximity is abandoned (cf. deactivating strategy) (Mikulincer & Shaver, 2007). The hyperactivating or anxious strategy is accompanied by an increased alertness for signs of separation or rejection, an exaggerated need for affirmation, attention, and support from others. The deactivating or avoidant strategy involves controlling the desire for closeness by devaluing the importance of intimate relationships and acting independently; the other, as a potential source of support and comfort, has actually been given up.

An important assumption of attachment theory is that the bond a child has had with his caregivers is being manifested in affective relationships in adulthood (For a review of longitudinal studies supporting this view, see Mikulincer & Shaver, 2007, p. 124-126). Brennan et al. (1998) hypothesize that in intimate adult relationships, two dimensions can be distinguished that determine how a person feels in the relationship: 'anxiety about rejection and abandonment (not being accepted)' and 'avoidance of and discomfort with closeness'. These two dimensions (anxiety and avoidance) underlie Bartholomew's (1990) (theoretical) four-prototype model of attachment styles: secure, preoccupied, dismissive-avoidant, and fearful-avoidant. According to Bartholomew (1990), securely attached persons have little concern of not being accepted by others (they show low "anxiety") and easily form intimate bonds (they show low "avoidance"). Individuals with a preoccupied attachment style have an insatiable need for the approval of others and a deep conviction that they don't matter (Bartholomew, 1990). Hence, they show a strong desire for intimate relationships (low avoidance), but at the same time they are afraid of not being accepted (high anxiety). Those with a dismissive-avoidant attachment style, on the other hand, deny the need for intimacy (high avoidance) in order to maintain a sense of complacency and invulnerability (low anxiety). High avoidance is also a characteristic of those with the fearful-avoidant attachment style, but this stems from fear of being hurt by potential loss or rejection (high anxiety), without really relinquishing the desire to be accepted. Research has shown that attachment-related anxiety in particular is a risk factor for depression and anxiety disorders. Furthermore, there are indications that avoidant attachment, and in particular fearful-avoidant attachment, increases the risk of dissociative disorders (Mikulincer & Shaver, 2007). For this reason, some researchers regard the fearful-avoidant attachment style as an, essentially, dissociative form of attachment (Liotti, 2006).

Attachment researchers have been developing a rich variety of dimensional 'multi-item' adult attachment measures. One of the most frequently used instruments is the Experiences in Close Relationships Scale (ECR, Brennan et al., 1998), a two-dimensional measure that emerged from a principal components analysis of 323 items from 60 attachment "subscales" (stemming from 14 questionnaires). The ECR includes items about attachment anxiety (e.g., "I worry about being rejected or abandoned" and "My desire to be very close sometimes scares people away") and attachment avoidance (e.g., "I try to avoid getting close to others" and "I feel comfortable sharing my private thoughts and feelings with others", negative item). Noticeably, half of the avoidance items refer to secure attachment. So, the avoidance scale of the ECR is essentially a secure-avoidance contrast.

Van Oudenhoven et al., (2003) created the (Dutch) HechtingsStijlLijst (HSL), or Attachment Style List, a measure with a four-dimensional structure, of which the scales are labelled in accordance with Bartholomew's typology, viz. Secure, Preoccupied, Dismissing, and Fearful attachment. They used and rephrased some items stemming from the Relationship Style Questionnaire (RSQ, Griffin & Bartholomew, 1994), but also wrote new items in accordance with Bartholomew's (1990) original vignettes. Van

Oudenhoven and Hofstra (2005) refined the HSL by deleting a few items, particularly from the fearful scale. As a result, all (four) remaining "fearful" items explicitly conveyed an approach and avoidance tendency, which is the defining feature of this attachment style (Collins & Feeney, 2004). An example is the item: "I would like to have close relationships with other people, but I find it difficult to trust them". Van Oudenhoven and Hofstra (2005) studied the internal structure of the HSL items in a large sample of Dutch students and Dutch emigrants. They extracted four factors, "(...) which clearly corresponded with the four attachment styles" (Hofstra et al., 2005, p. 603). Regarding internal consistency, several studies have shown that the secure, preoccupied, and fearful subscales are satisfactory, but that the dismissing subscale displays somewhat low alphas of around 0.60 (Hofstra & Oudenhoven, 2005; Hofstra et al., 2005; Polek et al., 2010).

Feeney et al. (1994) developed a five-dimensional attachment measure for use in adolescent and adult populations: the Attachment Style Questionnaire (ASQ, 40 items). They first formulated 65 items covering the major features of Hazan and Shaver's (1987) three-group and Bartholomew and Horowitz' (1991) four-group attachment models. After deleting items with low communalities, a principal components analysis (with varimax rotation) on the remaining 40 items yielded "five" meaningful factors, including a secure dimension (Confidence in Self and Others), two anxiety related dimensions (Need for Approval, and Preoccupation with Relationships), and two avoidance related dimensions (Discomfort with Closeness, and Relationships as Secondary).

All things considered, it seems that "anxiety" and "avoidance" are fundamental (higher-order) dimensions of adult attachment. Brennan et al. (1998) have demonstrated that many attachment "subscales" can be projected against a background defined by these two dimensions. The circular configuration in the study of Brennan et al. (1998) further suggests that attachment subscales display the features of a "circumplex". Hence, many attachment subscales can be conceived of as a blend of the two underlying dimensions (cf. Stein et al., 2002). A two-dimensional model of anxiety and avoidance is theoretically appealing for several reasons. First, it integrates Bowlby's (1969/1982) ideas about the critical features of (in)secure attachment: "(un)lovability of self", cf., anxiety, and "(un)availability of others", cf., avoidance. Second, the "quadrants" of the two-dimensional space can be interpreted in terms of a four-category typology (Mikulincer & Shaver, 2007). The identification of a "dismissing avoidant" and "fearful avoidant" prototype by Bartholomew (1990), thereby extending Ainsworth et al.'s (1978) original three group-classification, may thus be considered as the fruit of the paradigmatic influence of this model. Finally, it should be noted that dimensional models do not preclude a classification into (four) attachment prototypes, because prototypes can also be conceptualized as (heterogeneous) clusters or regions in a dimensional space. Feeney et al. (1994), for instance, clustered cases on the basis of their patterns on "five" dimensions, and compared two-, three, and four-cluster solutions. They concluded that their "(...) results tend to provide strong support for the existence of four rather than three groups" (p. 142), cf. Bartholomew's typology. In this study, aiming at more fine grained subscales, we used the richer item pools of the HSL and ASQ.

Adult attachment and psychopathology

According to Mikulincer and Shaver (2007), "attachment insecurities, [i.e.,] negative models of self and others, and both intra- and interpersonal regulatory deficits, rooted in discouraging experiences with unavailable, rejecting, or neglectful attachment figures put a person at risk for psychological disorders" (p. 369) (cf. Bowlby, 1969/1982; for a theoretical discussion, see Dozier et al., 2008). Numerous studies support the view that insecure attachment predisposes to negative affectivity, proneness to distress, and psychopathology. Studies with non-clinical samples, reveal that global attachment anxiety as well as global attachment avoidance are associated with neuroticism, negative affectivity, and general distress, but the associations for anxiety are more consistent and also much stronger than those for avoidance (For a review, see Mikulincer & Shaver, 2007, p. 375-377).

Regarding depression, studies with non-clinical samples have found strong associations with global attachment anxiety and preoccupied attachment style ratings. Most studies also report associations of global attachment avoidance with depression, but the picture is less clear than that for attachment anxiety (For a review, see Mikulincer & Shaver, 2007, p. 378-385). An overview of studies with attachment style ratings showed that depression is more consistently associated with fearful-avoidant attachment than with dismissing-avoidant attachment (Mikulincer & Shaver, 2007). Thus, the anxiety component of insecure attachment, rather than the avoidance component, seems to be the more critical vulnerability factor. Research with samples of clinically depressed people revealed that more severe depressive symptomatology has been linked with a blend of attachment anxiety and avoidance (cf., fearful-avoidant attachment). Also, several clinical studies revealed that patients diagnosed with major depression, as compared to controls, were more likely to display features of fearful-avoidant attachment (Mikulincer & Shaver, 2007).

Remarkably, there are not that many studies about the relationship between attachment and dissociation, even though dissociative states—i.e., disturbances in the integrative processes of consciousness—seem to be an inherent aspect of fearful-avoidant or disorganized attachment (Liotti, 2006; Wallin, 2007; Farina et al., 2019; Van Geel et al., 2019). A few prospective longitudinal studies investigated the effects of early childhood attachment (as assessed in the Strange Situation) on dissociative symptoms later in life. Ogawa et al. (1997) studied a cohort from the Minnesota Mother-Child Project (e.g., Egeland et al., 1983), a prospective longitudinal study in which expectant mothers, living in high risk environments as indicated by poverty and single parenthood, were recruited while receiving prenatal care at public health clinics. Ogawa et al. studied whether (childhood) trauma, sense of self, and the early attachment relationship with the mother were related to dissociative symptoms measured at four times across 19 years. In a series of

stepwise MRA's, the dissociative symptoms of these children at four different ages were predicted by variables measured previously or concurrently (e.g., child abuse, attachment, and parental risk factors). Regarding attachment, the results indicated that avoidant attachment and disorganized attachment, as assessed in the Ainsworth Strange Situation at 12-18 month of age, were significant predictors of the degree of dissociation at the age of 17.5. The degree of disorganized attachment, as assessed in the Strange Situation in infancy, was also a significant predictor of dissociation at the age of 19. Carlson (1998) also used a sample from the Minnesota Mother-Child Project. Her focus was on the relationship between disorganized infant attachment and dissociative symptoms measured four times across 19 years of lifespan. Ratings of attachment disorganization (as assessed in the Strange Situation at 12-18 months) consistently showed positive correlations with dissociative symptoms throughout the 19 year period. In addition, by using structural equation modelling, she found support for a mediational model in which the relationship between quality of early caregiving (3-12 months) and dissociation (19 years, DES-total score) was mediated by the attachment disorganization rating assessed during the Strange Situation (12-18 months). Carlson (1998) concluded that "attachment disorganization may have particular long-term implications for the development of dissociative symptoms in childhood and adolescence" (p. 1123). In a similar (small sample, $N = 56$) prospective longitudinal study of children growing up in a low income cohort, Dutra et al. (2009) did not find that "ratings" of attachment disorganization (as assessed in the Strange Situation at 18 month; cf. Carlson, 1998) were significantly related to DES dissociation at the age of 19. Their results rather suggest that variables related to the quality of mother-infant interactions (i.e., disrupted communication, flatness of affect, and low positive affective involvement, as observed during naturalistic interactions at the age of 12 months) may result in dissociation later in life. In a large cohort study ($N = 1{,}149$) of data from the US National Institute of Child Health and Human Development (NICHD), Haltigan and Roisman (2015) also prospectively studied the influence of early attachment (as assessed in the Ainsworth Strange Situation at 15 months of age) on dissociative symptoms measured at several times across 15 years. Using time-aggregated dissociation scores of teachers and of mothers, they found "scant evidence that infants classified as "disorganized" [compared to secure infants] were [more] at risk for dissociative symptomatology from kindergarten through mid-adolescence" (p.38). However, consistent with Ogawa et al. (1997), they found statistical evidence that infants classified as avoidant (compared to secure infants) were indeed at higher risk for dissociative symptomatology from kindergarten through mid-adolescence. In summary, the results of these longitudinal studies suggest that early childhood attachment experiences may resound throughout life, i.e., that young children with avoidant or disorganized attachment are more at risk to develop dissociative symptoms in their lives.

Cross-sectional studies with adults and adolescents point at the same vulnerabilities predisposing to dissociation. Some of these studies allude to avoidant attachment as being the more critical factor. For example, in a cross-sectional study concerning the proneness to hallucinations, Berry et al. (2018) reported consistently higher positive correlations of DES dissociation subscales with attachment avoidance than with attachment anxiety in a sample of adolescent psychology students. Riggs et al. (2007) studied the associations between attachment and psychopathology (including dissociation) in a group of inpatients receiving special care for trauma related disorders. With respect to dissociation, they only found a result when using a coefficient-based ECR-classification procedure: "fearful and dismissing adults were more likely than preoccupied adults to receive a diagnosis of DID [Dissociative Identity Disorder, DES_Total > 30]" (p. 277). These results indicate that avoidance ("negative model of others") may be a critical component predisposing to dissociation.

Some cross-sectional studies report that both anxiety and avoidance are substantially associated with dissociative symptoms, suggesting that it is particularly the fearful-avoidant attachment (high anxiety and high avoidance) that makes people more vulnerable. Nilsson et al. (2011) studied the associations between trauma exposure, attachment (ECR), and dissociation (DIS-Q) in a sample of adolescents. They reported moderate positive correlations of dissociation with both anxiety and avoidance. The results of a sequential MRA showed that, in addition to trauma measures, ECR anxiety ($\beta = 0.30$) and ECR avoidance ($\beta = 0.20$) accounted for a substantially extra proportion of the variance in dissociation (20%). In a sample of psychiatric outpatients who visited a specialized trauma clinic, Kong et al. (2018) studied the mediational role of insecure attachment (RAAS) in the relationship between childhood trauma and dissociation. Attachment avoidance and attachment anxiety were both related to dissociation, but in a mediational analysis only attachment anxiety emerged as crucial mediator.

There are cross-sectional studies that point more directly to the link between fearful attachment and dissociation. Anderson and Alexander (1996) studied the association between attachment and dissociation in a sample of female incest survivors. They studied the relationship between four interview based attachment prototypes and the DES self-report dissociation scale. Only the fearful attachment rating emerged as a significant predictor of dissociation. In a sample of female psychology students, Sandberg (2010) studied the associations between attachment (ratings of four RQ prototypes), sexual and physical abuse during childhood and adolescence, post-traumatic stress, and dissociation. He reported moderate positive correlations of fearful attachment with dissociation (DES-II) and pathological dissociation (DES-taxon). In the additional MRA, controlling for abuse, only fearful attachment uniquely predicted pathological dissociation (i.e., DES-taxon). Shevlin et al. (2014) studied the associations between four cluster-based attachment prototypes (RAAS) and psychopathology in a group of bereaved parents who had lost a child within the last 5 years. Especially the fearful cluster, but also the preoccupied cluster displayed higher mean scores on several psychopathological measures (including dissociative and depressive symptoms).

Although attachment research has mainly focused on the two higher-order attachment dimensions (and allied attachment prototypes), we believe that identifying sub-compo-

nents within these dimensions may be a prolific enterprise. For example, Strodl and Noller (2003), examining the relationship of adult attachment dimensions to depression, used Feeney et al.'s (1994) five-dimensional attachment measure. They concluded that only the need for approval, preoccupation with relationships, and relationships as secondary were uniquely associated with BDI depression. Feeney's ASQ was also used by Rodrigues (2010), when studying the effects of a (mixed cognitive-behavioral and experiential) therapy for depression. She found that pre-treatment measures of confidence, discomfort with closeness, and need for approval were related to a range of treatment outcomes, including BDI depression. Also Gušić et al. (2016) used the ASQ, when studying the effects of attachment and trauma on dissociation, in a group of adolescents (13-20 of age). They reported substantial positive correlations of discomfort with closeness, preoccupation with relationships and the need for approval with dissociation. In an additional MRA the former two ASQ scales emerged as significant (direct) predictors of dissociation, but it also revealed a significant "need for approval × trauma" interaction, which suggests that this attachment anxiety variable may moderate (i.e., exacerbate) the relationship between trauma and dissociation. Because the attachment style measures accounted for 15% of unique variance in dissociative complaints, Gušić et al. concluded that the "adolescents' inner models of self and others may be a more important factor to the development of dissociation than traumatic experiences" (p. 348). Paetzold et al. (2015) developed a scale that measures "disorganized adult attachment" directly, which focuses on confusion, problems with trusting partners, and fear in romantic relationships. Employing a Bayesian approach, Paetzold et al. (2017) found evidence that this disorganized attachment scale was related to dissociative symptoms (DES), even when ECR anxiety, ECR avoidance, and childhood trauma were controlled in the model. In addition, their results also suggest that disorganized attachment may moderate (i.e., strengthen) the relationship between childhood maltreatment and dissociation. In an additional study, Paetzold and Rholes (2021) reported substantive correlations of DES dissociation with anxiety and avoidance (ECR short form) and disorganized attachment. However, additional mediational analysis revealed that only disorganized attachment played a major mediating role in the relationship between child abuse and dissociation. These studies illustrate that it may be fruitful to use multifaceted attachment measures in research and psychotherapy, as these may provide more information about specific vulnerabilities (predisposing to depression and dissociation) and clues for fine-tuning psychotherapy.

The present study

The primary aim of the present study was to explore the factorial structure of a combined set of items originating from two frequently used adult attachment measures in the field of psychopathology. Although the HSL and ASQ have different structures—the HSL contains four scales that are labeled according to four attachment prototypes, whereas the ASQ contains five scales without a specific reference to the prototypes, overall, both instruments contain items referring to three overlapping aspects: (1) (in)security, i.e., [lack of] trust in others, [not] sharing intimacy and [not] feeling confident); (2) anxiety (preoccupation with rejection, need for approval), and (3) avoidance (discomfort with intimacy/closeness and devaluation of interpersonal relationships). Hence, we expected the items to combine in a meaningful way, resulting in refined (sub)factors related to attachment. Even though the study was mainly exploratory in nature, we had several expectations regarding the clustering of items. First, we were anticipating the prospect that the items originally allocated to HSL Secure and ASQ Confidence would form a contrast with HSL fearful-avoidant attachment, thus constituting a bipolar factor about 'general attachment (in)security', as it has repeatedly been demonstrated that these scales exhibit 'opposite' attachment orientations (e.g., Stein et al., 2002; Van Geel et al., 2016). Second, we expected an obvious affinity of the HSL Preoccupied items with ASQ-items pertaining to the Need for Approval and Preoccupation with Relationships, as they both concern a submissive-communal interpersonal orientation. In the analysis of these items, we were particularly attentive to a possible two-factor structure (cf. Feeney et al., 1994). Third, we expected a convergence of items about HSL Dismissing-avoidant, ASQ Discomfort with Closeness and ASQ Relationships as Secondary, as these three facets entail an interpersonal disconnection and a distancing from others (cf., Stein et al., 2002)—undeniably, the latter conveying an extreme form of insensitivity towards others.

With regard to validation, we included a circumplex of interpersonal values, which positions a spectrum of interpersonal values in social interactions on a circle around two bipolar axes: (1) agency vs. submission and (2) communion vs. separation (cf., connection vs. disconnection) (Locke, 2000, cf. Leary, 1957; Wiggins, 1996). According to this circumplex, interpersonal values are assumed to be composed of blends of agentic and communal orientations. For example, agentic separation (keeping the upper hand, being in charge) can be distinguished from agentic communion (being treated with respect, being listened to), the same goes for submissive separation (not revealing positive feelings for others, keeping my thoughts or feelings to myself) and submissive communion (not being rejected, not hurting others feelings). Consequently, we predict that the scales pertaining to attachment anxiety will be situated in the submissive-communal segment of the circumplex and scales pertaining to 'attachment avoidance' (including those reflecting dismissive-avoidance and fearful-avoidance) in the separated and submissive-separated segments. In addition, it is likely that secure attachment scales will be positioned in the agentic-communal segment (cf. De Schutter et al., 2009). A distinct advantage of a circumplex is that it offers an integrative (two-dimensional) visual background for other interpersonal variables (Wiggins & Broughton, 1991), including (newly formed) attachment measures.

We also investigated the relationships of the newly formed attachment scales with the Self, Other, Positive, and Negative Affect Scales (SOPN-scales, Hermans & Hermans-Jansen, 1995). According to the underlying valuation theory of Hermans and Hermans-Jansen (1995), the Self scale represents the (agentic) striving for self-enhancement (e.g., self-confidence, strength) and the Other scale reflects the (communal) striving for contact and union (e.g., love,

Table 1. Basic types of valuations and corresponding themes associated with levels of the Self (S), Other (O), Positive (P), and Negative (N) Scales

Type	S	O	P	N	Theme
+O	low	high	high	low	love and unity
+HH	high	high	high	low	strength and unity
+S	high	low	high	low	success, autonomy, perseverance
–S	high	low	low	high	aggression, anger, opposition
–LL	low	low	low	high	powerlessness and isolation
–O	low	high	low	high	unfulfilled longing, loss

tenderness). Valuation theory distinguishes six basic types of experiences, each representing a different theme and derived from specific combinations of these four affect scales, the so-called SCM prototypes.

Table 1 shows the typology, the combinations of the scales per basic type, and their corresponding themes. Hermans used the affective components and typology purely 'idiographically', viz., to study the structure of a person's self-narrative which is made up of so-called 'valuations', short sentences representing important personal experiences from the past, present and future. For example, the text "I am often afraid that I won't get children as we have been trying for five years" is classified as a –O valuation, i.e., with more emphasis on O than on S (O > S) and with more negative than positive feelings (N > P), referring to the experience of 'unfulfilled longing and loss'. Examples of the other types of valuations can be found in Van Geel et al. (2019). Hermans and Hermans-Jansen (1995) situated the six types of experiences in a two-dimensional circular model, in which two (bipolar) dimensions can be recognized that underlie the hexagonal arrangement: (a) self vs. other, differentiating S types (+S and −S) from O types (+O and −O); and (b) positive vs. negative, distinguishing negative (−S, −LL, −O) from positive types (+S, +HH, +O). In the present study, we are not using the thematic hexagonal configuration to obtain an overview of a person's self-narrative (cf., idiographic approach), but to create a convenient reference frame for mapping 'persons' and 'psychological scales' in a group space (cf. circumplex analysis). According to Van Geel (2000), Hermans' hexagonal arrangement of thematic experiences types bears a lot of resemblance to the circumplex model of interpersonal behavior. Accordingly, we use similar arguments regarding the positioning of the attachment scales within the boundaries of the hexagon of affective experiences. Attachment anxiety has a theoretical resemblance to the theme of unfulfilled longing (viz., they both concern a submissive-communal interpersonal orientation), attachment avoidance shows a resemblance to the theme of 'anger and opposition', and attachment security shows a theoretical resemblance to the theme of 'love and unity' (viz., they both concern a communal interpersonal orientation). Consequently, we predict attachment scales pertaining to anxiety, avoidance and security to be situated in the vicinity of the –O, –S and +O segments, respectively. A concept mapping technique, so-called 'hexagon analysis', was employed to investigate these kinds of relationships graphically.

In addition to these initial validation studies, we also examined the correlations of the newly formed attachment (sub)scales with two psychopathological measures (dissociation and depression). As mentioned in the introduction, dissociation can be conceived of as an inherent aspect of 'fearful-avoidant attachment', suggesting that anxiety as well as avoidance are both important predictors of dissociative states. We therefore examined a path model in which dissociation was conceived as a mediator between attachment factors and depression.

METHOD

Subjects and procedure

The data of this study were collected from seven different groups. In each group, the participants filled out an online survey that included two measures about adult attachment (HSL and ASQ, see Measures), and several additional measures depending on the central research questions of the study (e.g., interpersonal relationships, dissociation and/or depression). Table 2 presents an overview of the questionnaires that were being used in these groups.

The subjects of the first group participated in an online survey about "Attachment, interpersonal relationships and vulnerability for depression" of Litmaath (2011), who was gathering data for her master's thesis in the summer of 2011 (under supervision of the two authors of this article). The survey included the two measures about adult attachment, the Circumplex Scales of Interpersonal Values (CSIV) and depressive personality factors (not included in the present study). An online call was posted in several discussion forums of the Open University of the Netherlands (OU), at the faculty announcements of the OU and also at several public internet forums: www.lotgenotenforum.nl, www.depressief.nl, and www.psycholoog.net (with the permission of administrators). In addition, seven bachelor students, who were planning to make use of the data being gathered, contacted their social networks (friends, acquaintances, colleagues, and family members) by sending a personal e-mail using the invitation letter, with the request to fill out the online survey anonymously. Eventually, 458 respondents

Table 2. Overview of questionnaires used in seven different groups or data-gathering rounds

Group (data-gathering round)	*N*	HSL	ASQ	CSIV	SOPN relationships	DES	MDI
1. Litmaath (2011)	458	V	V	V			
2. bachelor group (2012)	212	V	V			V	
3. bachelor group (2014)	221	V	V				V
4. bachelor group (2015)	156	V	V				V
5. bachelor group (2016)	120	V	V		V		V
6. bachelor group (2017)	165	V	V		V		V
7. Trompert (2019)	201	V	V			V	V
Total cases	1,533	1,533	1,533	458	285	413	863

Note: HSL = HechtingsStijlLijst (Attachment Style List), ASQ = Attachment Style Questionnaire, CSIV = Circumplex Scales of Interpersonal Values, SOPN = Self, Other, Positive, and Negative affect scales, DES = Dissociative Experiences Scale, MDI = Major Depression Inventory.

completed the questionnaire (128 men, 328 women, 2 of unknown gender; mean age = 46.9 years, *SD* = 13.0).

The subjects of the second, third, fourth, fifth and sixth group consisted of the social networks of over thirty psychology students who started their bachelor research at the OU in the spring of 2012, 2014, 2015, 2016, and 2017 (under supervision of the first author of this article). The survey included the two measures about adult attachment, and a version of the Self-Other-Positive-Negative Affect Scales (2016, and 2017, see Table 2 for details), the DES dissociation scale (only in the 2012 group), the MDI depression scale (not for the 2012 group), and a range of other measures that were not included in the present study (e.g., satisfaction with life, relationship satisfaction, resilience). The bachelor students contacted persons from their social networks by sending a personal e-mail, with the request to fill out the online survey anonymously. In total 874 respondents completed the questionnaires (256 men, 618 women; mean age = 47.9 years, *SD* = 13.7).

The subjects of the seventh group participated in an online survey about "Attachment relationships and psychological well-being" of Trompert (2019), who was gathering data for her master's thesis in 2018 (under supervision of the first author of this article). The online survey included the two measures about adult attachment, the DES dissociation scale and MDI depression scale. The research proposal was assessed by the Research Ethics Committee (cETO) of the OU and approved because it was not within the scope of "Medical Research Involving Human Participants Act" (WMO, Wet Medisch-wetenschappelijk Onderzoek met mensen). In the invitation letter, participants were briefly informed about the nature of the study, the voluntary basis of the research and the anonymous processing of the data. People with serious mental health problems (such as a mood disorder, anxiety disorder, personality disorder or psychosis) were advised not to participate, because of the expected mental load and associated risks. Respondents were recruited via social media and several discussion forums of the OU. In total, 201 respondents completed the questionnaire (48 men, 148 women, 5 of unknown gender; mean age = 43.5 years, *SD* = 15.4).

Measures

Attachment Style List

(HSL [Dutch]; Van Oudenhoven & Hofstra, 2005). The HSL 'dimensionally' assesses Bartholomew's (1990) prototypical attachment styles, using four subscales: Secure, Preoccupied, Dismissing-avoidant, Fearfully-avoidant. People are being asked how one generally 'feels in relationships with others'. In this study the original Dutch version was used; for an English translation, see Hofstra et al. (2005). The 24 items are being scored on a 5-point answer scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Attachment Style Questionnaire

(ASQ; Feeney et al., 1994). The ASQ is used to assess the attachment orientation of adolescents and adults in close relationships (Jewell et al., 2019). It consists of a secure dimension (Confidence in Self and Others), two anxiety related dimensions (Need for Approval, and Preoccupation with Relationships), and two avoidance related dimensions (Discomfort with Closeness, and Relationships as Secondary). The 40-item questionnaire has a 6-point answer scale ranging from 1 (totally disagree) to 6 (totally agree). We used the Dutch version of Conradi et al. (2006).

Circumplex Scales of Interpersonal Values

(CSIV, Locke, 2000). The CSIV assesses agentic and communal interpersonal values related to social situations, by means of eight scales that are being arranged in a two-dimensional circular structure. In the theoretically ideal circumplex, the eight scales are evenly distributed on a circle, thus constituting a regular octagon. The original CSIV consists of 64 items referring to interpersonal values in social interactions with others, e.g., When I am with others, it is not/mildly/moderately /very/extremely important to me "… that they show me respect" (agentic-communal), "… that I feel connected to them" (communal), and "… that they not reject me (submissive-communal). In this way people are rating the importance of these kinds of interpersonal aspects on a 5-point scale ranging from 0 (not important to me) to 4 (extremely important to me). We used the Dutch version of

Litmaath (2011). In the present study, four items were removed due to low item-total correlations (< 0.30): csiv49 (separate), csiv2 (submissive-separate), csiv6 and csiv22 (agentic-communal). The technical rationale of circumplex analysis is further explained below (see Analysis and Results).

Self, Other, Positive, and Negative affect scales

(SOPN-24, Van Geel & De Mey, 2003). The SOPN-scales were developed within the context of Hermans' Self-Confrontation Method, a form of counselling in which agentic and communal themes of a person's self-narrative are identified and discussed in a profound dialogue (Hermans & Hermans-Jansen, 1995; Van Geel, 2000; Van Geel et al., 2019). The Self (S) scale consists of indicators that express the (agentic) striving for self-enhancement (e.g., self-confidence, strength). The Other (O) scale includes feelings that reflect the (communal) striving for contact and union (e.g., love, tenderness). Feelings such as joy and happiness belong to the Positive (P) affect scale, whereas feelings such as worry and unhappiness cover the Negative (N) affective domain. Although originally developed to provide a concise and transparent picture of the affective side of a client's self-narrative during counselling, in this study these scales were used to gain an impression about how one was generally feeling in relationships ("To what extent were these feelings evoked in relationships with others?"). The 24 items were being scored on a 6-point scale (0 = not at all/not applicable, 1 = slightly, 2 = to some extent, 3 = rather much, 4 = much, and 5 = very much).

Dissociative Experiences Scale

(DES-II, Carlson & Putnam, 1993). This questionnaire was developed to assess dissociation by self-reporting the frequency of experiences related to: (1) depersonalization (e.g., "… looking in a mirror and not recognizing themselves"; (2) absorption (e.g., … sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time; and (3) amnesia (e.g., "… are told that they sometimes do not recognize friends or family members"). Participants answered these kind of statements on a Likert scale from 0% (never) to 100% (always). Although Carlson and Putnam (1993) identified three subscales, there are indications that the three factors reflect the frequency with which persons endorse particular items (Waller, 1995). The DES is a widely used instrument with good internal consistency, test-retest reliability and adequate clinical validity (Ensink & Van Otterloo, 1989; Frischholz et al., 1990; Van IJzendoorn & Schuengel, 1996). We used the Dutch translation of the DES-II provided by Boon and Draijer (1995; https://hulpgids.nl/testen/des).

Major Depression Inventory

(MDI, Bech et al., 2001). The MDI consists of 12 items pertaining to symptoms of depression, listed in DSM-IV and ICD-10. A person was asked how many times a particular symptom was present in the past two weeks (e.g., "How much of the time have you felt low in spirits or sad?" and "How much of the time have you felt lacking in energy and strength?") The items are scored on a 6-point scale from 0 (at no time) to 5 (all the time). The purpose of the MDI is to determine whether depression is present and to determine the severity of depressive symptoms. Several studies indicate excellent internal consistencies (Bech et al., 2001; Olsen et al., 2003; Cuijpers et al., 2007) and adequate content and construct validity (Olsen et al., 2003). We downloaded a Dutch version from the internet, https://meetinstrumentenzorg.nl/instrumenten/major-depression-inventory. In the present study, one item was removed due to consistently low item-total correlations in the five samples in this study (mdi10b: "Have you suffered from increased appetite?").

Analyses

In order to find meaningful clusters in the set of HSL and ASQ items, we employed a mix of exploratory and confirmatory factor analytic techniques. The sample was split into two separate groups: the uneven numbered cases were used for exploring the correlational structure with EFA (N = 768) and the even numbered cases for cross-validation with CFA (N = 765). Subsequently, for the purpose of validation, we examined the correlations of the derived (sub)factors with interpersonal variables (CSIV circumplex). For a graphical integration of the variables, a circumplex analysis was performed, a kind of factor analysis in which variables that can be arranged in a circular pattern (in two dimensions) serve as background for other variables. Applying this method to our data, we first approximated the octagonal configuration of the eight interpersonal scales with the aid of orthogonal procrustes rotation (Verboon, 1994) and subsequently, projected the other scales within the boundaries of the octagon (Wiggins & Broughton, 1991). Then the correlations of the derived (sub)factors with the SOPN affect scales were examined. In addition, we explored the relationships visually by employing a concept mapping technique (hexagon analysis) with which scales are being projected within the boundaries of a hexagonal frame representing six valuation types (see Table 1). Finally, we examined the correlations of the newly formed attachment scales with DES dissociation and MDI depression, in different subsamples. Most analyses were done with SPSS 27, including exploratory factor analysis, data screening, multiple regression analysis, calculations of Omega reliabilities (Hayes, 2021), circumplex analysis (Van Geel, 2006) and hexagon analysis (Van Geel, 2011). Confirmatory factor analysis and path analysis were performed with the R-package LAVAAN (Rosseel, 2012; 2021).

RESULTS

Exploratory factor analysis and refinement of subscales

In order to examine the structure of the HSL and ASQ questionnaires (initially totaling 64 items) in the 'exploratory sample', containing the uneven numbered cases in the dataset (N = 768), we first conducted a principal components analysis on all items. Four (unrotated) factors emerged with eigenvalues larger than two, accounting for 45.2% of the variance. The item pool was further refined by screening for items with low loadings on all factors (< .30) and items with high secondary loadings (> .40) in the pattern matrix (PAF,

Oblimin). As a result five items were removed (i.e., hsl18, asq31, asq34, asq35, asq40).

The remaining 59 items clearly displayed a simple four-dimensional structure, which accounted for 45.8% of the variance. Factor I revealed a contrast between 'Secure-Attachment and (Fearful) Avoidance', containing seven HSL-Secure items, six ASQ-Confidence items, five ASQ-Discomfort with Closeness items, four HSL-Fearful items, and three additional items (originally) referring to Preoccupation with Relationships (asq28), Relationships as Secondary (asq14), and Dismissing attachment (hsl4). Factor II was a prominent Anxiety factor, composed of seven HSL-Preoccupied items, six ASQ-Preoccupied items, six ASQ-Need for Approval items, and two additional items referring to Relationships as Secondary (asq6) and Self-Confidence (asq33). Factor III was a distinct cluster of five ASQ items referring to 'Relationships as Secondary'. Finally, Factor IV was a mixture of four HSL-Dismissing-Avoidant items and four ASQ-Discomfort with Closeness items. A closer look at the content of the items of Factor IV revealed that they all conveyed a 'Preference for Independency'.

The internal structure of the 25 items of the higher-order Factor I was studied in more detail (PAF, Oblimin). We considered the two- and three-factor solution, as they were clearly disclosing distinct aspects of this item pool. First, we discarded three items due to relatively low loadings in both solutions (i.e., hsl10, asq19 and asq28). In the two-factor solution (of the remaining 22 items), the larger (bipolar) subfactor (consisting of 16 items) revealed a secure-avoidance contrast, including items about '(dis)comfort with intimacy', 'avoidance of closeness' and 'confidence in relationships'; the second (unipolar) subfactor covered aspects of 'distrust in others' and 'fearful-avoidance' (hsl2, hsl5, hsl20, hsl23, asq16, asq20). The three-factor solution suggested that within the secure-avoidance factor of the two-factor solution a further distinction could be made in two subfactors: (1) (dis)comfort with intimacy and (2) confidence in relationships. Like the two-factor solution, the three-factor solution also suggested a separate subfactor covering the aspect of 'distrust and fearful-avoidance' (hsl2, hsl5, hsl20, hsl23, asq16, asq20), although one item (asq20) displayed a moderately high secondary loading on the subfactor 'confidence in relationships'. The internal consistencies of all (possible) subscales in this domain were acceptable: within each subscale, all corrected item-total correlations were larger than 0.40.

The 22 items of the higher-order Factor II were also subjected to a more thorough analysis. Both the two and three factor solutions (PAF, oblimin) seemed sensible, since they separated this factor into theoretically relevant facets; one item was removed due to high secondary loadings in both solutions (hsl7). In the two-factor solution (of the remaining 21 items) the larger (uni-polar) subfactor covered two aspects related to attachment anxiety the 'preoccupation with relationships (inferiority and isolation)' and 'separation anxiety'; the second subfactor consisted of items about the 'need for approval' (hsl17, hsl24, asq11, asq12, asq13). The three factor solution showed that a distinction can be made in three (correlated) factors: (1) preoccupation, (2) separation anxiety (hsl13, asq30, asq39) and (3) need for approval (hsl17, hsl24, asq11, asq12, asq13). Regarding internal consistency, all (possible) subscales in this domain were satisfactory (i.e., within each subscale, all corrected item-total correlations were larger than 0.40). Even though the internal consistencies of all (possible) subscales within Factor I and Factor II were acceptable, a more sophisticated confirmatory technique is needed for a closer examination of the number and composition of subfactors in this domain (see next paragraph).

Within Factor III and Factor IV we did not distinguish subfactors. All five items of Factor III had clearly one aspect in common: building relationships is less important than the investment in achievement related goals. The eight items of Factor IV expressed a need for independency (i.e., 'preference for being on oneself' and 'not needing other people'). Psychometrically, the Relationships-as-Secondary Factor III was predominantly sound, with only one item displaying a dissonant low item-total correlation of 0.30 (asq36). The internal consistency of Factor IV also seemed adequate as most corrected item-total correlations were larger than 0.40, but some were relatively small (< 0.40, hsl16 and hsl19).

Confirmatory factor analysis and cross-validation

Before examining the complete CFA models, in which all of the items of Factors I, II, III, and IV were included, we first investigated the item pool of the higher-order Factors I and II separately within a CFA framework. In addition, we tested the single factor models of Factor III and IV with CFA, searching for possible psychometric weaknesses of these item pools. In contrast to EFA, the CFA framework offers the possibility of testing a theoretically based clustering of items (by fixing cross-loadings to zero), and estimating method effects (by permitting measurement errors to be correlated) (Brown, 2006). Moreover, in order to approximate an acceptable CFA model fit (CFI > .90, TLI > .90, RMSEA < .06, SRMR < .08, cf. Brown, 2006), items with large item-to-factor and large item-to-item error correlations may be progressively eliminated, as signaled by many large modifications indices (of an item) (cf. Desmet et al., 2010).

In accordance with the EFA results, we fitted three CFA models referring to the higher-order Factor I (security vs. avoidance). In the one-factor model all items were allowed to load on one general (bipolar) factor. In the two-factor model the items referring to '(dis)comfort with intimacy' and 'confidence in relationships' were allowed to load on one (bipolar) factor and the items about 'distrust and fearful-avoidance' on a second factor (cf. EFA results). In the three-factor model the items of the three facets were allowed to load on three different (correlated) factors. In order to improve model fit, seven correlated measurement errors between pairs of similarly or reversely worded items were included (hsl1-hsl15, hsl2-hsl5, hsl14-hsl15, hsl22-asq3, asq1-asq38, asq16-asq20, asq25-asq26). The fit indices indicated that the observed correlations among items were more adequately explained by the three-factor model than by the one- and two-factor model: the fit measures of the three-factor model (χ^2/df = 681.179 /199 = 3.423, CFI = 0.941, TLI = 0.931, RMSEA = 0.058, SRMR = 0.042) were much better than those of the one-factor model (χ^2/df =

Table 3. Confirmatory Factor Analysis in two samples: Fit indices of four-, six- and eight-factor models

Exploratory sample (N=693)		χ^2	*df*	CFI	TLI	RMSEA	SRMR
	4-factor	4467.197	1308	0.828	0.819	0.059	0.079
extended	6-factor	3840.456	1299	0.862	0.853	0.053	0.070
	8-factor	3507.982	1286	0.879	0.871	0.050	0.066
	4-factor	3447.488	1018	0.851	0.841	0.058	0.073
short	6-factor	2821.100	1009	0.889	0.881	0.051	0.061
	8-factor	2493.687	996	0.908	0.900	0.046	0.056
Crossvalidation sample (N = 686)							
	4-factor	4383.933	1308	0.824	0.814	0.059	0.076
extended	6-factor	3871.443	1299	0.853	0.844	0.054	0.067
	8-factor	3499.414	1286	0.873	0.864	0.050	0.062
	4-factor	3539.311	1018	0.837	0.827	0.060	0.071
short	6-factor	3030.205	1009	0.869	0.860	0.054	0.060
	8-factor	2668.164	996	0.892	0.882	0.049	0.055

Note: The extended version contains 53 items, the short version 47 items (see Table 4). In all models eleven extra correlated errors were included: hsl1-hsl15, hsl2-hsl5, hsl6-hsl12, hsl14-hsl15, hsl22-asq3, hsl24-asq11, asq1-asq38, asq16-asq20, asq25-asq26, asq15-asq24, asq32-asq33. Due to the "list-wise" handling of missing cases in LAVAAN, in both samples, the number of cases is fewer than the total numbers. CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

1064.134/202 = 5.268, CFI = 0.894, TLI = 0.879, RMSEA = 0.077, SRMR = 0.056) and also somewhat better than those of the two-factor model (χ^2/df = 835.695/201 = 4.158, CFI = 0.922, TLI = 0.910, RMSEA = 0.066, SRMR = 0.050). Based on the whole profile of fit measures, we conclude that the three-factor model displays an 'acceptable to good' fit and the two-factor model a 'marginally acceptable' fit.

With regard to the higher-order Factor II (anxiety), we fitted three CFA models. In the one-factor model all items were assumed to load on one general factor. In the two-factor model the items referring to 'preoccupation' and 'separation anxiety' were assumed to load on one factor and the items about 'need for approval' on a second factor. In the three-factor model the items of the three facets were allowed to load on three different (correlated) factors. In order to improve the model fit, three correlated measurement errors between pairs of similarly worded items were included (hsl24-asq11, asq15-asq24, asq32-asq33). The LAVAAN results indicated that the fit measures of the three-factor model (χ^2/df = 630.192/164 = 3.842, CFI = 0.937, TLI = 0.927, RMSEA = 0.062, SRMR = 0.044) were much better than those of the one-factor model (χ^2/df = 958.821/167 = 5.741, CFI = 0.893, TLI = 0.878, RMSEA = 0.080, SRMR = 0.061), but only slightly better than those of the two-factor model (χ^2/df = 700.367/166 = 4.219, CFI = 0.928, TLI = 0.917, RMSEA = 0.066, SRMR = 0.048). Based on the total profile of fit measures, we conclude that, both, the two- and three-factor model display an 'acceptable to good' fit.

In order to complete the picture of these preliminary analyses, we also tested the one-factor models of Factor III and Factor IV. The LAVAAN results indicated moderate fit of the one-factor model of Factor III (relationships as secondary, five items: χ^2/df = 38.613/5 = 9.731, CFI = 0.960, TLI = 0.920, RMSEA = 0.094, SRMR = 0.042). The one-factor model of Factor IV (independency, eight items), however, did not directly result in an acceptable fit. A further inspection of the standardized residuals indicated large residuals for hsl16 and hsl19 (remember that these items also displayed low corrected item-total correlations in the item analysis, see previous paragraph). Only after removing these items and adding a correlation between the measurement errors of two similarly worded items (hsl6 and hsl12), a marginally acceptable fit was reached for this one-factor model (χ^2/df = 54.375/8 = 6.797, CFI = 0.948, TLI = 0.902, RMSEA = 0.087, SRMR = 0.041).

Based on these preliminary analyses, we further examined the three nested CFA models (with four, six and eight latent factors) in which all of the remaining items of the main Factors I, II, III and IV were included (i.e., 53 items). The four-factor model was composed of the main Factors I, II, III and IV, without a further distinction in subscales within Factor I and II. The six-factor model contained two facets of Factor I ('intimacy vs. confidence' and 'distrust') and two facets of Factor II ('preoccupation - separation anxiety' and 'need for approval'). In the eight-factor model, a more fine-grained distinction was made in three aspects within Factor I (intimacy, confidence and distrust) and Factor II (preoccupation, separation anxiety and need for approval). The LAVAAN results indicated that the incremental fit values were in favor of the eight-factor model over the four- and six-factor models, but the values of the RMSEA and SRMR were consistently low for all these three models (see Table 3, exploratory sample, extended version). In order to improve the model fit, we 'simultaneously' analyzed the four-, six- and eight-factor models and progressively eliminated items with large item-to-factor and item-to-item error correlations in these models. By successively removing items that displayed a disturbing affinity with other factors (i.e., asq6, hsl4, asq17, asq36, hsl11, asq20), not only

Table 4. Correlations between Hybrid Attachment Scales (N = 1,521) and correlations with depression (MDI, N = 860) and dissociation (DES, N = 409)

	Avoidance	Distrust	Confidence	Preoccupation	Need for Approval	Separation Anxiety	Relationships as Secondary	Independency	Item-rest correlations (Min-Max)
Avoidance	0.89								0.53 - 0.74
Distrust	0.72	0.87							0.65 - 0.75
Confidence	-0.62	-0.57	0.79						0.38 - 0.64
Preoccupation	0.60	0.65	-0.59	0.91					0.49 - 0.78
Need for Approval	0.19	0.22	-0.17	0.54	0.79				0.48 - 0.65
Separation Anxiety	0.32	0.46	-0.25	0.59	0.46	0.63			0.39 - 0.46
Relationships as Secondary	0.28	0.22	-0.10	0.17	0.03	0.11	0.73		0.43 - 0.61
Independency	0.43	0.39	-0.32	0.14	-0.14	0.00	0.19	0.68	0.34 - 0.51
MDI [a]	0.43	0.47	-0.46	0.59	0.34	0.42	0.11	0.13	0.56 - 0.81
DES [b]	0.30	0.36	-0.18	0.29	0.05	0.23	0.19	0.15	0.51 - 0.71

Note: Reliability estimates (McDonald's ω) for the attachment scales are placed on the diagonal. [a] Combined data of Group 3, 4, 5, 6 and 7 (see Table 2). [b] Combined data of Group 2 and 7 (see Table 2). The reliabilities of MDI depression (ω = 0.92, 11 items) and DES dissociation (ω = 0.96, 28 items) were adequate. MDI and DES total scores were both logarithmically transformed.

all three models improved considerably in fit, but also the incremental fit values of the short version of the six-factor model approached levels indicating adequate fit (see Table 3, exploratory sample, short version). This suggests that, being more parsimonious than the short version of the eight-factor model, this version of the six-factor model may be a good candidate for describing the correlational structure of the data. However, cross-validation supported the idea that the observed correlations among items are more adequately explained by an eight-factor model (see Table 3, 'cross-validation sample'). With respect to the extended version (of 53 items), the eight-factor model displayed a better fit than the four-factor model, χ^2diff = 884.52, df = 22, p < .0001, and also a better fit than the six-factor model, χ^2diff = 372.03, df = 13, p < .0001. Considering the short version (of 47 items), the eight-factor model gave a significant improvement in fit as compared to the four-factor model, χ^2diff = 871.15, df = 22, p < .0001 and the six-factor, χ^2diff = 362.04, df = 13, p < .0001. Likewise, in the cross-validation sample, the incremental fit values were in favor of (the extended and short version) of the eight-factor model over the (extended and short version) of the six-factor model (see Table 3). Based on the whole profile of fit measures, we concluded that only the short version of the eight-factor model displays an adequate fit.

The final composition of the shortened (sub)scales of this model as well as the initial composition of extended (sub)scales are reported in the Appendix. Regarding the whole sample (N = 1,379, due to 'listwise deletion') the fit measures of the short version of the eight-factor model (χ^2/df = 3973.575/996 = 3.990, CFI = 0.906, TLI = 0.897, RMSEA = 0.046, SRMR = 0.051) were somewhat better than those of the extended version (χ^2/df = 5514.881/1286 = 4.288, CFI = 0.881, TLI = 0.873, RMSEA = 0.049, SRMR = 0.060). The factor loadings of these two models as estimated within the entire sample are presented in the Appendix. The reader can verify that in the short version (in most cases) items with a relatively low loading were removed from the extended version, and that in both models most loadings are moderately high (> .50).

Correlations between "hybrid attachment scales" and data screening

We examined the correlational structure of our hybrid attachment measure, consisting of eight scales created by unit weighting of standardized items, according to the 'short version' of the eight-factor model (see Appendix). We started by (1) inspecting the fit between the frequency distributions and the assumptions of multivariate analysis (i.e., extreme deviations from 'normality'), (2) identifying univariate and multivariate outliers, (3) checking pairwise linearity and (4) evaluating multicollinearity (cf. Tabachnick & Fidell, 2001; Field, 2018). In the total sample (N = 1,533, see Table 2), some of the distributions were slightly positively or negatively skewed, but no serious deviations from normality were detected, which was also reflected in small absolute skewness statistics (< 0.70) and small absolute kurtosis statistics (< 0.75) for the eight variables. For three variables, a few univariate outliers were found, viz. with high scores on Avoidance (z > 3.25, n = 2), low scores on Confidence (z < -3.25, n = 8), or high scores on Relationships as Secondary (z > 3.25, n = 9). The inspection of boxplots revealed only one "extreme case" (> 3 IQR) for relationships-as-secondary. Some of the univariate outliers were also identified as multivariate outliers, that is with a large Mahalonobis distance, $X^2(8) > 26.125$, p < .001, but only 12 cases met this

Table 5. CSIV-60 scales: descriptives, intercorrelations, and loadings on communal and agentic principal components (N = 449)

				Correlations								Loadings (Ideal loadings)		Angle with horizontal axis
Octant	ω	*M*	*SD*	PA	BC	DE	FG	HI	JK	LM	NO	Communal	Agentic	(Ideal angles)
Agentic (PA)	0.75	0.25	0.37	–								0.00 (0.00)	0.80 (1.00)	89.92º (90º)
Agentic – Separate (BC)	0.77	-0.40	0.39	0.40	–							-0.43 (-0.71)	0.67 (0.71)	122.72º (135º)
Separate (DE)	0.80	-1.00	0.43	-0.19	0.12	–						-0.74 (-1.00)	-0.07 (0.00)	185.46º (180º)
Submissive – Separate (FG)	0.87	-0.34	0.48	-0.39	-0.27	0.20	–					-0.53 (-0.71)	-0.57 (-0.71)	227.01º (225º)
Submissive (HI)	0.87	-0.18	0.44	-0.57	-0.47	0.01	0.42	–				-0.10 (0.00)	-0.83 (-1.00)	263.47º (270º)
Submissive – Communal (JK)	0.81	0.38	0.37	-0.48	-0.52	-0.26	-0.06	0.37	–			0.51 (0.71)	-0.63 (-0.71)	308.84º (315º)
Communal (LM)	0.83	0.66	0.49	0.15	-0.10	-0.46	-0.59	-0.42	0.07	–		0.75 (1.00)	0.29 (0.00)	21.12º (0º)
Agentic – Communal (NO)	0.77	0.63	0.41	0.24	-0.01	-0.45	-0.46	-0.45	-0.13	.33	–	0.56 (0.71)	0.51 (0.71)	42.39º (45º)

Note: CSIV scale scores were ipsatized. Due to missing values, McDonald's reliability measures (ω) are based on different sample sizes ranging from 433 to 440. Absolute correlations > 0.12 are significant at $p < .01$. The factor loadings were obtained with the aid of orthogonal Procrustes rotation; the ideal coordinates of the target solution (cf., 'ideal loadings' in brackets) are cosines and sines corresponding to the angular positioning in a regular octagon (cf., 'ideal angles' in brackets).

Table 6. Correlations between hybrid attachment scales and CSIV-60 scales (N = 449)

Attachment scale	PA	BC	DE	FG	HI	JK	LM	NO
Avoidance	-0.16	-0.13	0.32	0.44	0.20	0.01	-0.45	-0.27
Distrust	-0.16	-0.08	0.30	0.43	0.14	0.00	-0.41	-0.25
Confidence	0.26	0.15	-0.31	-0.47	-0.28	-0.07	0.51	0.27
Preoccupation	-0.36	-0.27	0.17	0.47	0.37	0.20	-0.39	-0.26
Need for Approval	-0.38	-0.35	-0.17	0.34	0.45	.031	-0.18	-0.10
Separation Anxiety	-0.21	-0.14	-0.06	0.22	0.17	0.14	-0.05	-0.11
Relationships as Secondary	0.10	0.16	0.13	0.10	0.00	-0.17	-0.22	-0.08
Independency	0.09	0.11	0.16	0.18	-0.03	-0.19	-0.28	-0.04

Note: CSIV scale scores were ipsatized. Absolute correlations > 0.12 are significant at p < 0.01.

criterion. We also checked pairwise scattergrams, which showed that some of the multivariate outliers were influential cases (i.e., clearly outside the ellipse of datapoints). In order to curb this problem, we removed the 12 multivariate outliers, leaving 1,521 cases for all subsequent analyses. Finally, in this dataset (N = 1,521), technically speaking, no exceptional problems were encountered with respect to multicollinearity: most VIF's were < 3.0; one was larger, VIF(preoccupation) = 3.24. Inspection of "Collinearity Diagnostics" (Condition Indexes and variance proportions) also revealed no severe problems.

Nevertheless, the correlation matrix (see Table 4) clearly shows that many scales are substantially correlated. Partially, this is triggered by the (heuristic) procedure with which these scales have been developed. It is no coincidence that three subscales within the higher-order avoidance-security domain are highly correlated with each other, and the same holds for the three subscales within the higher-order anxiety domain. Yet, the preoccupation subscale exhibits consistently high correlations with variables outside the higher-order anxiety domain, i.e., with the subscales avoidance, distrust and confidence (see Table 4).

A second-order principal factor analysis (PAF, Oblimin) of the eight subscales supported the notion that there were two distinguishable (correlated) factors present in this dataset (explaining 52.7% of the variance): one factor consisted of the three anxiety subscales (loadings > .63) and the other factor consisted of the three avoidance-security subscales and independency (absolute loadings > .63). However, the preoccupation subscale exhibited a high secondary loading of .42 on the avoidance-security factor, showing that it cannot be unambiguously conceptualized as a facet of one single overarching higher-order factor (cf. correlational pattern in Table 4).

The circumplex of interpersonal values

We explored the relationships between the attachment scales and the eight CSIV scales, using the dataset of the 1st group (see Table 2) from which, previously, in the data-screening of the attachment scales seven multivariate outliers were removed. Regarding the CSIV-60 scales, two additional multivariate outliers were discarded, which displayed exceptionally high scores on the DE scale. In the final dataset (N = 449) no serious deviations from normality were detected for the CSIV variables; only the DE scale was somewhat positively skewed (skewness = 1.10, kurtosis = 0.93).

Table 5 reports some descriptive statistics, reliabilities and intercorrelations of the "ipsatized" CSIV scales. The internal consistencies of all scales were adequate (ranging from 0.75 to 0.87), albeit somewhat lower for the three agentic scales (NO, PA and BC). Overall, respondents tended to describe their interpersonal values as more communal and as less separate (JK, LM and NO means were above the midpoint, whereas BC, DE and FG were below the midpoint).

A prerequisite for circumplex analysis is that the eight CSIV scales can be arranged in a circular octogonal pattern (in two dimensions), in which the scales are evenly spread around a circle. This model is known as the "circulant correlation model", referring to the descending and ascending pattern of the "band-diagonal elements" of the correlation matrix between variables (Gurtman & Pincus, 2000). One way to test whether the 28 correlations in Table 5 match with the "ordinal properties" of a circumplex model is to compare the magnitude of correlations between adjacent (at 45º), orthogonal (at 90º), octants at 135º and opposite octants (at 180º), for example: r(PA, BC) > r (PA, DE), > r (PA, FG) > r (PA, HI). A circular model comprising eight evenly distributed scales results in 288 predictions about the relative magnitudes of correlations among scales (Locke, 2019). Tracey (2000) developed a randomization procedure to test these hypothesized ordinal relations, which is implemented in the R-Package RANDALL (Tracey, 2016). RANDALL computes a Correspondence Index (CI) equal to the 'proportion of predictions met' minus the 'proportion of predictions violated'. The CI can range from -1.0 (all predictions violated) to 1.0 (perfect fit). In the current data, 271 out of 288 predictions were met, CI = 0.88, p < 0.0004, indicating sufficient conformity to a circular model. Regarding the band-diagonal structure, on the whole, there is a descending and ascending pattern discernible. However, there are also some obvious deviations from a perfect circumplex model. For example, close inspection shows that the octant LM displays a dissonant null correlation with the "adjacent" octant JK (0.07), a discongruent negative correlation with the "orthogonal" octant HI (-0.42) and a null correlation with the BC octant "at 135º " (-0.10). Notwithstanding these (and some other) deviations from the ideal circumplex, we believe that this CSIV circumplex offers a useful reference frame for the interpretation of other variables. This is also corroborated by the communal and agentic loadings and

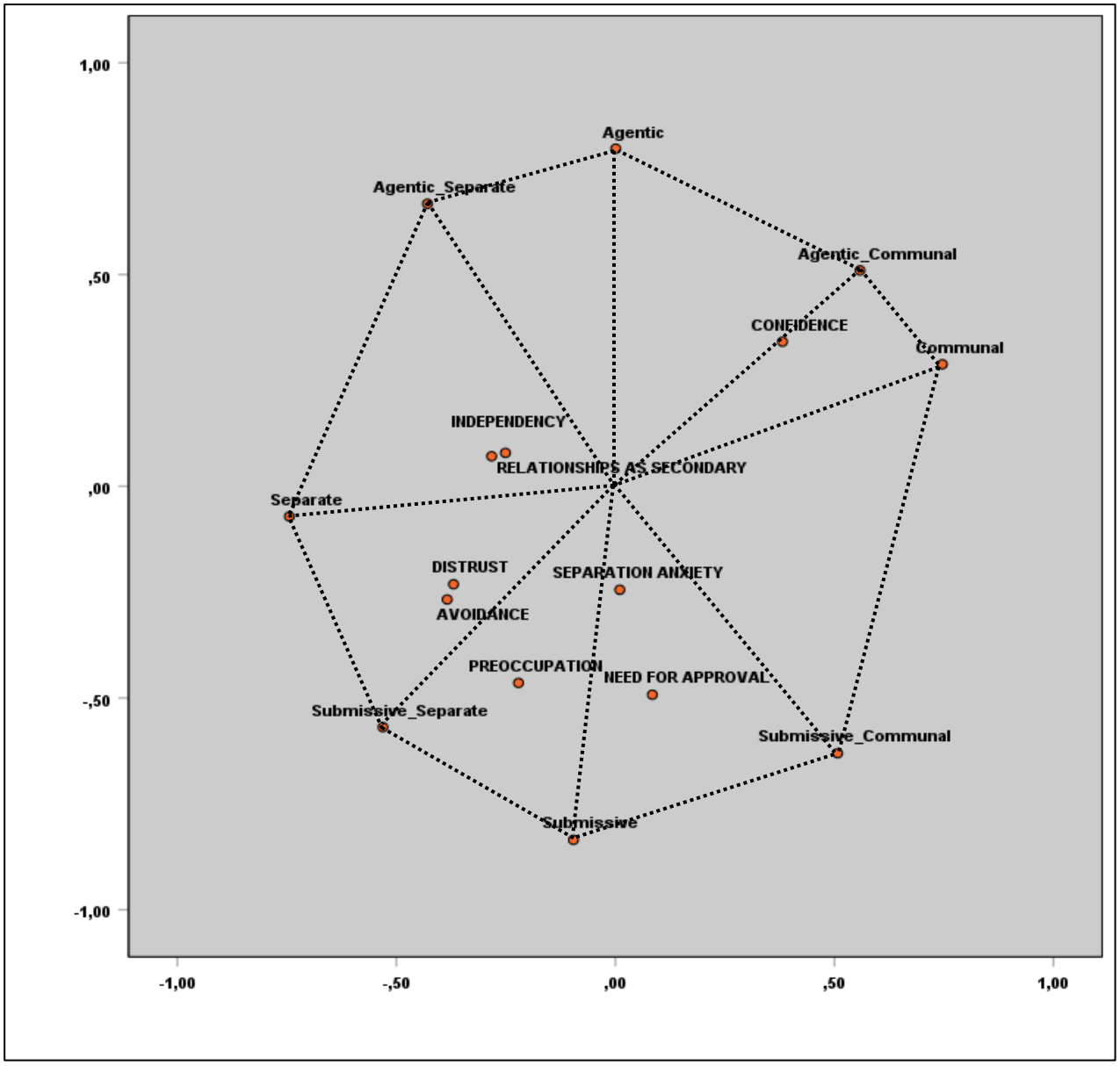

Figure 1. Circumplex of Interpersonal Values (CSIV-60) containing attachment scales (N = 449)

corresponding angular locations (see last three columns in Table 5), which demonstrates that the octagonal configuration as envisioned can be sufficiently approximated with the aid of algebraic techniques.

Table 6 reports the correlations between the attachment and CSIV scales. The correlational pattern of Avoidance and Distrust with the circumplex scales were very similar, disclosing moderate positive correlations with DE and FG and a moderate negative correlation with LM. For Confidence the opposite pattern of correlations was found, showing moderate negative correlations with DE and FG, and a positive correlation with the LM scale. Preoccupation and The Need for Approval, both, displayed weak/moderate positive correlations with the submissive scales FG, HI, and JK, and weak/moderate negative correlations with two of the agentic scales PA and BC. Separation Anxiety only correlated weakly positive with FG and HI and weakly negative with PA. The correlational pattern of Relationships as Secondary and Independency were comparable, correlating weakly positive with the separate scales BC and DE, and weakly negative with the communal scales JK and LM.

Figure 1 presents the attachment scales projected into the interpersonal circumplex, offering an integrated perspective on the data. For correct understanding: the projection shows how all of the variables are interrelated in terms of interpersonal values. Variables that are close together in the same segment of the circumplex will more often than not intercorrelate positively, but the projection may deform those relations. The position of Confidence in the upper right quadrant of the circumplex signifies that this attachment scale is associated with agentic-communal values. The positioning of the three anxiety subscales in the lower part of the circumplex implies that they are associated with a submissive orientation, in which the Need for Approval is somewhat

Table 7. SOPN affect scales: descriptives and intercorrelations (N = 278)

Affect Scale	ω	*M*	*SD*	S	O	P
Self (S)	0.90	4.12	0.95	–		
Other (O)	0.90	4.29	0.93	0.72	–	
Positive (P)	0.90	4.36	0.92	0.85	0.86	–
Negative (N)	0.84	2.15	0.68	-0.54	-0.37	-0.56

Table 8. Correlations between hybrid attachment scales and SOPN affect scales (N = 278)

Attachment Scale	S	O	P	N
Avoidance	-0.51	-0.55	-0.61	0.48
Distrust	-0.45	-0.45	-0.54	0.47
Confidence	0.62	0.60	0.67	-0.51
Preoccupation	-0.60	-0.41	-0.54	0.64
Need for Approval	-0.31	-0.04	-0.14	0.32
Separation Anxiety	-0.41	-0.20	-0.34	0.45
Relationships as Secondary	-0.01	-0.14	-0.12	0.05
Independency	-0.15	-0.31	-0.30	0.16

Note: Absolute correlations > 0.15 are significant at $p < 0.01$.

more related to communal values (cf. friendly-submission) and Preoccupation to separate interpersonal values (cf. disconnected-submission); Separation Anxiety seems to imply purely submissive values, but the location nearby the origin denotes that the interpersonal content of this variable is minimal (cf., low correlations in Table 6). The projection of Distrust and Avoidance in the lower left quadrant indicates that these scales are related to submissive-separate interpersonal values. Relationships as Secondary and Independency, located in the upper left quadrant of the circumplex, seem to be more related to purely separate interpersonal values.

The hexagon of affective experiences

We explored the relationships of the attachment scales with the Self, Other, Positive, and Negative affect scales (SOPN-scales), using the combined dataset of the 5th and 6th group (see Table 2) from which some cases were removed. Regarding the attachment scales, one multivariate outlier was removed previously. Regarding the SOPN-scales, two cases with many missing values and four multivariate outliers—i.e., with a large Mahalonobis distance, $X^2(4) > 18.467$, $p < .001$—were discarded, two of which displayed extremely high scores on Negative affect. In the final dataset (N = 278) no extreme univariate outliers could be detected anymore. Furthermore, no severe deviations from normality were visible, although the N scale was positively skewed and somewhat peaked (skewness = 1.22, kurtosis = 1.98).

Table 7 reports some descriptive statistics, reliabilities and intercorrelations of the the SOPN-scales. The internal consistencies of all scales were adequate (ranging from 0.84 to 0.90). Respondents mainly outlined their interpersonal relationships in positive terms, i.e., with relatively high scores on S, O, and P, and low scores on N. The S and O scales were strongly correlated, and both scales displayed even stronger correlations with Positive affect (P). In addition, moderate negative correlations were found between Negative affect and the other three scales.

The correlations of the attachment scales with the SOPN-scales are presented in Table 8. Overall, the pattern of correlations were similar for Avoidance, Distrust, and Preoccupation, showing moderate to strong negative correlations with S, O, and P and a moderate to strong positive correlation with N. For Confidence the opposite pattern of correlations was found, showing strong positive correlations with S, O, and P and a moderate negative correlation with N. Both Need for Approval and Separation Anxiety, showed a moderate negative correlation with S and a moderate positive correlation with N, but a less pronounced (negative) association with O and P. For Relationships as Secondary only weak correlations were found with all four affect scales. Most notably for the Independency scale were the moderate negative correlations with O and P.

For a graphical integration of the variables, a so-called 'hexagon analysis' was used (Van Geel, 2011). This kind of concept mapping provides a depiction of the attachment scales against a hexagonal 'two-dimensional' background of SCM prototypes (Hermans & Hermans-Jansen, 1995). Technically, scales are being projected into the hexagon by calculating the correlations with the two underlying main axes, i.e., 'Self vs. Other' (Dimension 1), and 'Negative vs. Positive' (Dimension 2). The technique is fairly straightforward as it uses the factor score coefficients derived from a principal component analysis of SOPN-scales of the (six) extreme prototypes (Van Geel & De Mey, 2004). Usually, the following formulas are used in the calculations:

DIM1 = (O - S).
DIM2 = 0.38269*(O + S) + 0.92388*(P - N) - 1.91343.

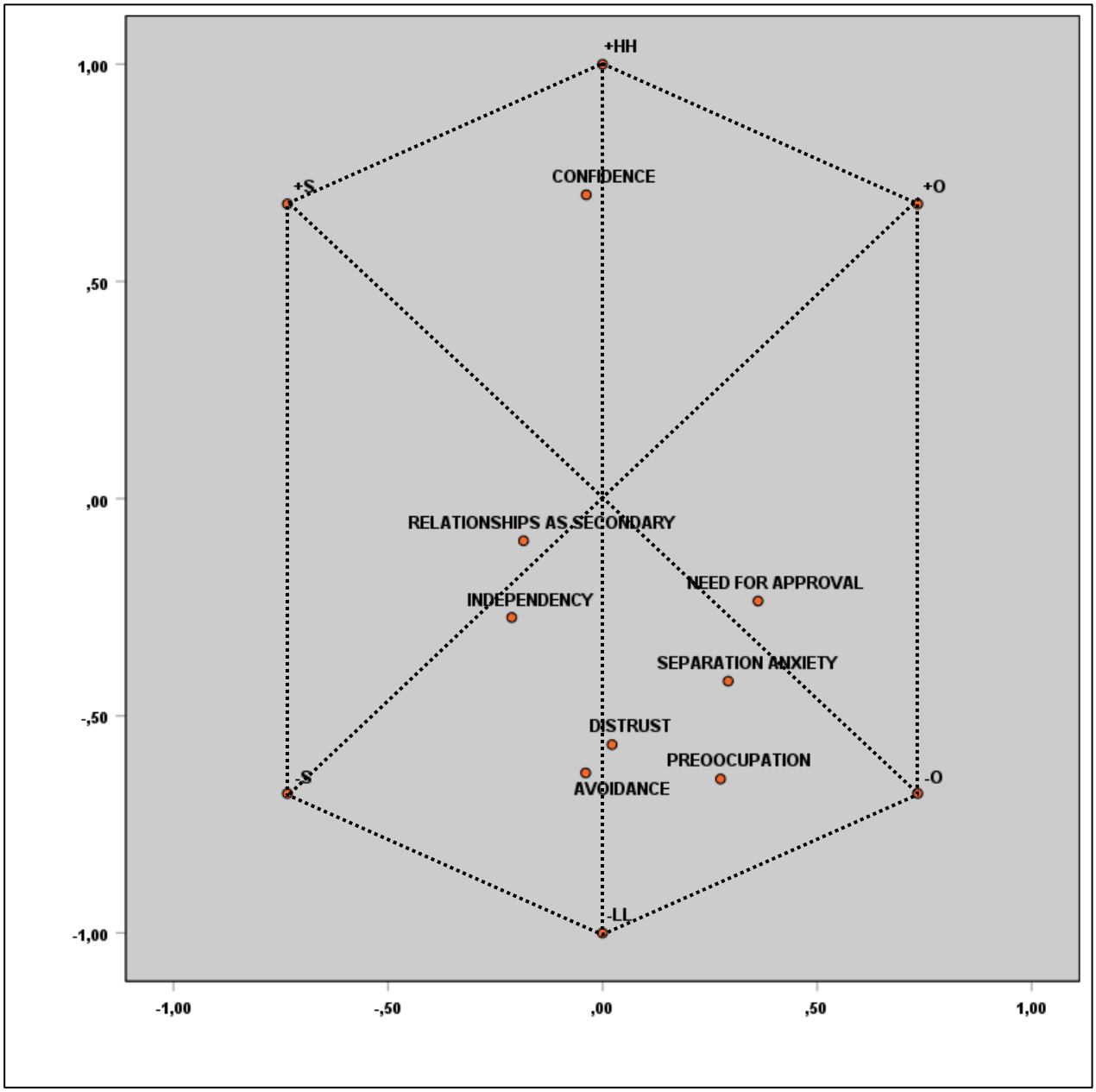

Figure 2. Hexagonal models of SCM typology containing attachment scales (N = 278). +O = love & unity, +HH = strength & unity, +S = succes & autonomy, –S = anger & opposition, –LL = powerlessness & isolation, –O = unfulfilled longing & loss.

Figure 2 presents the result of this fixed hexagon analysis, showing how the eight attachment scales are interrelated 'affectively' and 'thematically', i.e., in terms of their shared similarity with the SCM prototypes. Variables that are close together in the hexagon will more often than not inter-correlate positively, but the projection may deform those relations. The location of the Confidence scale at the top of the hexagon indicates that this scale is akin to the experience of 'strength and unity' (+HH). The positioning of the three anxiety subscales (Need for Approval, Separation Anxiety and Preoccupation) on the bottom right of the hexagon signifies that they are associated with 'unfulfilled longing and loss' (–O). Avoidance and Distrust, located in the lower part of the depiction, are associated with 'powerlessness and isolation' (–LL). The Dependency scale positioned in the lower left part, indicates that it bears some resemblance to the theme of 'anger and opposition' (–S). Finally, the subscale Relationship as Secondary is close to the origin, which denotes that the affective content of this variable is only minimal (cf. low correlations in Table 8).

Associations with depression and dissociation: A mediational model

To obtain an overview of the relationships of the (newly formed) attachment scales with depression and dissociation, we examined a path model in which dissociation was conceived as a mediator between the attachment scales and depression. Before analyzing this path model, for which only

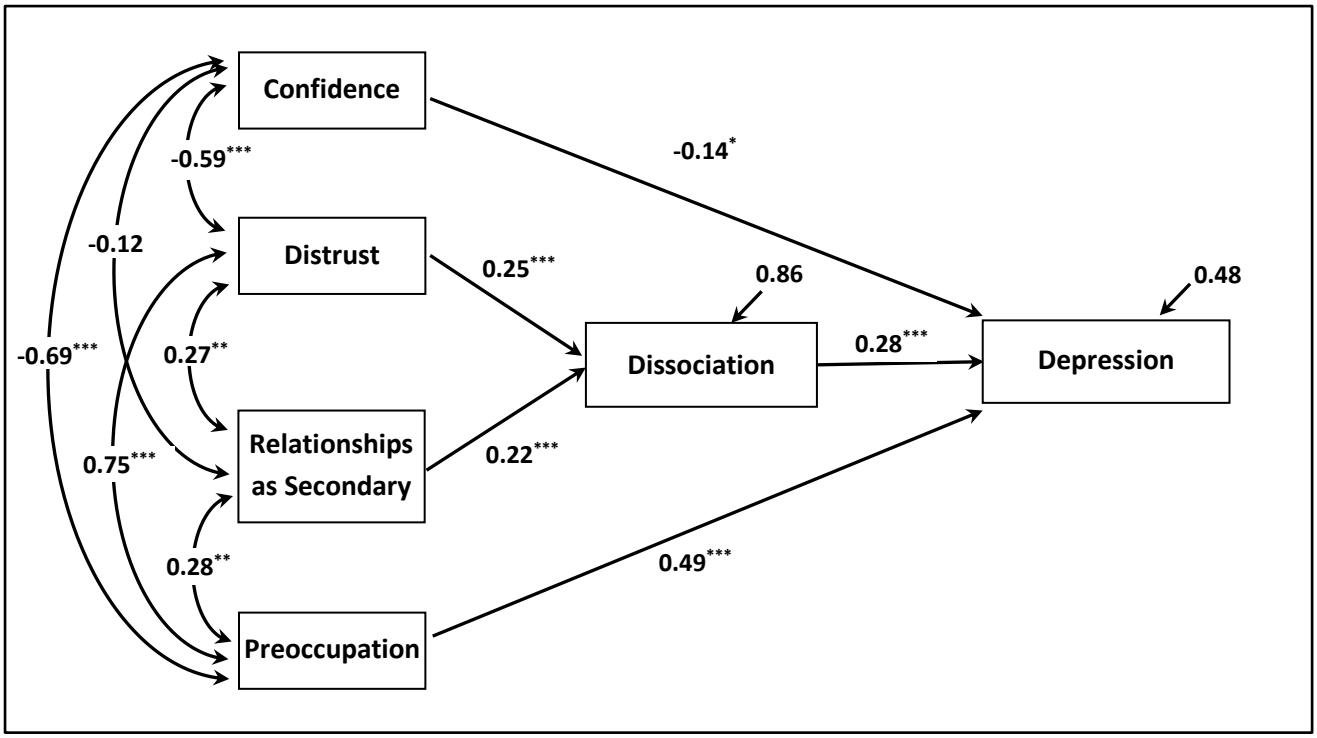

Figure 3. Path Diagram of a mediatonal model, including two direct paths (N = 199). MDI and DES total scores were both logarithmically transformed. The residual variance components (error variances) indicate the proportion of unexplained variance $1 - R^2$. Significant correlations and path coefficients are marked: * = $p < 0.05$, ** = $p < 0.01$, *** $p < 0.001$.

a relatively small sample was available (Group 7, N = 199), we first investigated the relationship between attachment and depression, and between attachment and dissociation, in two 'larger' combined groups. We expected that with these higher-powered classical multiple regression analyses (MRA), the importance of each of the attachment variables in explaining depressive and dissociative symptoms would become clear. Subsequently, with the knowledge from these initial MRA analyses, we tested and further examined the mediational model, attachment→dissociation→depression, in which only the most important predictors of depression and dissociation were included. The correlations of the attachment scales with MDI depression and DES dissociation are shown in Table 4. To reduce extreme skewness and kurtosis, MDI_total was logarithmically transformed. By doing this, the skewness of this variable reduced somewhat from 1.91 to 0.87 but the kurtosis reduced considerably from 4.08 to 0.36, and no univariate outliers could be detected anymore (z > 3.25). DES_total was also logarithmically transformed, which reduced the skewness from 2.15 to 0.83 and the kurtosis from 5.61 to 0.25; after the transformation there were no univariate outliers (z > 3.25).

Table 4 shows that MDI depression was substantially related with Avoidance (r = .43), Distrust (.47), Confidence (-.46), Preoccupation (.59) and Separation Anxiety (.42) and also somewhat with Approval (.34) (N = 860, see Table 4 for details, previously three cases were removed from these groups). We further examined these associations employing multiple regression analysis (SPSS), entering the eight attachment scales as predictor variables of MDI depression, using the data of five groups (N = 860, see Table 2). The (stepwise) MRA results revealed four significant predictors of (the natural logarithm of) MDI_total: Confidence (β = -0.16, $p < .001$, semi-partial correlation sr = -0.12), Distrust (β = 0.08, $p < .05$, sr = .06), Preoccupation (β = 0.38, $p < .001$, sr = 0.24), and Separation Anxiety (β = 0.11, $p < .01$, sr = 0.08), explaining 38.3% of the variance, $F(4,855) = 132.462$, $p < .001$. Table 4 shows that, overall, the correlations of the attachment scales with DES dissociation were consistently lower than with MDI depression: Avoidance (.30), Distrust (.36), Preoccupation (.29), Separation Anxiety (.23) and Relationships as Secondary (.19) (N = 409, see Table 4 for details, previously four multivariate outliers were removed from these groups). For the MRA analysis of dissociation, we used the combined groups 2 and 7 (N = 409, see Table 2). A stepwise MRA (SPSS) showed that of the eight attachment variables only two entered as significant predictors of (the natural logarithm of) DES_total: Distrust (β = 0.34, $p < .001$, sr = 0.33), and Relationships as Secondary (β = 0.12, $p < .01$, sr = 0.12), explaining 14.5% of the variance, $F(2,406) = 34.374$, $p < .001$.

We also examined a path model in which dissociation was conceived as a mediator between (a selection of) attachment scales and depression (N = 199, 2 cases were previously removed from Group 7). Because in this sample, Separation Anxiety clearly did not emerge as a significant predictor of depression, only "four" attachment scales were included as predictor variables (Confidence, Distrust, Preoccupation, and Relationships as Secondary). The path model assuming 'complete' mediation by DES dissociation did not result in an acceptable overall fit (χ^2 /df = 107.810/4 = 26.810, CFI = 0.786, TLI = 0.196, RMSEA = 0.361, SRMR

= 0.182). By including two additional direct paths (Preoccupation→MDI and Confidence→MDI), excellent fit was reached, which was being preserved when two other parameters were fixed to zero (Confidence→DES and Preoccupation→DES): χ^2 /df = 1.059/4 = 0.265, CFI = 1.000, TLI = 1.023, RMSEA = 0.000, SRMR = 0.010. The parameter estimates of the latter model are included in the path diagram of Figure 3. The diagram shows that Distrust and Relationships as Secondary are the important predictors of DES dissociation (R^2 = .14) and that Confidence, Preoccupation and DES dissociation predict MDI depression (R^2 = .52). Notably, the diagram suggests that DES dissociation mediates the relationship between Distrust and MDI depression and between Relationships as Secondary and MDI depression.

DISCUSSION

The findings of our factor analyses suggest that the HSL and ASQ items can be merged into four meaningful (higher-order) factors: (I) Avoidance vs. Security; (II) Anxiety; (III) Relationships as Secondary, and (IV) Independency (see Appendix).

As anticipated, we extracted an overarching (bipolar) factor expressing 'general attachment (in)security' (Factor I), which comprised items from HSL Secure, ASQ Confidence and HSL fearful-avoidant attachment, but it also contained some items from ASQ Discomfort with Closeness and one item from ASQ Relationships as Secondary. Interestingly, we discovered three facets within Factor I. The items of the bipolar Factor Ia, predominantly originating from HSL Secure and ASQ Discomfort with Closeness, shared the theme of being (un)comfortable with intimacy in relationships. The items of Factor Ib, including all HSL Fearful-avoidant items and items referring to Discomfort with Closeness, explicitly express a distrust in others and fear of being deceived. Fascinatingly, with its emphasis on distrust, Factor Ib is reminiscent of the "disorganized adult attachment" scale developed by Paetzold et al. (2015). Moreover, the approach-avoidance aspect of the HSL Fearful-avoidant items may be interpreted in terms of "confusion in relationships", a component which is also present in Paetzold et al.'s "disorganized adult attachment". Finally, within this avoidance-security domain, we largely replicated Feeney et al.'s (1994) factor that expresses a confidence in self and others (Factor Ic).

As expected, the HSL Preoccupied attachment items showed a distinct affinity with ASQ items pertaining to the Need for Approval and Preoccupation with Relationships. Initially, there were indications for a two-factor solution in this itempool, but ultimately we found substantive clues for a classification into three subscales: Preoccupation (IIa), Need for Approval (IIb), and Separation Anxiety (IIc). Factor IIa was predominantly composed of a mix of HSL and ASQ items expressing a preoccupation with others, but it also included some ASQ items about the Need for Approval and one ASQ Confidence item. In accordance with the original labelling of these items, we used "Preoccupation" as the main label of Factor IIa, but also connected an extra label to this cluster of items, because we saw that some of the items express inferiority (hsl9, hsl21, asq15, asq24) whereas others refer to isolation (asq18, asq22, asq27, asq32, asq33) (see Appendix). All of these items reflect a tangible fear of being rejected or not being accepted by others. Within the anxiety domain, we identified two additional smaller subfactors. Most of the items of Factor IIb explicitly refer to the need for being liked by others, which may be interpreted in terms of a Need for Approval. Factor IIc was labelled Separation Anxiety, referring to helplessness and vulnerability when being alone.

We expected a convergence of items about HSL Dismissing-avoidant, ASQ Discomfort with Closeness and ASQ Relationships as Secondary, expressing an interpersonal disconnection and a distancing from others. However, this was only partially reflected in the final solution, in which two HSL dismissing and four ASQ Discomfort with Closeness items constituted a separate factor, which we named "Independency" (Factor IV). Notice that, as mentioned previously, several other ASQ items about Discomfort with Closeness were distributed over different subfactors of the avoidance-security domain (Factor Ia and Ib). In addition, most of the ASQ items on Relationships as Secondary formed a distinct factor (Factor III, cf. Feeney et al., 1994), although one item (asq14) displayed more affinity with the avoidance of intimacy (Factor Ia). Considering the content of the items of Factor III and Factor IV, both scales seem to represent a dismissive-avoidant attachment orientation. Factor III clearly reflects a denial of attachment needs and Factor IV expresses the need for independence in a mild way.

Investigation of the intercorrelations among the hybrid attachment scales revealed that the higher-order structure was much more complex than anticipated, as the (presupposed) anxiety subscale Preoccupation (Factor IIa) correlated quite highly with all three subscales of the avoidance-security domain (Factor I). To some extent this may be the result of the heuristic procedure with which these scales were being developed, i.e., by employing oblique rotational techniques in the exploratory phase of the factor-analysis, it is likely that correlated facets may emerge. Furthermore, as paradoxical as this may seem, in attachment research it is not exceptional to encounter moderate or high correlations between anxiety and avoidance components (e.g., Gušić et al., 2016; Conradi et al., 2006; Nilsson et al., 2011; Paetzold et al., 2015). For example, Nilsson et al. (2011) reported a correlation of 0.69 between ECR anxiety and ECR avoidance in a sample of young adolescents. Apparently, in empirical research it is rather difficult to achieve orthogonality between constructs that are regarded as theoretically dissimilar.

In order to explore the interpersonal and affective meaning of the hybrid attachment scales, we performed two supplementary validation studies using instruments that accentuate agentic and communal interpersonal orientations in human contact. It is important to stress that, by employing multivariate techniques such as circumplex analysis and hexagon analysis, the whole pattern of correlations of attachment scales with the (eight) circumplex variables, respectively the (four) SOPN affect variables, were being taken into account. At first glance, it seems that the configuration of scales in the circumplex (Figure 1) is quite similar to that in the hexagon (Figure 2), viz., in both depictions there is a contrast discernible between secure attachment (i.e., Confidence) and avoidant attachment (i.e., Avoidance

and Distrust). The circumplex shows that, consistent with our expectations, Confidence is related to agentic-communal interpersonal values whereas Avoidance and Distrust are related to opposite submissive-separate interpersonal values, which is congruent with the bipolar nature of Factor I. In the hexagon we see a similar contrast between Confidence (at the top) and Avoidance and Distrust (at the bottom), indicating that secure attachment is associated with the theme of 'strength and unity' (+HH), whereas insecure aspects such as avoidance and distrust are associated with 'powerlessness and isolation' (–LL). Both depictions lead to the conclusion that the 'security-avoidance' contrast equates with a contrast between 'agentic connection vs. submissive disconnection'.

The configuration of scales in the circumplex as well as in the hexagon exhibited a similar clustering of anxiety scales. The circumplex revealed that, contrary to our expectations, the three anxiety subscales were somewhat more strongly associated with submissive values (e.g., living up to the expectations of others, not embarrassing myself) than with submissive-communal values (e.g., not being rejected, not hurting others feelings). Consequently, the three anxiety scales were positioned in the lower (submissive) part of the circumplex, albeit not as a compact homogeneous cluster. In the hexagon, the three anxiety subscales were projected in the vicinity of the –O type, indicating that these aspects are associated with the theme of 'unfulfilled longing and loss', alluding to a friendly-submissive interpersonal orientation (Van Geel, 2000). Hence, it seems that the anxiety attachment scales form a heterogeneous cluster displaying a variety of interpersonal orientations, ranging from 'submissive disconnection' (Preoccupation) to 'submissive connection' (Need for Approval and Separation Anxiety).

Relationships as Secondary and Independency were positioned close to each other in the circumplex and hexagon. Because these attachment variables were only weakly related to the interpersonal circumplex variables (see Table 6) and SOPN affect scales (see Table 8), in both of these depictions they were projected close to the origin. Nevertheless, the positions in the circumplex revealed that these scales are characterized in particular by separate interpersonal values (e.g., [others] not knowing what I am thinking or feeling, [others] keeping their distance from me) implying a disconnection from others. In the hexagon, these subscales were localized close to the –S type, indicating that they are associated with the theme of 'anger and opposition'. Hence, it seems that these dismissive-avoidant attachment scales form a homogeneous cluster, involving 'cold disconnection'.

With the aid of multiple regression, we examined the relationships of attachment with dissociation and depression, in which dissociation was conceived as a mediator. The path model (Figure 3) suggests that Confidence and Preoccupation directly influence depression, where Preoccupation increases the risk for depression while Confidence diminishes it. In addition, the path model suggests that the relationships between Distrust and Relationships as Secondary, on the one hand, and depression, on the other, are being mediated by dissociation. In other words, depression is indirectly increased by Distrust and Relationships as Secondary, via dissociation.

The MRA results, i.e., the standardized regression coefficients and semi-partial correlations, further signify that Preoccupation may be an important predictor of depression. This finding is consistent with previous research, as numerous studies have found strong associations of depression with global attachment anxiety and preoccupied attachment style ratings (Mikulincer & Shaver, 2007). Likewise, research into depressive personality vulnerabilities have consistently pointed out that the oversensitivity to others (i.e., fear of criticism and rejection) is pernicious to one 's health (For a review, see Van Geel et al., 2016). In the path model, the influence of Confidence on depression was not very impressive, indicating that this attachment aspect didn't share much "unique" variance with depression. Apparently, the relationship between Confidence and depression is (also) explained—i.e., partially mediated—by the relationships between Distrust, Preoccupation, and depression (cf., high negative correlations of confidence with these two predictors).

The path model suggests that Distrust and Relationships as Secondary may indirectly increase the risk for depressive complaints via dissociation. These findings are consistent with previous empirical research, as in several studies fearful-avoidant or disorganized attachment (cf., Distrust), as well as dismissive-avoidant attachment (cf., Relationships as Secondary) has been found to be related to dissociation (For a review, see introduction).

Theoretically, the path Distrust→dissociation→depression may be explained by the nature of the attachment scale (see Appendix, Factor Ib), which expresses not only a conspicuous "distrust in others", but also incorporates an approach-avoidance conflict, i.e., a "wish for close relationships" (the approach tendency) together with a "fear of being rejected" (the avoidance tendency). As alluded to in Van Geel et al. (2019), persons with a fearfully avoidant style are caught up in an approach-avoidance conflict: they shun intimacy in relationships in order to preclude potential rejection, without really relinquishing their desire for acceptance from others. According to Liotti (2006), fearful-avoidant or disorganized attached people, when feeling insecure and distressed, tend to display incoherent attachment behavior, that is a mixture of simultaneous or quickly alternating anxious and avoidant tendencies. For example, at one moment they may seek comfort and intimacy (cf., primary strategy) but, due to the anticipated or imagined rejection may abruptly deny these needs (i.e., distance themselves from others and avoid intimacy, cf., de-activation) and then suddenly resume the pursue for reassurance and support in an exaggerated clingy way (cf., hyperactivation). Hence "(…) they may enact both [secondary] strategies in a haphazard, confused and chaotic manner (…) their behavior under stress may be an incoherent blend of contradictory, abortive approach/avoidance behaviors or perhaps paralyzed inaction or withdrawal" (Simpson & Rholes, 2002, p. 225). Persons that display this kind of erratic behavior may be extra at risk to develop depressive complaints, as they are more likely to evoke disapproval and rejection from others. Moreover, the dissociative states themselves (detachment from reality and suppression of feelings) are also likely to impair coping with relational problems, increasing depressive feelings (Van Geel et al., 2019).

We also found evidence for the idea that Relationships as Secondary may increase the risk for depressive complaints via dissociation. Theoretically, this mediational path may be clarified by the nature of the attachment scale (see Appendix, Factor III). In all of the items of Factor III personal achievement is portrayed as being important, but some of the items clearly refer to detachment from others (asq8, asq9) or even misanthropic tendencies (asq10). According to Feeney et al. (1994), the items of this scale imply a "protection [of oneself] against hurt and vulnerability by emphasizing achievement and independence" (p. 135), which is consistent with Bartholomew's (1990) dismissing-avoidant style. Correspondingly, Mikulincer and Shaver (2007) argue that the de-activating strategy is characterized by a denial of attachment needs and compulsive self-reliance: "Avoidant individuals defensively inflate their self-conceptions, presumably to feel less vulnerable and less interested in relying on deficient relationship partners" (p. 42). Hence, the one-sided focus on achievement related goals is one (behavioral) way to defensively exclude information and feelings from consciousness that may activate the attachment system. In this perspective, the dismissing-avoidant attachment style may thus be considered as "inherently dissociative" (cf. Egeland & Susman-Stillman, 1996; Haltigan & Roisman, 2015).

The primary aim of the present study was to explore the factorial structure of an item pool originating from two attachment questionnaires. Overall, the results demonstrate that the items can be subsumed into a meaningful factorial structure, with the first two (higher-order) factors representing global avoidance attachment and global anxiety attachment (cf., ECR of Brennan et al., 1998), supplemented with two factors that are presumably more characteristic of the dismissive-avoidant attachment prototype. The reader can observe that the composition of the hybrid scales challenges the operationalization for some of the original HSL and ASQ scales. For example, the ASQ items about discomfort with closeness were distributed over several (sub)factors, revealing that only a few items involve the avoidance of intimacy (Factor Ia, cf., definition of this concept), but that others entail aspects related to distrust (Factor Ib) or independency (Factor IV). In addition, the original two-group clustering of ASQ anxiety items wasn't replicated either. It seems that most of these items refer to the preoccupation with inferiority and isolation (Factor IIa), whereas only a few refer to the need for approval (Factor IIb) and others indicate separation anxiety (Factor IIc). Finally, several HSL dismissive-avoidant items that displayed a disturbing affinity with other factors were removed, and only two items were preserved in the final model and allocated to the independency factor. Hence, it seems that for some of the HSL and ASQ subscales modifications should be considered.

When considering the validity and utility of an attachment measure, it seems relevant to question and check whether all theoretical aspects of the attachment prototypes are sufficiently represented. This applies to our hybrid self-report measure as well as to the original HSL and ASQ (see Appendix). Regarding the assessment of secure attachment in the HSL and ASQ, it appears that they are quite differently operationalized, as most of the HSL items are about "(dis)comfort with intimacy" (Factor Ia), while those in the ASQ are mainly about "(trust in) receiving support from others" (asq3, asq37, cf., secure base) and "being accepted and respected" (asq1, asq38) (see Factor Ic). This raises the fundamental question as to which components belong to the "secure attachment" construct. It seems that many more aspects (and concomitant item pools) are eligible, such as trust in others, proximity seeking, availability of others, using others as a secure base (cf. Brennan et al., 1998, pp. 60-61). Although less well-known, Brennan and colleagues have developed rich item pools for the specific assessment of secure attachment in intimate relationships, which may be particularly useful for the further development of this attachment domain (Brennan & Shaver, 1995; Brennan et al., 1996). Regarding to depression, our findings suggest that it is not specifically the closeness and intimacy with others (Factor Ia), but rather the confidence in self and others (Factor Ic, i.e., receiving support from others, being accepted and respected) that diminishes the risk for depression.

Within the higher-order Factor I, we extracted a distinct factor that focuses on distrust in relationships (Factor Ib), which seems a critical component of fearful-avoidant attachment. Previously, we mentioned that this subfactor is theoretically akin to "disorganized adult attachment" (characterized by problems with trusting partners, fear and confusion in romantic relationships; Paetzold et al., 2015), which is known to be related to dissociation and depression. Item pools that can be considered for improving and fine tuning the measurement of distrust, can be found in Brennan et al. (1996, see "trust" scale, which contains eight recoded items related to distrust). Furthermore, the fearful aspect of disorganized attachment may well be captured by items in scales of Brennan and Shaver (1995, see subscale "frustration with partners") and Brennan et al. (1996, see subscales "uncertainty about feelings" and "anger"). In addition, the confusion in relationships and the approach-avoidance aspect can be recognized in several items of the "ambivalence" scale of Brennan and Shaver's (1995) attachment measure. Finally, in this context, the items from Armsden and Greenberg's (1987) adolescent attachment measure are also interesting, especially those related to "alienation and anger". Hence, for the further development of (facets of) fearful-avoidant or disorganized attachment there is a substantial archive of item pools available.

Within the higher-order Factor II, we distinguished facets related to the preoccupation with others, the need for approval and separation anxiety, in all probability only comprising a part of the whole palette of the relevant anxiety facets (associated with the preoccupied and fearful-avoidant prototypes). For the completion of this palette, not only item pools developed within attachment theory can be considered (Brennan et al., 1998: e.g., anxious clinging, fear of rejection, loss or abandonment, see pp. 60-61; Brennan et al., 1996: see subscales "separation anxiety", and "repellent desire to merge"), but also items stemming from psychodynamic and cognitive depression theories (For a review see Luyten et al., 2005). Van Geel et al. (2016), working with a hybrid framework of attachment and depression theory, distinguished three anxiety or anaclitic facets, viz., concern what others think, pleasing others, dependency (difficulty with being alone), of which the former two emerged as significant predictors of depression.

We extracted two extra (small) attachment components (i.e., Factor III and IV) that seem to represent critical components of dismissive-avoidant attachment. Item pools that can be considered for improving the measurement of these aspects, can be found in Brennan et al. (1996) who formulated a "tough dependence" attachment scale, which in addition to some ASQ items (viz., asq9, asq10, and asq36, subsumed in our Factor III) also includes items that may enrich the measurement of the "denial of attachment needs". They also discerned a "self-reliance" scale, containing items related to self-sufficiency and independence (cf., Factor IV). Importantly, the results of a canonical discriminant analysis supported the idea that these scales were useful for the discrimination of dismissive-avoidant from the preoccupied attachment prototype (Brennan et al., 1996). Additional aspects (sensitizing concepts) that may be utilized to improve and extend the measurement of avoidant facets (associated with the dismissive-avoidant and fearful-avoidant prototypes), are the introjective depressive personality dimensions: e.g., "defensive separation" and "the need for control" (Robins et al., 1994; for a review, see Van Geel et al., 2016). Several studies have found the need for control to be substantially associated with depression (Sato & McCann, 1997; Bieling et al., 2000; Van Geel et al., 2016).

Limitations of this study refer to self-report biases and response sets and a possible self-selection bias due to the voluntary nature of respondent participation. The response group consisted predominantly of a (nonclinical) group of higher-educated middle-aged women. The factor structure which resulted from the data, therefore, may not generalize to the Dutch population. Some caution is also warranted, as considerable steps were needed (in which 17 items were eliminated) to reach an acceptable model fit. Hence, the factor structure requires replication in other samples, including clinical samples.

Future research may benefit from adding items from other multifaceted measures. An extensive archive of attachment items has been provided by Brennan et al. (1996), who extracted no fewer than 12 dimensions from the initial ECR item pool of 323 items (Brennan et al., 1998). In addition, within the field of depressive personality theory, several instruments have been developed that also apply to adult attachment relationships (For a review, see Van Geel et al., 2016). Studying the correlational structures of these richer item pools may illuminate our understanding of the critical attachment dimensions that predispose people to psychopathology.

ACKNOWLEDMENTS

We thank the many bachelor students for the assistance in the data gathering. We also thank Janneke Litmaath and Marieke Trompert for putting the data from their master theses at our disposal.

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Received January 28, 2022
Accepted March, 29, 2022

Appendix

Standardized loadings of the eight-factor confirmatory solution of the extended and the short version (N = 1,379)

Scales and items		Original classification	loadings extended	loadings short
I	AVOIDANCE VS. SECURITY			
Ia	Avoidance of Intimacy			
hsl1	I feel at ease in emotional relationships.	secure	-0.61	-0.61
hsl3	I feel uncomfortable when relationships with other people become close.	secure	0.72	0.72
hsl4	*I feel comfortable without having close relationships with other people.*	*dismissing*	*0.44*	–
hsl8	I avoid close ties.	secure	0.75	0.74
hsl14	I find it easy to get engaged in close relationships with other people.	secure	-0.69	-0.68
hsl15	I feel at ease in intimate relationships.	secure	-0.62	-0.62
asq14	My relationships with others are generally superficial.	relationships as secondary	0.60	0.60
asq23	I worry about people getting too close.	discomfort with closeness	0.64	0.64
asq25	I have mixed feelings about being close to others.	discomfort with closeness	0.78	0.78
asq26	While I want to get close to others, I feel uneasy about it.	discomfort with closeness	0.79	0.80
Ib	Distrust			
hsl2	I would like to be open to others, but I feel I can't trust other people	fearful	0.65	0.64
hsl5	I would like to have close relationships with other people, but I find it difficult to fully trust them	fearful	0.77	0.77
hsl20	I am afraid that my hopes will be deceived when I get too closely related to others	fearful	0.79	0.80
hsl23	I am wary to get engaged in close relationships because I am afraid to get hurt	fearful	0.77	0.78
asq16	I find it hard to trust other people.	discomfort with closeness	0.81	0.80
asq20	*I find it easy to trust others.*	*discomfort with closeness*	*-0.66*	–
Ic	Confidence			
hsl22	I trust that others will be there for me when I need them.	secure	0.62	0.62
asq1	Overall, I am a worthwhile person.	confidence	0.62	0.62
asq2	I am easier to get to know than most people.	confidence	0.46	0.46
asq3	I feel confident that other people will be there for me when I need them.	confidence	0.67	0.67
asq37	If something is bothering me, others are generally aware and concerned.	confidence	0.44	0.44
asq38	I am confident that other people will like and respect me.	confidence	0.79	0.79
II	ANXIETY			
IIa	Preoccupation (inferiority and isolation)			
hsl9	I have the impression that usually I like others better than they like me.	preoccupied	0.64	0.63
hsl11	*I am often afraid that other people don't like me.*	*preoccupied*	*0.77*	–
hsl21	I usually find other people more interesting than myself.	preoccupied	0.51	0.51
asq6	*To ask for help is to admit that you're a failure.*	*relationships as secondary*	*0.50*	–
asq15	Sometimes I think I am no good at all.	need for approval	0.74	0.73
asq18	I find that others are reluctant to get as close as I would like.	preoccupation with relationships	0.54	0.55
asq22	I worry that others won't care about me as much as I care about them.	preoccupation with relationships	0.75	0.75
asq24	I worry that I won't measure up to other people.	need for approval	0.78	0.77
asq27	I wonder why people would want to be involved with me.	need for approval	0.76	0.76
asq29	I worry a lot about my relationships.	preoccupation with relationships	0.71	0.72
asq32	I often feel left out or alone.	preoccupation with relationships	0.73	0.73
asq33	I often worry that I do not really fit in with other people.	confidence	0.79	0.78
IIb	Need for Approval			
hsl17	I don't worry whether people like me or not.	preoccupied	-0.63	-0.63
hsl24	I find it important to know whether other people like me.	preoccupied	0.72	0.72
asq11	It's important to me that others like me.	need for approval	0.65	0.66
asq12	It's important to me to avoid doing things that others won't like.	need for approval	0.57	0.57
asq13	I find it hard to make a decision unless I know what other people think.	need for approval	0.65	0.65

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IIc	Separation Anxiety			
hsl13	I fear to be left alone.	preoccupied	0.78	0.77
asq30	I wonder how I would cope without someone to love me.	preoccupation with relationships	0.56	0.57
asq39	I get frustrated when others are not available when I need them.	preoccupation with relationships	0.46	0.46
III	RELATIONSHIPS AS SECONDARY			
asq7	People's worth should be judged by what they achieve.	relationships as secondary	0.73	0.74
asq8	Achieving things is more important than building relationships.	relationships as secondary	0.82	0.83
asq9	Doing your best is more important than getting on with others.	relationships as secondary	0.54	0.54
asq10	If you've got a job to do, you should do it no matter who gets hurt.	relationships as secondary	0.46	0.47
asq36	*I am too busy with other activities to put much time into relationships.*	*relationships as secondary*	*0.34*	–
IV	INDEPENDENCY			
hsl6	I prefer that others are independent of me, and that I am independent of others.	dismissing	0.60	0.57
hsl12	It is important to me to be independent.	dismissing	0.50	0.47
asq4	I prefer to depend on myself rather than other people.	discomfort with closeness	0.63	0.62
asq5	I prefer to keep to myself.	discomfort with closeness	0.55	0.60
asq17	*I find it difficult to depend on others.*	*discomfort with closeness*	*0.64*	–
asq21	I feel comfortable depending on other people.	discomfort with closeness	-0.47	-0.42

Note: HSL = HechtingsStijlLijst, Dutch for 'Attachment Style List'; ASQ = Attachment Style Questionnaire. Due to the "listwise" handling of missing cases in the analysis with LAVAAN, the number of cases is fewer than the total number.