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Short-term temporal stability and factor structure of the revised experiences in close relationships (ECR-R) measure of adult attachment

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Abstract

The factor structure and short-term temporal stability of the Revised Experiences in Close Relationships questionnaire (Fraley, Waller, & Brennan, 2000) were examined. Separate exploratory and confirmatory factor analyses indicated that the ECR-R provided a reliable and replicable dual factor self-report measure of adult romantic attachment. These results provide important additional information about the ECR-R, and suggest that the scale maintains acceptable classical psychometric properties while also assessing a range of trait scores more evenly distributed than previous measures (as reported by Fraley et al., 2000). Latent variable path analyses suggested that longitudinal measures of both the anxiety and avoidance subscales were remarkably stable over a 6-week assessment period (86% shared variance over time). This result supports previously published test re-test reliability estimates based on simulation analyses, and suggests that the scale provides stable estimates of trait attachment which are largely free from measurement error over short assessment periods. The importance of using reliable and precise measures in order to minimize bias in repeated measures of attachment in romantic and interpersonal relationships over prolonged time periods is discussed.

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1. Introduction

Previous research has presented an extensive array of self-report survey measures of adult attachment. These measures have ranged from the original category models (Bartholomew &

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Horowitz, 1991; Hazan & Shaver, 1987) to more recently developed measures of the two latent dimensions, termed *anxiety* and *avoidance*, which are hypothesized to underlie the attachment construct (Brennan, Clark, & Shaver, 1998; Fraley, Waller, & Brennan, 2000; Griffin & Bartholomew, 1994a). One pertinent issue relevant to the measurement of attachment is the temporal instability reported in both previous categorical and continuous measures. Previous research has documented an average 30% change in attachment categories over relatively short time periods (e.g. Baldwin & Fehr, 1995; Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Kirkpatrick & Davis, 1994; Kirkpatrick & Hazan, 1994; Pistole, 1989; Senchak & Leonard, 1992). Similarly, when attachment is assessed using continuous measures, test re-test assessments commonly report between 0.25 and 0.65 shared variance (e.g. Collins & Read, 1990; Feeney, Noller, & Callan, 1994a; Feeney, Noller, & Hanrahan, 1994b; Fuller & Fincham, 1995; Keelan, Dion, & Dion, 1994; Levy & Davis, 1988; Shaver & Brennan, 1992). Although often interpreted as representing acceptable levels of test re-test reliability, these findings suggest that a considerable degree of variance remains unaccounted for by repeated measures of attachment over relatively short time periods (Baldwin & Fehr, 1995).

Two different explanations of short-term adult attachment instability have been proposed. The first perspective views change in attachment ratings as a meaningful process that may be influenced by individual differences and changing personal circumstances (Baldwin & Fehr, 1995; Davila, Burge, & Hammen, 1997; Hammond & Fletcher, 1991; Pierce & Lydon, 2001). However, although the majority of researchers agree that attachment may change over prolonged time periods (Bowlby, 1969, 1973, 1980; Crowell, Treboux, & Waters, 2002; Fraley, 2002), researchers have also argued that common estimates of attachment stability may also be biased by imprecise and unreliable measurement (Fraley & Waller, 1998; Fraley et al., 2000; Scharfe & Bartholomew, 1994). According to this second perspective the relatively high levels of short-term attachment instability reported in previous research may be at least partially due to unreliable measurement, rather than any meaningful change in underlying trait attachment itself (Scharfe & Bartholomew, 1994). Furthermore, recent research has suggested that some commonly used attachment scales (e.g. Collins & Read, 1990; Griffin & Bartholomew, 1994b) may actually overestimate attachment stability due to their inability to accurately discriminate levels of trait attachment across the entire range of trait scores (Fraley et al., 2000).

In an attempt to provide a more accurate and reliable measure of adult attachment, Fraley et al. (2000) developed the Revised Experiences in Close Relationships questionnaire (ECR-R), which was based on the reanalysis of a comprehensive 323 item dataset previously collected by Brennan et al. (1998). Exploratory factor analysis of the initial item clusters revealed a circular pattern of loadings, and thus no easily discernable two factor solution. Fraley et al. (2000) therefore manually rotated the axes until they aligned in a theoretically meaningful way with clusters of anxiety or avoidance related items. A pool of items was then selected using a relatively lenient item loading criterion derived from this manually rotated solution. The final ECR-R items were then selected from this reduced item pool based on their discrimination values (refer to van der Linen & Hambleton, 1997, for a detailed discussion of Item Response Theory). This yielded a scale with increased measurement precision, as item discrimination values were more evenly distributed across the entire trait range.

Fraley et al. (2000) examined the stability of the ECR-R using simulation analyses rather than repeated measures survey data. These simulation analyses estimated the shared variance in

repeated measures of both anxiety and avoidance to be $\sim 90\%$. This estimate remained consistent when both actual and more ideal item parameter statistics were used. This suggests that unlike previous attachment scales, temporal stability estimates of the ECR-R are not biased by measurement imprecision.

However, although Fraley et al. (2000) provided strong evidence supporting the increased measurement precision of the ECR-R, the more traditionally assessed classical psychometric properties of the ECR-R, such as its internal reliability and factor structure, have not been previously examined. This issue is pertinent given the relatively lenient item loading criterion that was used when selecting the initial ECR-R item pool. In addition, the temporal stability of the ECR-R has not yet been assessed using repeated measures survey data. The present study therefore seeks to provide confirmatory analyses exploring these previously unexamined psychometric properties of the ECR-R.

2. Method

2.1. Participants

Participants were students enrolled in an undergraduate psychology course who received partial course credit for participation. Data was collected from 197 participants at time 1 and 199 participants at time 2. One hundred and forty-two people (37 male, 104 female, one unreported) with a mean age of 21.78 years ($S.D. = 5.71$) participated during both time periods. There were no significant differences in anxiety or avoidance between people who completed the survey during only the first time period and those who participated during both sessions ($F(1, 195) = 0.32$, $P = 0.857$; $F(1, 195) = 1.292$, $P = 0.257$; respectively).

2.2. Procedure

At the start of the trimester, participants completed the ECR-R (Fraley et al., 2000). The ECR-R is a self-report survey measure of adult attachment containing 36 Likert type items, half of which assess attachment anxiety and half of which assess avoidance. Six weeks later participants completed the ECR-R a second time, which was included as the first questionnaire in a larger battery of survey measures. Participants' data were matched across time periods using confidential student identification numbers.

3. Results

3.1. Factor analyses

A principal components exploratory factor analysis with varimax rotation was performed on the ECR-R data collected during time 1. Two factors were extracted, which explained 51% of the total variance. Although a number of factors with eigenvalues greater than 1 were reported, a two factor solution appeared to be the most parsimonious given that the eigenvalues displayed a

steeply decreasing trend after the second value, i.e. 9.798, 8.562, 2.795, 2.223, 2.080. The rotated factor loadings for ECR-R items are displayed in Table 1. The ECR-R items were then plotted in a two-dimensional space using multidimensional scaling. Visual analysis of this plot also suggested a discernable two-factor solution, however as suggested by the item loadings presented in Table 1,

Table 1

Principal component factor loadings for the Revised Experiences in Close Relationships (ECR-R) questionnaire^a

	Factor 1	Factor 2
<i>Avoidance ($\alpha = 0.9344$)</i>		
1. I prefer not to show a partner how I feel deep down.	0.813	−0.100
2. I feel comfortable sharing my private thoughts and feelings with my partner. ^b	0.798	0.155
3. I find it difficult to allow myself to depend on romantic partners.	0.443	0.385
4. I am very comfortable being close to romantic partners. ^b	0.595	−0.012
5. I don't feel comfortable opening up to romantic partners.	0.829	0.041
6. I prefer not to be too close to romantic partners.	0.608	0.097
7. I get uncomfortable when a romantic partner wants to get very close.	0.736	−0.161
8. I find it relatively easy to get close to my partner. ^b	0.814	0.282
9. It's not difficult for me to get close to my partner. ^b	0.774	0.084
10. I usually discuss my problems and concerns with my partner. ^b	0.807	0.077
11. It helps to turn to my romantic partner in times of need. ^b	0.827	0.136
12. I tell my partner just about everything. ^b	0.639	0.124
13. I talk things over with my partner. ^b	0.742	0.176
14. I am nervous when partners get too close to me.	0.823	0.163
15. I feel comfortable depending on romantic partners. ^b	0.711	0.386
16. I find it easy to depend on romantic partners. ^b	0.736	0.243
17. It's easy for me to be affectionate with my partner. ^b	0.847	−0.006
18. My partner really understands me and my needs. ^b	0.236	0.290
<i>Anxiety ($\alpha = 0.9477$)</i>		
1. I'm afraid that I will lose my partner's love.	0.140	0.896
2. I often worry that my partner will not want to stay with me.	0.188	0.831
3. I often worry that my partner doesn't really love me.	0.081	0.772
4. I worry that romantic partners won't care about me as much as I care about them.	0.091	0.814
5. I often wish that my partner's feelings for me were as strong as my feelings for him/her.	−0.030	0.576
6. I worry a lot about relationships.	0.100	0.671
7. When my partner is out of sight, I worry that he or she might become interested in someone else.	−0.162	0.747
8. When I show my feelings for romantic partners I'm afraid they won't feel the same way about me.	0.231	0.622
9. I rarely worry about my partner leaving me. ^b	0.255	0.673
10. My romantic partner makes me doubt myself.	0.130	0.758
11. I do not often worry about being abandoned. ^b	0.257	0.617
12. I find that my partner(s) don't want to get as close as I would like.	0.018	0.740
13. Sometimes romantic partners change their feelings about me for no apparent reason.	0.214	0.247
14. My desire to be very close sometimes scares people away.	0.050	0.681
15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	0.343	0.667
16. It makes me mad that I don't get the affection and support I need from my partner.	0.030	0.737
17. I worry that I won't measure up to other people.	0.197	0.786
18. My partner only seems to notice when I'm angry.	−0.136	0.463

^a Loadings > 0.3 are printed in bold. Items are sorted by the discrimination values reported by Fraley et al. (2000).

^b Item is reverse scored.

item 3 and item 18 of the avoidance sub-scale appeared as outliers in this analysis. Overall, these results indicate that the anxiety and avoidance sub-scales of the ECR-R were largely consistent with previous research (Brennan et al., 1998; Fraley et al., 2000) and comprise distinctive dimensions with high internal reliabilities ($\alpha = 0.9477$; $\alpha = 0.9344$ respectively).

In order to further assess the factor structure of the ECR-R, a confirmatory factor analysis (CFA) was performed on the ECR-R data collected during time 2. Items were parceled into groups of 3, each of which attempted to include a range of the item discrimination values reported by Fraley et al. (2000). Overall, there were six parcels assessing anxiety, and six parcels assessing avoidance. Fit indices suggested that the data were best described by a two factor solution (Goodness of Fit [GFI]=0.92; Non-Normed Fit Index [NNFI]=0.96; Comparative Fit Index [CFI]=0.97; Root Mean Square Residual [RMR]=0.083; Root Mean Square Error of Approximation [RMSEA]=0.068; refer to Kline, 1998; Tabachnick & Fidell, 1996 for a discussion of these fit indices). Chi-squared difference tests also supported this interpretation, as a two factor solution described the data significantly better than both a single factor solution (difference in $\chi^2(1) = 1381.73$, $P < 0.001$) and a 3 factor solution derived from exploratory factor loadings (difference in $\chi^2(1) = 47.78$, $P < 0.001$). All standardized path coefficients in the two factor solution were statistically significant and ranged from 0.37 to 0.62 for item parcels assessing avoidance and 0.41 to 0.58 for item parcels assessing anxiety. These two latent factors correlated at 0.42. Both the anxiety ($\alpha = 0.9281$) and avoidance ($\alpha = 0.9111$) sub-scales displayed acceptable internal reliabilities during time two measurements.

3.2. Temporal stability

Repeated measures of the anxiety and avoidance sub-scales were entered into separate latent variable path analyses. As with the CFA, items assessing these two latent factors during each time period were parceled into groups of three, each of which attempted to include a range of the item discrimination values reported by Fraley et al. (2000). This analysis revealed a remarkably high degree of temporal stability in both factors. Eighty-six percent of the variance in the latent repeated measures of the avoidance sub-scale were shared across the 6-week time period. Similarly, 86.5% of the variance in the latent repeated measures of the anxiety sub-scale were also shared over the 6-week time period. The fit statistics for these two models were acceptable (GFI=0.88; NNFI=0.95; CFI=0.96; RMR=0.066; RMSEA=0.094); (GFI=0.83; NNFI=0.90; CFI=0.92; RMR=0.066; RMSEA=0.129 respectively).

4. Discussion

The factor structure, internal reliability and short-term temporal stability of the ECR-R were assessed. Separate exploratory and confirmatory factor analyses performed on the data collected at time 1 and time 2 indicated that the ECR-R displayed a clear two factor structure, and provided reliable and replicable measures of both the attachment anxiety and avoidance subscales. These results provide important additional information on the psychometric properties of the ECR-R, and suggest that the scale maintains acceptable classical psychometric properties while also capturing a more evenly distributed range of trait scores, as reported by Fraley et al. (2000).

Consistent with estimates based on previously published simulation analyses (Fraley et al., 2000), repeated survey measures of both the anxiety and avoidance subscales of the ECR-R were remarkably stable over the 6-week assessment period. Indeed, latent variable path analyses suggested that repeated measures of each subscale shared ~86% of their variance.

The high levels of attachment stability found in the present study contrast with previous research, which has reported considerable levels of attachment change in continuous measures over longer time periods ranging from months to years (e.g. Collins & Read, 1990; Davila et al., 1997; Feeney et al., 1994b; Hammond & Fletcher, 1991; Pierce & Lydon, 2001; Shaver & Brennan, 1992). This difference in observed attachment stability may be primarily due to two factors; (a) the use of less reliable and precise measures of attachment in previous research (see also Fraley et al., 2000), and (b) the comparatively short (6-week) assessment period used in the present study. Although aspects of people's attachment undoubtedly change over long time periods (Bowlby, 1969, 1973, 1980; Crowell et al., 2002; Fraley, 2002), the use of an assessment period as short as 6-weeks should have largely precluded the possibility of much meaningful change in attachment style. Thus, this short assessment period provided temporal stability estimates that should theoretically be influenced primarily by measurement error (cf. Baldwin & Fehr, 1995). The remarkably high levels of shared variance reported by the present study therefore suggests that the ECR-R provides stability estimates of trait attachment that are largely free from measurement error over short periods of time.

By developing more precise and reliable self-report measures of adult attachment, such as the ECR-R, future research will be able to more accurately assess the predictors of long-term change in working models of adult attachment. A related challenge for future research is the more detailed assessment of alternative models of attachment stability using repeated measures over multiple interspersed time periods (see Fraley, 2002).

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References

- Baldwin, M. W., & Fehr, B. (1995). On the instability of attachment style ratings. *Personal Relationships*, 2, 247–261.
- Baldwin, M. W., Keelan, J. P. R., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social-cognitive conceptualizations of attachment working models: availability and accessibility effects. *Journal of Personality and Social Psychology*, 71, 94–109.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: a test of a four-category model. *Journal of Personality and Social Psychology*, 61, 226–244.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. Reading MA: Addison-Wesley.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: anxiety and anger*. New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss: sadness and depression*. New York: Basic Books.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: an integrative overview. In J. A. Simpson, & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.

- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology*, 58, 644–663.
- Crowell, J. A., Treboux, D., & Waters, E. (2002). Stability of attachment representations: the transition to marriage. *Developmental Psychology*, 38, 467–479.
- Davila, J., Burge, D., & Hammen, C. (1997). Why does attachment style change? *Journal of Personality and Social Psychology*, 73, 826–838.
- Feeney, J. A., Noller, P., & Callan, V. J. (1994a). Attachment style, communication and satisfaction in the early years of marriage. In K. Bartholomew, & D. Perlman (Eds.), *Advances in personal relationships: Vol. 5. Attachment processes in adulthood* (pp. 269–308). London: Jessica Kingsley Publishers.
- Feeney, J. A., Noller, P., & Hanrahan, M. (1994b). Assessing adult attachment. In M. B. Sperling, & W. H. Berman (Eds.), *Attachment in adults: clinical and developmental perspectives* (pp. 128–152). New York, NY, USA: Guilford Press.
- Fraley, R. C. (2002). Attachment stability from infancy to adulthood: meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review*, 6, 123–151.
- Fraley, R. C., & Waller, N. G. (1998). Adult attachment patterns: a test of the typological model. In J. A. Simpson, & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 77–114). New York: Guilford Press.
- Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, 78, 350–365.
- Fuller, T. L., & Fincham, F. D. (1995). Attachment style in married couples: relation to current marital functioning, stability over time, and method of assessment. *Personal Relationships*, 2, 17–34.
- Griffin, D. W., & Bartholomew, K. (1994a). Models of the self and other: fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology*, 67, 430–445.
- Griffin, D. W., & Bartholomew, K. (1994b). The metaphysics of measurement: the case of adult attachment. In K. Bartholomew, & D. Perlman (Eds.), *Advances in personal relationships: Vol. 5. Attachment processes in adulthood* (pp. 17–52). London: Jessica Kingsley.
- Hammond, J. R., & Fletcher, G. J. O. (1991). Attachment styles and relationship satisfaction in the development of close relationships. *New Zealand Journal of Psychology*, 20, 56–62.
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 59, 511–524.
- Keelan, J. P. R., Dion, K. L., & Dion, K. K. (1994). Attachment style and heterosexual relationships among young adults: a short-term panel study. *Journal of Social and Personal Relationships*, 11, 201–214.
- Kirkpatrick, L. A., & Davis, K. E. (1994). Attachment style, gender, and relationship stability: a longitudinal analysis. *Journal of Personality and Social Psychology*, 66, 502–512.
- Kirkpatrick, L. A., & Hazan, C. (1994). Attachment styles and close relationships: a four-year prospective study. *Personal Relationships*, 1, 123–142.
- Kline, R. B. (1998). *Principles and practices of structural equation modelling*. New York: Guilford.
- Levy, M. B., & Davis, K. E. (1988). Lovestyles and attachment styles compared: their relation to each other and to various relationship characteristics. *Journal of Social and Personal Relationships*, 5, 439–471.
- Pierce, T., & Lydon, J. E. (2001). Global and specific relational models in the experience of social interactions. *Journal of Personality and Social Psychology*, 80, 613–631.
- Pistole, C. (1989). Attachment in adult romantic relationships: style of conflict resolution and relationship satisfaction. *Journal of Social and Personal Relationships*, 6, 505–510.
- Scharfe, E., & Bartholomew, K. (1994). Reliability and stability of adult attachment patterns. *Personal Relationships*, 1, 23–42.
- Senchak, M., & Leonard, K. E. (1992). Attachment styles and marital adjustment among newlywed couples. *Journal of Social and Personal Relationships*, 9, 51–64.
- Shaver, P. R., & Brennan, K. A. (1992). Attachment styles and the “big five” personality traits: Their connections with each other and with romantic relationship outcomes. *Personality and Social Psychology Bulletin*, 18, 536–545.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins College Publishers.
- van der Linen, W. J., Hambleton, R. K. (Eds.). (1997). *Handbook of modern item response theory*. New York: Springer.