

Adoption, Attachment and Relationship Concerns: A Study of Adult Adoptees

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Published in the journal *Personal Relationships*, 2007, Volume 14, Issue 1, pp. 129-147.

Abstract

Given ongoing controversy regarding the psychosocial adjustment of adoptees, this study examined the impact of adoptive status and family experiences on adult attachment security, and the role of attachment in predicting relationship outcomes. Adults who were adopted as infants ($N = 144$), and a comparison sample of non-adoptees ($N = 131$), completed measures of attachment security at recruitment and again six months later; other measures assessed parental bonding and adoptees' reunion experiences (Time 1), and relationship variables (e.g., loneliness, relationship quality; Time 2). Insecurity was higher for adoptees and for those reporting negative childhood relationships with parents. For adoptees only, recent relationship difficulties also predicted insecurity. Attachment dimensions were more important than adoptive status in predicting relationship variables, and mediated the effects of adoptive status. The results support the utility of attachment theory in understanding adoptees' relationship concerns.

Consistent with the suggestion that adoption is a risk factor for general adjustment problems (Verrier, 1993), some studies have shown that adoptees are over-represented in clinical groups (Wierzbicki, 1993), or fare worse than non-adoptees on variables such as self-esteem, depression and anxiety (e.g., Borders, Penny, & Portnoy, 2000; Cubito & Obremski-Brandon, 2000; Tieman, van der Ende, & Verhulst, 2005). However, other studies comparing adoptees and non-adoptees have found no differences in psychological distress (Collishaw, Maughan, & Pickles, 1998) or life satisfaction (Borders et al., 2000). Indeed, recent reviews and meta-analyses suggest that most adoptees are well-adjusted, although there is evidence of over-representation in mental health settings and small increases in rates of behavior problems (Juffer & van IJzendoorn, 2005; Nickman et al., 2005; van IJzendoorn, Juffer, & Klein Poelhuis, 2005). Hence, the claim that adoption is a risk factor for general adjustment difficulties remains controversial. Further, the reason for the mixed findings is unclear: Methodological (sampling and measurement) differences between studies may be one factor, but another possibility is that the link between adoption and adjustment depends on a range of factors, both biological (e.g., prenatal drug exposure) and psychosocial (e.g., functioning within the adoptive family).

Despite the mixed findings for *general* adjustment, there are convincing arguments linking adoption to increased risk of *interpersonal* problems. Issues concerning loss are inherently relational, and are central to the adoption experience: Adoptees have lost their birth parents, and more generally, a sense of being biologically tied to significant others (Brodzinsky, 1990; Jones, 1997; Schechter & Bertocci, 1990); further, there is a ‘status loss’ associated with being different (Brodzinsky, 1990). Moreover, in cases where attempted reunions with birth relatives are difficult or unsuccessful, adoptees may experience further loss and rejection. Finally, in comparison to parental loss through death or divorce, adoption-related losses have unique features that may predispose the individual to relational problems. Specifically, the losses are often unacknowledged or downplayed (a situation associated with little support provision), and may entail a sense of abandonment and rejection (Brodzinsky, 1990; Jones, 1997; Nickman, 1985).

Adoption and Attachment

Despite the considerable literature dealing with adoption, loss and abandonment, few studies have assessed the impact of adoption on adults’ peer relationships. Further, research in this area has lacked a strong theoretical framework. Some years ago, a theoretical paper by Edens and Cavell (1999) proposed the utility of attachment principles in the study of adoption. (Attachment refers to the affectional bond that characterizes many close relationships, and that promotes a sense of comfort and security.) The authors noted that infants who are adopted may be at greater risk of prenatal or birth complications and parental psychopathology; in turn, such factors may increase the likelihood of particular attachment behaviors (e.g., dislike of being held) that make the role of adoptive parents more difficult. Adoptive parents may also experience lack of role autonomy and uncertainty about role obligations, which may interfere with the bonding process. Further, disclosure of adoptive status may (depending on its timing and manner) lead adoptees to feel that they do not ‘belong’ in the adoptive family (Edens & Cavell, 1999). Attachment theory suggests possible long-term implications of these difficulties: Experiences with caregivers are gradually internalized in the form of working models, or generalized expectancies about the self

in relation to close others. As working models are relatively stable and play an active role in guiding later interactions (Shaver, Collins, & Clark, 1996), negative experiences early in life are likely to influence adults' relational adjustment.

Recent literature on the lifelong importance of attachment supports this claim. For example, a wealth of data indicates that needs for security and a sense of belonging apply across the lifespan (Baumeister & Leary, 1995; Weiss, 1991). A growing body of research also supports the tenets of adult attachment theory, as first expounded by Hazan and Shaver (1987). That is, adults' close personal relationships share important emotional and behavioral similarities with the bonds that form between infants and caregivers. Further, the concept of attachment style applies to both types of relationships; that is, early social experiences (including loss and rejection) create individual differences in security, which shape relational attitudes and behaviors. In the context of adult attachment, these individual differences have been variously conceptualized in terms of categories (styles), or continuous dimensions such as avoidance and relationship anxiety (Shaver & Mikulincer, 2004). Regardless of their conceptual basis, however, studies have shown systematic links between adult attachment measures and key relational processes and outcomes. For example, secure attachment is associated with more open expression of thoughts and feelings, and with higher relationship quality (see Feeney, 1999, for a review).

To date, however, Borders et al. (2000) are the only researchers to have systematically explored the link between adoption and adult attachment security. These researchers studied a sample of adoptees and their non-adopted friends, and found differences between these two groups in attachment and perceptions of social support. Specifically, adoptees were under-represented in the secure attachment group and over-represented in the preoccupied and fearful groups, and reported less support (from both family and friends) than their non-adopted counterparts. This study provided an important first step in linking adoption and adult attachment, but was limited by its cross-sectional nature, its reliance on a categorical measure of attachment, and its failure to fully consider the role of early parenting and ongoing relationship experiences in relation to attachment.

The Present Study

No study to date has thoroughly explored the impact of adoption on attachment security and relationship outcomes in adulthood, or the possible moderating role of family experiences. The present study addressed these issues by recruiting a sample of adults who had been adopted as infants and a comparison sample of adults from intact biological families, and following them over a six-month period.

The relevance of infant adoption stems from the fact that from the early twentieth century through to the 1970s, the dominant type of adoption in many western countries (e.g., England, the United States, Australia, New Zealand) involved infants who were born out-of-wedlock, and whose adoption was based on secrecy and anonymity (Brodzinsky, 2005; Hoksbergen & ter Laak, 2005; Ryburn, 1994). The losses associated with such early adoption placement are subtle and covert, emerging gradually over time with the individual's growing awareness of the meaning of having been adopted (Brodzinsky, 1990). Specifically, as children come to realize the implications of having been adopted, they often experience a loss of self (or identity)

and a loss of stability in their relationships with adoptive parents (Brodzinsky, 1990; Nickman et al., 2005). These various losses (together with the loss of biological ties) may leave adoptees feeling ‘incomplete, alienated, disconnected, abandoned, or unwanted’ (Brodzinsky, 1990, p. 7). These arguments further support the relevance of attachment theory, given its focus on working models of the self in relation to close others. As detailed next, the present study had two broad aims.

Adoption as a risk factor for insecure attachment. The first aim was to assess the extent to which adoption represents a risk factor for insecure attachment in adulthood. As noted earlier, there are sound reasons for suggesting that the losses associated with the adoption experience may predispose individuals to relational difficulties, including a sense of insecurity. Specifically, being adopted may be associated with a sense of having been rejected or abandoned by birth parents, and of ‘not belonging’ (Brodzinsky, 1990; Jones, 1997). For this reason, adoption may be linked with negative working models of attachment; that is, with perceptions that the self is unworthy of love and attention, and/or that other people are unavailable, uncaring and rejecting (Bartholomew & Horowitz, 1991).

At the same time, it is important to recognize that the association between adoptive status and insecurity in adulthood may not be strong, and that family experiences are also likely to have an impact on working models. Previous studies have reported greater variability on measures of psychosocial wellbeing within adopted than non-adopted samples (e.g., Borders et al., 2000), and have provided evidence that open and affectionate relationships within the adoptive family may act as a buffer against adjustment difficulties (e.g., Levy-Shiff, 2001; Passmore, Fogarty, Bourke, & Baker-Evans, 2005). Further, given that search and reunion experiences are often emotionally intense and are linked to perceptions of acceptance and rejection (Verrier, 1993), these experiences may also shape working models of self and others. Hence, as part of our first broad aim, we were interested in assessing the importance of both adoptive status and family experiences (with adoptive parents and birth mothers) as predictors of adult attachment security.

Another issue relevant to the effects of adoption on attachment security concerns patterns of stability and change. This issue has theoretical and applied significance, as it addresses questions about the malleability of working models. Previous studies point to moderate rates of attachment stability in adult samples over intervals from one week to 25 years, although stability is higher when more reliable measures (e.g., multiple-item scales) are used (Feeney & Noller, 1996). Given that attachment measures are not perfectly stable (even when their limited reliability is taken into account), researchers have considered the *causes* of change over time. For example, change in attachment style may be most likely in response to major relationship changes, such as the formation and dissolution of couple bonds (Hammond & Fletcher, 1991; Kirkpatrick & Hazan, 1994). Attachment measures may also be prone to more short-term instability: Individuals may have multiple attachment orientations, based on their varied relationship experiences, and situational factors operating at any given time may affect responses (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996). Finally, vulnerability factors (e.g., family disruptions and psychopathology) may make some people more susceptible to change,

by creating more tentative views of self and others (Davila, Burge, & Hammen, 1997).

What does this mean for the adoption experience? Attachment theorists propose that the expectations embodied in working models solidify over time, and tend to be self-fulfilling (Shaver et al., 1996). However, they also accept that attachment style may be affected by powerful relationship experiences. As noted earlier, adoptees face unique relational issues pertaining to the loss of biological ties. As they become aware of the implications of having been adopted, they may also experience a loss of identity, a de-stabilizing of relationships with adoptive parents, emotional challenges linked to the search process, and difficulty in juggling relationships with adoptive and birth families. Hence, adoptees' working models may be more malleable than those of other adults. In particular, their working models may be reactive to salient events in romantic relationships, such as relationship deterioration: Romantic relationships are the prototypical attachment bond for adults (Ainsworth, 1989; Weiss, 1991), and play a unique role in meeting attachment needs (Doherty & Feeney, 2004).

The role of attachment in predicting relational adjustment. Our second broad aim was to assess the role of adult attachment in predicting relationship attitudes and behaviors. As noted earlier, considerable evidence points to the link between security and positive relational processes and outcomes. For example, secure attachment has been linked to high levels of interdependence, commitment and satisfaction, and to low levels of loneliness; conversely, relationship anxiety has been linked to conflict and coercion, and avoidance has been linked to emotional distancing and to the perception that intimate bonds involve a high level of risk (e.g., Rholes, Simpson, & Grich Stevens, 1998; Shaver & Hazan, 1993; Simpson, 1990). Further, both experimental and field studies show that working models of attachment shape relational expectations, behaviors and memories (Pietromonaco, Greenwood, & Feldman Barrett, 2004; Shaver & Mikulincer, 2002).

Much of the research in this area has been cross-sectional, but longitudinal designs are particularly useful when examining relational adjustment. For example, Shaver and Brennan (1992) were able to demonstrate that attachment measures showed only modest relations with personality variables, and that attachment measures were more predictive of relationship outcomes (eight months later) than were personality measures. Such findings show that associations between attachment and relationship functioning do not simply reflect common-method variance or global response sets.

In this study, we tested the ability of attachment measures to predict relationship variables assessed six months later, after controlling for the effect of adoptive status. For completeness, we also compared patterns of prediction for adoptees and non-adoptees, although the effects of attachment security are usually robust across diverse variables such as race (Cooper, Shaver, & Collins, 1998) and sexual orientation (Feeney & Noller, 2004). Given the expected link between adoptive status and attachment insecurity, together with the active role of working models in shaping relational attitudes and behaviors, we also tested whether the association between adoptive status and relationship functioning was mediated by attachment. This important question addresses underlying processes involved in the link between adoption and adjustment; that is, attachment may be one mechanism through which adoptive status influences later relationship experiences.

Hypotheses

In terms of predicting attachment, we expected that adults who were adopted as infants would report more insecurity than those who grew up with both biological parents (Hypothesis 1). However, we also expected higher insecurity among those perceiving more negative childhood relationships with parents (biological or adoptive) (Hypothesis 2), and, in the case of adoptees, less satisfying reunions with birth mothers (Hypothesis 3). (In testing Hypothesis 2, we also checked for interactive effects of adoptive status and parenting on attachment security, given previous suggestions that a well-functioning adoptive family may act as a buffer against adjustment difficulties.) Further, we expected that in comparison to non-adoptees, adoptees' responses to attachment measures would be more reactive to recent relationship events (Hypothesis 4).

With regard to relationship outcomes, we expected that attachment insecurity (assessed at Time 1) would predict more negative relational attitudes and behaviors at follow-up, after controlling for adoptive status. That is, we expected insecurity to predict higher scores on loneliness and perceived risk in intimacy, and lower scores on relationship quality (Hypothesis 5); these effects were expected to apply to both adoptees and non-adoptees, although for completeness, we checked for interactive effects of attachment and adoptive status. Finally, we expected attachment variables to mediate the link between adoptive status and relationship functioning (Hypothesis 6).

Method

Participants

Two groups of participants were recruited. Both groups were restricted to individuals who were at least 18 years of age, had been born in Australia, and had lived in a two-parent family (either biological or adopted) for the first 16 years of life. At the beginning of the study, the adopted group consisted of adults who had been adopted as infants, by non-kin ($N = 144$; 111 females and 33 males), and the comparison group consisted of adults who grew up with their biological parents ($N = 131$; 96 females and 35 males). Age at adoption ranged from 1 week to 78 weeks ($M = 5.98$ weeks, $SD = 10.91$).

Because there are unique issues in Australia associated with indigenous adoptions, these were not included in the study, and both groups were almost exclusively Caucasian. For both groups, the largest recruitment source ($n = 160$ of the total 275) involved advertisements in local media. Smaller numbers were recruited via social networks available to the researchers ($n = 62$), undergraduate Psychology pools at the University of Queensland and the University of Southern Queensland ($n = 30$), and brochures placed on university campuses and in community centers ($n = 10$). In addition, a small number of adoptees heard about the study through adoption-related support groups ($n = 6$), or through internet sites dealing with these issues ($n = 7$). Those interested in participating were informed of the purpose and confidential nature of the study, and were mailed a questionnaire package with a pre-paid envelope for returning the materials. Each questionnaire was assigned a unique identifying code, so that it could be matched to the follow-up questionnaire that was mailed out six months later. For both questionnaires, the various measures were presented in one of six random

orders. The comparability of the two groups and the extent of attrition are considered in the Procedure section.

Measures: Time 1

The first questionnaire assessed background variables, attachment security, and parental bonding (detailed below). In addition, adoptees answered open-ended and structured questions about their adoption (e.g., age at adoption, age at learning adoptive status), and their search and reunion experiences.

Background variables. Participants were asked to indicate their age, gender, relationship status (single, cohabiting, married, divorced/separated), parental status (children, no children), education level (did not complete school, completed school only, technical college certificate or diploma, some university education), and employment status (full-time, part-time, not currently employed).

Attachment security. To provide a comprehensive assessment of current attachment security, two measures were used. First, participants completed the Relationship Questionnaire (Bartholomew & Horowitz, 1991). This measure consists of single-paragraph descriptions of each of four attachment styles: fearful, preoccupied, secure and dismissing. Participants are asked to read the descriptions and choose the one that best describes the way they generally are in close relationships.

Second, participants completed the Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994). Although the ASQ can yield scores on five attachment scales, the two major factors are avoidance and relationship anxiety (Alexander, Feeney, Hohaus, & Noller, 2001). Avoidance (16 items) assesses the tendency to be uncomfortable with intimacy and to have difficulty in depending on relationship partners. A sample item is ‘I find it difficult to depend on others’. Relationship anxiety (13 items) assesses fears of being rejected or abandoned, and concerns about the extent of partners’ love and commitment (e.g., ‘I worry that others won’t care about me as much as I care about them’). The response format is from 1 (*totally disagree*) to 6 (*totally agree*). Alpha coefficients for these scales at Times 1 and 2 ranged from .87 to .90.

Parental bonding. The Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) contains 25 items describing various parental attitudes and behaviors. This measure requires participants to think back over the first 16 years of life, and to rate each item (separately for mother and father) from 0 (*very unlike this parent*) to 3 (*very like this parent*). Adoptees answered these questions with respect to their adoptive parents, whereas those in the comparison group answered with respect to their biological parents. The PBI yields scores on the dimensions of care (12 items, e.g., ‘spoke to me with a warm and friendly voice’), and overprotection (13 items, e.g., ‘tried to control everything I did’). A large body of work by Parker and his colleagues (e.g., Parker, 1983) supports these constructs as the two basic dimensions of parenting that impact on the bonding process. Both scales were highly reliable, with alpha coefficients exceeding .90 for each parent.

Reunion experiences. Adoptees answered a series of questions about their reunion experiences. This report considers only three questions assessing relationships with birth

mothers. These questions tapped satisfaction with the initial reunion and satisfaction with the current relationship (1 = *extremely dissatisfying* to 6 = *extremely satisfying*), and emotional closeness of the current relationship (1 = *extremely distant* to 6 = *extremely close*); the three ratings were analyzed separately.

Measures: Time 2

At the six-month follow-up, participants completed the same two measures of attachment security included in the first questionnaire. In addition, they completed the following measures of relationship attitudes and relationship functioning.

Risk in intimacy. The 10-item Risk in Intimacy scale (Pilkington & Richardson, 1988) assesses perceptions of the risks and dangers associated with being close to others (e.g., ‘I’m afraid to get really close to someone because I might get hurt’). Items use a 6-point response scale, from 1 (*strongly disagree*) to 6 (*strongly agree*), and formed a reliable scale ($\alpha = .91$).

Loneliness. The 37-item Social and Emotional Loneliness Scale for Adults (DiTommaso & Spinner, 1993), contains three subscales: romantic (12 items; e.g., ‘I find myself wishing for someone with whom to share my life’), family (11 items; e.g., ‘I feel alone when I’m with my family’), and social loneliness (14 items; e.g., ‘What’s important to me doesn’t seem important to the people I know’). The response format ranges from 1 (*strongly disagree*) to 7 (*strongly agree*). Alpha coefficients exceeded .90 for each scale.

Relationship quality. Participants who were currently in a romantic relationship ($n = 199$) reported the length of that relationship, and completed three measures assessing relationship quality. *Relationship satisfaction* and *commitment* were assessed using sub-scales (5- and 7-item, respectively) of the Investment Model Scale (Rusbult, Martz, & Agnew, 1998). Sample items are ‘My relationship is close to ideal’ (satisfaction) and ‘I am committed to maintaining my relationship with my partner’ (commitment); response options range from 0 (*do not agree at all*) to 8 (*agree completely*). Both sub-scales were highly reliable (alpha coefficients exceeded .95). *Dyadic trust* was assessed with a short (13-item) version of the Trust in Close Relationships Scale (Boon & Holmes, 1992). A sample item is ‘My partner is truly sincere in his/her promises’. Response options range from 1 (*strongly disagree*) to 7 (*strongly agree*), and reliability was very high ($\alpha = .96$). Preliminary analyses showed that the three measures of relationship quality were strongly inter-related (r s ranged from .70 to .81). Hence, we formed a composite measure of *relationship quality* by summing standardized scores on the three scales ($\alpha = .97$).

Relationship changes. Finally, we asked respondents about any changes in romantic relationships over the 6-month period between assessment sessions. That is, participants indicated whether they had experienced one or more of the following changes: ending of a relationship, formation of a new relationship, and deterioration or improvement in the quality of an existing relationship (regardless of whether that relationship existed at the start of the study). Four dichotomous variables were thus created (no = 0, yes = 1), one for each type of relationship change. For each item, space was also provided for respondents to give a brief description of the relationship change.

Procedure: Assessing Group Comparability and Attrition

Before presenting the main data analyses, it is important to consider the comparability of the two groups and the extent of attrition.

Comparability of the groups. To assess whether the two groups of participants were similar at the beginning of the study, we compared them on the background variables of age, gender, relationship status, parental status, education level, and employment status (see Table 1). Analysis of variance indicated that the groups were similar in terms of age, $F(1, 272) < 1$. In addition, frequency comparisons revealed no significant differences on the remaining variables: gender $\chi^2(1) < 1$, relationship status $\chi^2(3) = 3.68$, parental status $\chi^2(1) = 1.94$, education level, $\chi^2(3) = 1.35$, and employment status $\chi^2(2) = 3.84$ (all $ps > .10$). Overall, the samples were relatively well-educated and predominantly female, but represented a wide range in terms of age and occupational status.

Attrition. To minimize attrition, we informed participants of the importance of their continued involvement in the study. We also telephoned them prior to the second mail-out, to check the accuracy of contact details and to encourage them to complete the materials. The rate of attrition was minimal for both groups. Specifically, of the original 144 respondents in the adopted group, 138 completed the follow-up questionnaire. Similarly, of the 131 comparison respondents, 128 completed the study. Given the very low numbers of respondents who did not complete the second questionnaire, it was not feasible to conduct statistical analyses to check that attrition was random. Nevertheless, all subsequent data analyses were restricted to those who completed both assessments.

Results

The results are presented in two sections, corresponding to the two broad aims of the study. First, we investigated the roles of adoptive status and family variables in predicting attachment measures, together with patterns of stability and change. Second, we examined the role of the attachment scales in predicting relationship variables assessed at follow-up, including the issue of mediation.

Adoption as a Risk Factor for Insecure Attachment

Role of adoptive status. The association between adoptive status and attachment security was assessed in two ways. First, a frequency comparison was conducted, relating adoptive status (comparison versus adopted) to the four-group (forced-choice) measure of attachment style completed at Time 1. The association was highly significant, $\chi^2(3) = 21.31, p < .001$. Results showed that the numbers of insecure participants were greater in the adoption group than in the comparison group: preoccupied, 27 vs. 16, respectively; dismissing, 30 vs. 21; and fearful, 33 vs. 12. Conversely, there were fewer secure participants in the adoption group than in the comparison group (49 vs. 80). These results support Hypothesis 1.

Second, a mixed-design MANOVA was conducted on the two scales of the ASQ, with adoptive status varied between subjects, and time (Time 1, Time 2) varied within. The multivariate tests revealed only a significant main effect of adoptive status, multivariate $F(2, 262) = 10.23, p < .001, \eta^2 = .07$. Univariate tests showed that this significant group difference applied to both avoidance ($F(1, 273) = 6.96, p < .001$), and

anxiety ($F(1, 273) = 16.82, p < .001$). Consistent with Hypothesis 1, adoptees obtained higher scores than non-adoptees on both attachment dimensions (see Table 2).

Role of parental relationships. To further explore predictors of the two attachment dimensions (assessed at Time 1), we conducted hierarchical regression analyses. Based on the natural chronology of events, we entered adoptive status (adopted = 0, comparison = 1) at Step 1, and reports of parental bonding at Step 2 (see Table 3 for bivariate correlations and regression weights).¹ At Step 1, adoptive status was inversely related to avoidance ($R^2 = .04, p < .001$) and to anxiety ($R^2 = .07, p < .001$); that is, adoptees reported more insecurity than non-adoptees. At Step 2, the effect of adoptive status remained significant for both dependent variables. However, consistent with Hypothesis 2, the parental bonding scales were also strongly predictive; R^2 increment = .18 for avoidance, and .10 for anxiety, $p < .001$ in each case. Specifically, maternal ($\beta = -.24$) and paternal care ($\beta = -.21$) were negatively linked to avoidance, and paternal care ($\beta = -.16$) was negatively linked to anxiety. We also checked for interactive effects of adoptive status and parenting scales, but no significant effects emerged. For completeness, we also repeated the analyses with Time 2 attachment dimensions as the dependent variables: Introducing the time-lag between the independent and dependent measures produced only small decreases in the amount of explained variance, and the pattern of prediction was the same as that already reported.

For those adopted persons who had had contact with their birth mothers ($n = 84$), we also correlated the attachment dimensions (Time 1) with the three ratings assessing perceptions of relationships with birth mothers, controlling for time elapsed since the first contact. Perceptions of a less satisfying reunion were associated with higher levels of avoidance ($r = -.31, p < .01$) and anxiety ($r = -.24, p < .05$). This finding supports Hypothesis 3. In contrast, ratings of current satisfaction and emotional closeness were unrelated to attachment (r s ranged from $-.10$ to $.21$). Again, these analyses were repeated using Time 2 attachment dimensions; perceptions of a less satisfying reunion were related to later avoidance ($r = -.32, p < .01$), but not to later anxiety ($r = -.12, ns$).

Stability and change in attachment. The stability of attachment was investigated using both categorical and continuous measures of attachment security. For the categorical measure, we calculated the proportion of participants who endorsed the same attachment style at both times. The proportion was similar for adoptees ($n = 79, 64.75\%$) and non-adoptees ($n = 79, 65.55\%$), $\chi^2(1) = .02, ns$. Further, test-retest correlations for the scales assessing avoidance and anxiety were similar for both samples, ranging from .77 to .80.

Despite the relative stability of the attachment measures, adoptees' working models may be more sensitive to recent relationship events. To address this question, we conducted regression analyses to predict attachment dimensions at Time 2, separately for each group and each type of relationship change. The numbers of participants who had ended or formed a new relationship were too small to warrant analysis; hence, analyses were restricted to the measures of deterioration and improvement. Initial scores on attachment and relationship length were entered as control variables at Step 1, and a dichotomous measure of relationship change (i.e., whether a romantic relationship had deteriorated, or improved, in the 6-month interval) was entered at Step 2. (Participants who had not had a romantic relationship

at any point during the study were omitted from these analyses.) It is important to note that the numbers of participants reporting recent relationship changes did not differ according to group; deterioration was reported by 26 adoptees and 19 non-adoptees, and improvement was reported by 37 adoptees and 35 non-adoptees. Further, the descriptions of relationship changes were similar for each group. Specifically, for both groups, the common difficulties were withdrawal (by one or both partners), increased conflict, lack of open communication, and outside stressors such as work and study; conversely, the common areas of improvement were increased closeness and commitment, and more open and less conflicted communication.

As would be expected from the relative stability of attachment, strong prediction of later attachment was provided by Time 1 attachment scores and relationship length (R^2 ranged from .51 to .65). In the comparison group, neither relationship deterioration nor improvement added to the prediction of avoidance or anxiety at Step 2. For adoptees, however, reports of recent relationship deterioration predicted higher levels of anxiety ($\beta = .19, p < .005$), and avoidance ($\beta = .15, p < .01$). Further, the regression weight for the effect of relationship deterioration was significantly larger for adoptees than for non-adoptees in predicting both anxiety, $t(196) = 3.77, p < .001$, and avoidance, $t(196) = 2.33, p < .001$. Similar analyses were also conducted, assessing the effect of a composite measure of relationship distress (defined as the experience of either relationship dissolution or deterioration). Again, this variable predicted later avoidance ($\beta = .13, p < .05$) and later anxiety ($\beta = .13, p < .05$) for adoptees only. These results support Hypothesis 4.

The Role of Attachment in Predicting Relationship Outcomes

Our second aim was to assess the role of attachment dimensions in predicting relational adjustment; within this broad question, we were interested in possible interactive effects of group and attachment (i.e., in the relative predictive power of attachment for each group). Hence, regression analyses were conducted to predict each relationship variable assessed at follow-up (risk in intimacy; romantic, family and social loneliness; relationship quality), from adoptive status and Time 1 attachment security.

Correlational data. Table 4 shows the correlations among the variables used in the regression analyses, separately for adoptees and non-adoptees. Associations between the independent and dependent variables were generally moderately strong, and there was no evidence of multi-collinearity. As relationship quality was relevant only to participants who were currently in a romantic relationship, it is not included in Table 4. However, for those participants in a romantic relationship, correlations between the independent variables and relationship quality were as follows: for avoidance, $r = -.24, p < .02$ (adoptees) and $-.15, ns$ (non-adoptees); for anxiety, $r = -.19, p < .06$ (adoptees) and $-.06, ns$ (non-adoptees). Mean scores for relationship quality were -0.08 ($SD = 2.95$) for adoptees, and 0.14 ($SD = 2.64$) for non-adoptees.

Regression analyses. In the regression analyses, adoptive status (group) was entered at Step 1, and avoidance and anxiety were entered at Step 2. The two-way interaction terms (avoidance by anxiety, group by avoidance, group by anxiety) were entered at Step 3, and the three-way interaction term was entered at Step 4. Interaction

terms were calculated using centered scores, as recommended by Aiken and West (1991). These results are summarized in Table 5; for ease of presentation (and given the scarcity of interaction effects, as noted later), only the first two steps are summarized.²

At Step 1, adoptive status afforded significant prediction of three of the five dependent measures, although the amount of explained variance was small. Specifically, adoptive status predicted risk in intimacy ($R^2 = .02, p < .02$), and both family ($R^2 = .02, p < .02$) and social loneliness ($R^2 = .03, p < .01$). In each instance, being adopted was associated with higher scores (more negative outcomes) on these variables.

At Step 2, the attachment dimensions provided a significant increase in explained variance in all dependent measures, supporting Hypothesis 5. The increment in explained variance was substantial for measures of more general relationship experiences (e.g., .44 for risk in intimacy, .27 for social loneliness), but was smaller for the measure of the quality of a specific romantic relationship (.04). The regression weights indicated that avoidance was associated with perceptions of more risk in intimacy, more loneliness (all three scales), and less relationship quality; anxiety predicted greater risk in intimacy, and more loneliness (again, all three scales). Interestingly, adoptive status no longer predicted any of the dependent variables, once the attachment dimensions were included (this point is revisited shortly, in the section on mediation).

Interactive effects were very scattered. Avoidance and anxiety interacted to predict perceived risk in intimacy ($\beta = .12, p < .05$). Simple slopes analysis indicated that the effect of avoidance was more marked at high levels of anxiety (regardless of group); those high in both avoidance and anxiety perceived the most risk in intimacy. Only one product term involving group (of a possible 15) was significant. Specifically, the three-way interaction predicted family loneliness ($\beta = .18, p < .02$), with follow-up analyses revealing a 2-way (avoidance by anxiety) interaction for non-adoptees only. High levels of family loneliness were reported by non-adoptees who were high in both avoidance and anxiety (cf. fearful); in contrast, for adoptees, high levels of family loneliness were reported by those high in avoidance, regardless of level of anxiety (cf. fearful *or* dismissing).

Attachment dimensions as mediators of the effects of adoptive status. Results reported to this point indicate that (a) adoptive status was related to attachment dimensions (b) attachment dimensions were related to the dependent variables, and (c) all significant associations between adoptive status and the dependent variables (risk in intimacy, family and social loneliness) became non-significant when the attachment dimensions were entered. These results are suggestive of mediated effects (Baron & Kenny, 1986).

To provide a further check on possible mediated relationships, the Sobel test was used – this test evaluates whether the indirect effect of an independent variable on a dependent variable via a proposed mediator is significantly different from zero (Howell, 2002). The Sobel tests provided strong and consistent support for attachment as a mediator of the effects of adoptive status (Hypothesis 6). Specifically, both avoidance and anxiety mediated the effects of adoptive status on risk in intimacy, and on social and

family loneliness. The z values for the six tests ranged from -3.11 to -3.79 , and the associated p values ranged from $.002$ to $.0002$.

Supplementary analyses: Age-related effects. As adoptive status explained only small amounts of variance in the relationship outcomes, supplementary analyses were conducted to explore the effects of age-related variables. First (and in light of the wide age range of the sample), three age groups were formed: young adults (aged 18 to 30 years, $n = 83$), middle adults (aged 31 to 40 years, $n = 96$), and older adults (aged 41 and over, $n = 95$). Supplementary regressions showed that the effects of adoptive status on the relationship variables were generally similar across age groups; however, adoptive status explained more variance in social loneliness for young adults than for all others ($R^2 = .09$ and $.01$, respectively; $z = 2.30$, $p < .025$). For adoptees, we also examined the effects of age at adoption and age at learning adoptive status. (These variables showed substantial positive skew; hence, a log transformation was applied.) The only significant links with relationship variables were that later adoption placement was associated positively with perceived risk in intimacy ($r = .18$, $p < .05$), and family loneliness ($r = .21$, $p < .02$).

Discussion

This study used attachment theory as a framework to examine the relationship experiences of a sample of adults who were adopted as infants, and a comparison sample of adults who grew up with their biological parents. The results suggest that insecure attachment may be more widespread among adoptees than among non-adoptees. Adoptees scored higher than comparison participants on avoidance and anxiety, which have consistently emerged as the two key dimensions underlying measures of adult attachment (Brennan, Clark, & Shaver, 1998). Adoptees were also over-represented in the insecure attachment categories, particularly the fearful style. According to attachment theory, fearful attachment represents the most problematic pattern of working models, involving negative perceptions both of self-worth and of the availability and responsiveness of others (Bartholomew & Horowitz, 1991). Further, empirical research on the characteristics of the four styles supports this assertion (e.g., Feeney et al., 1994). These findings on the attachment characteristics of the samples support Hypothesis 1, and corroborate the suggestion that attachment theory provides a useful perspective on relationship issues that arise for adoptees, including loss, search and reunion (Edens & Cavell, 1999).

At the same time, it is important to acknowledge that adoptive status explained only seven percent of the variance in attachment, despite the statistical significance of the associations. It is also important to note that adoptees in this sample were adopted as young infants. For this reason, a specific attachment between infant and birthmother was unlikely to have formed before the child was relinquished (and hence, unlikely to have been lost); theory and research suggest that attachment bonds develop through a history of repeated, mutual interactions, and involve the infant's conscious awareness of the attachment figure as a distinct person (Noller, Feeney, & Peterson, 2001). Further, although Verrier (1993) argued (from a psychoanalytic perspective) that separating an infant from the mother inflicts lasting damage by disrupting prenatal attachment and the infant's emerging sense of self, this claim is highly contentious, and some suggest that adoption-related losses may be largely socially constructed. Leon (2002), for example, proposed that deep-seated cultural beliefs in the values of kinship and maternal instinct

cause us to view child relinquishment in terms of rejection and abandonment. It is also possible that adoptees for whom the adoption experience is a salient concern tend to attribute relationship difficulties (arising for whatever reason) to that experience. These arguments do not deny the reality of adoption-related losses, however, or the possibility of some degree of loss linked to the experience of being parented by non-kin (Leon, 2002). In short, there is clear evidence that many adoptees feel rejected or abandoned by birth parents (e.g., Brodzinsky, 1990; Jones, 1997); hence, the attachment perspective is relevant, given its focus on working models of the self and others.

However, consistent with Hypothesis 2, results clearly indicated that attachment security was not a function of adoptive status alone. In fact, self-reports of parental bonding were more powerful predictors of the attachment dimensions than was adoptive status, and the patterns of prediction did not differ according to group. (Similarly, research by Passmore et al., 2005, has shown that parental variables are more important than adoptive status in predicting self-esteem.) Perceptions of care and affection from mothers and fathers during childhood were particularly relevant in predicting adult attachment security. This finding fits with a large body of literature linking attachment security to experiences of sensitive and responsive caregiving (e.g., Rothbard & Shaver, 1994), and highlights the influential role of both parents in the bonding process. The fact that patterns of prediction were similar for both groups highlights the importance of adoptees' experiences with their adoptive parents, and is consistent with research showing that open and caring relationships in the adoptive family facilitate adjustment (Kelly, Towner-Thyrum, Rigby, & Martin, 1998).

Despite the undisputed importance of relationships with adoptive parents, the role of interactions with birth relatives should not be ignored. With recent changes in legislation in many countries (regarding disclosure of identifying information), increasing numbers of adult adoptees are searching for birth relatives, and subsequently having reunions; moreover, although some search and reunion experiences are very positive, others involve perceptions of further loss and rejection. In the present study, for adoptees who had met their birth mothers, dissatisfaction with the initial reunion was associated with higher levels of avoidance and anxiety. This finding is consistent with Hypothesis 3. However, only the link with avoidance was robust over time. Hence, the nature of the association between attachment anxiety and dissatisfaction with the reunion is unclear - it is possible that anxiety colors reports of the reunion experience, rather than (or in addition to) the reverse.

Interestingly, only reports of the *initial reunion* with birth mothers (as opposed to current closeness and satisfaction) were linked to adult attachment security. This finding may reflect the highly emotional nature of the search and reunion experience (Verrier, 1993); further, adoptees bring particular hopes and expectations to the reunion experience, and failure to fulfill these may impact negatively on working models. Perceptions of current relationships with birth mothers may have less impact on attachment models for at least two reasons. First, some of these relationships do not extend beyond the initial reunion or its immediate aftermath. Second, even in cases where there is some ongoing contact, these relationships may be less formative than those that are established early in life with primary caregivers and involve very regular and sustained interaction.

The attachment measures were relatively stable for both samples over the course of the study. These results are consistent with the claim that in adulthood, mental models of attachment ‘tend to persist relatively unchanged’ (Bowlby, 1973, p. 235), although Bowlby recognized that these models could be accommodated to fit a changing social reality. Indeed, within the adopted sample only, reports of recent relationship deterioration predicted later avoidance and anxiety, after controlling for initial attachment scores. This finding supports Hypothesis 4, and suggests that adoptees’ working models are more sensitive to recent relationship events that involve challenge or perceived threat, such as relationship conflict and emotional distancing. This result is noteworthy, given that increases in insecurity are likely to interfere with the resolution of relationship problems. In short, the present data highlight the fact that working models are somewhat malleable, even in adulthood, and provide indirect support for Davila et al.’s (1997) claim that factors such as parental adjustment difficulties and family disruption may affect the coherence of working models.

The fifth hypothesis proposed that insecurity would predict relationship variables assessed six months later. This hypothesis was supported. After controlling for adoptive status, the attachment dimensions provided a significant increase in explained variance in all relationship measures. The increase in explained variance was quite large for measures of general relationship attitudes and experiences (risk in intimacy, and the three forms of loneliness), but was smaller for the measure tapping perceptions of a specific couple bond. One explanation for these findings is that ratings of a specific relationship are influenced more strongly by actual partner characteristics and by the course of couple interaction, than by the individual’s working models of attachment. In addition, excluding participants who were not currently in a romantic relationship resulted in some loss of statistical power.

There were few interactions with adoptive status in predicting relationship variables, suggesting that the implications of attachment for relationship functioning are similar for adoptees and nonadoptees. An exception was the finding that family loneliness was related to high avoidance in adoptees (a main effect), but to the *combination* of high avoidance and high anxiety in non-adoptees. Perhaps adoption-related losses tend to sensitize avoidant adoptees to the possibility of rejection by family members, resulting in perceptions of ‘being alone’ within the family (regardless of level of anxiety).

In contrast to the very scattered interactive effects, adoptive status itself predicted perceived risk in intimacy, and reports of family and social loneliness. It is interesting to speculate on why adoptees and non-adoptees differed on these relational measures, but not the remaining ones. The remaining measures focused on romantic relationships, either in terms of relating to a specific partner (relationship quality), or in terms of perceiving a bond with ‘one special person’ who provides love and encouragement (romantic loneliness). Adoptees may perceive fewer challenges with these issues than with developing closeness and trust in the family context, feeling ‘in tune’ with others generally, and being confident that others will not be hurtful or rejecting. Given that health and well-being are predicted by perceived family support and by a sense of belonging to a strong social network (e.g., Cunningham & Barbee, 2000), these latter issues are clearly important.

A key finding of this study was the consistent support for the mediating role of attachment in the association between adoptive status and relationship outcomes (Hypothesis 6). That is, the negative associations of adoptive status with risk in intimacy and family and social loneliness were fully mediated by avoidance and anxiety. This finding points to the pivotal role of insecurities regarding the worthiness of the self and the dependability of others, and lends further support to the relevance of attachment principles for the study of adoptees' relationships in adulthood.

In short, our findings support the claim that adoption may represent a risk factor for relational difficulties later in life, at least in terms of family relationships, general perceptions of intimacy and belonging, and reactivity to relationship stressors. The amount of variance explained by adoptive status was small, however, and many other factors are likely to impact on adoptees' relational adjustment. In the present study, later adoption placement was linked to family loneliness and perceived risk in intimacy. Moreover, adoptive status explained more variance in social loneliness for young adults than for older adults, suggesting that some of the effects of adoption may decrease with the passage of time or with increased relationship experience. Although beyond the scope of this study, the extent of secrecy surrounding the adoption, and the manner of learning one's adoptive status, are also likely to be relevant (Brodzinsky, 2005). In addition, biological factors (both prenatal and genetic) may impact on adjustment (Brodzinsky, 1990), and may also affect attachment security. Hence, it has been suggested that researchers should measure preadoptive risk history, consider the interdependent nature of biological and environmental risk factors, and examine the *cumulative* nature of risk factors (Brooks, Simmel, Wind, & Barth, 2005).

Limitations and Strengths of the Study

The present study had several limitations. First, it involved convenience sampling, as there was no register of adoptions occurring in this era. Further, the samples were predominantly female. Although this gender imbalance is typical in studies of adult adoptees, it may have influenced some of the results. For example, the four-group measure of attachment often shows gender differences (Feeney & Noller, 1996); hence, the distribution of attachment styles may differ somewhat in a more balanced sample. However, gender was not related to adoptive status or relationship outcomes, and did not moderate the effect of adoptive status on these outcomes; hence, the gender imbalance is unlikely to affect interpretation of the focal results. The fact that the study was conducted in a single country raises concerns over the generality of the findings, as the acceptability of adoption varies in different countries and cultures; further, more recent adoptions in Australia are less likely to involve secrecy and anonymity, and more likely to involve children from other countries and ethnic backgrounds. As noted earlier, however, similar adoption practices to those discussed in this paper occurred in many western countries for much of the twentieth century.

In terms of adoptees' relationship history, the focus was on relationships with adoptive parents and birth mothers, rather than on categorical variables such as search status (having searched or not searched for birth relatives) or reunion status (having been reunited with one or more birth relatives). Other studies suggest that these variables also predict adjustment outcomes (e.g., Borders et al., 2000; Cubito & Obremski-Brandon, 2000). In addition, to maintain adequate sample sizes, we did not investigate relationships

with other birth relatives with whom reunions were less common, such as fathers and siblings - these relationships may also have an important impact on some adoptees.

All measures in the study involved self-reports from the same informant, leading to the possibility of informant bias. However, there is growing evidence of concordance between self-reports and observers' ratings of relational behavior (e.g., Hahlweg, Kaiser, Christensen, Fehm-Wolfsdorf, & Groth, 2000). Similarly, many studies indicate that self-reports of adult attachment do not simply tap a generalized tendency to perceive events more or less favorably. For example, these reports have been linked to independent ratings of behavior (e.g., Rholes et al., 1998), corroborative reports from friends and partners (e.g., Kobak & Hazan, 1991), and indices of unconscious processes, including physiological measures of arousal and affect regulation (e.g., Diamond & Hicks, 2005).

As already noted, adoptive status explained small amounts of variance in the relational measures, although the attachment dimensions provided relatively strong prediction. However, as Whitley (1996) noted, even a small effect can have practical significance if it (a) applies to a large population, (b) is cumulative, or (c) informs theory. All these factors are relevant to studies of adoption and attachment. First, although it is impossible to establish exact numbers of adults who were adopted in the past under systems involving secrecy and anonymity, the numbers are likely to be large; in terms of current statistics, between 2 and 4 percent of American families include an adopted child (Brooks et al., 2005), and 6 in 10 Americans have had some personal experience of adoption (including that of friends or family members; Evan B. Donaldson Institute, 1997). Further, variables that increase insecurity tend to have cumulative effects, insofar as working models are self-fulfilling; for instance, someone who fears rejection is likely to approach others defensively, eliciting further rejection and exacerbating insecurity (Feeney, 1999). Finally, studies of adoption and attachment add to the growing body of literature supporting the relevance of attachment principles to adults' close relationships.

A notable strength of the present study is its short-term longitudinal design. In contrast, many studies in this area have relied on cross-sectional data, which are prone to the problem of common-method variance. In addition, the broad method of recruitment is an important feature; much research on adoption has relied on samples recruited largely through clinical settings or support groups, which are unlikely to be representative of the wider population. Further, the attachment perspective provides a strong theoretical framework that recognizes both the formative nature of early social experiences and the possibility of later revision of working models.

Implications of the Findings

A key finding of this study was that adoptive status no longer predicted relational adjustment when attachment dimensions were included in the analyses. In other words, it seems that the greater levels of loneliness and risk in intimacy reported by adoptees reflect their negative working models of self and/or others. This finding has important implications for those working in counseling and clinical settings. In recent years, attention has been directed to developing interventions based directly on attachment principles (e.g., Davila, 2003; Johnson, 2003). This work recognizes the traumatizing nature of loss and rejection, the self-fulfilling nature of working models, and the therapeutic effect of interventions that focus on the need for secure emotional

connections. Such interventions may offer a useful approach for those struggling with adoption-related issues (including reunions), and those dealing with other complex family experiences such as foster care (Levy & Orlans, 2003).

Other aspects of our findings are also relevant to practitioners. First, the small effect sizes for adoptive status fit with previous research, which suggests that most adoptees are relatively well-adjusted (e.g., Nickman et al., 2005). Hence, practitioners should not assume that adoptees invariably face major adjustment problems. Similarly, our findings point to the importance of various family relationships as influences on adjustment. Perceptions of relationships with adoptive parents are clearly important. In addition, reunions with birth relatives are salient experiences, and adoptees' expectations of this process are likely to impact on their satisfaction with the outcome. Practitioners should also be sensitive to the important features of different types of adoption, including 'traditional' (as studied in the present research), international, and special-needs adoptions; although the theme of loss is central to adoption, many other issues are specific to the context of the adoption.

Conclusions

This study employed a short-term longitudinal design to investigate the relationship experiences of adopted and non-adopted adults. The results support the view that adoption may be a risk factor for negative relational attitudes and relationship difficulties in adult life, particularly in terms of attachment security. However, the effects were generally small, and relationships with adoptive parents and reunions with birth mothers also emerged as factors that impact on adoptees' attachment security. Overall, the findings support the call to view the adoption experience as a "lifelong process" (Borders et al., 2000), and suggest that attachment principles can be usefully applied in examining these issues.

Footnotes

1. The effects of adoptive status on perceptions of parenting were not a focus of this paper. However, MANOVA revealed an interaction between adoptive status and gender of parent on PBI scores, multivariate $F(2, 266) = 5.01, p < .01$. Adoptees perceived their mothers as less caring ($M = 2.07, SD = 0.81$) than did non-adoptees ($M = 2.28, SD = 0.73$), and as more overprotective ($M_s = 1.29$ and $1.02, SD_s = 0.76$ and 0.65 , respectively); adoptive status was unrelated to perceptions of fathering.

2. Possible effects of gender were examined in preliminary regression analyses, in which gender and adoptive status were entered at Step 1, and their product term was entered at Step 2; no main or interactive effects of gender were obtained. Further, although relatively few participants were recruited through adoption-related support groups or internet sites, these participants may experience particular difficulty in dealing with their adoptive status, and hence may unduly influence the results. For this reason, the regression analyses were repeated, deleting these participants. The results of these analyses were almost identical to those reported in Table 5.

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Table 1
Participant Characteristics

Variable	Adopted (<i>n</i> = 144)	Comparison (<i>n</i> = 131)
age	<i>M</i> = 37.76 yrs	<i>M</i> = 37.67 yrs
gender	77.08% female	73.28% female
relationship status	25.40% single	31.71% single
	12.70% cohabiting	10.57% cohabiting
	42.86% married	46.34% married
	19.05% divorced	11.38% divorced
parental status	57.64% children	49.23% children
education	9.72% < Yr 12	9.16% < Yr 12
	9.03% Yr 12	6.11% Yr 12
	15.97% technical college	13.74% technical college
	65.28% some university study	70.99% some university study
employment	50.00% full-time	43.08% full-time
	34.72 part-time	32.31% part-time
	15.28% unemployed	24.62% unemployed

Table 2

Mean Scores on Attachment According to Group and Time

	Adopted	Comparison
Avoidance		
Time 1	3.12 (0.83)	2.83 (0.71)
Time 2	3.08 (0.83)	2.84 (0.72)
Anxiety		
Time 1	3.29 (1.00)	2.75 (0.88)
Time 2	3.23 (1.03)	2.79 (0.88)

Note. Scales scores (divided by the number of items) could range from 1 to 6. Standard deviations are in parentheses.

Table 3
Predicting Time 1 Attachment from PBI Scales

Predictor	Avoidance		Anxiety	
	<i>r</i>	β	<i>r</i>	β
STEP 1				
Adoptive status	-.20**	-.20***	-.26***	-.26***
STEP 2				
Adoptive status	-.20**	-.16**	-.26***	-.24***
Mother care	-.39***	-.24**	-.25***	-.05
Father care	-.30***	-.21**	-.24***	-.16*
Mother control	.31***	.12	.29***	.12
Father control	.20**	-.08	.26***	.07

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

Table 4
Descriptive Statistics and Correlations Among the Focal Variables (Full Sample)

Variable	1.	2.	3.	4.	5.	6.
1. Avoidance (Time 1)	--					
2. Anxiety (Time 1)	.51*** .40***	--				
3. Risk in intimacy	.65*** .63***	.45*** .38***	--			
4. Romantic loneliness	.33*** .23**	.29*** .22*	.35*** .22*	--		
5. Family loneliness	.42*** .44***	.27** .38***	.38*** .50***	.54*** .39***	--	
6. Social loneliness	.51*** .50***	.39*** .37***	.61*** .53***	.34*** .36***	.46*** .43***	
Mean (SD)	3.12 (0.83) 2.83 (0.71)	3.29 (1.00) 2.75 (0.88)	2.61 (1.13) 2.30 (0.96)	2.67 (1.76) 2.74 (1.64)	2.17 (1.33) 1.81 (1.08)	2.63 (1.14) 2.26 (1.04)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. In each cell, the upper entry is for adoptees; the lower entry is for non-adoptees. Scales scores (divided by the number of items) could range from 1 to 6 (avoidance, anxiety, risk in intimacy), or from 1 to 7 (loneliness scales).

Table 5
Summary of Explained Variance and Significant Predictors of Relationship Variables

Dependent variable	Step 1	Step 2
Risk in intimacy	$R^2 = .02^*$ adoptive status $\beta = -.15^*$	R^2 inc = .44*** avoidance $\beta = .59^{***}$ anxiety $\beta = .16^{**}$
Romantic loneliness	$R^2 = .01$, ns	R^2 inc = .10*** avoidance $\beta = .22^{**}$ anxiety $\beta = .17^*$
Family loneliness	$R^2 = .02^*$ adoptive status $\beta = -.15^*$	R^2 inc = .20*** avoidance $\beta = .37^{***}$ anxiety $\beta = .15^*$
Social loneliness	$R^2 = .03^{**}$ adoptive status $\beta = -.15^*$	R^2 inc = .27*** avoidance $\beta = .42^{***}$ anxiety $\beta = .20^{***}$
Relationship quality	$R^2 = .01$, ns	R^2 inc = .04* avoidance $\beta = -.18^*$

Note. Adoptive status was entered at Step 1; avoidance and anxiety were entered at Step 2. The analysis predicting relationship quality was restricted to those who were currently in a romantic relationship.

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