



## Orthogonal dreams in an oblique world: A meta-analysis of the association between attachment anxiety and avoidance

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### ABSTRACT

The association between attachment dimensions (anxiety and avoidance) can influence measurement creation and statistical analyses. Our goal was to test the assumption that anxiety and avoidance was orthogonal in two popular measures: the 'Experience in Close Relationships Scale – Revised' (ECR-R) and the original 'Experiences in Close Relationships Scale' (ECR). Our meta-analysis of 242 studies revealed that despite both scales being highly reliable, the anxiety–avoidance correlation was higher for the ECR-R than the ECR. Other variables also moderated the association. Implications include methods of statistical analysis and recommendations for future measurement creation and use.

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### 1. Introduction

In attachment research, like any scientific study, the quality of empirical findings is dependent on the measurement quality. Although there is a great deal of variability in the measurement of adult attachment (see, Kurdek, 2002), a growing number of researchers rely on self-report surveys of the anxiety and avoidance dimensions (see, Fraley & Waller, 1998; Mikulincer & Shaver, 2007). In many theories, these dimensions are implicitly assumed or explicitly required to be orthogonal (e.g., Mikulincer & Shaver, 2003). The association between anxiety and avoidance *should* reflect the theory upon which the scale was created and thus, the observed association represents a form of validity. We investigated whether anxiety and avoidance dimensions are orthogonal using two recently popular self-report adult attachment measures: 'The Experiences in Close Relationships Scale' (ECR; Brennan, Clark, & Shaver, 1998) and the 'Experiences in Close Relationships Scale – Revised' (ECR-R; Fraley, Waller, & Brennan, 2000).

Attachment theory stipulates that early experiences with primary caregivers set the stage for a lifetime of expectations and learned reactions to relational events (Bowlby, 1982). Caregivers providing consistent, warm, and responsive environments for infants foster the development of secure attachments which cultivate future attachments to others. However, individuals with histories unresponsive, cruel, or neglectful caregiving will lack faith that others will help and thus, insecure attachments are formed.

Attachment measures typically assess attachment (in)security with the use of anxiety and avoidance dimensions (see Mikulincer & Shaver, 2003, 2007). Secure individuals score low on both dimensions. However, individuals scoring high on anxiety experience a strong desire to obtain closeness with others, anxiety over a partner's availability, and use coping strategies characterized by excessive reassurance seeking. Individuals scoring high on avoidance experience discomfort being close and dependent on an attachment figure, desire to keep emotional distance, and use coping strategies that include denying the need to obtain comfort from others.

The assumption in most attachment theories is that anxious and avoidance dimensions should be orthogonal (see Mikulincer, Shaver, Sapir-Lavid, & Avihou-Kanza, 2009). For example, Mikulincer and Shaver (2003) present hyperactivating and deactivating strategies, measured by anxious and avoidance dimensions respectively, as either/or responses to attachment relevant threats and thus, the assumption is that these dimensions are unrelated. However, not all attachment theories rely on the orthogonal dimensions; in Bowlby's (1973) original conceptualization of the stages of attachment, he posited that these two dimensions could be orthogonal in theory but oblique in actual practice. Furthermore, Fraley and Shaver (2000) suggest that anxiety could be considered a monitoring system and avoidance a behavioral orientation system. Although these theorists do not explicitly address the issue of dimensional orthogonality, the implicit message is that the independence of anxiety and avoidance is not a requirement for that framework. Thus, even though many attachment theories imply that anxiety and avoidance dimensions should be orthogonal, not all theoretical descriptions of the attachment system are based on the assumption that the dimensions are independent.

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### 1.1. The ECR and ECR-R

To create the ECR, Brennan et al. (1998) collected all non-redundant items from available self-report adult attachment measures and conducted a factor analysis, resulting in two 18-item dimensions representing anxiety and avoidance. The ECR has become incredibly popular (Mikulincer & Shaver, 2007) yet fails to adequately measure the secure ends of the dimensions. Fraley et al. (2000) aimed to rectify this problem by utilizing item response theory on Brennan et al.'s (1998) original pool of items and revised the scale. Although many items remained similar, items yielding better item discrimination replaced items failing to tap the full range of scores. The ECR and the ECR-R exhibit comparable reliability, stability, and validity (see Mikulincer & Shaver, 2007).

Although Brennan et al. (1998) and Fraley et al. (2000) used different scale creation methods, they both used techniques to pull for orthogonal factors and indeed, both found latent factors that were virtually orthogonal. However, close scrutiny of the literature reveals that these dimensions are not always orthogonal in practice. Other researchers have noted personal observations that the anxiety–avoidance association is lower in the ECR than the ECR-R (Mikulincer & Shaver, 2007). Moreover, the composite scores for each dimension were more highly correlated in the ECR-R ( $r = .35$ ; R.C. Fraley, personal communication, March 3, 2010) than in the ECR ( $r = .11$ ; Brennan et al., 1998). Authors finding these significant correlations often make excuses and apologize for this finding (e.g., Carnelley & Rowe, 2007) as if their results are unusual. We suggest that such findings are common-place in actual practice.

Our study is the first to conduct a systematic investigation of the anxiety–avoidance association by conducting a meta-analysis on the ECR and ECR-R. We did not expect to find an anxiety–avoidance correlation that was exceedingly close to 1.0 (Crano & Brewer, 2002) as numerous investigations have supported a two or more dimensional structure (see Mikulincer & Shaver, 2007). Instead, we expected to find correlations closer to the medium (.30) to large (.50; Cohen, 1988) range. Such a finding would suggest that the ECR and ECR-R do not maintain the intended orthogonal nature (as represented by a zero to .10 or small effect size; Cohen, 1988). Furthermore, such a finding would suggest that researchers must address shared variance in their analysis; a practice that we later report is not widely adopted. Such results would spark a discussion about the utility of the ECR and ECR-R and perhaps also the theoretical assumption that anxiety and avoidance are orthogonal.

In addition to our primary goal of determining the anxiety–avoidance correlation in the ECR and the ECR-R, we investigated possible moderators and tested whether one version was more influenced by potential moderators. As part of our meta-analysis, we also examined the reliability of the ECR and ECR-R.

## 2. Method

### 2.1. Sample

We collected articles through two electronic databases (*PsycINFO* and *Web of Science*), using the search terms “ECR”, “ECR-R”, and “Experiences in Close Relationships” (final date of retrieval was December 17, 2007). We also tried a ‘Citing Articles Search’ for articles citing Brennan et al. (1998) or Fraley et al. (2000) and we cross-referenced citations from Mikulincer and Shaver (2007) with previous searches. In total, we found over 800 citations. Inclusion criteria for the meta-analysis were (a) the use of the full, unabbreviated version of either the ECR or ECR-R, and (b) the article was published in English.

Of the 257 studies meeting our criteria, 99 did not report the correlation and/or the reliability coefficients. We contacted these authors requesting the missing information and received

responses for 46 studies; the remaining 53 studies were excluded from the meta-analysis. Our final sample of published studies included 204 studies – 172 used the ECR and 32 used the ECR-R.

To avoid the “file drawer problem” (Rosenthal, 1991), we posted an email on the Society of Personality and Social Psychology and the International Association of Relationship Researchers email list services requesting researchers who had used the ECR or ECR-R in any unpublished research to complete an online survey detailing their study. Through this method, we obtained complete data from 38 previously unpublished studies (23 ECR; 15 ECR-R). Altogether, 242 studies and 62,012 participants were included in the meta-analysis.

### 2.2. Procedure

Two raters independently coded the studies for sample and scale characteristics (see Table 1). Across all codes, inter-rater reliability was high (90–100%) and all discrepancies were resolved by a third rater.

#### 2.2.1. Sample characteristics

Raters recorded the exact sample size, the proportion of the sample that was female, and the mean age. For the type of sample used, raters categorized the authors' description of the sample as “university”, “non-university”, or from both sources.

Next, relationship status was coded. We accommodated the various styles of reporting by recording the portion of the sample that was in a committed (i.e., married, cohabitating) or uncommitted (i.e., single, dating) relationship. Unfortunately, only 72 reported relationship status.

Finally, raters indicated whether the sample was from North America or was collected outside of North American.

#### 2.2.2. Scale characteristics

Raters recorded the Pearson correlation coefficient between anxiety and avoidance dimensions and the reliability (Cronbach's alpha) of each dimension. Raters also recorded whether the scale was translated.

### 2.3. Meta-analytic procedures

To address our primary research question we analyzed the data using the procedures outlined in Lipsey and Wilson (2001). For the anxiety–avoidance association, Pearson correlation coefficients (i.e., the effect size) were transformed into Fisher's  $z$  and weighted with the inverse variance. Wilson's (2005) macros for SPSS statistical software provided analogous analyses of variance and multiple regression analyses. In reporting the results, all values were converted back into correlation coefficients.

## 3. Results

When we encountered missing data for a moderator, the study was dropped from the analysis involving that variable.

### 3.1. Association between anxiety and avoidance

Using Wilson's (2005) random effects meta-analysis SPSS macros, on the 242 studies, the average random effect size was .20 (95% CI = .18 to .22),  $Z = 17.52$ ,  $p < .001$ . That is, the average anxiety–avoidance correlation was .20, significant and in the small to medium range.

A homogeneity analysis revealed that the sample of effect sizes was highly heterogeneous,  $Q(241) = 1702.73$ ,  $p < .001$ , ranging from  $-.22$  to  $.68$  across studies. Consequently, the sample of

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