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The Nature and Predictors of the Trajectory of Change in Marital Quality for Husbands and Wives Over the First 10 Years of Marriage

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Four parameters of the trajectory of change in marital quality (initial status as well as linear, quadratic, and cubic patterns of change) were estimated for husbands and wives over the first 10 years of marriage (n = 522 couples at Year 1 and 93 couples at Year 10). Both husbands and wives started their trajectories of change at fairly high levels of marital quality and showed a cubic pattern of change such that marital quality declined fairly rapidly in the early years of marriage, stabilized, and then declined again. Whereas individual-differences variables predicted the initial status of the trajectory, husbands and wives living with only their biological children showed a steeper decline in marital quality than husbands and wives living without children or stepchildren.

Marriage is usually described in developmental literature as a normative personal life event that occurs in early adulthood (e.g., Gould, 1978; Levinson, Darrow, Klein, Levinson, & McKee, 1978; G. E. Vaillant, 1977) and influences the nature of subsequent developmental tasks (e.g., Havighurst, 1972). The present study focuses on the complementary view that marriage itself can be viewed from a developmental perspective. For example, Kovacs (1983) regarded marriage not as a single life event but as a set of stages in which spouses attempt to achieve a balance between dependence and autonomy as they negotiate issues of control, power, and authority.

Despite evidence that approximately 90% of both men and women in the United States are married by the age of 45 (United States Bureau of the Census, 1997), that marital happiness is centrally important for adults' overall well-being (Glenn & Weaver, 1981), that there is substantial variability in the happiness of those who are in durable marriages (Heaton & Albrecht, 1991), and that nearly half of all marriages end in divorce (National Center for Health Statistics, 1991), there is currently a lack of descriptive information regarding both how marital quality changes and the variables that affect the pattern of this change.

Karney and Bradbury (1995) noted that one reason for the lack of this information is that few researchers have recruited both spouses from newly wed couples and repeatedly assessed their appraisals of marital quality over time with the same measure. These authors further noted that in the few studies that met these criteria, researchers usually studied change in marital quality by assessing differences in the means of each spouse's marital quality score over time. For example, MacDermid, Huston, and McHale (1990) found that husbands and wives reported equivalent declines in mean quality of satisfaction and love over three assessments spanning the first 2.5 years of marriage.

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Karney and Bradbury (1997) argued that more precise information about the nature of change in marital quality can be obtained by focusing not on average levels of marital quality over time but rather on the *trajectory of change* in marital quality over time. Derived from growth curve analyses of longitudinal data collected over more than two time points, this trajectory includes information regarding the level of marital quality at the start of the marriage (e.g., high) and—depending on how many assessments are available—the number of bends or changes in the curve over time (see Cohen & Cohen, 1983, p. 233).

If data are available from at least four assessments, then one can determine whether the growth function that best describes the pattern of change in marital quality is linear, quadratic, or cubic. For a linear function, the rate of change is the same from assessment to assessment, and there are no bends in the growth curve. For a quadratic function, there is one phase of accelerated change resulting in one bend in the growth curve (e.g., marital quality may decline over the early years of marriage and then level off). Finally, for a cubic function, there are two phases of accelerated change resulting in two bends in the growth curve (e.g., marital quality may decline over the early years of marriage, level off, and then decline again).

In what appears to be the only report of findings from growth curve analyses of longitudinal data from newly wed couples, Karney and Bradbury (1997) obtained global assessments of marital quality from 54 pairs of first-married spouses up to eight times over the first 4 years of marriage. They found that a linear rather than a quadratic growth function fit the pattern of change in marital quality for both husbands and wives, that husbands and wives showed equivalent rates of linear decline in marital quality, and that husbands' rate of linear decline and wives' rate of linear decline were positively related. The finding that change in marital quality was not accelerated (i.e., that the quadratic growth function was not significant) is noteworthy because it is at odds with accounts that feelings of closeness and passion decline at a fairly rapid pace in the early stages of the relationship (Kovacs, 1983; Sternberg, 1986).

The first purpose of this study was to build on Karney and Bradbury's (1997) evidence regarding the normative pattern of

change in marital quality for newlywed couples in two ways. First, newly wed spouses in remarriages after divorce as well as newly wed spouses in first marriages were assessed. The inclusion of remarried spouses is important because reports have shown that only 54% of all current marriages involve both spouses in first marriages (Clarke, 1995b). Second, spouses were assessed over the first 10 years of marriage rather than over only the first 4 years of marriage. The longer time span provided an opportunity to explore whether the growth curve of marital quality for spouses in fairly durable marriages had multiple bends (i.e., conformed to a cubic growth function).

In the current study, marital quality was assessed with Spanier's (1976) Dyadic Adjustment Scale, one of the most widely used measures in the literature on marital quality. Although this measure includes subscores regarding the level of agreement between partners on important issues, amount of shared activity, degree of expressed affection, and level of satisfaction with the relationship, these four subscores tend to be so highly intercorrelated that they conform to a single second-order factor (Sabourin, Lussier, Laplante, & Wright, 1991). Consequently, only the total score was used.

For each spouse, two questions regarding the growth curve for marital quality were of interest: (a) At what level of marital quality does the growth curve start, and (b) what is the growth function—linear (equal rates of change), quadratic (one bend or phase of accelerated change), or cubic (two bends or phases of accelerated change)—that best describes the pattern of change? On the basis of Karney and Bradbury's (1997) findings as well as the commonly held view that marriages begin at peak levels of positivity, the trajectory of change in marital quality for each spouse was expected to start at a high level of marital quality. Despite Karney and Bradbury's failure to obtain evidence of accelerated change, there was reason to expect one or even two phases of accelerated change. Consonant with a "honeymoon-is-over" effect (Kovacs, 1983; Sternberg, 1986), the decline in marital quality might be especially steep over the early years of the marriage and then stabilize. Further, consonant with a "7-year-itch" effect (Kovacs, 1983) as well as evidence that the median duration of marriage for divorcing couples is about 7 years (Clarke, 1995a), one might also expect that a second phase of accelerated change follows the period of stabilization.

In addition to determining which growth function best describes the pattern of change in marital quality, a growth curve analysis of longitudinal data on marital quality also provides a way to assess whether a variable that is a risk factor for marital distress exerts its deleterious effect on marital quality by being linked to low levels of marital quality at the start of the marriage or to a pattern of deterioration in marital quality over time. In their study of newly wed couples, Karney and Bradbury (1997) found that two risk factors assessed at the beginning of the marriage—psychological distress (neuroticism) and problematic conflict resolution styles—were related differently to the parameters of the growth trajectory. High levels of psychological distress predicted that spouses would begin the trajectory at low levels of marital quality, whereas frequent negative conflict resolution styles predicted declines in marital quality.

The second purpose of this study was to build on Karney and Bradbury's (1997) evidence regarding the factors that explained variability in each spouse's trajectory of change in marital quality. Of particular interest was whether three sets of variables predicted any of the four parameters of the trajectory of interest here—initial status as well as a linear, quadratic, or cubic pattern of change. The first set of predictor variables included information about each spouse's divorce history. This information was of interest because the probability of marital distress is high for spouses who have experienced multiple divorces (Clarke, 1995a; Wilson & Clarke, 1992). Consequently, spouses were categorized as having experienced no divorce (the reference group), one divorce, or multiple divorces. If people who remarry after multiple divorces are at risk for marital distress because they are quick to identify marital problems and have low thresholds for dealing with marital distress (Brody, Neubaum, & Forehand, 1988), then, compared with people who have not been divorced, they (as well as their spouses) may be especially likely to show early accelerated declines in marital quality rather than merely low levels of marital quality at the start of the marriage.

The second set of predictor variables included information regarding either the presence of residential stepchildren at the start of the marriage or the presence of any children born during the course of the marriage. The presence of residential stepchildren was relevant because spouses in stepfamilies have been thought to have unique sources of stress related to ill-defined social and legal roles for stepparents, the prevalence of myths holding the stepfamily to unachievable standards, and difficulties related to interacting with complex family systems that include former spouses and their kin (Ganong & Coleman, 1994).

The presence of biological children born during the course of the marriage was of interest because there is conflicting evidence regarding how marital quality changes over the course of the family life cycle. Data from retrospective reports (e.g., Burr, 1970) support the view that marital quality follows a U-shaped pattern such that marital quality is lowest when children are present, whereas data from prospective reports show that parents and nonparents do not differ in how marital quality changes over time (Karney & Bradbury, 1997; MacDermid et al., 1990; C. O. Vaillant & Vaillant, 1993).

In the present study, couples were divided into three child-related groups: couples in which husbands and wives never lived with either children or stepchildren over the course of the study (the reference group); couples in which husbands lived with only the children of their wives from a previous marriage (i.e., residential stepfather families); and couples in which husbands and wives lived with only their own biological offspring at some point during the study. Other child-status groups (e.g., couples with residential stepmothers and couples in which spouses lived with stepchildren and their own biological children) were too few in number to be included.

It seemed plausible that husbands with stepchildren might report lower initial levels of marital quality than those without children or stepchildren because the cost of having stepchildren is likely to be known at the beginning of the marriage (Ganong & Coleman, 1994). Alternatively, if interactions with stepchildren become increasingly negative as the stepchildren grow older and negotiate issues regarding personal autonomy (Hetherington & Clingempeel, 1992), then husbands who live with stepchildren may be especially likely to show declines in marital quality over time. Because previous findings regarding how a couple's own biolog-

ical children affect marital quality are inconsistent, no hypotheses on this issue were advanced.

The final set of predictor variables included individual-differences variables known to be linked, either concurrently or prospectively, to marital quality. Studies of concurrent linkages have shown that partners with low evaluations of their spouses' dependability (Rempel, Holmes, & Zanna, 1985), strong dysfunctional beliefs about relationships (e.g., disagreements are destructive; Eidelson & Epstein, 1982), low expressiveness (or "femininity"; Kurdek & Schmitt, 1986a), or high levels of psychological distress (Karney, Bradbury, Fincham, & Sullivan, 1994) tend to report low marital quality. Longitudinal studies indicate that wives with high levels of instrumentality (or "masculinity") tend to report decreases in marital satisfaction (Bradbury, Campbell, & Fincham, 1995).

Of interest here was whether values for these five individual-differences variables assessed at the beginning of the marriage showed intraspouse as well as cross-spouse relations to the four elements of each spouse's own trajectory of change in marital quality. That is, were husbands' own individual-differences variables as well as those of their wives linked to where each one began the trajectory as well as to each one's rate of linear, curvilinear, and cubic change? Although researchers have rarely examined intraspouse and cross-spouse effects, two studies are relevant here.

In the first study, Karney and Bradbury (1997) found that high levels of psychological distress (neuroticism) at the start of the marriage for both husbands and wives were linked to husbands' beginning the trajectory at low levels of marital quality. However, no such links were obtained for wives, and psychological distress was not related to the rate of linear change for either spouse. In the second study, Bradbury et al. (1995) found that wives' marital satisfaction tended to decline to the extent that they were high in instrumentality and that their husbands were low in both instrumentality and expressiveness. Because there was no compelling reason for these linkages to have occurred for only one spouse and because of the scarcity of information regarding what personality variables at the start of the marriage predict change in marital quality, only a general hypothesis was advanced. This was that husbands' and wives' problematic levels of the individual-differences variables assessed at the start of the marriage (i.e., low dependability of spouse, strong dysfunctional beliefs, high instrumentality, low expressiveness, and high psychological distress) would be linked to the low initial status of each one's own trajectory of change in marital quality.

Method

Participants

Participants were recruited from the lists of marriage licenses published in the *Dayton Daily News* from May 1986 through January 1988. Generally, licenses appeared 1 month after the marriage. Each couple was sent a letter that described the focus of the study as the identification of factors contributing to marital happiness. Although the initial letter indicated that the study would involve the completion of five annual mail surveys, there was sufficient interest in the study to extend it another 5 years. If both spouses were interested in participating in the study, they returned information regarding names and address in a postage-paid envelope. Of the 7,899 couples who received the letter, 1,407 indicated an interest in the study. This response rate of 18% is similar to those obtained from other studies that recruited participants from public records (e.g., 18% by Davila, Bradbury, Cohan, & Tochluk, 1997; and 17% by Spanier, 1976).

Completed surveys were returned by 538 couples at Year 1. This return rate of 38% is similar to the rate of 33% obtained by Kurdek and Schmitt (1986b) in a study that involved a survey of similar length but that required the anonymous participation of both partners. Because of their small numbers, couples in which a spouse was remarried after the death of a previous spouse and couples in which a spouse died in the course of the study were not included, leaving the base sample at Year 1 at 522 couples.

For these couples, the mean age at Year 1 was 29.09 years (SD = 7.54) for husbands and 27.05 years (SD = 6.72) for wives, and the mean length of cohabitation was 0.74 years (SD = 1.06). Nearly all of the husbands (95%) and wives (95%) were White. The modal level of education for each spouse was the completion of a baccalaureate degree (32% of husbands and 33% of wives), and most husbands (92%) and wives (79%) were employed. There were two modal levels of personal annual income for husbands: 15% earned between $15,000 and $19,999, and another 15% earned between $25,000 and $29,999. Twenty-three percent of the wives earned less than $5,000. The numbers of husbands with 0, 1, and multiple divorces were 339, 132, and 51, respectively, whereas the corresponding numbers for wives were 334, 131, and 57. The numbers of couples with no children, only biological children born after the marriage, and only residential stepchildren in stepfather families were 215, 140, and 77, respectively. Ninety couples did not belong to any of these child-status categories because they were members of fairly small subgroups (e.g., couples who experienced a premarital pregnancy or couples who had both biological children and stepchildren).

Procedure

At each annual assessment (Year 1 through Year 10), couples were mailed two identical surveys. The Year 1 survey included measures of background information, divorce history, child-related status, individual-differences variables, and marital quality. Follow-up surveys included measures of child-related status and marital quality. Spouses were directed to complete their surveys privately and not to discuss their answers until the surveys had been completed and returned in separate postage-paid envelopes. However, no checks were made to ensure that these directions were followed.

For the follow-up surveys, if completed surveys were not returned by both spouses within a 1-month period after they were mailed, a letter prompting a response was sent. In this letter, spouses also were given an opportunity to indicate whether they had separated or divorced (not distinguished) or to withdraw from the study. Three prompt letters were sent. If no response was received after the third letter, participants were notified that they would not be contacted further (i.e., they were dropped from the study), but they were asked to provide information on couple status (i.e., still living together or separated or divorced). The number of couples at each assessment is presented for each of the four outcome status categories (completed all assessments, separated, withdrew, and dropped) in Table 1. Bias in the sample of couples who completed all 10 assessments is addressed later.

Measure of Background Information at Year 1

Spouses provided information regarding age, gender, race, education (represented by eight intervals ranging from completion of less than seventh grade to the award of a doctorate), annual personal income (represented by 12 intervals ranging from $5,000 or less to $50,000 or more), and the number of months they had lived with their husbands or wives.

Measure of Divorce History at Year 1

Spouses provided information about their divorce history by selecting one of four options: (a) "This is my first marriage," (b) "I have been

Table 1
Number of Couples in Each Follow-Up Status Category by Year of Assessment

Year	Completed all assessments	Separated	Withdrew	Dropped
1	522	—	—	—
2	392	—	—	—
3	307	21	16	48
4	262	13	6	26
5	230	7	6	19
6	197	6	15	12
7	150	7	29	11
8	130	3	9	8
9	113	1	11	5
10	93	1	7	12

Note. Dashes indicate that values were not computed.

divorced, and this is my first remarriage," (c) "I have been divorced twice, and this is my second remarriage," or (d) "I have been divorced more than twice, and this is my third or more remarriage." Because only a few of the respondents selected option (d), they were combined with the respondents who selected option (c) to form a single multiple-divorce group.

Measure of Child-Related Status at Each Assessment

Spouses were asked to list the first name, the age, and the gender of each child living with them as well as their relationship to each child (e.g., mother or stepfather). From this information, three child-status groups were formed. These included couples in which husbands and wives never lived with either children or stepchildren, couples in which husbands lived with only the children of their wives from a previous marriage, and couples in which husbands and wives lived with only their biological children. Of the 140 couples who lived with only their biological children, the numbers making the transition to parenthood during the course of the first through the ninth assessment were 32, 31, 26, 23, 6, 11, 4, 5, and 2, respectively. The mean number and the mean age of children and stepchildren are presented in Table 2 by year of assessment. It is noteworthy that, on the average, biological children (53% of whom were female) were preschoolers and stepchildren (51% of whom were female) were adolescents.

Measures of Individual-Differences Variables at Year 1

Dependability of spouse. Respondents used a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) to indicate how strongly they agreed with six items from the Dependability subscale of Rempel et al.'s (1985) Trust Scale (e.g., "I have found that my partner is a thoroughly dependable person, especially when it comes to things that are important"). High scores reflected high levels of spousal dependability. Cronbach's alpha for the summed composite score was .70 for husbands and .76 for wives. Means were 36.81 (SD = 5.07) for husbands and 36.28 (SD = 5.84) for wives. Additional psychometric properties of this score are described by Rempel et al.

Dysfunctional beliefs about relationships. Respondents used a 6-point scale ranging from 0 (*very false*) to 5 (*very true*) to indicate how strongly they endorsed 32 beliefs from Eidelson and Epstein's (1982) Relationship Beliefs Inventory that included "disagreement is destructive" (e.g., "I take it as a personal insult when my partner disagrees with an important idea of mine"), "mindreading is expected" (e.g., "I get very upset if my partner does not recognize how I am feeling and I have to tell him/her"), "partners cannot change" (e.g., "My partner does not seem capable of behaving other than he/she does now"), and "sexual perfection is expected" (e.g., "I get upset if I think I have not completely satisfied my partner sexually"). High scores indicated strong dysfunctional beliefs. Cronbach's alpha for the summed composite score was .83 for husbands and .82 for wives. Means were 51.81 (SD = 13.51) for husbands and 50.59 (SD = 13.73) for wives. Additional psychometric properties of this score are presented by Bradbury and Fincham (1993).

Instrumentality and expressiveness. Respondents used a 7-point scale ranging from 1 (*never or almost never true*) to 7 (*always or almost always true*) to describe themselves in terms of instrumentality (11 items; e.g., "assertive, strong personality, dominant") and expressiveness (12 items; e.g., "affectionate, compassionate, eager to soothe hurt feelings"). Items were based on Kurdek's (1987) factor analysis of items from Bem's (1974) Sex Role Inventory (BSRI). High scores indicated high levels of instrumentality and expressiveness. Cronbach's alphas for the summed composite instrumentality and expressiveness scores were .86 and .88, respectively, for husbands and .86 and .87, respectively, for wives. For instrumentality, means were 55.77 (SD = 9.46) for husbands and 50.82 (SD = 9.98) for wives. For expressiveness, means were 67.46 (SD = 8.40) for husbands and 71.67 (SD = 7.28) for wives. Relevant information on the psychometric properties of scores derived from the BSRI is provided by Kurdek (1987) as well as by Brems and Johnson (1990).

Psychological distress. Respondents used a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*) to indicate how much discomfort 90 problems from Derogatis's (1983) Symptom Checklist–90–Revised caused them during the past 7 days. Symptoms covered the areas of somatization, obsessions and compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. High scores indicated severe symptoms. Cronbach's alpha for the summed composite score was .97 for husbands and .97 for wives. Means were 41.28 (SD = 36.84) for husbands and 45.97 (SD = 38.29) for wives. Additional psychometric properties of this score are presented by Derogatis (1983) as well as by Schwarzwald, Weisenberg, and Solomon (1991). For descriptive purposes, correlations between all of the individual-differences scores for husbands and wives are presented in Table 3. Because correlations within spouses and between spouses were not high, each score was retained.

Measure of Marital Quality

At each assessment, marital quality was assessed by the total score from Spanier's (1976) 32-item Dyadic Adjustment Scale, for which high scores reflect high marital quality. Over the 10 assessments, Cronbach's alpha for the summed composite score (maximum value = 151) ranged from .90 to .96 for husbands and from .91 to .95 for wives. Additional psychometric properties of this score are reported by Kurdek (1992).

Table 2
Mean Number of Children and Stepchildren, Mean Age (in Years) of Children and Stepchildren, and Sample Size (n) by Year of Assessment

	Children			Stepchildren		
Year	Number	Age	*n*	Number	Age	*n*
1	—	—	—	1.56	8.84	72
2	1.16	1.03	32	1.55	10.60	40
3	1.10	1.05	52	1.57	13.20	23
4	1.20	1.30	69	1.67	14.33	15
5	1.31	1.23	86	1.73	15.29	11
6	1.51	1.88	81	1.60	15.75	10
7	1.60	2.07	67	1.60	18.13	10
8	1.80	2.42	59	1.71	18.00	7
9	1.81	2.93	57	1.25	17.63	4
10	1.96	3.84	52	1.50	20.75	2

Note. Dashes indicate that values were not computed.

Table 3
Pearson Correlations Between Husband (H) and Wife (W) Year 1 Scores

Score	1	2	3	4	5	6	7	8	9	10
1. H dependability	—									
2. H beliefs	−.33**	—								
3. H instrumentality	.05	−.04	—							
4. H expressiveness	.24**	−.24**	.23**	—						
5. H distress	−.28**	.35**	−.02	−.14**	—					
6. W dependability	.21**	−.19*	−.04	.07	−.19**	—				
7. W beliefs	−.20**	.28**	−.01	−.12**	.12**	−.39**	—			
8. W instrumentality	.00	−.02	.13**	.19**	−.03	.02	−.10*	—		
9. W expressiveness	.11*	−.04	.13**	.10*	.03	.12	−.11*	.11*	—	
10. W distress	−.22**	.16**	.03	−.01	.20**	−.31**	.40**	−.06	−.03	—

Note. $N = 522$.
* $p < .05$. ** $p < .01$.

Results

Bias in the Longitudinal Sample

Although the growth curve analyses used in this study included data from all 522 couples (see later), bias in the sample of couples who completed all 10 assessments was evaluated with a one-way (couple status) multivariate analysis of variance in which the 93 couples with all 10 assessments were compared with the 429 couples with fewer than 10 assessments on three sets of variables from Year 1. The first set included the following 11 demographic variables: husband's age, education, employment status (0 = *unemployed,* 1 = *employed*), income, and number of divorces; wife's age, education, employment status (0 = *unemployed,* 1 = *employed*), income, and number of divorces; and years of cohabitation. The second set included the following 10 individual-differences variables: husband and wife versions of dependability of spouse, relationship beliefs, instrumentality, expressiveness, and psychological distress. Finally, the third set included husband and wife versions of the marital quality score.

The multivariate effect was significant for the set of demographic variables, $F(11, 510) = 5.91$, $p < .001$. Univariate analyses indicated that relative to husbands who did not complete all assessments, husbands who did had higher levels of education and higher personal annual incomes, Fs(1, 520) = 39.05 and 7.34, respectively, ps $< .01$. In addition, relative to wives who did not complete all assessments, wives who did had higher levels of education, $F(1, 520) = 43.14$, $p < .01$.

The multivariate effect was also significant for the set of individual-differences variables, $F(10, 511) = 3.77$, $p < .01$. Univariate analyses indicated that relative to husbands who did not complete all assessments, husbands who did had lower scores regarding dysfunctional beliefs and instrumentality, Fs(1, 520) = 4.20 and 5.41, respectively, ps $< .05$, and that relative to wives who did not complete all assessments, wives who did had higher scores for dependability and lower scores for dysfunctional beliefs, expressiveness, and psychological distress, Fs(1, 500) = 6.39, 15.82, 6.36, and 5.68, respectively, ps $< .05$. Finally, the multivariate effect for the two marital quality scores was not significant, indicating that the two groups of couples were equivalent on spouses' reports of relationship quality at the beginning of the marriage. Nonetheless, because of the other differences found, the current sample cannot be regarded as representative.

Statistical Issues

Determining where husbands and wives began their trajectory of change in marital quality and assessing whether the pattern of change in marital quality for each spouse was best captured by a linear, quadratic, or cubic growth function posed two problems regarding statistical analyses. First, because Pearson correlations between husbands' and wives' marital quality scores ranged from .56 to .64 over the 10 assessments, separate analyses could not be conducted for each spouse without biased tests of statistical significance (Kenny, 1996). Instead, one analysis needed to be done in which the four effects for one spouse (i.e., initial status as well as linear, quadratic, and cubic patterns of change) were estimated and tested for statistical significance with controls for the four effects of the other spouse. Second, because over the course of the study, couples separated, withdrew from the study, or were dropped from the study, sample size decreased from Year 1 to Year 10. To prevent the loss of information for couples without complete data, I needed to conduct analyses so that information from all couples could be used.

Both statistical problems were solved by conducting two-level hierarchical linear modeling analyses with version 4.04 of Bryk, Raudenbush, and Congdon's (1996) Hierarchical Linear Modeling (HLM) program. Raudenbush, Brennan, and Barnett's (1995) guidelines for analyzing data from marital dyads were followed (see Willett, Singer, & Martin, 1998, for a general discussion of growth modeling). In all two-level analyses, the model at Level 1 captured aspects of within-couple variability in marital quality, whereas the model at Level 2 captured facets of between-couples variability in each aspect of within-couple variability. Specifically, the model at Level 1 treated the couple as the unit of analysis and used a set of coded vectors (see Pedhazur, 1982, chap. 14) to define the four parameters of the trajectory of growth in marital quality for each spouse within each couple. An example of the Level 1 record of one couple with marital quality scores from the Dyadic Adjustment Scale at all 10 assessments is presented in Table 4.

As shown in this table, for each spouse, intercepts (i.e., estimates of initial status) were identified by dummy variables, and linear, quadratic, and cubic components of each spouse's growth curve were identified by sets of orthogonal polynomial contrasts that provided unique weights for the marital quality score at each

Table 4
An Example of the Level 1 Data Setup for One Couple With Scores From the Dyadic Adjustment Scale (DAS) at Each Year of Assessment

		Husband				Wife			
Code	DAS	Intercept	Linear	Quadratic	Cubic	Intercept	Linear	Quadratic	Cubic
001	110	1	−9	6	−42	0	0	0	0
001	108	1	−7	2	14	0	0	0	0
001	109	1	−5	−1	35	0	0	0	0
001	118	1	−3	−3	31	0	0	0	0
001	117	1	−1	−4	12	0	0	0	0
001	116	1	1	−4	−12	0	0	0	0
001	130	1	3	−3	−31	0	0	0	0
001	118	1	5	−1	−35	0	0	0	0
001	124	1	7	2	−14	0	0	0	0
001	119	1	9	6	42	0	0	0	0
001	111	0	0	0	0	1	−9	6	−42
001	106	0	0	0	0	1	−7	2	14
001	101	0	0	0	0	1	−5	−1	35
001	109	0	0	0	0	1	−3	−3	31
001	104	0	0	0	0	1	−1	−4	12
001	112	0	0	0	0	1	1	−4	−12
001	106	0	0	0	0	1	3	−3	−31
001	113	0	0	0	0	1	5	−1	−35
001	116	0	0	0	0	1	7	2	−14
001	107	0	0	0	0	1	9	6	42

Note. The first 10 DAS scores are from the husband at Year 1 through Year 10, respectively, whereas the second 10 scores are from the wife.

of the 10 assessments (see Cohen & Cohen, 1983, p. 243). For example, the weights for the linear component were −9, −7, −5, −3, −1, 1, 3, 5, 7, and 9 for scores from Year 1 through Year 10, respectively. For couples with incomplete data, as many of the 10 assessment weights were assigned as there were assessments available.

In equation form (see Equation 1 below, where H = husband and W = wife), it can be seen that the Level 1 model simultaneously defined a cubic growth model for each spouse (four parameters for husbands and four parameters for wives), thereby controlling for the problem of partner interdependence:

$$\begin{aligned}\text{Marital quality} = {} & \text{H (intercept + linear component} \\ & \text{+ quadratic component + cubic component)} \\ & \text{+ W (intercept + linear component} \\ & \text{+ quadratic component + cubic component).} \quad (1)\end{aligned}$$

Because the HLM program (Bryk et al., 1996) first uses ordinary least-squares methods to estimate the eight parameters on an individual couple-by-couple basis, the problem of having couples with differing numbers of assessments in the same analysis was handled such that each couple had its own growth curve. These initial least-squares values were used to obtain more precise estimates of Level 1 effects using empirical Bayes methods such that Level 1 estimates were optimally derived so as to borrow strength from the information provided by the full sample (see Bryk et al., 1996, pp. 4–5).[1] Thus, the estimates reported here were based on data from the entire sample of 522 couples, resulting in a total of 4,792 assessments of marital quality for each spouse.

Estimating the growth curve for each spouse required that each of the eight parameters of the Level 1 model in Equation 1 become an outcome variable to be explained by variables in the Level 2 model, plus a random couple effect. Length of cohabitation was included in the Level 2 model as a control variable. Thus, the growth curve model that included the intercept (or initial status) and the linear, quadratic, and cubic components of change com-

[1] The HLM program also provided information regarding whether the ordinary least-squares estimates of change were reliable. The reliability of each parameter is defined as the ratio of the variance of the true means to the variance of the estimates and depends on the number of observations per spouse, the magnitude of the variance associated with the true means, and the magnitude of the variance associated with measurement error. Generally, the reliability of the least-squares estimate of the mean increases with the number of observations per spouse, the amount of variance among spouses in their true means, and the number of items in the scale. In the current study, the reliabilities vary from couple to couple because the number of observations varies with the number of completed assessments. The HLM program calculated the average of these reliabilities with data from the 197 couples that had sufficient data for computation. The reliability values for intercept (initial status), linear change, quadratic change, and cubic change were .71, .50, .33, and .20 for husbands, respectively, and .72, .53, .34, and .26 for wives, respectively. Bryk and Raudenbush (1992, p. 202) recommended that average reliabilities should exceed .05 in order to avoid computational difficulties with the iterative computing routines. The current reliabilities exceeded this cutoff value and ensured that it was possible to use each spouse-specific change parameter to discriminate between couples.

prised Equation 1 at Level 1 and the following eight equations at Level 2:

$$\text{H intercept} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (2)$$

$$\text{H linear component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (3)$$

$$\text{H quadratic component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (4)$$

$$\text{H cubic component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (5)$$

$$\text{W intercept} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (6)$$

$$\text{W linear component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (7)$$

$$\text{W quadratic component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (8)$$

$$\text{W cubic component} = \text{grand mean} + \text{length of cohabitation} + \text{random couple effect.} \quad (9)$$

Estimates of the Level 2 coefficients (fixed effects) as well as both the variance associated with each fixed effect and the covariation among the fixed effects (random effects) were accomplished through full maximum-likelihood methods which, in the present case, allowed the fit of nested models to be compared.

The Nature of the Trajectory of Change in Marital Quality

Four nested models were estimated to determine where spouses started the trajectory of change in marital quality and whether the growth curve for each spouse was best characterized as linear, quadratic, or cubic in nature. The first model (intercept) estimated only husband and wife intercepts. The second model (linear) estimated spousal intercepts and linear components of the growth curve. The third model (quadratic) estimated spousal intercepts and linear and quadratic components of the growth curve. Finally, the fourth model (cubic) estimated spousal intercepts and linear, quadratic, and cubic components of the growth curve. Thus, "higher order" models were tested with controls for "lower order" effects. Findings regarding the fixed effects (estimates of the parameters of the "best" growth curve) are presented before those relevant to the random effects (the amount of variability within each parameter and the correlations between those parameters).

Fixed effects. The fit of a hierarchical linear model is assessed within the HLM program (Bryk et al., 1996) by a deviance statistic. Low values of this statistic reflect good fit. In the present study, the improved fit of increasingly more complex growth models was assessed by testing whether the decrease in the deviance statistic associated with going from the more simple to the more complex model was statistically significant. (The sample size for these tests changes because the relevant statistic is based on the number of cases with complete data.) These tests indicated that the linear model provided a better fit to the data than did the intercept model, $\chi^2(11, N = 392) = 1{,}357.81$, $p < .01$; that the quadratic model provided a better fit to the data than did the linear model, $\chi^2(15, N = 307) = 203.33$, $p < .01$; and that the cubic model provided a better fit to the data than did the quadratic model, $\chi^2(19, N = 197) = 118.83$, $p < .01$. Thus, of the four models, the cubic growth model provided the best fit to the pattern of change in marital quality.

The unstandardized coefficients for each of the four parameters of each spouse's cubic growth model are presented for husbands and wives in the top panel (Model 1) of Table 5. In the HLM program, these coefficients are tested for statistical significance with a t ratio. Following Karney and Bradbury (1997), I converted t ratios to effect-size rs to facilitate the interpretation of the coefficients.[2] Small, medium, and large effects were designated by rs of .10, .30, and .50, respectively (per Cohen, 1988). As shown in Table 5, the level of marital quality at the beginning of the trajectory was fairly high for both spouses. (Because the total Dyadic Adjustment Scale score was always greater than 0, both initial status effects had to be significant, so the relevant effect sizes are not presented.) As also shown in Table 5, the significant cubic effect for each spouse was medium in size.

For descriptive purposes, a graphical estimate of the nature of the growth curve for each spouse was derived by plotting the observed means of the marital quality scores obtained at each of the 10 assessments for the 93 couples who provided data for all years. The resulting graph is only an estimate, however, because—as noted earlier—the actual parameter estimates were based on information provided by the full sample of 522 couples. As shown in Figure 1, a cubic growth function best represented the pattern of change for each spouse because there were two bends in the growth curve. For each spouse, marital quality declined fairly rapidly over the first 4 years of marriage (the first phase of accelerated change), stabilized, and then declined again at about the 8th year of marriage (the second phase of accelerated change).[3]

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[2] According to Rosenthal and Rosnow (1984, p. 217), $r = \sqrt{[t^2/(t^2 + df)]}$. In HLM analyses, df = the number of Level 2 units (e.g., couples) − the number of Level 2 predictors − 1. By convention, r (which is always positive in sign) was assigned a positive or negative sign that matched the corresponding t ratio.

[3] The two-level baseline model was also estimated with data from only the 93 couples with complete data. Estimates were similar to those obtained for the total sample. For husbands, respective unstandardized estimates for initial status, the linear component, the quadratic component, and the cubic component were 114.65, −0.40, 0.19, and −0.03, with corresponding t ratios of 96.02, −4.83, 2.80, and −3.43, ps $< .01$. For wives, respective unstandardized estimates for initial status, the linear component, the quadratic component, and the cubic component were 116.23, −0.54, 0.12, and −0.03, with corresponding t ratios of 103.39, −6.73, 1.99, and −3.72, ps $< .05$. There was significant variability within each of the eight parameters, $\chi^2(92, N = 93)$ ranging from 115.17 (wife's cubic component) to 3,782.60 (husband's initial status), ps $< .05$.

Table 5
Fixed Effects Estimates for Two Models of the Trajectory of Change in Marital Quality

Parameter	Husband			Wife		
	Coefficient	*t*	*r*	Coefficient	*t*	*r*
Model 1: Controlling for length of cohabitation						
Initial status	111.48	124.85**	—	111.04	117.56**	—
Growth curve						
Linear component	−0.69	−8.61**	−.52	−0.89	−9.98**	−.58
Quadratic component	0.37	4.79**	.32	0.28	3.67**	.25
Cubic component	−0.03	−4.75**	−.32	−0.03	−4.60**	−.31
Model 2: Controlling for length of cohabitation and follow-up status						
Initial status	115.45	79.32**	—	116.86	77.35**	—
Growth curve						
Linear component	−0.44	−4.47**	−.30	−0.54	−5.06**	−.34
Quadratic component	0.27	2.64**	.18	0.18	1.78	.13
Cubic component	−0.03	−3.24**	−.23	−0.03	−2.50**	−.18

Note. Dashes indicate that no value was calculated because the estimate for initial status had to be different from 0.
** $p < .01$.

Random effects. The random effects associated with the cubic growth model addressed two issues. First, was there sufficient variability within each parameter of the cubic growth model to warrant retaining each parameter in later analyses that were designed to account for such variability? The standard deviations for each of the eight random effects from the cubic model are presented in the diagonal of Table 6. The HLM program provides a chi-square test regarding the heterogeneity of the variance of each random effect. Because each of the eight resulting chi-square values was significant—$\chi^2(195, N = 197)$ ranged from 224.38 (for wife's cubic change) to 4,295.80 (for wife's initial status), $ps <$ .01—the eight-parameter model was used in later analyses designed to explain the variability within each parameter.

The second issue was the extent to which husbands' trajectory of change in marital quality was related to that of their wives. Correlations among all of the random effects are presented below

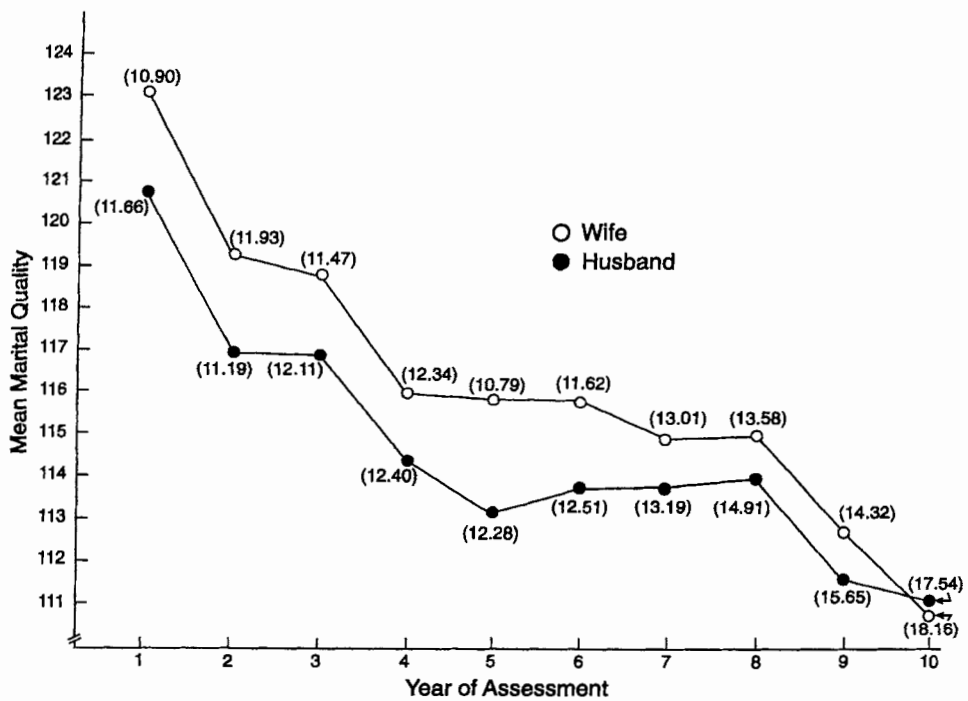

Figure 1. Mean marital quality scores (and standard deviations) by spouse and year of assessment for couples completing all 10 assessments ($n = 93$).

Table 6
Standard Deviations for Random Effects and Correlations Between Random Effects

Random effect	1	2	3	4	5	6	7	8
1. Husband initial	13.93							
2. Wife initial	.79	14.60						
3. Husband linear	.64	.51	0.81					
4. Wife linear	.56	.59	.88	0.97				
5. Husband quadratic	−.10	−.06	−.20	−.24	0.68			
6. Wife quadratic	.00	−.13	.00	−.02	.82	0.70		
7. Husband cubic	−.05	.10	−.16	−.27	−.06	−.24	0.05	
8. Wife cubic	.35	.42	.19	.02	−.44	−.57	.79	0.06

Note. Standard deviations are presented in the diagonal, and correlations are presented below the diagonal.

the diagonal of the data matrix in Table 6, from which cross-spouse correlations can be obtained. As shown in this table, because the husband–wife correlations were highly positive for initial status, linear change, quadratic change, and cubic change, spouses' trajectories of change in marital quality were very similar to one another. A multivariate test within the HLM program was run to determine whether the four parameters for husbands differed from the corresponding four parameters for wives. This test was significant, $\chi^2(4, N = 197) = 9.99, p < .05$. Subsequent univariate comparisons indicated that husbands and wives differed on only one of the four parameters: Relative to husbands, wives showed a steeper rate of linear change, $\chi^2(1, N = 197) = 8.68, p < .01$.

The Nature of the Trajectory of Change in Marital Quality With Controls for Longitudinal Outcomes

One possible concern with the cubic growth model just described is that it included data from couples with different outcome statuses over the course of the study. In particular, one might argue that the pattern of deterioration in marital quality just reported was due to the fact that spouses who separated or divorced were included with spouses who remained together. Consequently, a second cubic model was estimated in which Equations 2 through 9 (at Level 2) included three dummy variables that represented variability in outcome status (as well as controls for length of cohabitation). Because the couples with complete longitudinal data were used as the reference group, the dummy variables carried information about the extent to which couples who separated or divorced, withdrew from the study, or were dropped from the study differed from couples with complete longitudinal data.

The unstandardized weights associated with the three dummy variables are presented for each of the four parameters of the growth trajectory for each spouse in the top panel of Table 7. It can be seen that couples in which spouses separated or divorced differed from couples with complete longitudinal data in that the former group included husbands and wives with lower initial status and wives with steeper linear decreases: effect-size *r*s = −.30 (medium), −.46 (medium), and .29 (small), respectively. Couples who withdrew from the study differed from couples with complete longitudinal data in that the former group included wives with lower initial status: effect-size $r = -.17$ (small). Finally, couples who were dropped from the study differed from couples with complete longitudinal data in that the former group included husbands and wives with lower initial status and husbands and wives with steeper linear change: effect-size *r*s = −.18 (small), −.25 (small), −.14 (small), and −.18 (small), respectively.

With regard to the estimates of the parameters of the growth trajectory with controls for outcome status (as well as length of cohabitation), the degree to which increasingly more complex growth models improved the fit of the model to the data again was assessed. As in the previous analysis, the linear model provided a better fit to the data than did the intercept model, $\chi^2(17, N = 392) = 1{,}451.28, p < .01$; the quadratic model provided a better fit to the data than did the linear model, $\chi^2(21, N = 307) = 187.15$, $p < .01$; and the cubic model provided a better fit to the data than did the quadratic model, $\chi^2(25, N = 197) = 114.91, p < .01$. Thus, even with additional controls for outcome status, the cubic growth model still provided the best fit to the pattern of change in marital quality. However, as shown in the bottom portion of Table 5, the strength of the cubic effect was reduced from medium to small for both husbands and wives. Because the effects associated with outcome status were significant, following Karney and Bradbury (1997), I used the dummy variables representing these effects, along with length of cohabitation, as control variables in all subsequent analyses.

Explaining Variability in Each Parameter of the Trajectory of Change

Attention is now directed to whether spouses' divorce history, the presence of residential children or stepchildren, and spouses' individual-differences variables predicted any of the parameters that defined the cubic pattern of change in marital quality.

Divorce history. For husbands and wives, the link between both their own divorce history and that of their spouse and each of the four parameters relevant to their own trajectory of change in marital quality was examined with a two-level model. The Level 1 model included husbands' own initial status, linear change, quadratic change, and cubic change as well as the four parallel terms for wives. At Level 2, each of these terms was explained by two sets of variables. These included the set of four control variables (length of cohabitation and the three dummy variables capturing information about outcome status) and a set of four dummy variables that carried information regarding the husband's own divorce history and that of the wife (no divorce, one divorce, or multiple divorces). Within this second set, two of the dummy variables represented variability in one spouse's own divorce history (with no divorce as the reference group), and the other two dummy

Table 7
Unstandardized Coefficients Associated With Predictors of Each Parameter of the Trajectory of Change in Marital Quality

Predictor	Initial status		Linear change		Quadratic change		Cubic change	
	Husband	Wife	Husband	Wife	Husband	Wife	Husband	Wife
Outcome status (with controls for length of cohabitation)								
Separated vs. complete	−14.82**	−25.93**	−0.68	−2.60**	0.80	−0.51	0.03	−0.02
Withdrew vs. complete	−2.64	−5.32*	−0.27	−0.45	−0.06	−0.05	−0.01	0.00
Dropped vs. complete	−5.06**	−7.66**	−0.43*	−0.62**	0.18	−0.10	0.00	−0.02
Divorce history (with controls for length of cohabitation and outcome status)								
1 vs. none								
Husband	3.73	5.55**	0.10	0.18	0.12	0.26	0.01	0.00
Wife	−2.52	−1.88	−0.35*	−0.16	0.10	0.19	0.00	−0.01
Multiple vs. none								
Husband	0.82	1.89	−0.02	0.08	0.10	0.18	−0.05	0.00
Wife	−1.49	−0.52	−0.42	−0.46	−0.37	−0.46	−0.02	−0.02
Child status (with controls for length of cohabitation and outcome status)								
Biological vs. none	−4.87**	−3.46*	−0.48**	−0.35*	−0.24	−0.27	0.00	0.00
Step vs. none	−0.49	−2.10	−0.24	−0.36	−0.12	−0.19	0.00	−0.02
Other vs. none	−2.53	−1.03	−0.38	−0.21	−0.32	−0.20	−0.03	−0.02
Individual-differences variables (with controls for length of cohabitation and outcome status)								
Dependability								
Husband	0.95**	0.69**	−0.44	0.01	0.02	0.00	0.00	0.00
Wife	0.71**	1.17**	0.00	0.02	0.01	0.01	0.00	0.00
Dysfunctional beliefs								
Husband	−0.25**	−0.18**	−0.01	−0.01	0.00	0.00	0.00	0.00
Wife	−0.12**	−0.23**	0.00	0.00	0.00	0.00	0.00	0.00
Sex role self-concept								
Instrumentality								
Husband	0.05	−0.01	0.00	0.01	0.00	0.00	0.00	0.00
Wife	−0.03	−0.08	0.00	0.00	0.00	0.00	0.00	0.00
Expressiveness								
Husband	0.38**	0.26**	−0.02*	−0.01	−0.01	0.00	0.00	0.00
Wife	0.32**	0.43**	0.00	0.00	0.00	0.01	0.00	0.00
Psychological distress								
Husband	−0.12**	−0.08**	−0.01**	−0.01*	0.00	0.00	0.00	0.00
Wife	−0.05**	−0.07**	0.00	0.00	0.00	0.00	0.00	0.00

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

variables represented variability in the divorce history of the other spouse (again, with no divorce as the reference group). Thus, eight equations with eight terms were specified at Level 2, four for each spouse.

The resulting unstandardized coefficients are presented in the second panel of Table 7. Although 2 of the 32 coefficients associated with comparisons between spouses with a history of one divorce and those with a history of no divorce were significant, they might best be regarded as chance findings. Of more substantive interest is the finding that none of the coefficients associated with comparisons between spouses with a history of multiple divorce and those with a history of no divorces was significant. Analyses not reported here indicated that Husband Divorce History × Wife Divorce History interactions also were not significant and that main effects for divorce history were still nonsignificant even when outcome status was not controlled.

Presence of residential children or stepchildren. The link between whether the couple lived with children or stepchildren and each of the four parameters of the growth trajectory at Level 1 for each spouse was examined by including seven terms in each of the eight equations at Level 2. These included the set of four control variables (length of cohabitation and three dummy variables representing outcome status) and three dummy variables in which couples with no children were contrasted with each of three other groups: couples living with only their own biological children at some point in the study, couples in which the husband lived with only his stepchildren, and an "other" category that included the remaining couples. As can be seen from the unstandardized coefficients presented in the third panel of Table 7, relative to couples who did not live with any children, those who lived with only their biological children included husbands and wives with lower initial status for marital quality as well as stronger linear declines in marital quality: effect-size $rs = -.19$ (small), $-.13$ (small), $-.21$ (small), and $-.14$ (small), respectively.

In order to explore this linear effect in more detail, I tested a two-level model using data from only the 140 couples living with

their biological children. The Level 1 model included four terms such that marital quality was defined in terms of the husband intercept, the husband linear component, the wife intercept, and the wife linear component. In turn, at Level 2, these four terms became outcome scores, each to be explained by five terms that captured much of the heterogeneity within this subsample of couples: years of cohabitation (as a control variable), year during which the transition to parenthood was made (ranging from 1 to 9), total number of children at last assessment (ranging from 1 to 4), total number of male children (ranging from 0 to 3), and mean age of all children (ranging from 1 to 8 years).

As can be seen from the unstandardized coefficients presented in Table 8, with controls for the other predictors at Level 2, year of transition and total number of children independently explained variability in each of the four parameters. Specifically, fathers and mothers who made the transition to parenthood relatively early started their respective trajectories of change at fairly low levels of marital quality, *r*s = .30 (medium) and .40 (medium), respectively, and they experienced relatively steep declines in marital quality, *r*s = .25 (small) and .35 (medium), respectively. In addition, fathers and mothers who had a relatively large number of children started their respective trajectories of change at fairly low levels of marital quality, *r*s = .18 (small) and .17 (small), respectively, and they experienced relatively steep declines in marital quality, *r*s = .24 (small) and .20 (small), respectively. In analyses not reported here, effects associated with the interaction between the timing of the transition to parenthood and total number of children, total number of male children, and mean age of all children were also examined. None of these effects was significant.

Individual-differences variables. Because with two exceptions—instrumentality and expressiveness—the individual-differences variables did not form a coherent conceptual package, separate analyses were conducted for each variable. Instrumentality and expressiveness were considered together because they represented two dimensions of sex role self-concept. Thus, for dependability, dysfunctional beliefs, and psychological distress, each of the four parameters of a spouse's own trajectory of change in marital quality at Level 1 was explained for each spouse by the set of four control variables (length of cohabitation and three dummy variables carrying information about outcome status) and the self-version and spouse version of the individual-differences variable of interest, resulting in eight equations (four for each spouse) with six terms at Level 2. For the analyses involving sex role self-concept, self-versions of instrumentality and expressiveness and spouse versions of instrumentality and expressiveness were considered together, for a total of eight equations with seven terms at Level 2.

Table 8
Unstandardized Coefficients Associated With Predictors of Each Parameter of the Trajectory of Change in Marital Quality for Couples Living With Only Their Biological Children

	Initial status		Linear change	
Predictor	Husband	Wife	Husband	Wife
Year of transition to parenthood	2.33**	3.00**	0.16**	0.25**
No. of total children	4.10*	3.54*	0.44**	0.36*
No. of total male children	−2.48	−1.15	−0.16	−0.01
Mean age of all children	0.39	1.26	0.01	0.09

Note. Years of cohabitation was used as a control variable.
* $p < .05$. ** $p < .01$.

The resulting unstandardized coefficients are presented in the last panel of Table 7 and reveal one striking pattern: Independent intraspouse and cross-spouse effects were obtained for dependability of spouse, dysfunctional beliefs, expressivity, and psychological distress, but almost exclusively for the initial status of the trajectory of change. Specifically, husbands who began their trajectory of change at fairly low levels of marital quality at the start of their marriages regarded their wives as low in dependability (effect-size r = .42, medium), endorsed many dysfunctional beliefs about relationships (r = −.31, medium), saw themselves as low in expressiveness (r = .29, small), and reported high psychological distress (r = .38, medium). In addition, they also had wives who, at the start of the marriage, regarded them as low in dependability (effect-size r = .37, medium), endorsed many dysfunctional beliefs about relationships (r = −.16, small), saw themselves as low in expressiveness (r = .23, small), and reported high psychological distress (r = −.20, small).

In parallel fashion, wives who started their trajectory at fairly low levels of marital quality at the beginning of the marriage regarded their husbands as low in dependability (effect-size r = .54, large), endorsed many dysfunctional beliefs about relationships (r = −.29, small), saw themselves as low in expressiveness (r = .30, medium), and reported high psychological distress (r = .25, small). In addition, they also had husbands who, at the beginning of the marriage, regarded them as low in dependability (effect-size r = .32, medium), endorsed many dysfunctional beliefs about relationships (r = −.21, small), saw themselves as low in expressiveness (r = .20, small), and reported high psychological distress (r = .24, small).

Discussion

The Nature of the Trajectory of Change in Marital Quality

The focus of this study was not on marriage as a static life event but on marital quality as a developmental phenomenon. Accordingly, the first purpose of this study was to describe the nature of change in marital quality over the first 10 years of marriage. Growth curve analyses were conducted on reports of marital quality from a sample of both spouses that is among the largest ever recruited and among the longest ever continuously assessed in this area of study. In order to explore rather complex patterns of change, a cubic growth curve was fitted for each spouse. This curve consisted of the level of marital quality with which the curve began and whether the pattern of change was characterized as changing at the same rate from assessment to assessment (linear), as having one phase of accelerated change (quadratic), or as having two phases of accelerated change (cubic).

Similar to the findings of Karney and Bradbury (1997), who used growth curve analyses to characterize the nature of change in marital quality for 54 first-married couples over the first 4 years of marriage, the growth curves of husbands and wives in

the current study over the first 10 years of marriage were positively related to each other. In an extension of Karney and Bradbury's findings, husbands and wives in the present study (with controls for the length of time they had been living together) showed a similar pattern of cubic change such that marital quality declined fairly rapidly over the first 4 years of marriage (the first phase of accelerated change), stabilized, and then declined again at about the 8th year of marriage (the second phase of accelerated change). Although reduced in strength, the cubic growth effect remained significant for each spouse even when additional controls for the outcome status of couples over the course of this investigation (e.g., separated or divorced, withdrew from the study, were dropped from the study, or provided all 10 assessments) were introduced. Further, with these controls, the parameters of husbands' trajectories were equivalent to those of their wives.

As a normative account of how marital quality changes over time, the present findings have implications for how adult development is conceptualized. In his classic description of the developmental tasks of adulthood, Havighurst (1972) characterized early adulthood as a time of selecting a mate and adjusting to marriage and portrayed middle adulthood as a time of revitalizing marriage. The findings regarding change in marital quality over time suggest that early adulthood—a developmental period when most people still marry for the first time (United States Bureau of the Census, 1997)—might also be described as a time when one needs to be prepared for two sets of normative declines in marital quality. The first decline occurs over the early years of marriage, consistent with the common notion of a "honeymoon is over" effect (Kovacs, 1983; Sternberg, 1986). The second decline occurs at about the 8th year of marriage, consistent with the common notion of a 7-year-itch effect (Kovacs, 1983). Given evidence that evaluations of outcomes depend on the standards of evaluations used (see review by Higgins, Strauman, & Klein, 1986), the severity of some instances of marital distress might be mitigated by spouses' expecting and being prepared for "normal" periods of decline in marital quality.

One issue that merits further investigation is whether any specific dimensions of marital quality are most likely to decline over time. Addressing this issue is problematic for at least two reasons. First, there is as yet no well-articulated and empirically defended multidimensional model of marital quality (Fincham, 1998). Second, current measures that assess multiple dimensions of marital quality, such as Spanier's (1976) Dyadic Adjustment Scale, which was used in the present study, have the unfortunate psychometric property of highly intercorrelated subscores with attendant statistical problems of multicollinearity. Perhaps Sternberg's (1986) argument that love can be conceptualized in terms of intimacy, passion, and commitment is one starting point for further investigation into the structure of marital quality. It is possible, for example, that different components of marital quality change in different ways. For example, passion, because of its initial high extremes, may decline most quickly, whereas commitment, especially when viewed as barriers to leaving the marriage, may actually increase over time (Adams & Jones, 1997).

Accounting for Variability in the Trajectory of Change in Marital Quality

The second purpose of this study was to determine whether variability in any of the four parameters of the growth trajectory was accounted for by three sets of factors: spouses' divorce history, whether couples had children or stepchildren over the course of the study, and spouses' individual-differences variables assessed at the start of the marriage. The findings regarding divorce history were remarkable in that intrapartner and cross-partner effects were largely nonsignificant even when no controls were made for outcome status. This unexpected pattern of findings might be due to the fact that the group of multiply divorced spouses collapsed spouses that were divorced twice with those divorced more than twice.

In their discussion of "serial marriers," Brody et al. (1988) speculated that persons who have been divorced more than twice are at risk for psychological problems because of dysfunctional personality characteristics, unrealistic expectations of marriage, poorly developed negotiation and compromise skills, and cumulative negative stresses associated with living in a society in which serial marriers are regarded negatively. Unfortunately, the risk status of serial marriers could not be evaluated in this study because their number was too small to warrant including them as a distinct group.

The effects regarding having children or stepchildren are noteworthy because they indicate that relative to husbands and wives with no children or stepchildren, those who lived with only their biological children during the course of the study not only started their trajectories at lower levels of marital quality but also showed steeper linear declines in marital quality over time. Both of these effects are somewhat difficult to interpret because no information was available regarding the reasons why couples did not have children. For example, couples could want children eventually but postpone having them, deliberately choose not to have children, or not be able to have children for medical reasons (Houseknecht, 1987).

It is possible that spouses who eventually lived with only their biological children started their trajectories at lower levels of marital quality than those who never lived with any children or stepchildren because they were less motivated to maintain positive illusions about their relationships (Murray, Holmes, & Griffin, 1996). The perception that one's marital relationship is less than perfect may, in time, fuel one's desire to experience a parental relationship, perhaps as one way to compensate for emotional deficiencies within the marital relationship (Belsky, Youngblade, Rovine, & Volling, 1991). Alternatively, spouses who are highly invested in having children may regard their marriages as missing some critical element until children actually arrive.

The finding that relative to husbands and wives with no children or stepchildren, those who lived with only their biological children showed steeper linear declines in marital quality over time may be explained by the fact that in the present sample, most biological children were infants or preschoolers. It is possible that the presence of very young children acts as a barrier to ending even a marriage that is deteriorating (Cherlin, 1977). Consistent with the findings from this study that the decline in marital quality was especially likely for spouses who made the transition to parenthood fairly early in their marital careers and had many children, it is also plausible that the decline in marital quality is linked to an increase in the stressors of parenting that occur as young children develop (e.g., Belsky, Wood-

worth, & Crnic, 1996) and that leave parents with little time and energy to nurture their marital relationship. It would be of interest to determine whether marital quality stabilizes or even increases as children become more autonomous.

In light of discussions of the special stressors associated with living with stepchildren (see summary by Ganong & Coleman, 1994), the finding that the trajectory of change in marital quality for couples with no children or stepchildren was the same as that for spouses in stepfather families is consistent with Martin and Bumpass's (1989) finding that wives' bringing children into a remarriage does not affect the odds of marital success. It is possible that one of the factors that protected the marital quality of spouses in stepfather families was that the stepchildren in these families tended to be adolescents. Although raising adolescents in stepfather families has its own set of issues regarding discipline and control (Hetherington & Clingempeel, 1992), the relative autonomy of adolescents need not interfere with, and may even facilitate, the development of positive marital quality between mothers and stepfathers.

Finally, the effects associated with the individual-differences variables are of note in that they involved both intrapartner and cross-partner links for both husbands and wives only to the initial status of the trajectory of change in marital quality. Consistent with the findings of earlier studies assessing concurrent linkages between individual-differences variables and marital quality, spouses who started their trajectories at relatively low levels of marital quality also reported at the beginning of their marriages low dependability of spouse (Rempel et al., 1985), strong dysfunctional beliefs regarding relationships (Eidelson & Epstein, 1982), low expressiveness (Kurdek & Schmitt, 1986a), and high psychological distress (Karney et al., 1994). The present findings extend these earlier reports by also showing that these individual-differences variables have independent, parallel cross-spouse effects for both husbands and wives.

The findings that having children or stepchildren was linked to linear change in marital quality whereas individual-differences variables assessed at the start of the marriage were linked to the initial status of the trajectory of marital quality are reminiscent of Karney and Bradbury's (1997) findings that spousal interactional patterns (such as one might expect to occur in family systems with children) forecast linear declines in marital quality whereas spouses' individual-differences variables measured at the beginning of the marriage were linked only to the initial status of the trajectory. To the extent that identifying characteristics of persons predisposed to marital distress is deemed important (e.g., Holman, Larson, & Harmer, 1994), the inability of individual-differences variables to predict change in marital quality is sobering. However, given that this change may need to be understood in terms of dynamic tensions between spouses' developing needs and desires rather than in terms of their fairly stable intrapersonal predispositions (Montgomery, 1993), the inability of the individual-differences variables to predict change in marital quality is, in hindsight, not too surprising.

Limitations and Conclusions

The findings from this study need to be viewed with its limitations in mind, four of which are noted here. First, no claim can be made that the couples studied were representative of all newly wed couples because couples at the beginning of the study were disproportionately White and college educated. Second, although the growth curve analyses used all of the available data and controlled for outcome status, the rate of attrition was fairly high, and couples who provided data at all 10 assessments were biased with regard to demographic and individual-differences variables. Third, all of the data collected in this study were self-reported, with attending biases of self-presentation. Fourth, although the notion that marital quality changes in terms of two phases of accelerated change is a plausible interpretation of the cubic growth model, no analyses were conducted that tested precisely when the discontinuities in change occurred (Willett, 1997).

Despite these limitations, this study included a fairly large sample of newlyweds with diverse divorce histories who were studied annually for a longer period of time than in most other comparable studies. Overall, the findings (a) validate Karney and Bradbury's (1997) exhortation that marital researchers attend to the trajectory of change in marital quality; (b) suggest that a pattern of two phases of decline in marital quality is normative; and (c) document that whereas individual-differences variables at the start of the marriage are linked in an intraspouse and cross-spouse manner to the initial status of the trajectory of change in marital quality, only variables that tap some aspect of spousal interactions (such as whether they have children) are linked to the level of change in marital quality.

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