

Attachment and the investment model: Predictors of relationship commitment, maintenance, and persistence

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Abstract

This research examines adult attachment and the investment model. Study 1 tests anxiety and avoidance predicting romantic relationship commitment, mediated by satisfaction, alternatives, and investments. Additional studies added outcomes of relationship maintenance (Study 2) and persistence (Study 3). In all 3 studies, satisfaction, alternatives, and investments mediated the associations between anxiety and avoidance and relationship commitment. A direct effect of avoidance on commitment remained. The investment model variables mediated the effect of anxiety and avoidance on accommodation and willingness to sacrifice (Study 2) and relationship persistence (Study 3). Direct effects remained for avoidance on accommodation and anxiety on persistence. The mediated model was supported for men and women, proximal and long-distance relationships, and college student and community samples.

Over the past three decades, research examining the predictors of romantic relationship commitment and stability has burgeoned, and the results of this work have clearly demonstrated the importance of high-quality and stable relationships in promoting general health and happiness (Berscheid & Reis, 1998). Many studies have investigated a range of variables associated with relationship stability, including individual difference dimensions and interdependence processes (Karney & Bradbury, 1995; Le, Dove, Agnew, Korn, & Mutso, 2010). Two important theoretical perspectives have guided much of this research: adult attachment theory (Hazan & Shaver, 1994) and the investment model

(Rusbult, 1983). Despite empirical support for both adult attachment theory and the investment model in understanding commitment and stability (Kirkpatrick & Davis, 1994; Le & Agnew, 2003), little research has examined the extent that these two frameworks provide complementary perspectives (see Slotter & Finkel, 2009, for an exception). In contrast, the literature has sometimes viewed these theories as competitors in explaining variance in relationship processes (Wieselquist, Rusbult, Foster, & Agnew, 1999). The goal of the current work is to explore the theoretical underpinnings of both adult attachment theory and the investment model to develop integrative hypotheses regarding commitment and stability.

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Adult attachment theory

Attachment theory outlines a comprehensive attachment behavioral system that monitors threats to attachment security and responsiveness from a partner (Mikulincer & Shaver, 2003, 2007). An assumption of this perspective is that the quality of a relationship is

evaluated based on the attachment figure's availability, attentiveness, and responsiveness to needs (Hazan & Shaver, 1994). Although attachment theory proposes a general attachment behavioral system, much attachment research has focused on individual differences in attachment orientations. Initial experiences with a primary caregiver shape individuals' orientations to close relationships, and these orientations are theorized to influence characteristics of adult romantic relationships (Hazan & Shaver, 1994). Early research examined categorical "attachment styles" (Hazan & Shaver, 1987), but subsequent work has considered attachment along continuous dimensions (Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998). Although given different labels (e.g., Bartholomew and Horowitz's models of "self" and "other"), the two orthogonal dimensions of relationship *avoidance* and *anxiety* capture much of the variability that exists in attachment (Brennan et al., 1998). High avoidance is associated with a deactivation of the attachment behavioral system, less valuing of close relationships, and less reliance on relationships to fulfill attachment needs. Those high on the avoidance measure eschew dependency on others, rely less on others for care, prefer relationships with low levels of closeness and intimacy (Mikulincer & Shaver, 2003), and view romantic partners as consistently unresponsive and undependable (Collins & Read, 1990).

In contrast, those high on anxiety typically exhibit a hyperactivation of the attachment system. They are excessively focused on their attachment needs and intensely desire closeness and intimacy in their relationships. This hyperactivation of the attachment system, likely arising from inconsistent meeting of attachment needs in prior relationships, leads to excessive vigilance in perceiving partners' disengagement from the relationship, and individuals high on attachment anxiety experience heightened levels of jealousy and worry about abandonment (Mikulincer & Shaver, 2003). A person's attachment-related memories, beliefs, expectations, needs, and strategies for attaining these needs form one's *working model* of attachment (e.g., Collins

& Allard, 2001; Collins & Read, 1990), which guides cognition and behavior within relationships.

An important feature of attachment theory is that it describes how prior social experiences influence internal working models of attachment, and these corresponding ideographic attachment profiles, in turn, are associated with current relationship cognition and behavior (Hazan & Shaver, 1994). Attachment dimensions predict a wide range of relationship variables and outcomes, including relationship quality (Pistole, Clark, & Tubbs, 1995; Saavedra, Chapman, & Rogge, 2010), trust (Collins & Read, 1990), and social support (Collins, Ford, & Feeney, 2011), among many others (Mikulincer & Shaver, 2007). Given the theoretical strength and comprehensiveness of the model, it is not surprising that adult attachment theory has been applied to understand relationship commitment and stability (Morgan & Shaver, 1999). However, other theoretical perspectives have also been used to understand commitment and stability in relationships, including the investment model (Rusbult, 1983).

The investment model

The investment model outlines a framework for understanding relationship commitment (Rusbult, 1980, 1983). Although there are other perspectives on commitment, including Levinger's (1999) attraction-barrier model and Johnson, Caughlin, and Huston's (1999) tri-partite model of commitment, the investment model provides a particular process and structure for predicting commitment that has been extensively supported (Le & Agnew, 2003).

The investment model is grounded in interdependence theory (Thibaut & Kelley, 1959) and posits that satisfaction with, alternatives to, and investments in a relationship uniquely predict relationship commitment. The construct of satisfaction comes directly from interdependence theory in that the rewards and costs associated with a relationship combine to create the overall level of relationship outcomes (i.e., positivity or negativity). Interdependence theory posits that outcomes are

compared with one's expectations, or *comparison level*. If the outcomes received from a relationship exceed the comparison level, then a person is satisfied, but if the outcomes fall short of the comparison, dissatisfaction arises.

Quality of alternatives refers to the level of outcomes available from the next best relationship, known as the *comparison level for alternatives*. Finally, although not included in early interdependence work (Thibaut & Kelley, 1959), investments refer to access to outcomes over time and corresponds to the desired outcomes that would be lost on relationship termination (e.g., shared resources, time spent on the relationship; Goodfriend & Agnew, 2008).

The investment model posits that these three variables, satisfaction, alternatives, and investments, predict commitment (Rusbult, 1980). Commitment is the motivation to maintain a relationship because outcomes meet or exceed expectations (i.e., high satisfaction), desired outcomes are not available from other relationships (i.e., low alternatives), and/or outcomes would be lost if the relationship was to end (i.e., high investments). The investment model has been well replicated, with satisfaction, alternatives, and investments jointly accounting for two thirds of the variance in commitment (Le & Agnew, 2003). Commitment predicts both relationship-maintaining behaviors (Rusbult, Wieselquist, Foster, & Witcher, 1999) and relationship persistence (Etcheverry & Agnew, 2004; Le et al., 2010).

Adult attachment, interdependence theory, and the investment model

Researchers have theorized about the interface between interdependence and attachment (Hazan & Shaver, 1994; Rusbult, Arriaga, & Agnew, 2001), but little empirical work has considered them simultaneously (with some exceptions; e.g., Campbell, Simpson, Kashy, & Rholes, 2001; Pistole et al., 1995). Some research view them as competing theories, testing which respective framework explains more variance in relational outcomes (e.g., maintenance; Wieselquist et al., 1999). However, the current work considers the investment model and attachment theory

as complementary in understanding relationship quality and stability.

As previously described, individuals' perceptions of outcomes associated with current and alternative relationships indicate the general positivity (or negativity) of those relationships and underlie the constructs that together comprise the investment model. Individual differences in how people think about and experience relationships, such as attachment anxiety and avoidance, can influence perceptions of and expectations for interactions with romantic partners and evaluations of outcomes (Hazan & Shaver, 1994; Rusbult et al., 2001).

Some theorists have considered the connections between adult attachment, interdependence theory, and investment model perspectives. Hazan and Shaver (1994) have argued that attachment influences an individual's needs, expectations, and estimates of benefits and costs associated with interpersonal interactions. Consistent with this perspective, individuals low in avoidance and anxiety believe others to be more altruistic and trustworthy (Collins & Read, 1990). In lexical decision tasks, secure attachment (low avoidance and low anxiety) was associated with faster responses to positive relationship outcomes, whereas avoidance facilitated responses to negative outcomes (Baldwin, Fehr, Keedian, Seidel, & Thomson, 1993). Participants primed with attachment security have better recall for positive attachment words and more positive interpersonal expectations, whereas an anxiety prime resulted in more negative interpersonal expectations (Rowe & Carnelley, 2003). In addition, avoidant individuals were more likely to view a hypothetical other to possess unwanted self-descriptive traits (Mikulincer & Horesh, 1999). As described earlier, attachment dimensions are relevant to positive or negative views of others and expectations of partners (Bartholomew & Horowitz, 1991). Drawing on this prior research, attachment dimensions can be argued to influence relational expectations and the benefits and costs that underlie relationship satisfaction, alternatives, and investments. Considering attachment through such a lens allows it to fit clearly into the

underlying bases of cognition and behavior as described by interdependence theory (Kelley & Thibaut, 1978).

An important aspect of interdependence theory and investment model is that members or relationships must transform individualistic, self-serving motives into couple-focused, relationship-serving motives. This “transformation of motivation” process is theorized to be what allows individuals to develop a relationship-serving orientation and relationship-maintaining goals (i.e., commitment; Kelley & Thibaut, 1978). While discussing adult attachment and interdependence theory, Rusbult and colleagues (2001) argue that attachment influences the transformations of motivation people are able to make. Although it was not couched in an interdependence theory framework, Mikulincer, Florian, Cowen, and Cowen (2002) make a similar argument that attachment dimensions should influence “interaction goals of togetherness” (p. 416) in relationships. These previous findings support the relevance of avoidance and anxiety to the rewards and costs that underlie satisfaction, alternatives, and investments.

On the basis of the connections made between attachment and interdependence theory and the investment model, predictions can be developed regarding how attachment dimensions are associated with satisfaction with, alternatives to, and investments in a romantic relationship (Rusbult, 1983).

Attachment and the investment model variables

Attachment and satisfaction

As previously discussed, attachment is argued to contribute to expectations in relationships as well as experiences of rewards and costs that influence the outcomes that form the basis of satisfaction. Anxiety is associated with more fears of abandonment and jealousy (Mikulincer & Shaver, 2003). In addition, high anxiety is associated with perceiving more conflict, less security, and being more sensitive to rejection (Campbell, Simpson, Boldry, & Kashy, 2005). These concerns of highly anxious people should be associated with lowered rewards and higher costs in

relationships. Avoidant people expect others will be unreliable and unresponsive to their needs (Collins & Read, 1990). These negative expectations will be associated with lowered relationship rewards and higher costs as well as less ability to develop relationship-promoting goals and motivations. According to interdependence theory, low rewards and high costs, along with more self-focused goals and motivations, will result in lowered relationship outcomes and decreased satisfaction in those with higher anxiety or avoidance. In support of this prediction, prior research has found that the avoidance and anxiety dimensions are negatively associated with relationship satisfaction (Pistole et al., 1995; Saavedra et al., 2010), and we expect similar findings in the current study.

Attachment and alternatives

There is less extant work on the associations between attachment and alternatives; however, Pistole and colleagues (1995) found no significant differences in perceived quality of alternatives between attachment orientations. However, this past work used categorical measures of attachment, and by using continuous measures, the current research will have greater sensitivity to detect associations between attachment dimensions and alternatives.

From an interdependence perspective, lower quality of alternatives is associated with greater dependence on a current relationship (Rusbult, 1983). Given their discomfort with intimacy and dependence (Mikulincer & Shaver, 2003), it is likely that avoidant individuals lessen feelings of dependence by perceiving more alternatives. In contrast, anxiety is associated with a desire for increased intimacy and closeness with a current partner (Mikulincer & Shaver, 2003), and discounting alternatives would increase dependence. However, research has also indicated that higher anxiety is associated with more negative reactions to breakup (Davis, Shaver, & Vernon, 2003), but expecting to have a new romantic partner is associated with less negative reactions to breakup (Spielmann, MacDonald, & Wilson, 2009). Inconsistent past research findings (Pistole et al., 1995) make it difficult to

make a clear prediction between anxiety and relationship alternatives, as past research findings have been inconsistent. Therefore, we hypothesize a positive association between alternatives and avoidance but will examine the association between anxiety and alternatives as a research question.

Attachment and investments

Following from prior research indicating avoidant individuals have negative perceptions and expectations of others, avoidant individuals should invest less in a romantic relationship. In addition, avoidant individuals should be less willing to invest in a relationship to minimize dependence on the relationship (Pistole et al., 1995). So avoidance is hypothesized to be associated negatively with investing in a romantic relationship. Anxious individuals desire increased closeness with a partner (Mikulincer & Shaver, 2003). Developing strong investments in a relationship can act to tie one's self to a partner and the relationship-strengthening feelings of closeness. Therefore, anxious individuals desire for closeness leads to the prediction that anxiety will be positively associated with investments.

Investment model variables and prediction of commitment

In line with meta-analytic results regarding the investment model (Le & Agnew, 2003), we predict that satisfaction and investments are positively associated and alternatives negatively associated with commitment.

Mediation of attachment predicting commitment and commitment-related behavior

Past research has shown attachment orientations to be significantly associated with relationship commitment (Mikulincer & Erev, 1991; Pistole et al., 1995; Shaver & Brennan, 1992). However, the central tenet of the investment model is that satisfaction, alternatives, and investments (Rusbult, 1983) are the bases of relationship commitment. Research on adult attachment and commitment has not considered the mediational role of the bases of commitment.

Satisfaction, alternatives, and investments together determine the subjective experience of dependence in the form of commitment (Le & Agnew, 2003). If attachment working models, in part, determine satisfaction, alternatives, and investments with a relationship, then it follows that these variables will mediate the association between attachment dimensions and commitment.

In addition, prior research has found that commitment predicts a wide range of relationship-relevant cognition and behavior (see Rusbult et al., 1994, for a review) and relationship persistence (Le & Agnew, 2003). Avoidance and anxiety have also been found to predict many of these same relationship cognitions and behaviors. If the investment model, primarily commitment, cannot mediate the attachment dimensions association with commitment-related relationship cognition and behavior, this mediational approach has limited utility for understanding interpersonal relationships. However, if as predicted the investment model mediates the association of anxiety and avoidance with commitment-related relationship cognition and behavior, it strengthens the value of this mediational approach for connecting attachment theory and the investment model, while also contributing to our understanding of interpersonal relationships.

This research

Three studies were conducted to test the links between attachment dimensions and investment model variables. Study 1 examines anxiety and avoidance predicting commitment, mediated by investment model variables. Studies 2 and 3 replicate this mediated model and include the outcomes of relationship maintenance (Study 2) and persistence (Study 3). The current research also tests whether the model replicates across different samples. Although no differences are hypothesized across samples, these analyses are important to demonstrate that the proposed model replicates across groups. Studies 1 and 2 compare the models for men and women, while Study 2 also compares long-distance versus proximal relationships. Study

3 compares college student to noncollege student samples.

Study 1

Method

Participants

Participants were 334 undergraduates (62% male) from a university in the United States involved in romantic relationships (99% heterosexual) who participated for course credit. The majority of the sample was White/Caucasian (92%; 3% Hispanic/Latino, 2% Asian American, 3% Other), and the average age was 20.40 years ($SD = 1.41$). All participants indicated that they were involved in a romantic relationship; among them, 6.9% of participants were married or engaged. The majority (73.1%) of participants had been in their romantic relationships for at least over 6 months (6.6% for over 4 years; 26.3% for 2–4 years; 24% for 1–2 years; 16.2% for 6–12 months; 15.9% for 2–6 months; 11.1% for 1–2 months).

Procedure and measures

Participants completed the measures during a mass-testing session. Along with demographic measures, participants completed a shortened version of the Investment Model Scale (Rusbult, Martz, & Agnew, 1998) to assess commitment (five items; $\alpha = .93$), satisfaction (three items; $\alpha = .93$), alternatives (three items; $\alpha = .67$), and investments (three items; $\alpha = .90$). The attachment dimensions of avoidance (six items; $\alpha = .82$) and anxiety (six items; $\alpha = .71$) were assessed with a shortened version of the Experiences in Close Relationships Scale (ECRS–Short Form; Wei, Russell, Mallinckrodt, & Vogel, 2007). Given the constraints of mass testing, shortened versions of measures were used; however, the reliabilities of the items were acceptable.

Results

Preliminary analyses

For anxiety, avoidance, and commitment, three separate indicators (parcels) were created for each variable (Russell, Kahn, Spoth,

& Altmaier, 1998). An exploratory factor analysis with maximum likelihood method was performed for the items of anxiety, avoidance, and commitment, respectively (the exploratory factor analysis [EFA] results are available on request from the authors). The items were sorted from the highest to the lowest values according to their factor loadings. We took two items (one item has the highest factor loading and the other has the lowest factor loading) to one of three parcels (Parcels A, B, or C) successively to make the parcels. These parcels represented the anxiety, avoidance, and commitment latent variables.

Table 1 presents the means, standard deviations, and zero-order correlations for 18 observed variables. A multivariate normality test indicated that the data violated the multivariate normality assumption, $\chi^2(2, N = 334) = 960.283, p < .001$. Therefore, we report the results of scaled chi-square statistics (Satorra & Bentler, 1988) to adjust for nonnormality.

Measurement model of the commitment model

A two-step approach of structural equation modeling (Anderson & Gerbing, 1988) was used, with a confirmatory factor analysis to test the measurement model, followed by a structural model. The measurement and structural models used LISREL 8.54 with the maximum likelihood method. Three indices of fit were used (Hu & Bentler, 1999): the comparative fit index (CFI; values of 0.95 or greater are acceptable), the root mean square error of approximation (RMSEA; values of 0.06 or less are acceptable), and the standardized root mean square residual (SRMR; values of 0.08 or less are acceptable).

The measurement model provided an appropriate fit to the data, $\chi^2(120, N = 334) = 274.13, p < .001$; scaled $\chi^2(120, N = 334) = 226.87, p < .001$; CFI = 0.98, RMSEA = 0.05, 90% CI [0.04, 0.06], SRMR = 0.07. The factor loadings were significant ($p < .001$), indicating these variables appropriately measured the latent variables. All latent variables were significantly correlated (Table 2), except anxiety and alternatives and anxiety and investments.

Table 1. Means, standard deviations, and correlations among 18 observed variables of Study 1

Observed variable	M	SD	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Anxiety 1	6.69	2.90	0.49	0.51	0.30	0.22	0.34	-0.31	-0.28	-0.26	-0.04	-0.02	0.06	-0.08	-0.14	-0.12	-0.29	-0.24	-0.21
2. Anxiety 2	6.41	2.55	—	0.53	0.19	0.09	0.20	-0.29	-0.23	-0.30	-0.08	-0.08	0.06	0.02	-0.04	-0.01	-0.25	-0.21	-0.15
3. Anxiety 3	6.89	2.48	—	—	0.13	0.03	0.16	-0.16	-0.13	-0.15	-0.02	-0.10	0.00	0.03	0.01	0.07	-0.15	-0.11	-0.05
4. Avoid 1	4.55	2.26	—	—	—	0.65	0.71	-0.50	-0.48	-0.51	-0.02	0.14	0.23	-0.41	-0.48	-0.44	-0.52	-0.53	-0.50
5. Avoid 2	4.53	2.18	—	—	—	—	0.70	-0.49	-0.49	-0.51	-0.03	0.18	0.26	-0.44	-0.51	-0.50	-0.59	-0.62	-0.57
6. Avoid 3	4.88	2.43	—	—	—	—	—	-0.54	-0.53	-0.53	-0.04	0.21	0.29	-0.41	-0.52	-0.49	-0.60	-0.62	-0.55
7. Satisfaction 1	7.53	1.72	—	—	—	—	—	—	0.79	0.87	0.18	-0.14	-0.24	0.35	0.54	0.48	0.74	0.72	0.76
8. Satisfaction 2	7.25	1.87	—	—	—	—	—	—	—	0.78	0.15	-0.10	-0.16	0.39	0.53	0.52	0.67	0.71	0.64
9. Satisfaction 3	7.72	1.68	—	—	—	—	—	—	—	—	0.21	-0.13	-0.18	0.36	0.55	0.46	0.72	0.75	0.76
10. Alternative 1	5.78	2.28	—	—	—	—	—	—	—	—	—	0.32	0.24	0.11	0.11	0.13	0.10	0.13	0.18
11. Alternative 2	5.45	2.30	—	—	—	—	—	—	—	—	—	—	0.65	-0.05	-0.16	-0.15	-0.24	-0.23	-0.14
12. Alternative 3	4.40	2.34	—	—	—	—	—	—	—	—	—	—	—	-0.11	-0.20	-0.19	-0.32	-0.32	-0.23
13. Investment 1	6.89	1.97	—	—	—	—	—	—	—	—	—	—	—	—	0.71	0.70	0.46	0.54	0.51
14. Investment 2	7.28	1.85	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.61	0.70	0.71
15. Investment 3	6.99	1.92	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.52	0.65	0.63
16. Commitment 1	7.60	1.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.82	0.77
17. Commitment 2	7.51	1.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18. Commitment 3	7.82	1.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note. N = 334. Anxiety 1, 2, 3 = three parcels from the anxiety subscale of Experiences in Close Relationships Scale; Avoid 1, 2, 3 = three parcels from the avoidance subscale of Experiences in Close Relationships Scale; Satisfaction 1, 2, 3 = three parcels from the Satisfaction scale; Alternative 1, 2, 3 = three parcels from the Alternative scale; Investment 1, 2, 3 = three parcels from the Investment scale; Commitment 1, 2, 3 = three parcels from the Commitment scale. Correlations greater than |0.13| are significant at $p < .01$.

Table 2. Correlations among latent variables for the measurement model of Study 1

Latent variable	1	2	3	4	5	6
1. Attachment anxiety	—	0.32***	-0.37***	-0.03	-0.06	-0.29***
2. Attachment avoidance		—	-0.67***	0.32***	-0.65***	-0.76***
3. Satisfaction			—	-0.20**	0.60***	0.88***
4. Alternatives				—	-0.20**	-0.32***
5. Investments					—	0.78***
6. Commitment						—

Note. $N = 334$.

** $p < .01$. *** $p < .001$.

Structural model

The structural model (Figure 1) provided an appropriate fit to the data, and the scaled chi-square statistics and fit indices were identical with the measurement model. All structural paths were significant ($p < .05$), except anxiety to alternatives and anxiety to commitment. Moreover, 48% of variance in satisfaction, 12% of variance in alternatives, and 44% of variance in investments were explained by

anxiety and avoidance. For commitment, 89% of variance was explained by avoidance, satisfaction, alternatives, and investments.

The bootstrap procedure for indirect effects

We used the bootstrap procedure (Shrout & Bolger, 2002) to test the indirect effect for our structural model. To begin, 1,000 estimations for each path coefficient were created by

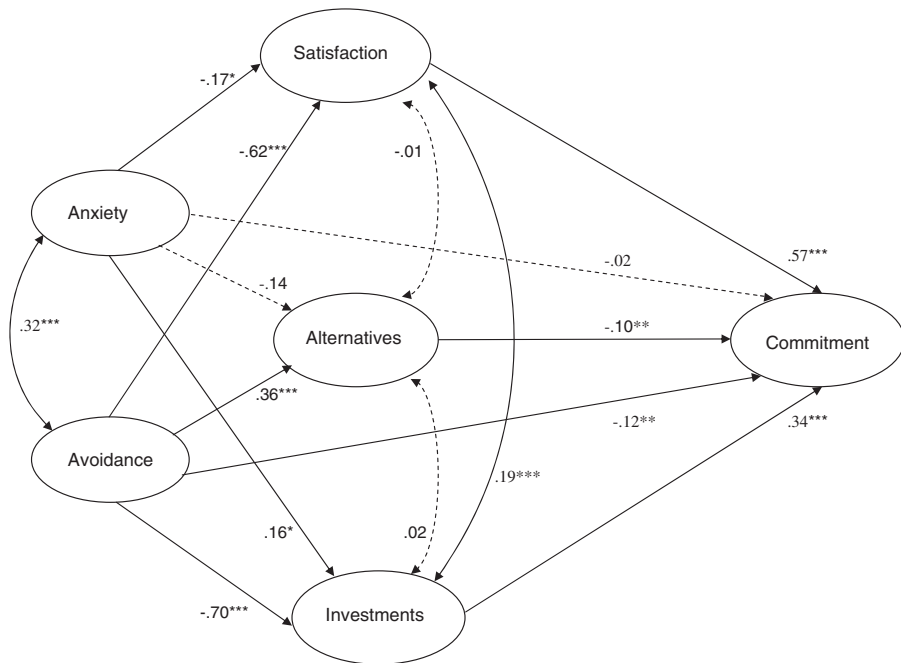


Figure 1. The commitment model (Study 1).

Note. $N = 334$. Latent variables were indicated by the three parcels described in the Method section.

* $p < .05$. ** $p < .01$. *** $p < .001$.

random sampling and replacement ($N = 334$). Next, we calculated the indirect effect for anxiety and avoidance on commitment through each of the three mediators (i.e., satisfaction, alternatives, and investments). All indirect effects were significant ($p < .05$; Table 3), except the indirect effect from anxiety to commitment through alternatives.

To test for gender differences, a freely estimated model, where paths were allowed to differ for men and women, $\chi^2(252, N = 334) = 445.29, p < .001$; CFI = 0.98, RMSEA = 0.06, 90% CI [0.05, 0.08], SRMR = 0.07, was compared with a constrained model, where paths for men and women were constrained to be equivalent, $\chi^2(263, N = 334) = 461.83, p < .001$; CFI = 0.98, RMSEA = 0.07, 90% CI [0.05, 0.08], SRMR = 0.10. The chi-square difference between these two models was nonsignificant, $\Delta\chi^2(11, N = 334) = 16.54, p > .05$, and the model was equivalent for men and women.

Discussion

The results of Study 1 support the predicted associations between attachment dimensions and the investment model variables (Rusbult, 1983). No explicit hypothesis was proposed for the association between anxiety and alternatives and no significant relation was found between these two variables. Attachment explained a significant amount of variance in all three bases of dependence. These findings are consistent with prior research and theorizing on attachment and the investment model (Hazan & Shaver, 1994; Rusbult et al., 2001). In addition, the prediction of commitment by avoidance was mediated by satisfaction, alternatives, and investments and the prediction of commitment by anxiety was mediated by both satisfaction and investments.

A direct negative path from avoidance to relationship commitment remained, even after controlling for satisfaction, alternatives, and investments. High levels of avoidance are associated with dismissing close relationships and avoiding dependence on a partner (Collins & Read, 1994). Highly avoidant people may purposely decrease their feelings of

Table 3. *Bootstrap analyses of the magnitude and statistical significance of indirect effects for Study 1*

Independent variable	Mediator variable	Dependent variable	β standardized indirect effect	Mean indirect effect (b) ^a	SE of mean ^a	95% CI, bias-corrected bootstrap ^a (lower and upper)
Anxiety	Satisfaction ↑	Commitment	$(-0.17) \times (0.57) = -0.10$	-0.07687	0.03664	-0.168, -0.011
Anxiety	Alternative ↑	Commitment	$(-0.10) \times (-0.09) = 0.01$	0.00959	0.00811	-0.002, 0.033
Anxiety	Investment ↑	Commitment	$(0.11) \times (0.29) = 0.03$	0.04069	0.02328	0.011, 0.090
Avoidance	Satisfaction ↑	Commitment	$(-0.55) \times (0.55) = -0.30$	-0.30111	0.04894	-0.406, -0.215
Avoidance	Alternative ↑	Commitment	$(0.21) \times (-0.09) = -0.02$	-0.02885	0.01216	-0.061, -0.011
Avoidance	Investment ↑	Commitment	$(-0.61) \times (0.29) = -0.18$	-0.20496	0.04247	-0.312, -0.138

Note. $N = 334$. CI = confidence interval.

^aThese values based on unstandardized path coefficients.

commitment to a relationship to decrease feelings of dependence.

Study 2

Study 2 expands on Study 1 by examining the investment model variables as mediators of the association of attachment dimensions with relationship-maintaining behaviors. Prior studies have found an association between attachment and relationship maintenance (Canary, Stafford, & Semic, 2002; Dainton, 2007; Guerrero & Bachman, 2006; Morgan & Shaver, 1999). However, these studies did not investigate commitment or investment model variables as mediators of the association between attachment and relationship maintenance.

Simply demonstrating that the attachment dimensions prediction of commitment is mediated by the investment model, as was done in Study 1, is just a step in testing the theorized mediational relationship between attachment dimensions and the investment model. It is equally important to demonstrate that attachment dimensions prediction of commitment-relevant behavior is also mediated by the investment model. If the proposed mediational associations between attachment dimensions and the investment model are correct, then commitment, as the most proximal predictor of relationship maintenance and persistence, should mediate the association of the investment model variables and attachment dimensions with relationship maintenance behaviors. Therefore, Study 2 will explicitly test the hypothesis that the investment model, and specifically commitment, mediates the association of the attachment dimensions with relationship maintenance.

One study examining the investment model and attachment theory did test the ability of both models to predict relationship maintenance variables (Wieselquist et al., 1999). In this study, attachment dimensions predicted a small amount of variance in prorelationship behaviors beyond the investment model. Wieselquist and colleagues (1999) treated attachment and investment variables as competing predictors, suggesting that the results are due to the investment model being more

directly relevant to a specific relationship than the more general, personality-like attachment variables. However, these prior results also fit into the current mediational predictions as the more distal attachment dimensions would be expected to explain less variance in prorelationship behaviors than more proximal, mediating investment model variables.

The current study examines two common relationship maintenance behaviors: accommodating, or responding positively to negative partner behavior (Rusbult, Yovetich, & Verette, 1996), and a willingness to sacrifice to maintain a romantic relationship. Prior research has found commitment to be a strong predictor of both accommodation and a willingness to sacrifice (Etcheverry & Le, 2005), making these particularly commitment-relevant variables for testing the proposed mediational model.

Method

Participants

Participants were 205 undergraduates at a large Midwestern university who participated for partial fulfillment of course credit (54% female). The majority of the sample self-identified as White/Caucasian (85%; 6% Asian American, 3% African American, 3% Hispanic/Latino, 2% Other), and the average age was 19.61 years ($SD = 1.48$). All participants were involved in romantic relationships (98% heterosexual); among them, 6.4% of participants were married or engaged. About 75.5% of the participants had been in the romantic relationships for at least over 6 months (6.4% for over 4 years; 22.1% for 2–4 years; 24.5% for 1–2 years; 22.5% for 6–12 months; 22.5% for 2–6 months; 2% between 1 and 2 months). The median dating duration was 14 months ($M = 18.68$ months, $SD = 16.19$) and 43.1% were in long-distance relationships (LDRs).

Procedure and measures

The Investment Model Scale (Rusbult et al., 1998) measured commitment (7 items; $\alpha = .93$), satisfaction (5 items; $\alpha = .92$), alternatives (5 items; $\alpha = .81$), and investments

(5 items; $\alpha = .78$). The attachment dimensions of avoidance (18 items; $\alpha = .90$) and anxiety (18 items; $\alpha = .89$) were assessed with the ECRS (Brennan et al., 1998).

Accommodation was assessed with a 12-item scale ($\alpha = .74$; modified from Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991; e.g., “When my partner is angry with me and ignores me for awhile, I consider breaking up”; “When my partner is rude and inconsiderate with me, I talk to him/her about what’s going on”), and willingness to sacrifice was measured with a 3-item scale ($\alpha = .84$; e.g., “I am willing to take on more responsibilities than my partner if it is important for our relationship”; Etcheverry & Le, 2005).

Results

Similar to Study 1, three indicators (parcels) were created for each of the above measures to represent the latent variables.

The measurement and structural model for the relationship maintenance model

The first analyses tested a hypothesized relationship maintenance model (Figure 2;

adding accommodation and willingness to sacrifice into the commitment model). The measurement model provided an appropriate fit for the data, $\chi^2(224, N = 205) = 375.54, p < .001$; scaled $\chi^2(224, N = 205) = 306.01, p < .001$; CFI = 0.98, RMSEA = 0.04, 90% CI [0.03, 0.05], SRMR = 0.05. The correlations among the latent variables are presented in Table 4. The structural model showed an acceptable fit to the data, $\chi^2(230, N = 205) = 384.49, p < .001$; scaled $\chi^2(230, N = 205) = 314.95, p < .001$; CFI = 0.98, RMSEA = 0.04, 90% CI [0.03, 0.05], SRMR = 0.05. As shown in Figure 2, all structural paths were significant ($p < .05$) with five exceptions: the paths from anxiety to alternatives, commitment, accommodation, and willingness to sacrifice, respectively. As well, the association between avoidance and willingness to sacrifice was non-significant. In this structural model, 22% of the variance in satisfaction, 13% of the variance in alternatives, and 20% of the variance in investments were explained by anxiety and avoidance. Also, 75% of the variance in commitment was explained by avoidance, satisfaction, alternatives, and investments. Finally,

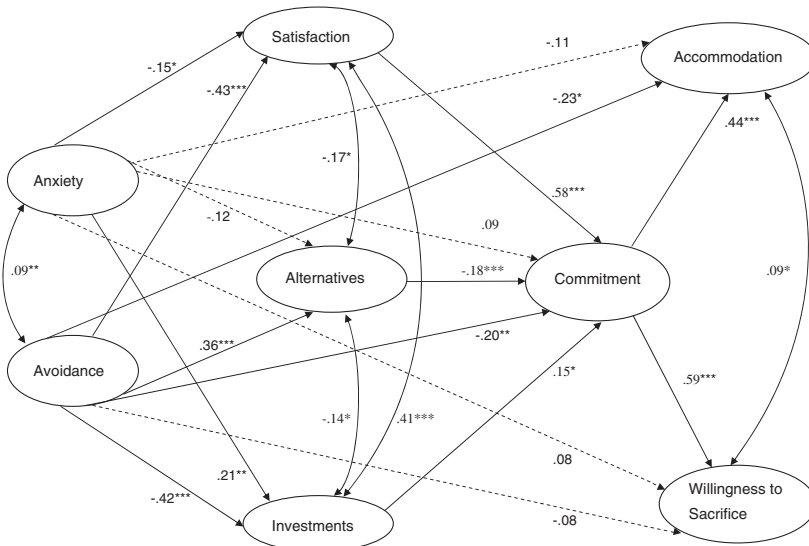


Figure 2. The relationship maintenance model (Study 2).

Note. $N = 334$. Latent variables were indicated by the three parcels described in the Method section.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Correlations among latent variables for the measurement model of Studies 2 and 3

Latent variable	1	2	3	4	5	6	7	8
1. Attachment anxiety	—	0.09	-0.19**	-0.08	0.17*	0.01	-0.13	0.08
2. Attachment avoidance	0.18**	—	-0.44***	0.34***	-0.40***	-0.57***	-0.49***	-0.41***
3. Satisfaction	-0.24***	-0.35***	—	-0.30***	0.55***	0.79***	0.45***	0.47***
4. Alternatives	0.03	0.23**	-0.23**	—	-0.29***	-0.48***	-0.30***	-0.23**
5. Investments	0.19**	-0.27***	0.30***	-0.31***	—	0.61***	0.25***	0.49***
6. Commitment	0.00	-0.36***	0.48***	-0.57***	0.40***	—	0.58***	0.64***
7. Accommodation	—	—	—	—	—	—	—	—
8. Willingness to sacrifice	—	—	—	—	—	—	—	—
9. Time 2 persistence	-0.17**	-0.14*	0.19**	-0.24**	0.10	0.23**	—	—

Note. $N = 205$. Study 2 correlations presented above the diagonal; Study 3 correlations presented below the diagonal. * $p < .05$. ** $p < .01$. *** $p < .001$.

38% of the variance in accommodation and 41% of the variance in the willingness to sacrifice were explained by commitment and avoidance.

Replicating Study 1

The Study 2 analyses replicate a test of the structural model in Study 1 (Figure 1: the commitment model). As can be seen in Figure 2, the pattern of the results for the commitment model were identical to the results found in Study 1.

The bootstrap procedure for indirect effects

A bootstrap procedure to test the indirect effects for the prediction of commitment provided similar results as Study 1, except the indirect effects from anxiety through investment to commitment ($z = -1.72, p = .09$) and from avoidance through investment to commitment ($z = 1.75, p = .08$) only approached significance in Study 2.

The bootstrap procedure tested the indirect effects of the attachment dimensions predicting accommodation and willingness to sacrifice in the relationship maintenance model (Figure 2). In total, 9 of 12 indirect effects were significant ($p < .05$; Table 5).

Gender differences were tested for the structural model (Figure 2), freely estimated model, $\chi^2(476, N = 205) = 707.16, p < .001$; CFI = 0.97, RMSEA = 0.04, 90% CI [0.02, 0.06], SRMR = 0.07; constrained model, $\chi^2(493, N = 205) = 723.86, p < .001$; CFI = 0.98, RMSEA = 0.07, 90% CI [0.05, 0.08], SRMR = 0.10, and the chi-square difference between these two models was nonsignificant, $\Delta\chi^2(17, N = 205) = 16.7, p > .05$, indicating that the structural model (Figure 2) did not significantly differ based on participant gender. Comparisons for the structural model were also made comparing participants in proximal versus LDRs. Again a free model, $\chi^2(252, N = 205) = 435.99, p < .001$; CFI = 0.96, RMSEA = 0.08, 90% CI [0.06, 0.09], SRMR = 0.08, and a constrained model, $\chi^2(263, N = 205) = 444.05, p < .001$; CFI = 0.98, RMSEA = 0.07, 90% CI [0.06, 0.09], SRMR

Table 5. *Bootstrap analyses of the magnitude and statistical significance of indirect effects for Study 2*

Independent variable	Mediator variables	Dependent variable	β standardized indirect effect ^a	Mean indirect effect (b) ^a	SE of mean ^a	95% CI, bias-corrected bootstrapped ^a (lower and upper)
Anxiety	Satisfaction → commitment	Accommodation	$(-0.15) \times 0.58 \times 0.44 = -0.04$	-0.0248	0.0124	-0.055, -0.005
Anxiety	Alternative → commitment	Accommodation	$(-0.12) \times (-0.18) \times 0.44 = 0.01$	0.0064	0.0057	-0.002, 0.022
Anxiety	Investment → commitment	Accommodation	$(0.21) \times 0.15 \times 0.44 = 0.01$	0.0097	0.0091	0.001, 0.029
Anxiety	Satisfaction → commitment	Sacrifice	$(-0.15) \times 0.58 \times 0.59 = -0.05$	-0.0144	0.0078	-0.036, -0.002
Anxiety	Alternative → commitment	Sacrifice	$(-0.12) \times (-0.18) \times 0.59 = 0.01$	0.0035	0.0031	-0.00, 0.011
Anxiety	Investment → commitment	Sacrifice	$(0.21) \times 0.15 \times 0.59 = 0.02$	0.0056	0.0055	0.001, 0.017
Avoidance	Satisfaction → commitment	Accommodation	$(-0.43) \times 0.58 \times 0.44 = 0.11$	-0.0847	0.0261	-0.158, -0.044
Avoidance	Alternative → commitment	Accommodation	$0.36 \times (-0.18) \times 0.44 = -0.03$	-0.0214	0.0077	-0.043, -0.009
Avoidance	Investment → commitment	Accommodation	$(-0.42) \times 0.15 \times 0.44 = -0.03$	-0.02194	0.01458	-0.054, 0.001
Avoidance	Satisfaction → commitment	Sacrifice	$(-0.43) \times 0.58 \times 0.59 = -0.15$	-0.0480	0.0146	-0.086, -0.026
Avoidance	Alternative → commitment	Sacrifice	$0.36 \times (-0.18) \times 0.59 = -0.04$	-0.0123	0.0049	-0.026, -0.006
Avoidance	Investment → commitment	Sacrifice	$(-0.42) \times 0.15 \times 0.59 = -0.04$	-0.0128	0.0085	-0.032, -0.001

Note. N = 205. Sacrifice = willingness to sacrifice; CI = confidence interval.

^aThe values of indirect effects are unstandardized path coefficients.

= 0.09, were compared and the chi-square difference was nonsignificant, $\Delta\chi^2(11, N = 205) = 8.06, p > .05$, indicating no difference between proximal and LDRs.

Discussion

The results of Study 2 partially supported the prediction that relationship commitment would mediate the association of the attachment dimensions with relationship-maintaining behaviors. Consistent with Study 1, satisfaction, alternatives, and investments again mediated the associations between attachment dimensions and relationship commitment. The results of the mediational analyses of Study 2 suggest that much of the association of the attachment dimensions with accommodation and willingness to sacrifice is mediated through the investment model variables and relationship commitment.

One unexpected finding was the negative direct association between avoidance and accommodation. The attachment behavioral system is activated by relationship stimuli relevant to attachment security and needs (Mikulincer & Shaver, 2003), and prior research has shown that those high in avoidance tend to hold a negative internal working model of others (Pietromonaco & Feldman-Barrett, 2000). The accommodation scenarios describing negative partner behavior likely activated the attachment behavioral system. Once activated, the attachment behavioral system will motivate behavior in response to the perceived threat. The negative internal working model of others likely contributes to making more avoidant individuals less able and less willing to respond positively to negative partner behaviors. Therefore, even when commitment is high, avoidant individuals may have less ability to respond positively to negative partner behavior.

Study 3

Commitment mediates the associations between satisfaction, alternatives, and investments and persistence in a romantic relationship (Le & Agnew, 2003; Rusbult et al., 1998). Prior research has also found that

attachment orientations are associated with relationship persistence (Kirkpatrick & Davis, 1994; Klohnen & Bera, 1998); however, these studies did not measure commitment and therefore it is difficult to determine whether attachment has a direct association with relationship persistence or whether it is mediated by commitment. One exception is the study by Davis (1999), which found commitment partially mediated the association of anxiety and avoidance with relationship stability. However, this study did not investigate satisfaction, alternatives, and investments; therefore, a more complete test of the mediational paths to relationship persistence was not tested.

Again, the usefulness of this mediational approach depends on the ability of the investment model to mediate the association of the attachment dimensions with important relationship behaviors and outcomes. A key prediction of this proposed mediational approach is that commitment, along with the other investment model variables, should mediate the association of attachment dimensions with relationship persistence. Study 3 examines this prediction by including measures of relationship persistence over time and testing mediation by the investment model variables in a sample of college students and noncollege participants.

Method

Participants

Participants were 395 individuals (86% female; 90% heterosexual) in LDRs, recruited with advertisements on facebook.com and craigslist.org, and collected as part of a larger study on geographic separation between romantic partners (see the study by Le et al., 2008, for a detailed description of the sample). Sixty-three percent were college students at Time 1. All participants were in a romantic relationship (18% married or engaged). Most participants (85.2%) were in the relationships for over 6 months (9.1% for over 4 years; 24.8% for 2–4 years; 26.8% for 1–2 years; 24.6% for 6–12 months; 12.2% for 2–6 months; 2.6% for 1–2 months). The median duration is 16.5 months ($M = 22.58$,

$SD = 20.68$). Comparing the college students with the noncollege students indicated that the noncollege student sample was significantly older than the student sample ($M_s = 26.7$ vs. 20.4 years), $F(1, 393) = 159.62$, $p < .001$. In addition, the noncollege student relationship duration was longer than student samples ($M_s = 24.4$ vs. 21.5 months), although this difference was not significant $F(1, 393) = 1.79$, $p = .18$. Examination of the differences in relationship status indicates that a higher percentage of the nonstudent sample was married (9.5%) than the student sample (2.8%).

Procedure and measures

Participants were recruited using advertising on online campus discussion boards and facebook.com to complete an online questionnaire. The full version of the Investment Model Scale (Rusbult et al., 1998) was administered to assess commitment ($\alpha = .84$), satisfaction ($\alpha = .92$), alternatives ($\alpha = .86$), and investments ($\alpha = .77$). Avoidance ($\alpha = .92$) and anxiety ($\alpha = .88$) were measured with the ECRS (Brennan et al., 1998).

Eight months later (34.5 weeks; Time 2), participants were contacted by e-mail and asked to complete a short measure of relationship stability (i.e., intact vs. terminated). Of the initial 395 participants, 238 (60%) provided follow-up data, with 74% of relationships persisting.¹

Results

The measurement and structural models of the relationship persistence model

In Study 3, we used the parcel procedures described in Study 1 to create three indicators for each measure (anxiety, avoidance, satisfaction, investment, and commitment). We first tested the relationship persistence model in Study 3 (Figure 3; adding Time 2 relationship persistence into the commitment model).

We then replicated the results from Study 1 (Figure 1; the commitment model) and compared the noncollege student sample to the college student sample.

The first model tested the prediction of relationship persistence (i.e., the commitment model with relationship persistence added) and only included participants with data at Time 2. The results of the relationship persistence measurement model indicated a good fit to the data, $\chi^2(132, N = 238) = 254.11$, $p < .001$; scaled $\chi^2(120, N = 238) = 249.77$, $p < .001$; CFI = 0.97, RMSEA = 0.06, 90% CI [0.05, 0.07], SRMR = 0.05. All latent variables are significantly correlated, except the association between anxiety and alternatives, anxiety and commitment, and investments with relationship persistence. The relationship persistence structural model showed a good fit to the data, $\chi^2(135, N = 238) = 257.10$, $p < .001$; scaled $\chi^2(120, N = 238) = 252.65$, $p < .001$; CFI = 0.97, RMSEA = 0.06, 90% CI [0.05, 0.07], SRMR = 0.05 (Figure 3). The results were similar to findings in Studies 1 and 2, except that neither avoidance nor investments were significantly associated with relationship commitment. This is likely due to the relatively small sample that provided breakup data. A direct significant negative association was found between anxiety and relationship persistence. Across both attachment predictors, 6% of the variance in satisfaction, 5% of the variance in alternatives, and 13% of the variance in investment were explained by attachment anxiety and avoidance. For commitment, 51% of the variance in commitment was explained by satisfaction and alternatives. Finally, 9% of the variance in Time 2 persistence was explained by attachment anxiety and commitment.

The bootstrap procedure for indirect effects

First, we replicated the indirect effects for the three mediator model predicting commitment originally tested in Study 1. The pattern of these indirect effects was the same as in Studies 1 and 2. Furthermore, we added the Time 2 relationship persistence into the three mediator model and tested the indirect effects

1. Participants who responded at Time 2 were significantly less committed and satisfied, perceived more alternatives, and were more anxious than participants who did not complete the follow-up, $t_s(236) > 2.40$, $p_s < .05$. They did not significantly differ on investments or avoidance, $t_s(236) < 1.94$, *ns*.

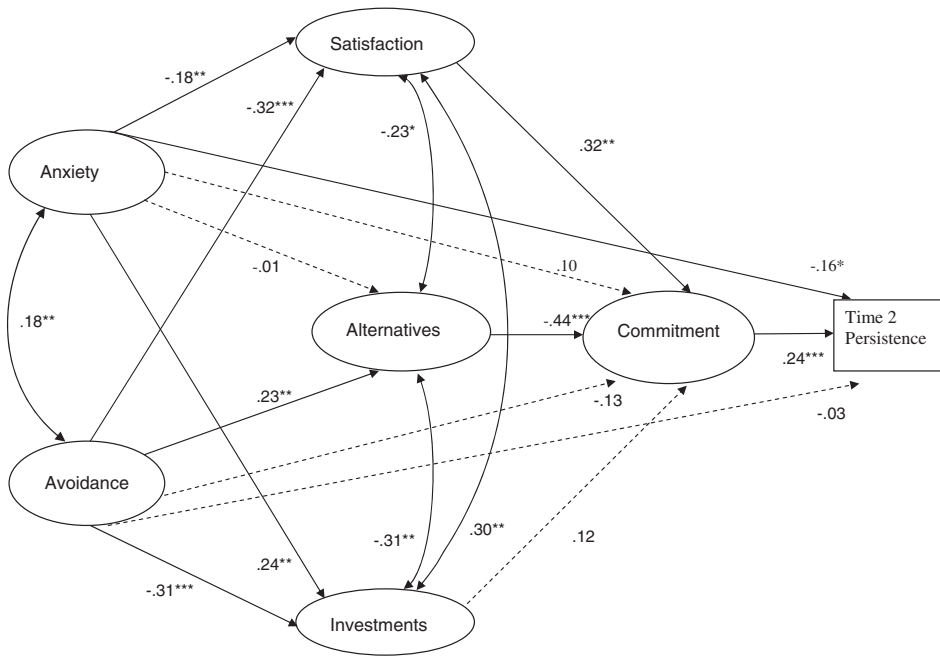


Figure 3. The relationship persistence model (Study 3).

Note. $N = 334$. Latent variables were indicated by the three parcels described in the Method section.

* $p < .05$. ** $p < .01$. *** $p < .001$.

of this new structural model (Figure 3). The association of anxiety with relationship persistence was mediated by satisfaction leading to commitment but not by alternatives or investments (Table 6). This is likely due to the nonsignificant path from anxiety to alternatives and investments to commitment. The association between avoidance and relationship persistence was mediated by satisfaction and alternatives predicting commitment, but the path from investments to commitment was nonsignificant.

We tested whether the pattern of the three mediator model commitment model (from Study 1) was different for student and community subsamples. The freely estimated model, $\chi^2(252, N = 238) = 417.64, p < .001$; CFI = 0.98, RMSEA = 0.06, 90% CI [0.05, 0.07], SRMR = 0.06, and the constrained model, $\chi^2(263, N = 238) = 441.43, p < .001$; CFI = 0.97, RMSEA = 0.06, 90% CI [0.05, 0.07], SRMR = 0.09, were compared and the chi-square comparison was significant, $\Delta\chi^2(11, N = 238) = 23.79, p < .05$. Two

structural paths were identified to be significantly different between college student and the community subsamples. The path coefficient from satisfaction to commitment was weaker for college students ($\beta = .26, t = 3.93, p < .001$) than the community sample ($\beta = .45, t = 5.56, p < .001$). The path from attachment avoidance to investment was weaker for college students ($\beta = -.29, t = -2.22, p < .01$) than for the community sample ($\beta = -.45, t = -5.09, p < .01$). However, all the paths were significant and in the direction predicted.

Discussion

The results of Study 3 provide support for the two-step mediational prediction that attachment dimensions will predict satisfaction, alternatives, and investments, which, in turn, predict commitment, and that commitment predicts relationship persistence. The investment model highlights relationship commitment as an important motivator of remaining

Table 6. *Bootstrap analyses of the magnitude and statistical significance of indirect effects for Study 3*

Independent variable	Mediator variables	Dependent variable	β standardized indirect effect ^a	Mean indirect effect (b) ^a	SE of mean ^a	95% CI, bias-corrected bootstrap ^a (lower and upper)
Anxiety	Satisfaction → commitment	Time 2	(-0.18) × 0.32 × 0.24 = -0.01	-0.0009	0.0005	-0.002, -0.001
Anxiety	Alternative → commitment	Time 2	(-0.01) × (-0.44) × 0.24 = 0.00	0.0001	0.0006	-0.001, 0.001
Anxiety	Investment → commitment	Time 2	0.24 × 0.12 × 0.24 = 0.01	0.0004	0.0004	-0.001, 0.002
Avoidance	Satisfaction → commitment	Time 2	(-0.32) × 0.32 × 0.24 = -0.02	-0.0021	0.0011	-0.005, -0.001
Avoidance	Alternative → commitment	Time 2	0.23 × (-0.44) × 0.24 = -0.02	-0.0020	0.0011	-0.005, -0.001
Avoidance	Investment → commitment	Time 2	(-0.31) × 0.12 × 0.24 = -0.01	-0.0008	0.0007	-0.003, 0.001

Note. N = 238. CI = confidence interval; T2 = Time 2 persistence.

^aThe values of indirect effects are unstandardized path coefficients.

in or ending a romantic relationship. Commitment partially mediated the associations between attachment dimensions, satisfaction, alternatives, and investments and relationship stability.

There was a significant direct negative association of anxiety, but not avoidance, with relationship persistence. The reason for this unmediated association is not entirely clear. One possibility is that anxiety influences a romantic partner's interest in maintaining a romantic relationship. If romantic partners are more likely to end a relationship with an anxious partner, this association of anxiety with breakup would not be mediated by the individual's commitment.

Although these results held for both college and noncollege samples suggesting generalizability to these findings, there were some differences found between these samples. Attachment avoidance predicted investments better for the community than the college sample. In a community sample, there may be a greater range than a student sample, in investments from minimal investments to substantial investments of time and resources (e.g., a house and children). This greater range may provide more ability for attachment avoidance to influence investments. The finding that satisfaction predicts commitment better for the community than student sample is also interesting. It is possible that community samples were more likely to be considering the very long-term future of the relationship as opposed to being committed just for the next couple of years of college. Therefore, community samples put a greater premium on satisfaction because of a longer term orientation to commitment. Although these explanations for the differences found between the student and community sample are plausible, they are at best ad hoc explanations and should be considered critically until supported with future data. It is also important to note that the community sample was only marginally older (~6 years) than the student sample, and although the community sample had more married couples than the student sample, the difference was not large (9.5% vs. 2.8%). Although the comparison between the two samples is interesting, the community

sample cannot be considered a representative sample of noncollege romantic relationships.

General Discussion

Across three studies, support was found for satisfaction, alternatives, and investments as mediators of the associations between attachment dimensions and commitment. In addition, the investment model argues that commitment will mediate the influence of the other investment model variables on relationship maintenance and persistence and these predictions were supported in Studies 2 and 3.

This research represents an important advance over prior research in this area. Past work has examined the associations between attachment dimensions and investment model variables, as well as the outcomes of relationship maintenance and persistence. However, these studies examined these associations piecemeal, rather than simultaneously in a full model. The current research supports a large mediational model describing the associations between adult attachment and the investment model. Importantly, commitment mediated the association of the attachment and investment model variables with relationship maintenance and persistence. The cumulative mediational model tested in the current three studies provides a theoretically grounded and empirically supported model of the association between the attachment dimensions and the investment model that has not been tested in its entirety in previous research.

The current research provides a structure for how attachment and interdependence theory are related. In addition, the mediational model suggests how the attachment model and the investment model combine to predict commitment relevant cognition and behavior. This may prove to be especially useful in broadening our understanding of the nature and causes of relationship cognition and behavior as it brings together processes that have typically been studied separately from distinct theoretical perspectives. This research and the mediational findings can provide a useful launching point for development of future hypotheses in this area.

Model replication across studies

An important component of the current research is the replication of the findings across different samples. Both male and female participants showed a similar pattern of results, as did those in proximal and LDRs. In Study 3, differences for college student and community samples were found, but all predicted paths remained significant. These replications suggest the mediational results are robust across a range of relationships and populations.

All three studies also found evidence for direct associations between attachment dimensions and the key dependent measures. Avoidance significantly and negatively predicted both relationship commitment and accommodation, and anxiety directly predicted relationship termination. Although these findings were not expected, further examination of the connections of attachment theory and interdependence theory help us understand these results. This is one of the key benefits of the current mediational approach to attachment theory and the investment model, it provides an alternative way of thinking about commitment and the prediction of commitment-related cognition and behavior. Studies 2 and 3 focused on the prediction of relationship maintenance and persistence, two variables that have been consistently found to be predicted by commitment (Rusbult et al., 1994). In a recent meta-analysis that examined predictors of relationship persistence in nonmarital relationships (Le et al., 2010), commitment was a strong predictor of relationship persistence ($d = 0.80$), while attachment dimensions were significant but weaker predictors ($d = 0.14-0.24$). These meta-analytic results fit well with the findings of Studies 2 and 3, given that if attachment dimensions' prediction of persistence is mediated by commitment, we would expect the effect size of attachment predicting persistence to be weaker than the effect size for commitment.

Alternative models

The currently tested model in which the investment model variables of satisfaction,

alternatives, and investments mediate the association of anxiety and avoidance with commitment was supported in three separate studies. However, a multitude of other models are possible. Although many alternative models could be tested, the mediational model used in the current three studies fits best with relevant theory. The investment model theorizes and a large number of studies have shown (Le & Agnew, 2003) that satisfaction, alternatives, and investment are proximal and strong predictors of relationship commitment.

Attachment dimensions, as more trait and personality-like measures, would be expected to be more distal predictors of commitment. In addition, examination of the current results indicates that the association of satisfaction, alternatives, and investments with commitment was stronger than the direct association of anxiety and avoidance with commitment. It is unlikely that a smaller association between the attachment dimensions and commitment would mediate the larger association between the investment model variables and commitment. At most, one would expect a small partial mediation finding of the investment model variables predicting commitment through anxiety and avoidance. Therefore, the mediational model tested in the current studies represents the model best supported by theory, the nature of the variables, and the results. Testing additional models to better examine whether attachment dimensions ever act as mediators would likely require large, longitudinal data sets. The current models tested represent the most theoretically and empirically supported hypotheses.

Attachment theory and the investment model

For the current research, attachment dimensions were studied because of the extensive prior research and the many theoretical discussions of attachment and because prior theorizing (Hazan & Shaver, 1994; Rusbult et al., 2001) has described their relation to interdependence theory and the investment model constructs. The question remains whether this research provides any insight into how other personality or dispositional variables would relate to the investment model

variables. However, the current research provides a guide to answer this question. As was done with attachment dimensions, other individual difference variables can be considered for whether they would influence satisfaction, alternatives, and investments along with commitment (Rusbult, 1983). Once these questions are asked, predictions can be made regarding whether the investment model variables mediate the influence of individual differences on commitment, relationship maintenance, and persistence.

Limitations and future directions

A few limitations of the current work are worth noting. It has been suggested that using mediators that are conceptually indistinct from the predictor or outcome variable can lead to significant mediational results that are of limited theoretical value (Spencer, Zanna, & Fong, 2005). Although this concern is relevant to the current work, a large amount of research on the investment model has supported the distinctness of these concepts. Future work experimentally manipulating these variables to test causal connections would expand on this current research.

Although the lack of longitudinal data and analyses are limitations, these types of analyses are areas for future research. The models tested in the current research do not preclude the possibilities of more complex relationships among variables and the current theoretical concepts can help guide this future research. Finally, there are opportunities to study other important relationship outcome variables that might be related to relationship commitment and attachment. These include infidelity, relationship conflict, and other forms of relationship maintenance among many others.

Conclusion

The current research attempted to integrate two important theories of interpersonal relationships, the attachment theory and the investment model. Using prior research and theory, mediational predictions were developed for how attachment dimensions predict

commitment, relationship maintenance, and persistence. This perspective helped develop an understanding of how both adult attachment theory and the investment model contribute to relationship maintenance and persistence.

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