Mapping the Intimate Relationship Mind: Comparisons Between Three Models of Attachment Representations

Nickola C. Overall
Garth J. O. Fletcher
Myron D. Friesen
University of Canterbury

This study compared three models of how attachment working models might be cognitively represented. Model 1 posits that attachment representations consist of a single global working model summarizing attachment across specific relationships and domains. Model 2 proposes three independent working models for the relationship domains of family, platonic friendships, and romantic partners. Model 3 postulates that specific relationship models are nested under relationship domain representations that are, in turn, nested under an overarching global working model. Participants completed standard attachment scales for the relationship domains of family, platonic friendships, and romantic partners and also provided attachment ratings for three specific relationships within each domain. As expected, confirmatory factor analyses showed that Model 3 attained the best fit, regardless of analysis strategy, measurement strategy, gender, and relationship status. Implications are discussed.

Keywords: *attachment; working models; relationships; domains; representations*

The explosion of research over the past 15 years on adult attachment relationships has adopted its theoretical base directly from theories applying to infant-caregiver relationships originally developed by Bowlby and Ainsworth. Indeed, the application of attachment theory to adult intimate relationships has been remarkably successful and influential, with attachment working models or styles being found to account for (in part) an ever-increasing range of individual differences in cognition, emotion, and behavior in relationships (see Feeney, 1999; Simpson & Rholes, 1998). Moreover, the major structural elements of attachment working models or styles seem to be isomorphic across infancy and adulthood. For example, working attachment models in both infancy and adulthood seem to be underpinned by two major independent dimensions: avoidance and anxious/ambivalence (Brennan, Clark, & Shaver, 1998; Simpson, Rholes, & Nelligan, 1992).

However, one possible critical difference between adulthood and infancy concerns the number of attachment figures and possible attachment domains. Adults (unlike young infants) have multiple relationships with family members, platonic friends, and romantic partners. Do adults possess one central, overarching model that slowly becomes more generalized as additional attachment relationships develop, and does such a global model operate across all relationships and relationship contexts in the same fashion? Given that adult attachment needs are likely to differ across relationship domains, are there independent working models for each domain? Or consider the specific relationships within given domains (such as romantic or platonic friendships); does one working model govern cognition, emotion, and behavior across all relationships within a single domain, or do individuals develop quite independent and specific attachment representations for

Authors' Note: The present study was carried out as part of the master's research of the first author and was facilitated by a research grant from the Marsden Research Foundation (M1032) to Garth Fletcher. The authors also would like to thank the relationship research group in the Psychology Department at the University of Canterbury for their assistance in recruiting and running participants and for their comments and feedback. Correspondence concerning this article should be addressed to Nickola C. Overall, Psychology Department, University of Canterbury, Private Bag 4800, Christchurch, New Zealand; e-mail: nco18@it.canterbury.ac.nz or Garth.Fletcher@canterbury.ac.nz.

PSPB, Vol. 29 No. 12, December 2003 1479-1493
DOI: 10.1177/0146167203251519

each relationship? Finally, if there exist multiple working models across specific relationships and/or relationship domains, how are such models related and cognitively organized? This research squarely addresses this last question, the answer to which has implications for all of the queries just raised.

MULTIPLE WORKING MODELS

Most conceptions of adult attachment have assumed that different attachment components and experiences are represented by single global cognitive and affective structures that influence relational responding across a variety of specific relationships. Thus, most research investigating adult attachment has assessed an individual's attachment style (and working model) as one trait or representation, or as two separate constructs representing avoidance and anxious/ambivalence. However, as already noted, individuals experience multiple attachment figures across different domains (see Fraley & Davis, 1997; Hazan & Zeifman, 1999; Trinke & Bartholomew, 1997). Moreover, different types of relationships should fulfill different attachment needs and therefore should be linked to different attachment concerns and expectations (e.g., La Guardia, Ryan, Couchman, & Deci, 2000; Lewis, 1994). For example, romantic relationships are likely to be more passionate, close, dependable, and exclusive than friendships and familial relationships, and will (usually) be the only source of sexual fulfillment. Similarly, social and exploration concerns may be more relevant to the friendship domain, whereas the familial domain may be characterized to a greater degree by security and nurturance. Thus, the nature of working models is likely to differ both across relationship domains and, to some extent, across specific relationships within these domains (see, e.g., Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Bartholomew & Horowitz, 1991; La Guardia et al., 2000; Pierce & Lydon, 2001; Trinke & Bartholomew, 1997).

Variability in working models across specific relationships and attachment domains may account for the instability of attachment classification, with up to 30% of individuals demonstrating change in attachment style over periods of 1 week to 2 years (e.g., Baldwin & Fehr, 1995). For example, relationship dissolution reduces attachment security, and the formation of a new relationship can reduce avoidance (Davila, Karney, & Bradbury, 1999; Kirkpatrick & Hazan, 1994). Similarly, increases in relationship satisfaction tend to increase security (Hammond & Fletcher, 1991). In addition, La Guardia et al. (2000) found that variability in attachment across partners (within individuals) was partly explained by the extent to which attachment-related needs, such as relatedness and autonomy, were met within each relationship. In short, individuals' attachments within specific relationships seem to be determined (in part) by the characteristics of those specific relationships and partners. Taken to an extreme, this process would produce as many independent attachment representations as relationships exist for a given individual.

However, the existence of relationship-specific attachment representations does not necessarily vitiate the validity of attachment theory or its application to adult relationships. Indeed, Bowlby (1980, 1988) theorized that working models are flexible and open to updating. One form this revision may take concerns the development of relationship-specific attachment representations or working models. Moreover, the formation of specific working models does not preclude the existence of global attachment styles. For example, there is some consistency in infant attachment classification across parents (Fox, Kimmerly, & Schafer, 1991), and adults report attachment styles in specific relationships that match, to some extent, measures of their general attachment orientation (Baldwin et al., 1996). Working models across relationships are also highly interrelated, supporting the existence of a global working model (Gerlsma & Lutejin, 2000).

Recent investigations distinguishing between global and relationship-specific attachment representations have shown that these models are distinct, but not redundant, constructs. For instance, Cozzarelli, Hoekstra, and Bylsma (2000) and Pierce and Lydon (2001) reported that global and specific attachment representations independently predicted attachment-related variables, such as life satisfaction and the quality of social interactions. In both of these studies, relationship-specific models explained these dependent variables to a greater extent than did global attachment models, highlighting the importance of specific relationship characteristics and relationship quality. However, Pierce and Lydon (2001) found that the quality and intimacy of social interactions for individuals with negative global working models varied across relationship-specific representations, whereas individuals with positive global working models reported similar (more positive) levels of social interactions across relationships. These results imply that relational responding is the product of an interaction between global and specific attachment representations.

Research involving social-cognitive methodology, using priming procedures, has provided support for this view (e.g., Baldwin & Meunier, 1999; Mikulincer & Arad, 1999). For example, Mikulincer and Arad (1999) found that participants primed to access relationship-specific working models processed information about their partners consistent with the attachment orientation associated with the relationship. This was the case even when

these specific models differed with the attachment style associated with global representations. However, global attachment style also influenced the extent to which individuals integrated this information into their overall perceptions of their partner, illustrating that both kinds of working models were guiding cognition.

In summary, the evidence suggests that individuals possess both relationship-specific working models that represent attachment within specific relationships and global working models that represent attachment across a variety of relationships and relationship contexts. However, beyond this generalization, we know relatively little about the different ways in which relationship-specific and global attachment working models are represented, and definitive tests of competing cognitive structures have not been reported.

Three Models of the Organization and Structure of Multiple Attachment Representations

Figure 1 displays three different versions of the way in which multiple working models are cognitively organized and structured. Model 1 suggests that individuals hold relationship-specific attachment representations in addition to a global working model that generalizes across various attachment relationships. Model 2 proposes that three independent general attachment representations exist for the relationship domains of family, friendships, and romantic partners. Model 3 incorporates both Models 1 and 2, hypothesizing that individuals hold differentiated relationship-domain representations that are connected to an overarching global working model. Each model will be discussed in turn.

Model 1: Single global working model. Most studies investigating multiple working models assume that global attachment representations are constructed from relationship-specific models, reflecting the most salient and consistent features across specific relationships. Model 1 represents this conception (with the observed variables in rectangles measuring relationship-specific attachment representations). Supporting this model, Pierce and Lydon (2001) showed that relationship-specific working models shaped global models over time (and, to a smaller extent, vice versa). However, Pierce and Lydon (2001) also reported modest associations between global working models and relationship-specific models. These results are not surprising. First, global attachment representations are unlikely to represent merely a summation of specific attachment relationships; for example, some relationships are likely to be more influential than others (e.g., mother, current romantic partner, long-standing vs. newly formed relationships, negative vs. positive representations). Second, past relationships that have ended are also likely to influence global attachment representations, but this possibility has not been investigated by researchers. Third, Model 1 does not take into consideration probable attachment differences across domains (i.e., the possibility that specific attachment representations might well be grouped together in different domains).

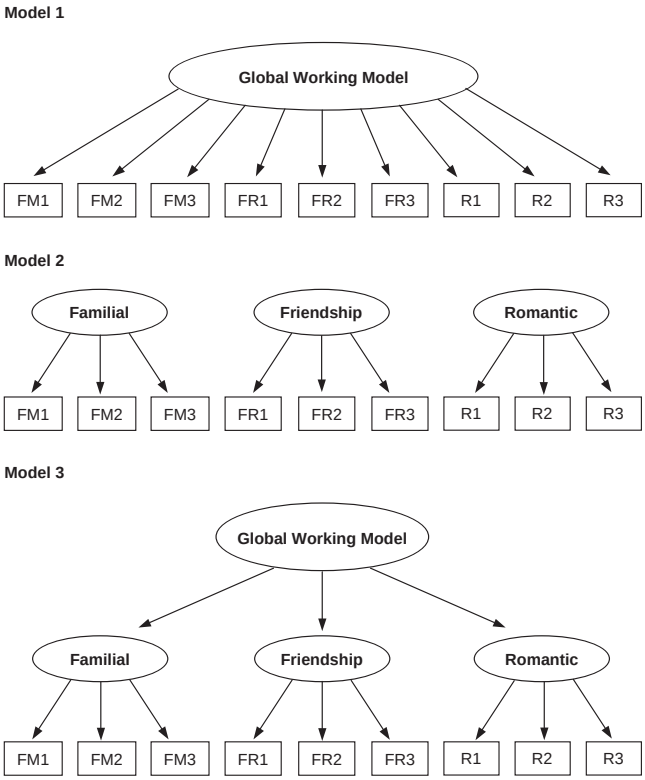

Figure 1 Three models of attachment representations.
NOTE: FM1-FM3 = family observed variables; FR1-FR3 = friendship observed variables; R1-R3 = romantic observed variables.

Model 2: Independent relationship-domain representations. This model suggests that individuals hold general attachment working models that operate independently for each relationship domain. This conceptualization is consistent with research showing that attachment-related functions are provided by a variety of relationships (Fraley & Davis, 1997; Trinke & Bartholomew, 1997) while allowing for differences in attachment needs and functions across domains. In addition, domain differentiation prevents the implications of negative experiences from infecting the entire attachment system. For example, experiencing a betrayal in a romantic relationship should have little effect on the representations within the familial and friendship domains. This should allow for increased accuracy in the content of attachment representations (i.e., beliefs, expectations, and behavioral strategies) and in the ability to obtain attachment goals in particular relationship

contexts (see Collins & Read, 1994; Shaver, Collins, & Clark, 1996).

However, the postulation of attachment modules that are completely independent across domains is implausible, in our view, and is contradicted by the research that has supported the existence of global working models (e.g., Baldwin et al., 1996; Gerlsma & Lutejin, 2000). This brings us to Model 3.

Model 3: Multilevel network of attachment representations. Model 3 adopts the strengths of Models 1 and 2 but avoids their weaknesses. At the uppermost, higher order level, one global attachment style is represented. This global overarching model should help encode general information that applies across relationship contexts and incorporate the most consistent, central, influential, and significant attachment information into the representational network. Nested under the global attachment model exist general attachment representations within particular relationship domains (family, friends, and romantic partners). This aspect should allow increased accuracy in representations of attachment across domains and, in turn, encourage flexibility when interacting within these domains. Finally, at the lowest level (nested under relationship-domain representations) there exist working models of attachment with specific relationships, such as an individual's mother and father, certain friends, and particular romantic relationships.

Collins and Read (1994) have described this model as a default hierarchy headed by a global abstract representation of the self and others developed from early relationship experiences, mainly with caregivers and early peers. This global attachment representation acts as the default, or automatic representation, which individuals are likely to use most frequently in times of stress, low availability of cognitive resources, or with unknown and ambiguous relationship partners. However, more specific representations (relationship-domain and relationship-specific working models) also may be activated depending on the relationship or domain context, providing more accurate and (sometimes) more useful attachment information.

THE PRESENT RESEARCH

There has been no previous research (to our knowledge) effectively testing the different conceptualizations of attachment representation outlined in Figure 1. In the present research, attachment measures that tap both relationship-specific and relationship-domain working models were used to directly test and compare the models depicted in Figure 1. Given the arguments and research outlined above, we predicted that Model 3 would be the best description of the organization and structure of attachment representations. We replicated the analyses using both standard self-report ratings of attachment for each of the relationship domains (family, platonic friendships, and romantic partners) and self-report attachment ratings of three specific relationships within each domain.

Model tests and comparisons were conducted using confirmatory factor analysis (CFA). CFA is a powerful tool to test whether nonexperimental correlational data fit a priori models that incorporate predicted testable relationships between observed variables (attachment measures in the current research) and latent variables—the factors that are believed to underlie the observed measures (in this case, relationship-domain and global working models). Furthermore, CFA not only provides stand-alone tests of model fit but also allows precise statistical comparisons between models (Bentler, 1995; Byrne, 1994). Thus, Model 3 should reveal a good fit to the sample data, and this fit should be superior to Models 1 and 2. In addition, CFA provides a means of investigating whether model fit is similar across different groups (Byrne, 1994; Marsh & Hocevar, 1985). This replication technique was used to identify whether there exist any differences in model fit across gender or current relationship status (individuals involved vs. not involved in a romantic relationship) in the organization and structure of attachment representations. None were expected. All tests were carried out independently for the two main attachment dimensions identified in prior research: anxious/ambivalence and avoidance.

In summary, we predicted, first, that Model 3 would provide a good fit to the sample data and that this fit would be superior to Models 1 and 2. Second, we expected that the fit for Model 3 would remain high and be similar across gender and relationship status. Third, we expected to replicate the findings across attachment dimensions (anxious/ambivalence and avoidance) and across measurement strategy (standard general attachment scales vs. reports of specific relationships, within each domain).

METHOD

Participants

One hundred men and 100 women from the University of Canterbury participated (M age = 22.67, SD = 4.83). Of the sample, 133 were involved in a relationship of some kind, 87 were in a dating relationship, 40 were living with their partner, and 6 were married. The mean length of these relationships was 23.65 months (SD = 29.35 months).

Materials

Relationship-general attachment measures. General attachment orientation within each relationship domain (family, friends, and romantic partners) was assessed using the Adult Attachment Questionnaire (AAQ), a standardized and well-validated scale developed by Simpson and colleagues (1992; Simpson, Rholes, & Phillips, 1996) to measure general attachment within romantic relationships. The AAQ involves 17 items, mainly derived from the original Hazan and Shaver (1987) attachment style descriptions, and produces independent scores for the two underlying attachment dimensions: avoidance (consisting of items from the secure and avoidant prototypes, which form opposite poles) and anxious/ambivalence (consisting of items from the anxious/ambivalent prototype as well as items tapping level of anxiety about abandonment or reciprocation of love). Participants were required to fill out the scales for each relationship domain by rating each item in reference to their "close family relationships in general," their "close platonic (nonsexual) friendships in general," and their "close romantic relationships in general." Both dimensions were internally consistent across all three domains. Internal reliability alphas for the family, friend, and romantic domains were .84, .78, and .79 for the avoidance items, and .81, .86, and .88 for the anxious items. These relationship-general domain items were used as the observed measures for each latent variable within each domain. To reduce complexity and power demands, the items were summed to create three observed variables for each dimension within each domain. This was done sequentially so that the first three items of each dimension were grouped, then the next three, and so on.[1] CFA analyses using these observed measures strongly confirmed the two-dimensional nature of the AAQ and attachment in terms of anxious/ambivalence and avoidance.[2]

Relationship-specific domain attachment measures. Participants identified their three most important relationships that they currently have, or have had, in each relationship domain: family (excluding children), friends, and romantic relationships (including their current romantic partner). Participants also were asked to indicate their particular familial relationship to family members (e.g., mother, father) and the status of their romantic relationships (i.e., current or past). For each of the nine relationships reported, participants were asked to rate each of the original paragraphs denoting prototype attachment styles (secure, avoidant, and anxious/ambivalent) designed by Hazan and Shaver (1987) on a single 7-point Likert-type scale indicating the extent to which each paragraph characterized their feelings and experiences in that particular relationship (1 = *strongly disagree*, 7 = *strongly agree*). The paragraphs were worded so that they applied to the particular relationship in question, that is, family member, friend, or romantic partner.

This measure was chosen (in part) because we wanted to use a conceptual analogue of the AAQ scale (which was derived directly from these same attachment prototypes). Moreover, Hazan and Shaver's (1987) three-group measure of attachment has remained popular, and its reliability and validity is supported by consistent findings of associations between the three measures and a range of relationship variables (e.g., Feeney, 1999; Griffin & Bartholomew, 1994).

Correlations among these ratings, and follow-up CFA analyses of these ratings, revealed relatively weak evidence for a clear two-dimensional structure (unlike the equivalent analyses with the relationship-general domain measures; see Note 2). Ratings of the secure prototype were certainly negatively correlated with ratings of the avoidance prototype in all of the nine specific relationship ratings (from –.31 to –.69). This is consistent with secure and avoidance items forming opposite poles of one dimension, avoidance, which is the commonly replicated finding using the AAQ (Simpson et al., 1992, 1996; Simpson, Rholes, Orina, & Grich, 2002). However, anxious ratings were also negatively correlated with the secure ratings (–.26 to –.52) and were, in general, positively correlated with the avoidant ratings (–.03 to .61).

Thus, initially, the subsequent CFA analyses on the relationship-specific measures were carried out in two ways. In one set of analyses, the secure, avoidance, and anxious ratings were analyzed separately. In the other set of analyses, the ratings were treated in the same way as with the AAQ; namely, the secure ratings were reverse coded and added to the avoidance ratings to produce the relationship-specific avoidance dimension. Both sets of analyses produced very similar results. Moreover, convergent correlations (using the combined measures) between the relationship-specific measures and the relationship-general domain scores were all positive and significant (.52 to .68 for anxious/ambivalence and .47 to .65 for avoidance) and higher than their respective discriminant (off-diagonal) correlations (.22 to .48 for anxious/ambivalence and .18 to .35 for avoidance). Accordingly, the combined measures were used to enhance meaningful comparisons with the CFA results using the AAQ scores.

These relationship-specific domain scores were used as the observed measures for each latent variable within each domain. The correlations among the three relationship ratings within each domain were next examined to establish preliminary validity for their use as

indicators for the domains. For both attachment dimensions, correlations within the family and friendship ratings were positive, strong, and significant (ranging from .27 to .52).

Perhaps not surprisingly, however, the romantic relationship ratings showed weak correlations with each other (ranging from –.04 to .19), probably because of the positive bias exhibited toward current relationship partners and the likely presence of negative thoughts and feelings regarding the past romantic relationships rated. Accordingly, we were forced to use a single observed variable for the CFA analyses, rather than a latent variable, to represent the romantic attachment category. When we analyzed the past and current romantic ratings separately, they produced a similar pattern of positive correlations with other key variables in the study, although the current relationship ratings showed higher correlations. However, the main CFA analyses (reported later) produced very similar results regardless of whether we used a summed variable of all three specific romantic relationships (current and past), the past relationship ratings only, or the current relationship ratings only (of necessity only for the sample currently involved in romantic relationships, n = 133). Finally, factorial analyses (reported later) comparing the overall structure of attachment representations across individuals not involved in romantic relationships versus those currently involved in a romantic relationship revealed no real differences in either the structure or the loadings in the romantic category (see Table 4). Thus, given the equivocal nature of the empirical findings, we chose to use the summed variable based on a pivotal assumption of attachment theory; namely, models of past relationships should remain in the representation network and continue to influence general working models.

Five participants were unable to identify three important romantic relationships, and one participant incorrectly completed their familial relationship ratings. These individuals were excluded from all analyses involving the relationship-specific measures, resulting in a sample size of 194 (96 women, 98 men) for these particular analyses.

Procedure

The materials were part of a larger set of questionnaires given to participants who completed them either individually or as part of a same-sex group of two to three people. Initially, participants were provided with brief general information about the study, assured of their anonymity and of the confidentiality of all information given, and informed that they may withdraw from the study at any stage. Once consent for participation was obtained, participants were given the set of questionnaires to complete, including a background information form that included the participants' gender, age, relationship status, and length of current relationship. Written and verbal instructions were provided to ensure the accurate completion of all forms. The order in which the two kinds of attachment scales were presented was counterbalanced (within sex). Participants were paid NZ$20 for their participation.

TABLE 1: Means and Standard Deviations of the Relationship Attachment Scales

	Anxious/ Ambivalence		*Avoidance*	
Measure	M	SD	M	SD
Relationship-general domain attachment scales				
Familial domain	1.84	0.94	2.52	1.12
Friendship domain	2.45	1.00	2.70	0.88
Romantic domain	3.49	1.18	3.09	1.00
Relationship-specific attachment ratings				
Family relationship one	1.66	1.17	1.84	1.18
Family relationship two	2.16	1.51	2.31	1.38
Family relationship three	2.19	1.51	2.27	1.31
Friend relationship one	1.96	1.23	1.93	0.95
Friend relationship two	2.33	1.54	2.17	1.02
Friend relationship three	2.30	1.50	2.41	1.18
Romantic relationship one	2.54	1.79	2.41	1.46
Romantic relationship two	3.34	1.90	3.46	1.38
Romantic relationship three	3.41	1.83	3.57	1.48

NOTE: All scores were converted to 7-point scales for ease of comparison.

RESULTS

Descriptive Results

The means and standard deviations of the relationship-general and relationship-specific attachment dimensions scores are reported in Table 1. Mean anxious/ambivalence and avoidance scores for both types of attachment measures were higher in the romantic domain, compared to familial relationships and friendships, and anxious/ambivalence scores were comparatively low in the family domain. Relationship-specific ratings for the first relationship reported on in each domain were lower for both attachment dimensions. Presumably, this reflects individuals identifying and reporting on their closest relationships first, with 58% of the first family ratings reflecting relationships with mother, and current romantic relationships reported on in 55.5% of the first romantic ratings (85% of all current romantic relationships rated). No significant differences were found between male and female mean attachment ratings.

CONFIRMATORY FACTOR ANALYSES

All confirmatory factor analyses were performed using EQS for Windows, Version 5.7b (Bentler, 1995). The significance level of the chi-square, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) were used to evaluate model fit. We relied mainly on the CFI and the RMSEA because these fit indices are relatively immune to sample size (unlike the chi-square) (Bentler, 1995; Marsh, Balla, & McDonald, 1988). A CFI value greater than .90 and a RMSEA value at or less than .08 are considered to indicate good model fit (Bentler, 1995; Browne & Cudeck, 1993). The fit of different models was compared by direct comparison between their CFI and RMSEA figures, along with the chi-square difference test (D test) that evaluates the significance of the parameters that differentiate the two models (Bentler & Chou, 1987; Byrne, 1994). Lagrange Multiplier tests, equivalent to the D test, were also used to evaluate the validity of equality constraints both within and across samples (Bentler, 1995).

The three models of attachment representations, outlined in Figure 1, were tested and compared for the anxious/ambivalence and avoidance dimensions independently using both the relationship-general and relationship-specific measures. Each of these four analyses will be discussed separately in turn. For each analysis, Models 1 and 2 were expected to show poor fits (i.e., lower fit indices and significant differences in fit) compared to Model 3. If attachment representations operate in the manner proposed—a network of nested working models—then Model 3 should reveal significant path loadings and produce a good fit to the sample data.

Relationship-General Domain Measures

The results for testing the three models using the relationship-general domain measures as the indicators of each domain are shown in Table 2. First, the models were analyzed using the anxious/ambivalence attachment scores with the results (excluding the error and disturbance terms) displayed in Figure 2. Factor loadings for all models were positive, moderate to high, and were all significant at the $p < .05$ level. As expected, Model 1, in which all attachment representations load on one global working model, showed a poor fit to the data, with a CFI considerably lower than .90, a RMSEA considerably higher than .08, and a significant chi-square. Also as expected, Model 2, which specifies that the attachment measures load onto three separate unrelated factors representing each attachment domain, showed an inadequate fit with a low CFI, high RMSEA, and a significant chi-square. A D test cannot be performed between these two particular models (1 and 2) because they have the same degrees of freedom. However, Model 2 shows better fit indices than Model 1, suggesting that differentiation across relationship domains is more representative of the variation and covariation within the sample data.

In the case of Model 3, which specifies that the relationship between domain representations is accounted for by a higher order global working model, the structure placed on the data to explain the covariation of the first-order factors (domains) is a transformation of the case where the three first-order factors are simply allowed to correlate. Thus, the second-order structure cannot be tested or rejected and is statistically just-identified (Bentler & Chou, 1987; Marsh & Hocevar, 1985). To circumvent this problem, in accordance with conventional procedures, two of the higher order paths were constrained to be equal, which effectively reduces the number of free parameters to be estimated, thus increasing the degrees of freedom allowing the model to be tested (Bentler, 1995; Marsh & Hocevar, 1985). A Lagrange Multiplier test revealed that these constrained paths were not significantly different from each other and the restriction did not unduly affect model fit, Lagrange Multiplier (LM) $\chi^2(1, 200) = 0.47$, $p > .05$, justifying the use of this procedure.[3] As predicted, Model 3 obtained good levels of fit with a CFI significantly greater than .90 and a RMSEA less than .08, although the chi-square remained significant. Finally, chi-square difference tests revealed that this model provided a significantly better fit compared to Models 1 and 2.

Full results for the CFA using the avoidance attachment measures are shown in Figure 3. Again, all models had positive and moderately high factor loadings, which were significant at the $p < .05$ level. As can be seen in Table 2, tests for model fit and comparisons showed the same pattern for the avoidance dimension as that described previously for the anxious/ambivalence dimension. Specifically, Models 1 and 2 showed poor fits with low CFIs and high RMSEAs. Model 3 (with the restriction explained above resulting in a nonsignificant LM test), [LM] $\chi^2(1, 200) = 2.55$, $p > .05$, fit the data adequately with a CFI of .91, although the RMSEA was slightly greater than the .08 level. However, importantly, the differences between these models were again significant in the predicted direction, with Model 3 showing a massive improvement in fit over Models 1 and 2.

Relationship-Specific Domain Measures

Each specific relationship rating for each dimension was used as an indicator for the first-order factors in the family and friendship domains. As noted previously, the romantic relationship ratings were summed to provide one observed variable (indicated by the rectangle in Figures 4 and 5).

The results for testing the four models using the relationship-specific domain measures for both dimen-

TABLE 2: Model Fit Indices and Comparisons

Model	χ^2	df	p	*CFI*	*RMSEA*	*Comparison*	c2 *Change*	df *Change*	p *for* χ^2 *Change*
Relationship-general domain measures									
Anxious/ambivalence dimension									
Model 1 (single general factor)	489.16	27	<.001	.54	.29	Models 1 and 3	450.97	2	<.001
Model 2 (three uncorrelated factors)	121.13	27	<.001	.91	.13	Models 2 and 3	82.94	2	<.001
Model 3 (three first-order factors, one second-order factor)	38.19	25	<.05	.99	.05				
Avoidance dimension									
Model 1 (single general factor)	332.73	27	<.001	.55	.24	Models 1 and 3	248.71	2	<.001
Model 2 (three uncorrelated factors)	131.75	27	<.001	.84	.14	Models 2 and 3	47.73	2	<.001
Model 3 (three first-order factors, one second-order factor)	84.02	25	<.001	.91	.11				
Relationship-specific domain measures									
Anxious/ambivalence dimension									
Model 1 (single general factor)	31.79	14	<.001	.93	.08	Models 1 and 3	10.77	1	<.001
Model 2 (three uncorrelated factors)	103.99	15	<.001	.66	.18	Models 1 and 2	72.20	1	<.001
Model 3 (three first-order factors, one second-order factor)	21.02	13	>.05	.97	.06	Models 2 and 3	82.97	2	<.001
Avoidance dimension									
Model 1 (single general factor)	25.46	14	<.05	.95	.07	Models 1 and 3	11.80	1	<.001
Model 2 (three uncorrelated factors)	98.76	15	<.001	.61	.17	Models 1 and 2	73.30	1	<.001
Model 3[a] (three first-order factors, one second-order factor)	13.66	13	>.05	1.00	.02	Models 2 and 4	85.10	2	<.001

NOTE: CFI = comparative fit index; RMSEA = root mean square error of approximation.

a. See Note 5.

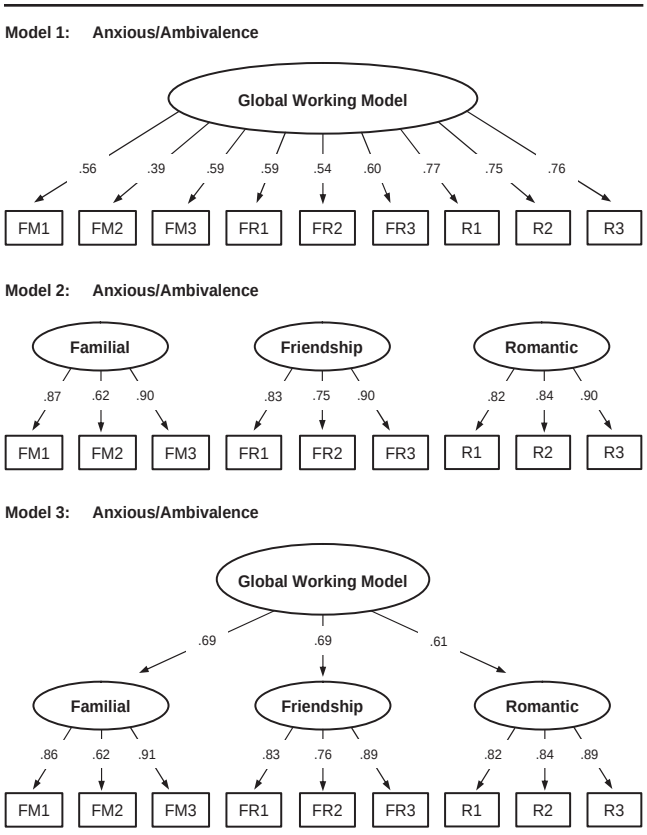

Figure 2 Confirmatory factor analyses of the three models of attachment representations: anxious/ambivalence dimension using relationship-general domain measures.
NOTE: FM1-FM3 = family summed items; FR1-FR3 = friendship summed items; R1-R3 = romantic summed items.

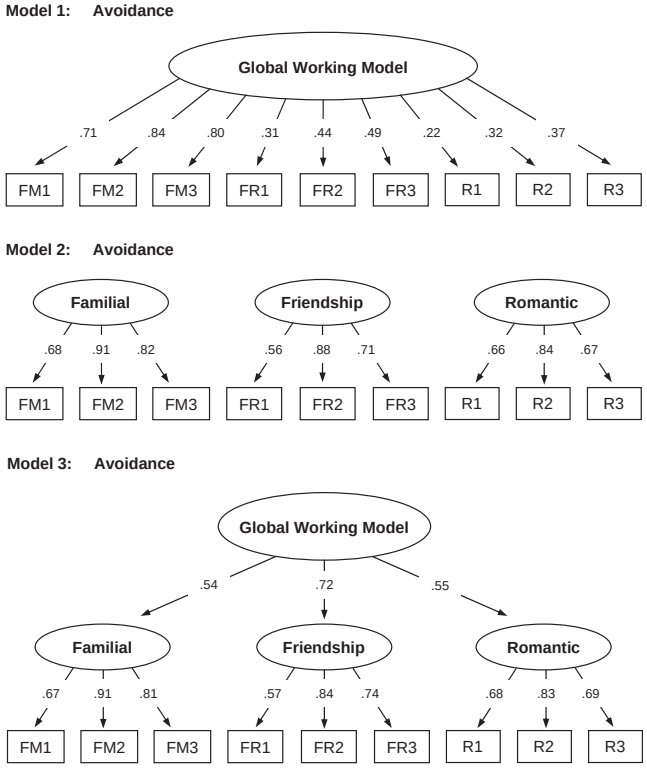

Figure 3 Confirmatory factor analyses of the three models of attachment representations: avoidance dimension using relationship-general domain measures.
NOTE: FM1-FM3 = family summed items; FR1-FR3 = friendship summed items; R1-R3 = romantic summed items.

sions are shown in Table 2. All models had positive and high factor loadings that were significant at the $p < .05$ level. Full CFA results for the anxious/ambivalence dimension are shown in Figure 4. Model 1 fit the data quite well with a CFI greater than .90 and a RMSEA of .08 (although the chi-square was significant), suggesting that an overarching global attachment representation is consistent with the covariation among ratings of different relationships. The fit of Model 1 was also significantly better than Model 2, which revealed a poor fit to the data, with a low CFI and a high RMSEA, and a significant chi-square.[4] The identification problems associated with Model 3 were again solved by constraining two of the higher order paths to be equal, which was consistent with the data and did not reduce model fit, LM $\chi^2(1, 194) = 0.15$, $p > .05$. As before, Model 3 showed a significantly superior fit to both Models 1 and 2, with a very high CFI, a low RMSEA, and a nonsignificant chi-square.

Full results for the avoidance attachment measures are shown in Figure 5. Factor loadings for all models were positive and high and were all significant at the $p < .05$ level. As can be seen in Table 2, results typically mirror those found with the anxious/ambivalence dimension. Model 1 produced a good fit to the data and was significantly better than Model 2, which displayed a poor fit. Model 3 was run with two of the higher order paths constrained to avoid problems with statistical identification (the constraint was reasonable and did not affect model fit), [LM] $\chi^2(1, 194) = 0.98$, $p > .05$, and as expected, it showed significantly superior fits to both Models 1 and 2 with a perfect CFI, very low RMSEA, and a nonsignificant chi-square.[5]

Summary

To summarize, across the two attachment dimensions and the two measurement strategies, CFA analyses clearly demonstrated that Model 3 provided a superior fit to Models 1 and 2 (see Figure 1).

Factorial Invariance Across Gender

Model 3 was next tested for invariance across gender. This was done in the standard fashion by testing a baseline multisample model where the fits of both the male and female data to Model 3 were considered simultaneously (see Byrne, 1994). The first-order and second-

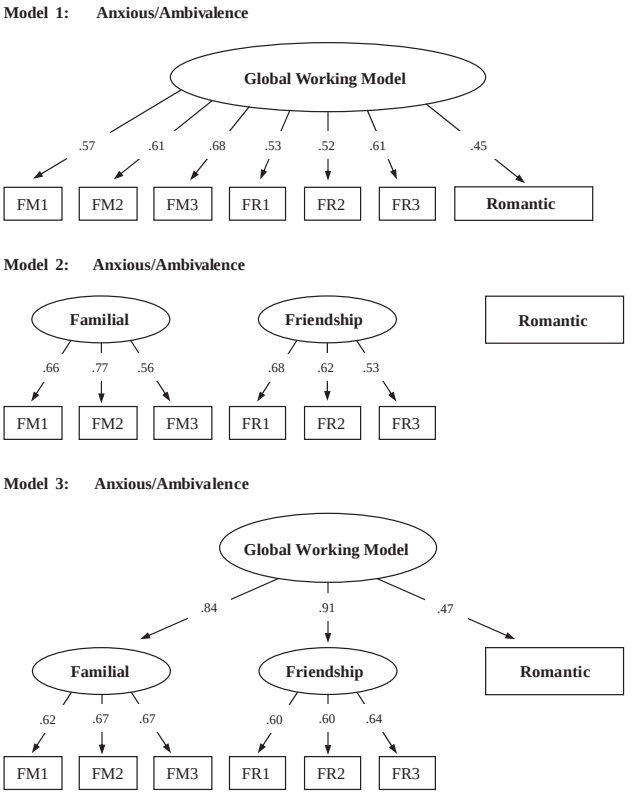

Figure 4 Confirmatory factor analyses of the three models of attachment representations: anxious/ambivalence dimension using relationship-specific domain measures (with observed variable for romantic domain).

NOTE: FM1-FM3 = family relationship ratings; FR1-FR3 = friendship relationship ratings.

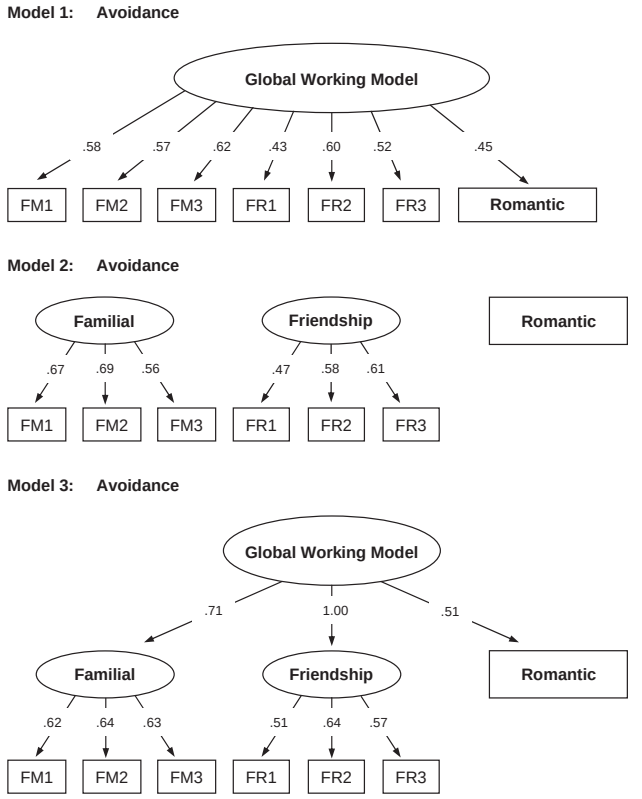

Figure 5 Confirmatory factor analyses of the three models of attachment representations: avoidance dimension using relationship-specific domain measures (with observed variable for romantic domain).

NOTE: FM1-FM3 = family relationship ratings; FR1-FR3 = friendship relationship ratings.

order factor loadings were then constrained to be equal across the two groups. Evaluation of invariance was achieved by comparison of the two models (baseline and constrained multisample models) and by the LM test, which directly tests the validity of the cross-group constraints independently (univariate) and concurrently (multivariate) (Bentler, 1995). The results are shown in Table 3.

For all but one comparison, the overall baseline model produced a good fit, there was very little change in the fit indices when constraining paths to equality, and multivariate LM chi-squares were nonsignificant. These results show that model fit and path loadings were very similar across men and women. The only exception was the anxious/ambivalence dimension relationship-general measured model, which revealed a significant multivariate LM statistic produced by gender differences evident in the family domain; the higher order path (family domain to global working model) was lower in the male sample because of a low first-order path for the family domain. Further investigation traced this difference to two specific anxious items (12 and 14) that possessed relatively low item-total correlations for the men in the family domain only. Releasing these two paths produced a lower multivariate chi-square statistic and significantly improved model fit. Overall, however, Model 3 provided a good fit to both male and female sample data, and a high degree of similarity between men and women was revealed across all four measures.

Factorial Invariance Across Relationship Status

The same procedure was used to examine the equivalence of Model 3 across individuals involved in a romantic relationship (N = 133) and those who were single (N = 67). Note that these two groups did not differ significantly according to either age or gender. The results for these tests are shown in Table 4.

In general, the overall baseline model produced a good fit, there was very little change in the fit indices when constraining paths to equality, and multivariate LM chi-squares were nonsignificant. These results show that model fit and path loadings were consistent across

TABLE 3: Factorial Invariance Across Gender for Model 3

Model	χ^2	df	p	*CFI*	*RMSEA*	*LM* χ^2	df	p
Relationship-general domain measures								
Anxious/ambivalence dimension								
Model 3 (three first-order factors, one second-order factor)	83.53	48	<.01	.96	.06			
Model 3 with all factor loadings set to equality	106.05	57	<.001	.95	.07	21.84	9	<.05
Model 3 with all factor loadings set to equality except for the second-order path and one first-order path in the family domain[a]	96.63	55	<.001	.96	.06	13.05	7	>.05
Avoidance dimension								
Model 3 (three first-order factors, one second-order factor)	97.73	48	<.001	.93	.07			
Model 3 with all factor loadings set to equality	101.77	57	<.001	.93	.06	3.51	9	>.05
Relationship-specific domain measures								
Anxious/ambivalence dimension								
Model 3 (three first-order factors, one second-order factor)	35.06	24	>.05	.96	.05			
Model 3 with all factor loadings set to equality	39.70	31	<.05	.97	.04	4.22	7	>.05
Avoidance dimension								
Model 3 (three first-order factors, one second-order factor)	44.14	26	<.05	.93	.06			
Model 3 with all factor loadings set to equality	50.67	33	<.05	.93	.05	6.41	7	>.05

NOTE: CFI = comparative fit index; RMSEA = root mean square error of approximation; LM χ^2 = Lagrange Multiplier chi-square.
a. Due to significant univariate LM chi-squares, the second-order path and one first-order path in the family domain were released, significantly improving model fit.

TABLE 4: Factorial Invariance Across Relationship Status for Model 3

Model	χ^2	df	p	*CFI*	*RMSEA*	*LM* χ^2	df	p
Relationship-general domain measures								
Anxious/ambivalence dimension								
Model 3 (three first-order factors, one second-order factor)	71.70	48	<.05	.98	.05			
Model 3 with all factor loadings set to equality	88.48	57	<.05	.97	.05	15.91	9	>.05
Avoidance dimension								
Model 3 (three first-order factors, one second-order factor)	116.79	48	<.001	.90	.08			
Model 3 with all factor loadings set to equality	127.62	57	<.001	.90	.08	10.24	9	>.05
Relationship-specific domain measures								
Anxious/ambivalence dimension								
Model 3 (three first-order factors, one second-order factor)	34.14	24	>.05	.93	.05			
Model 3 with all factor loadings set to equality	44.76	31	>.05	.95	.05	10.21	7	>.05

NOTE: CFI = comparative fit index; RMSEA = root mean square error of approximation; LM χ^2 = Lagrange Multiplier chi-square.

individuals of different relationship status. The only exception was a significant univariate LM statistic for one of the higher order paths (friendship domain to global working model) in the anxious/ambivalence dimension model using the relationship-general domain measures. This factor loading was much lower in the single sample.[6] In addition, tests for invariance could not be conducted for the avoidance dimension using the relationship-specific measures. This was because Model 3 would not run with the sample not currently in a romantic relationship because of statistical problems probably arising from the relatively small sample size (N = 65).

Summary

Overall, factorial invariance analyses suggested that Model 3 provided a good description of the structure and organization of attachment representations regardless of relationships status, and a high degree of similarity between single and romantically involved groups was revealed across all three measures, with the possible exception of the friendship domain.

DISCUSSION

This study compared three models of how attachment working models may be cognitively represented. Model 1 posits that attachment representations consist of a single global working model summarizing attachment across specific relationships and domains. Model 2 proposes three independent working models for the relationship domains of family, platonic friendships, and romantic partners. Model 3 postulates that specific relationship models are nested under relationship domain representations that are, in turn, nested under an overarching global working model (see Figure 1). Comparisons of model fit (using confirmatory factor analysis) consistently supported Model 3 for both attachment dimensions: avoidance and anxious/ambivalence. Moreover, these results were strikingly similar regardless of which mode of measurement was used (standard attachment scales vs. rated relationship exemplars), gender, and relationship status.

Implications and Further Questions

Questions concerning the nature and strength of the connections between global and relationship-specific attachment models are pivotal issues in (adult) attachment theory. Our results suggest the answers depend on how the level of globality versus specificity is defined and measured. Past research has reported that the links between global and specific working models are modest at best (e.g., Pierce & Lydon, 2001). However, our results show that by including relationship domain (i.e., parents, friends, and romantic partners) as a midlevel tier that mediates the connections between a global attachment style and relationship-specific models, a moderately strong set of associations between general and specific attachment representations are produced.

The existence of attachment representations specific to relationship domains is consistent with the thesis that different relationship categories may serve distinct attachment functions. Moreover, it is consistent with Bowlby's claim that attachment (both in terms of the behavioral system and the need for attachment) continues into adulthood and includes important attachment figures other than parents. Although all intimate relationships may include some same basic attachment functions and evolutionary benefits, there are, nevertheless, some obvious differences across relationship domains. For example, the mating sexual system is integrated with the attachment system in romantic relationships (and normally only romantic relationships), the caregiving system is involved in both familial relationships and romantic relationships, and the sociability and exploratory systems are possibly more dominant in friendships (Marvin & Britner, 1999; Shaver, Hazan, & Bradshaw, 1988).

In addition, social norms and roles should influence the way the attachment system is expressed in relationships both within and across domains. For example, being a mother or a sister, although part of the same familial domain, convey different expectations, responsibilities, and perhaps degrees of intimacy. These roles also differ considerably from that of a wife or girlfriend. Such differences are taken into account by separate representations for the different relationships within each domain.

The way in which attachment representations are elaborated as adults form new attachment relationships is unclear. Collins and Read (1994) argue that global models shape the construction of new specific representations, both in the initial development of the attachment representation network and when making new additions to the network. Presumably, also, relationship-specific attachment models become more distinct as experience is built up within particular relationships. Once attachment organization goes beyond an embryonic stage, however, new relationship-specific models are likely to develop in the context of the associated relationship-domain general representation to a greater extent than the overarching global working model. In addition, the content and evaluative nature of low-level representations is likely to exert strong bottom-up influences on higher order models; thus, general representations (both relationship-domain and global working models) should incorporate the most consistent, central, and influential attachment information. Pierce and Lydon (2001) found that specific attachment models

had a greater influence on the development of global models than vice versa, supporting the idea that evaluations and judgments of specific relationships are absorbed into an individual's general attachment representations. However, the impact of general attachment models on the formation of new attachment relationships has yet to be investigated. Our best bet is that both relationship-specific and general attachment representations (relationship-domain and global working models) reciprocally influence each other.

Attachment Representation Network and Relational Responding

A hierarchical model of multiple attachment representations (Model 3) provides the flexibility to operate in functional ways across relationship contexts. Thus, global models may be used most frequently with unknown relationship partners or with partners who are in ambiguous categories (e.g., friendship with sexual frisson). If a situation involves specific partners and relationships in particular relationship domains, then lower level representations may be more likely to be called into play (see Kobak & Sceery, 1988). Nevertheless, global working models may continue to be activated and partly govern cognition, emotions, and behavior in specific relational contexts (e.g., Pierce & Lydon, 2001; Simpson et al., 2002). In addition, individuals' current goals and emotions, the characteristics of the partner (e.g., gender, age, relationship type), and the nature of the unfolding interaction are likely to evoke models of relationships associated with similar partners and past experiences. For example, an argument about a romantic partner's interest in someone else is likely to activate representations of specific relationships in which these concerns have occurred in the past (see Anderson & Berenson, 2001).

Characteristics of an individual's representational network also may influence how attachment models are employed. Attachment models that are elaborate, based on greater experience, and have a frequent prior usage should be more readily accessible. For example, specific representations of an individual's long-term romantic partner are likely to be more chronically accessible than most platonic relationship models (Shaver et al., 1996). It also may be the case that relationship-specific representations that are highly consistent with general representations in the network will be more readily accessible (Baldwin et al., 1996, Study 2). In summary, which model or level of attachment representations is primarily accessed will depend on the specificity of the relationship context; individual variables, including current goals, emotions, and past experiences; and characteristics of the network, such as the accessibility and consistency of the overall model. However, even when a lower order specific relationship model is directly accessed, the entire network should continue to play a subtle but pervasive role in guiding subsequent cognitions, emotions, and behaviors.

This research also has implications for measurement issues related to attachment. On one hand, these results provide support for the common use of general scales, such as the AAQ, to assess attachment within domains such as the family, friends, and romantic relationships. On the other hand, if researchers wish to measure attachment styles or models that are truly global, then they may be advised to use measures that include all three domains. At bottom, the choice of measuring instruments will depend on both the questions being asked and the nature and generality of the constructs that the researcher is attempting to explain or predict.

Limitations and Caveats

In terms of the cognitive structure of multiple attachment representations, our results are consistent with both connectionist and standard social cognitive approaches. A classic connectionist approach would assume that all elements in a cognitive system would simultaneously influence one another until a state of stability is reached (see Smith, 1996). Such a model would not need to postulate a higher order node, such as a global attachment working model. In contrast, a standard social cognitive approach might postulate the existence of a stored higher order working model that would exert top-down pressure on the more specific representations. The CFA results cannot, on their own, distinguish between these two accounts. However, regardless of what overarching theory is used, it will need to take into account the way in which people conceptualize multiple attachment models that vary in specificity and how these are arranged in a hierarchical fashion.

To test the structure and organization of attachment representations, this research included nine relationship-specific ratings (three from each relationship domain). One question that arises is whether all these relationships qualify as full-fledged attachment figures (see Trinke & Bartholomew, 1997). However, the proof of the pudding is in the eating (to some extent). The fact that the CFA results were reliable for the specific relationship ratings in this study suggests that the relationships that participants accessed, and the procedures employed, were adequate to tap into extant attachment mental models. Admittedly, attachment figures will vary in terms of their influence on the content and nature of general representations. In our analyses, the specific relationship ratings were treated as equal indicators of domain representations, but it was clear that some relationships were more pivotal than others. For example, the association between relationship-specific ratings for partici-

pant's mother and the general familial domain were higher than for other relationships, current romantic relationship ratings were more strongly related to the romantic general model than past relationships, and the correlation between the first friendship ratings (presumably the closest) and the friendship general measure was higher than for the other friendships rated. Nevertheless, relationship-specific ratings were related in similar ways to the corresponding general domain ratings, as were the path loadings for each latent family and friendship domain factor in the confirmatory factor analyses.

This research used a university sample of mainly young adults, of whom 66% were involved in a romantic relationship and 23% were living with their partner or married. Different stages of life and romantic relationship status may affect the extent to which family, friends, or romantic relationships contribute to the fulfillment of attachment needs. For example, romantic partners may slowly become the dominant source of some attachment needs (e.g., secure base) as the term of the relationship lengthens, whereas family and friends may assume the dominant source of attachment needs for single individuals (Fraley & Davis, 1997; Hazan & Zeifman, 1999). However, it seems implausible that family and friendships will become irrelevant to the fulfillment of attachment needs even in late adulthood. Thus, we believe the overall organization of multiple attachment representations found with this sample is likely to reflect the standard configuration of an adult attachment representation network. It remains for further research, however, to test this claim.

Overall, the inevitable limitations in the methodology of this study do not detract from the importance of the findings or seriously weaken the conclusions drawn regarding the organization and structure of attachment representations. The use of two distinct methods of measurement, and their convergent findings, provides considerable validity to the findings.

Conclusion

Previous attachment theorists, especially Collins and her colleagues, have provided valuable theoretical accounts concerning the structure and organization of working models. However, our research results provide the most definitive evidence to date in support of a model that allows for three distinct levels of attachment representations: an overarching global working model, leading to relationship-domain attachment models, which are, in turn, connected to the bedrock psychological reality of specific or local relationships.

NOTES

1. Analyses also were run using a different summing procedure (dividing the items as evenly as possible in terms of item-total correlations to ensure that each resulting variable was of similar internal reliability), producing virtually identical results to those reported.

2. One model consisting of all items loading on one factor and a second model composed of the different dimension items (anxious/ambivalence and avoidance) loading on two correlated factors were tested and compared. The one-factor model showed a poor fit to the data for all three relationship domains shown by significant chi-squares, $\chi^2(9, 200) = 105.06$ to 189.66, $p < .001$, low comparative fit indices (CFI) (.69 to .81), and high root mean square errors of approximation (RMSEA) (.23 to .28). The two-factor model demonstrated a significantly better fit shown by nonsignificant chi-squares, $\chi^2(8, 200) = 10.03$ to 12.73, $p > .05$, CFIs of .99, and RMSEAs less than .08 (.04 to .06).

3. Even though Model 3 is presented as a hierarchical higher order model, the identification problems mean that statistically it is indistinguishable from a model where the first-order factors are allowed to freely correlate. However, a higher order model can be accepted over its lower-order equivalent if there is no decrease in fit (shown by the nonsignificant Lagrange Multiplier tests conducted) and if it is more theoretically meaningful. Ultimately, which model is chosen will depend on theoretical considerations and evidence apart from confirmatory factor analysis (CFA).

4. For the relationship-general measured model tests, Model 2 revealed a superior fit to Model 1, whereas with the relationship-specific model test, the reverse was true. This difference is probably due to the differences in specificity of the measurement, that is, relationship-general measures differentiate between domains to a greater extent than relationship-specific measures. However, the pivotal finding stands; namely, Model 3, which incorporates both domain differentiation and an overarching global working model, is a significantly better representation of the data in both cases.

5. As can be seen in Figure 5, the friendship domain disturbance variance in Model 3 was constrained at the lower bound (variance at or close to zero), indicating a perfect prediction of the first-order factor (friendship domain) from the second-order factor (global working model), evident as a regression coefficient of 1.0. Statistical problems (e.g., outliers, sample size, nonnormality, and factor redundancy) were ruled out, and the analysis was run again with the disturbance variance fixed to a positive figure close to 0, resulting in clean output. Given the above findings, the model was accepted with the variance at 0 and a resulting coefficient of 1.0 (Bentler, 1995; Byrne, 1994; Rindskopf & Rose, 1988).

6. Examination of the data revealed that the friendship variables for the single sample showed little relation with the other domains, in part due to higher romantic anxiety for both relationship-general and -specific measures. This suggests that current romantic relationships may positively influence romantic attachment security, resulting in anxiety levels more comparable to other domains. In the absence of a current romantic relationship, however, romantic attachment representation will be based on past relationships that are likely to have associated negative thoughts and feelings. Single participants also showed greater variability across their relationships within the friendship domain. This may be because single individuals are likely to have a greater number of friends who play a more important and influential attachment role than individuals who are involved in a romantic relationship and are likely to obtain a large percentage of their attachment needs from that relationship (e.g., see Hazan & Zeifman, 1999; Trinke & Bartholomew, 1997).

REFERENCES

Anderson, S. M., & Berenson, K. R. (2001). Perceiving, feeling, and wanting: Experiencing prior relationships in present-day interpersonal relations. In J. P. Forgas, K. D. Williams, & L. Wheeler (Eds.), *The social mind: Cognitive and motivational aspects of interpersonal behavior* (pp. 231-256). New York: Cambridge University Press.

Baldwin, M. W., & Fehr, B. (1995). On the instability of attachment style ratings. *Personal Relationships, 2*, 247-261.

Baldwin, M. W., Keelan, J. P. H., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social-cognitive conceptualization of attachment working models: Availability and accessibility effects. *Journal of Personality and Social Psychology, 71*, 94-109.

Baldwin, M. W., & Meunier, J. (1999). The cued activation of attachment relational schemas. *Social Cognition, 17*, 209-227.

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.

Bentler, P. M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software, Inc.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods and Research, 16*, 78-117.

Bowlby, J. (1980). *Attachment and Loss: Vol. 3. Loss*. New York: Basic Books.

Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. 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.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.

Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows*. Thousands Oaks, CA: Sage.

Collins, N. L., & Read, S. J. (1994). Cognitive representations of attachment: The structure and function of working models. In K. Bartholomew & D. Perlman (Eds.), *Attachment processes in adulthood: Vol. 5. Advances in personal relationships* (pp. 53-90). London: Jessica Kingsley.

Cozzarelli, C., Hoekstra, S. J., & Bylsma, W. H. (2000). General versus specific mental models of attachment: Are they associated with different outcomes? *Personality and Social Psychology Bulletin, 26*, 605-618.

Davila, J., Karney, B. R., & Bradbury, T. N. (1999). Attachment change processes in the early years of marriage. *Journal of Personality and Social Psychology, 76*, 783-802.

Feeney, J. A. (1999). Adult romantic attachments and couple relationships. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 355-377). New York: Guilford.

Fox, N. A., Kimmerly, N. L., & Schafer, W. D. (1991). Attachment to mother/attachment to father: A meta-analysis. *Child Development, 62*, 210-225.

Fraley, R. C., & Davis, K. E. (1997). Attachment formation and transfer in young adults' close friendships and romantic relationships. *Personal Relationships, 4*, 131-144.

Gerlsma, C., & Lutejin, F. (2000). Attachment style in the context of clinical and health psychology: A proposal for the assessment of valence, incongruence, and accessibility of attachment representations in various working models. *British Journal of Medical Psychology, 73*, 15-34.

Griffin, D. W., & Bartholomew, K. (1994). The metaphysics of measurement: The case of adult attachment. In K. Bartholomew & D. Perlman (Eds.), *Attachment processes in adulthood: Vol. 5. Advances in personal relationships* (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, 52*, 511-524.

Hazan, C., & Zeifman, D. (1999). Pair bonds as attachments. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 336-354). New York: Guilford.

Kirkpatrick, L. A., & Hazan, C. (1994). Attachment styles and close relationships: A four-year prospective study. *Personal Relationships, 1*, 123-142.

Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation, and perception of self and others. *Child Development, 59*, 135-146.

La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: A self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of Personality and Social Psychology, 79*, 367-384.

Lewis, M. (1994). Does attachment imply a relationship or multiple relationships? *Psychological Inquiry, 5*, 47-51.

Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin, 103*, 391-410.

Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First- and higher order factor models and their invariance across groups. *Psychological Bulletin, 97*, 562-582.

Marvin, R. S., & Britner, P. A. (1999). Normative development: The ontogeny of attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 44-67). New York: Guilford.

Mikulincer, M., & Arad, D. (1999). Attachment working models and cognitive openness in close relationships: A test of chronic and temporary accessibility effects. *Journal of Personality and Social Psychology, 77*, 710-725.

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.

Rindskopf, D., & Rose, T. (1988). Some theory and applications of confirmatory second-order factor analysis. *Multivariate Behavioral Research, 23*, 51-67.

Shaver, P. R., Collins, N., & Clark, C. L. (1996). Attachment styles and internal working models of self and relationship partners. In G. J. O. Fletcher & J. Fitness (Eds.), *Knowledge structures in close relationships: A social cognitive approach* (pp. 25-62). Mahwah, NJ: Lawrence Erlbaum.

Shaver, P. R., Hazan, C., & Bradshaw, D. (1988). Love as attachment. In R. J. Sternberg & M. L. Barnes (Eds.), *The psychology of love* (pp. 68-99). New Haven, CT: Yale University Press.

Simpson, J. A., & Rholes, W. S. (Eds.). (1998). *Attachment theory and close relationships*. New York: Guilford.

Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology, 62*, 434-446.

Simpson, J. A., Rholes, W. S., Orina, M. M., & Grich, J. (2002). Working models of attachment, support giving, and support seeking in a stressful situation. *Personality and Social Psychology Bulletin, 28*, 598-608.

Simpson, J. A., Rholes, W. S., & Phillips, D. (1996). Conflict in close relationships: An attachment perspective. *Journal of Personality and Social Psychology, 71*, 899-914.

Smith, E. R. (1996). What do connectionism and social psychology offer each other? *Journal of Personality and Social Psychology, 70*, 893-912.

Trinke, S. J., & Bartholomew, K. (1997). Hierarchies of attachment relationships in young adulthood. *Journal of Social and Personal Relationships, 14*, 603-625.

Received August 6, 2002

Revision accepted February 20, 2003