The Measurement of Perceived Relationship Quality Components: A Confirmatory Factor Analytic Approach

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This research tested three models of how the relationship evaluation components of satisfaction, commitment, intimacy, trust, passion, and love are structured and cognitively represented. Participants in Study 1 rated their intimate relationships on six previously developed scales that measured each construct and on a new inventory—the Perceived Relationship Quality Components (PRQC) Inventory. As predicted, confirmatory factor analysis revealed that, for both sets of scales, the best-fitting model was one in which the appropriate items loaded reliably on the six first-order factors, which in turn loaded reliably on one second-order factor reflecting overall perceived relationship quality. These results were replicated on a different sample in Study 2 and across sex. Implications and advantages of the PRQC Inventory are discussed.

Deciding which specific measure to use when assessing relationship quality can be a nightmare for researchers given the huge miscellany of existing scales and the multitude of terms that have been used to describe what different scales measure. Two general approaches have guided the development and use of such scales (Fincham, Beach, & Kemp-Fincham, 1997). The first approach, which tends to be atheoretical, treats self-report responses as proxies for objective estimates of relationship quality. The second approach, which is more theoretical and social psychological in nature, views these scales as assessing subjectively held attitudes or evaluations of relationships.

Scales originating from the atheoretical tradition include the Dyadic Adjustment Scale (Spanier, 1976) and the Marital Adjustment Test (Locke & Wallace, 1959). For example, the Dyadic Adjustment Scale, which has been used in more than 1,000 studies, produces a summed score that combines an array of different concepts and constructs, ranging from perceived happiness or satisfaction to self-reports of behavioral interactions involving the frequency of quarrels, the number of shared activities, the extent of agreement on important issues, and problems with sex or affection. From a theoretical standpoint, such scales are problematic for two reasons. First, they fail to recognize that reports of relationship behaviors are not necessarily equivalent to objective measures of the same behaviors. Second, they often confound (a) self-report evaluations of the relationship with self-reports of behavioral interactions and (b) the hypothetical causes of relationship processes (such as communication) with proposed effects (such as relationship satisfaction) (Eddy, Heyman, & Weiss, 1991; Fincham & Bradbury, 1987; Heyman, Sayers, & Bellack, 1994; Norton, 1983).

An alternative approach is to measure and view relationship quality in terms of subjectively held evaluations in the minds of relationship partners. Recently, there has been a burgeoning interest (particularly among social psychologists) in distinguishing between different components of perceived relationship quality, such as com-

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mitment, trust, passion, and satisfaction. Most of these constructs have their origins in different theoretical perspectives. For example, commitment is a principal outcome variable in Interdependence Theory (Thibaut & Kelley, 1959) and in its recent extensions (e.g., Rusbult's Investment Model: Rusbult, 1980, 1983). Trust lies at the theoretical core of both Attachment Theory (Bowlby, 1969) and Erikson's (1968) model of psychosocial development. Passion has theoretical origins in both attribution theories (Hatfield & Walster, 1978) and in various models of love (e.g., Sternberg, 1986). In terms of face validity, these constructs have different, although clearly overlapping, meanings. Indeed, it is easy to envision relationships in which these constructs show divergent patterns. For instance, an individual may love his or her partner passionately, be highly committed to the relationship, but not trust the partner and, thus, be dissatisfied. Conversely, another individual may be replete with commitment and trust but feel disillusioned about the disappearance of passion in the relationship.

Many researchers have developed scales that purport to measure distinct components of perceived relationship quality. After reviewing the empirical and theoretical literature, we identified six constructs that are commonly claimed to represent distinct components of perceived relationship quality and for which standardized and widely used self-report scales have been developed: satisfaction (S. S. Hendrick, 1988), commitment (Adams & Jones, 1997; Lund, 1985), trust (Boon & Holmes, 1990; Rempel, Holmes, & Zanna, 1985), closeness or intimacy (Aron, Aron, & Smollan, 1992; Sternberg, 1986), passion (Aron & Westbay, 1996; Sternberg, 1986), and love (Fehr & Russell, 1991; Rubin, 1973).

This eclectic array of measures raises a fundamental question: How are these evaluative dimensions structured and cognitively stored? One possibility is that people build and store a global evaluative attitude about their partner and relationship along a good versus bad dimension, which then dictates specific evaluative judgments about the partner and relationship. This implicit premise has guided the development of several scales designed to assess overall perceived relationship quality and is reflected in Gottman's (1990) claim that "in fact, if one selects a sample with sufficient range in marital happiness, it is difficult to measure anything other (than) marital satisfaction that involves the couple's perception of their relationship" (p. 78). According to this account, distinct evaluative domains such as commitment, trust, satisfaction, and love do not exist as separate psychological constructs. Instead, they are all isomorphic indicator variables that underlie global evaluations of the partner and relationship. This model is depicted as Model 1 in Figure 1 (all subsequent references to various models will refer to the models shown in Figure 1).

A second theoretical possibility is that people store and process relationship evaluations independently across different domains. This model, shown as Model 2 in Figure 1, is not particularly plausible. According to most theories (e.g., Rusbult, 1980; Sternberg, 1986), the different evaluative components should correlate. Moreover, previous research (some of which is discussed later) has found that many of these components are highly correlated.

The possibility that the evaluative domains might be correlated is shown in Models 3 and 4 in Figure 1. Model 4 is the major focus of this article. It depicts the different perceived relationship quality components as being domain-specific and quasi-independent evaluative constructs that, nevertheless, load on a second-order factor of overall perceived relationship quality. We believe that Model 4 represents the most plausible psychological account because most people should be motivated to keep their evaluative judgments relatively consistent across different domains. Furthermore, people might possess an overall evaluative node that summarizes how they feel about their partners/relationships. However, domain-specific judgments also may diverge—as illustrated in our prior examples—depending on factors such as the developmental stage of the relationship, the nature of the relationship, personality variables, and so forth.

Choosing which of the models shown in Figure 1 is most likely to be correct has significant ramifications for relationship theory and research. If Model 1 is correct, assessing different domains is not likely to explain or predict relationship behavior over and above a general simple measure of relationship quality. However, if people make evaluative distinctions between different domains, such domains might differentially predict relationship behavior and outcomes. Such evidence would indirectly support current relationship theories such as Rusbult's (1980, 1983) Investment Model, which posits that satisfaction and commitment measure distinct constructs. Although a considerable amount of psychometric and related research has examined different measures and components of perceived relationship quality, little research has addressed how the various components are structured and interrelated. The main goal of the present research was to test and compare the models shown in Figure 1, using confirmatory factor analysis (a seldom-used technique in this research domain).

Unlike exploratory factor analysis, confirmatory factor analysis allows one to test whether specific evaluative domains reflect quasi-independent judgments that are partially subsumed by a more general attitude toward the partner/relationship (i.e., global perceptions of relationship quality). This can be accomplished by comparing how well each of the models shown in Figure 1 fits

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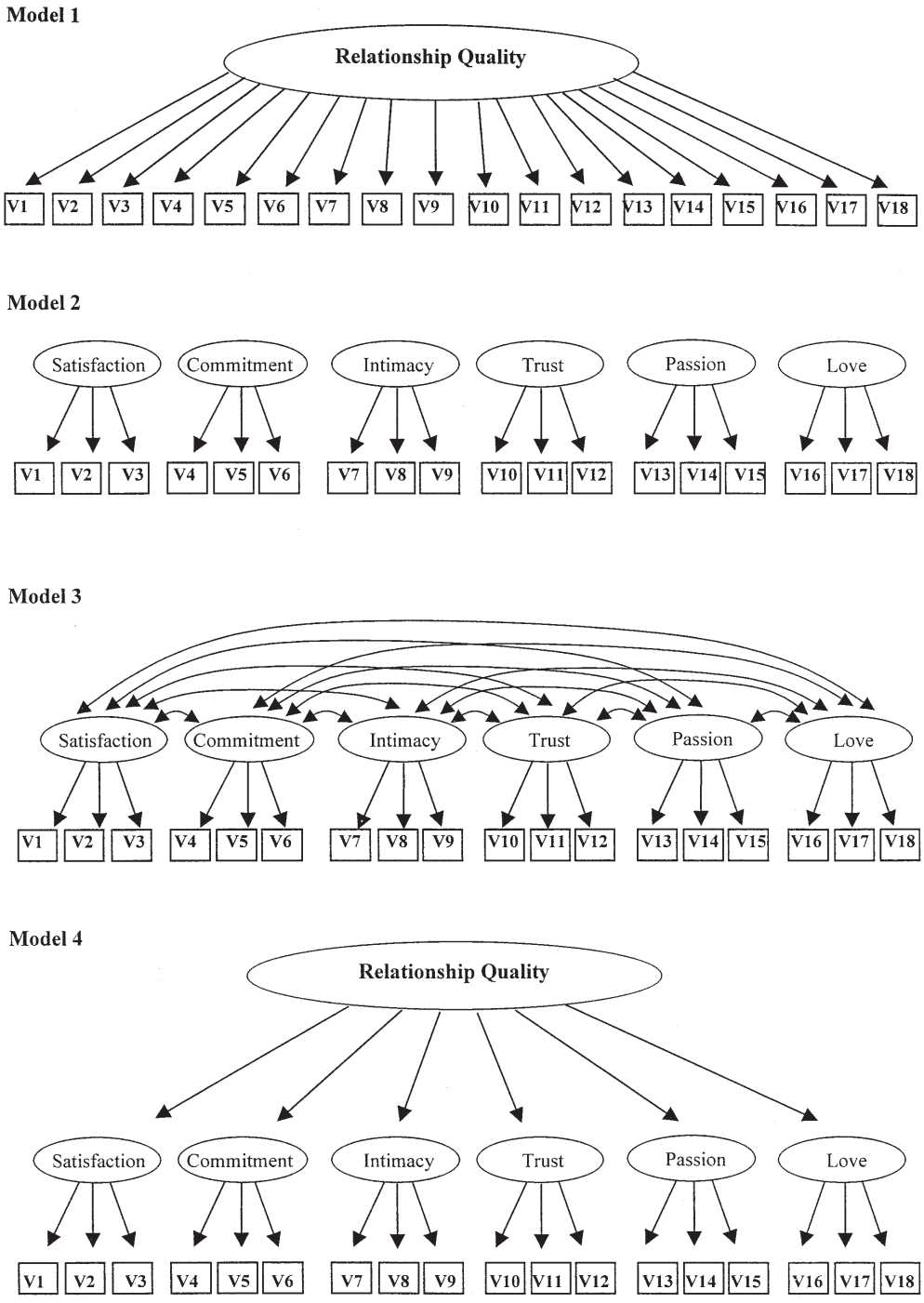

Figure 1 Four models of perceived relationship quality measures.

the empirical data. For our purposes, the most relevant fit comparison is between Model 1 and Model 4. If our central hypothesis is correct, Model 4 should achieve a much superior fit to Model 1. On the other hand, if perceived relationship quality is a unitary construct that accounts for virtually all evaluative judgments about the partner/relationship, the fit of Model 1 should be similar to the fit of Model 4.

Model 3 (also shown in Figure 1) is a benchmark model against which all other models can be compared. As Marsh and Hocevar (1985) note, higher-order models such as Model 4 attempt to explain covariation among

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the first-order factors in a parsimonious way. Consequently, the fit of a model that contains one or more higher-order factors cannot be greater than the fit of a first-order model in which all first-order factors are allowed to correlate (as is true of Model 3). Thus, the most rigorous test of Model 4 is to compare the fit of Model 4 to the fit of Model 3. If Model 4 provides a good fit, as we predicted, it should approximate the fit of Model 3. In comparison, Models 1 and 2 should have considerably poorer fits than both Model 3 and Model 4.

The Measurement of Perceived Relationship Quality Components

As already mentioned, relationship judgments may differ across different evaluative dimensions, and many theories are built on such distinctions. For example, Sternberg's (1986) triangular theory of love postulates that love is composed of three quasi-independent components: commitment, intimacy, and passion. Similarly, Rusbult's (1980, 1983) Investment Model clearly distinguishes between commitment (viewed as the key proximal cause of relationship stability) and satisfaction (believed to be one of the causes of commitment). Tests of these models have shown that these perceived relationship quality constructs are, to some extent, independent. For example, using self-report measures of Sternberg's (1988) three components of love, Whitely (1993) found that commitment was a significantly better predictor of relationship stability than was either passion or intimacy. Moreover, tests of Rusbult's Investment Model have found that self-reported commitment significantly predicts relationship stability above and beyond relationship satisfaction (Bui, Peplau, & Hill, 1996; Rusbult & Martz, 1995).

Recent psychometric evidence, however, raises questions about the independence of these constructs. For example, several psychometric investigations of Sternberg's scales measuring commitment, intimacy, and passion all report little evidence of a clean three-factor structure (with some items loading on the wrong factors) and consistent evidence that the three scales are highly correlated (often as high as .7 to .8; see Acker & Davis, 1992; C. Hendrick & Hendrick, 1989; Levy & Davis, 1988). The use of shorter versions of Sternberg's original scales (to reduce item overlap) has produced somewhat cleaner factor solutions; nevertheless, scale intercorrelations remain high, usually in the .6 to .7 range (Acker & Davis, 1992; Aron & Westbay, 1996). The proper interpretation of these findings is equivocal given that they were derived from exploratory factor analytic techniques. However, Whitely (1993) used confirmatory factor analysis to analyze Sternberg's model (using Sternberg's original scales) and found little difference in fit between models similar to 1 and 4 in Figure 1 when the three constructs (commitment, intimacy, and passion) were tested. Viewed as a whole, these results suggest that items assessing commitment, passion, and intimacy probably load on a single factor, namely, global perceived relationship quality (as shown in Model 1).

Confirmatory factor analysis—in contrast to standard exploratory factor analysis—is ideally suited to testing and comparing the kinds of models shown in Figure 1. Before conducting these tests, we identified some commonly used scales, all of which were developed to measure different facets of relationship quality: satisfaction (Hendrick, 1988), commitment (Lund, 1985), intimacy (Sternberg, 1986, 1988), trust (Boon & Holmes, 1990; Rempel et al., 1985), passion (Sternberg, 1986, 1988), and love (Rubin, 1973). We chose these particular scales based on the extent of their usage and the psychometric evidence concerning their reliability. When two or more different scales assessed the same construct and had equivalent reliabilities, we selected the scale for use based on the evidence for its validity compared to the other potential scale(s).[1]

One difficulty with using existing scales for our envisaged confirmatory factor analyses is that many of them suffer from problems of item overlap. Ironically, this problem may stem from scale designers following the well-accepted procedure whereby multiple facets of a construct (as suggested by prior theorizing) are assessed. For example, the scale assessing trust (Boon & Holmes, 1990) was developed from prior theorizing about three components of trust, which were then identified and assessed—faith, dependability, and predictability. Consequently, some items on the trust scale are very similar to items that appear in scales designed to measure other constructs. For example, the trust scale contains one item that reads, "My partner has always been responsive to my needs and feelings." This item is similar to a question in Hendrick's (1988) satisfaction scale, which asks, "How well does your partner meet your needs?" We do not suggest that some item overlap invalidates these scales. However, by using only existing scales that contain some item overlap, the results of the confirmatory factor analyses could well be biased in favor of Model 1 (where every item across all scales loads on overall perceived relationship quality) and correspondingly biased against Model 4 (in which the six constructs form quasi-independent subfactors that also load on overall perceived relationship quality).

To deal with this issue, we developed a set of three-item scales termed the Perceived Relationship Quality Components (PRQC) Inventory. The PRQC Inventory measures each of the six constructs already described: satisfaction, commitment, intimacy, trust, passion, and love (see the appendix). In developing the subscales of the PRQC, we tried to maximize the face validity and

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internal reliability of each relationship construct while avoiding item overlap as much as possible. For example, we assessed relationship satisfaction with highly face valid items that had very similar meanings: How satisfied are you with your relationship? How content are you with your relationship? and How happy are you with your relationship? We assessed relationship commitment with the following items: How committed are you to your relationship? How dedicated are you to your relationship? and How devoted are you to your relationship? Of course, using synonyms to assess each construct does not measure all of the complex facets of a construct in a thorough or theoretically complex fashion. However, this approach does generate straightforward, highly face valid measures of people's perceptions of each construct, which, in turn, allow fair tests of our hypotheses using confirmatory factor analysis.

Overview

In Study 1, we had participants complete both the six established scales (described above) and the PRQC Inventory. Applying confirmatory factor analysis, we used both sets of scales to test which of the models depicted in Figure 1 produced the best fit to the data. We made the same predictions for both sets of scales. First, we predicted a relatively poor fit for Model 1 (where all items load on a single factor representing perceived relationship quality). Second, we predicted a poor fit for Model 2 (where the six perceived relationship quality components represent independent constructs). This hypothesis was not based on the expectation that the measurement model would be inadequate (i.e., that the loadings of the three items on each factor would be low). Rather, it was based on the fact that Model 2 does not allow for the possibility that the six perceived relationship quality components are correlated. Third, we predicted a good fit for Model 4 (where the six components represent domain-specific and semi-independent constructs that then load on a higher-order factor of global perceived relationship quality). In conducting these tests, we examined the fits of each model independently. We also compared the fits of all models against Model 3 and Model 1 against Model 4. As discussed earlier, Model 3 was the benchmark comparison model against which the fit of all models can be compared.

STUDY 1

Method

Participants. Two hundred students in heterosexual relationships (127 women and 73 men) attending the University of Canterbury participated in this study. The mean age of the sample was 23.30 years (SD = 5.20), and the mean length of participants' relationships was 25.20 months (SD = 43.40 months). Most participants, therefore, were involved in fairly long-term relationships. Of this sample, 130 were dating, 50 were living with their partner, and 20 were married.

Procedure and scales. Participants completed all scales in one session. The PRQC Inventory, developed for this study, is shown in the appendix. In terms of development, the inventory went through two iterations with small samples before the final scale items were identified. The three items measuring each component were developed using a thesaurus and a dictionary to produce items that had high face validity and were as close as possible to the central meaning of each construct. The scales measured satisfaction, commitment, intimacy, trust, passion, and love.

The six previously developed scales were specifically designed to measure these same perceived relationship quality components. All of these scales have good internal and test-retest reliability. The scales measured satisfaction (Hendrick, 1988), commitment (Lund, 1985), intimacy (Sternberg, 1986, 1988: see Acker & Davis, 1992, for a full reproduction of this scale), trust (Boon & Holmes, 1990; Rempel et al., 1985), passion (Sternberg, 1986, 1988), and love (Rubin, 1973). All scales were completed according to their authors' instructions, and all items were answered on 7-point Likert-type scales.

Results

Descriptive results. Means and standard deviations for the perceived relationship quality components, as measured by both the PRQC and the six established scales, are shown in Table 1. Consistent with past research, the ratings were negatively skewed, reflecting the positive evaluations that individuals typically give to their romantic partners and relationships. The mean scores and variances for the established scales were slightly lower across the six perceived relationship quality components than were the means and variances for the PRQC Inventory. Table 1 also shows the reliability coefficients for each scale, which were uniformly high and similar across both sets of scales.

The correlations among the six perceived relationship quality components for both sets of scales also are shown in Table 1. They were typically high and positive, as we predicted. However, the degree of covariation was consistently higher among the six previously developed scales (mean r = .69, range = .54 to .80) than it was among the six PRQC scales (mean r = .50, range = .13 to .79).

Confirmatory factor analyses. All confirmatory factor analyses were done using version 5.5 of EQS for windows (Bentler & Wu, 1995). To make meaningful comparisons between the PRQC Inventory and the six existing

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TABLE 1: Correlations Among the Six Component Scores of the Perceived Relationship Quality Components (PRQC) Inventory and the Six Previously Developed Scales, Alphas, Means, and Standard Deviations: Study 1

Variable	*Satisfaction*	*Commitment*	*Intimacy*	*Trust*	*Passion*	*Love*
Satisfaction	—	.59	.57	.46	.39	.65
Commitment	.64	—	.62	.48	.25	.79
Intimacy	.82	.71	—	.50	.45	.76
Trust	.80	.54	.78	—	.13	.53
Passion	.71	.64	.74	.61	—	.78
Love	.61	.60	.73	.57	.78	—
Mean on PRQC scales	5.50 (1.21)	5.63 (1.30)	5.75 (1.07)	5.97 (1.07)	5.41 (1.30)	5.60 (1.39)
Mean on previous scales	5.43 (1.09)	5.22 (1.17)	5.36 (1.00)	5.42 (1.04)	4.85 (1.20)	4.97 (1.06)
Alpha on PRQC scales	.93	.94	.88	.74	.89	.90
Alpha on previous scales	.87	.85	.95	.90	.91	.89

NOTE: Correlations in the upper right diagonal are from the PRQC three-item perceived relationship quality component subscales; those in the lower left diagonal are from the previously developed scales. Means and standard deviations have been derived from summed scores for each scale, after converting all summed scores to a 7-point scale. Standard deviations are in parentheses. All correlations are significant at the $p < .05$ level, except for the .13 correlation between passion and trust. Alphas are Cronbach's internal reliability coefficients.

scales, each set of items from the six scales was evenly split into three parts and summed to form three observed variables for each perceived relationship quality component.[2] There was some evidence that the variables in both sets of scales were somewhat negatively skewed, and there was evidence of multivariate kurtosis. Thus, we used robust measures of fit (see Bentler & Dudgeon, 1996; Chou, Bentler, & Satorra, 1991; Curran, West, & Finch, 1996). Robust measures accept the maximum likelihood parameters but correct the standard errors and the chi-square statistic to take into account nonnormality of the data.

Levels of fit were assessed by the significance levels of the robust chi-square, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). The CFI, which is not adversely affected by sample size, is usually considered to show a good fit when it is .90 or higher (Bentler, 1995). The CFI is regarded as a better measure of fit than the statistical significance level, which tends to produce conservative estimates of fit when many variables are analyzed and which is acutely sensitive to sample size (Marsh, Balla, & McDonald, 1988). The RMSEA provides a measure of discrepancy per degree of freedom. Browne and Cudek (1993) suggest that a RMSEA value of .08 or lower reflects a reasonable fit.[3] We were primarily interested in the relative fit of the four a priori models rather than the precise fit of any single model. Along with Browne and Cudeck (1993), we assume that no a priori model will fit the data in a population perfectly because all models are approximations.

We tested and compared the four models shown in Figure 1. The results are reported in Table 2. We describe the results for the PRQC Inventory first, then present the results for the six established scales. In Model 1, we treated the observed variables (items) as all loading on a single factor. As expected, this model showed a poor fit, with a RMSEA well above .08 and a CFI well below .90. Next, we tested Model 2 (in which the first-order factors were not allowed to correlate). This model also revealed a poor fit, with a high RMSEA and a low CFI. As expected, Model 3, which allowed all factors to correlate, revealed a good fit, with a CFI well above .90 and a RMSEA of .08.

Model 4 (which involved six first-order factors and one second-order factor) also showed a good fit, with a CFI of more than .90 and a RMSEA of .08 (although the chi-square test remained significant). The full results for this model (excluding the error and disturbance terms) are shown in Figure 2. All of the first-order loadings were high and positive (ranging from .73 to .95), and the second-order loadings also were positive and generally high. The only exception was passion, with a modest loading of .28 (which was still significant at the $p < .001$ level). All first- and second-order factor loadings were significant at the $p < .05$ level.

Marsh and Hocevar (1985) have suggested that a suitable benchmark model (i.e., a model against which other models can be compared) is Model 3, in which all factors are correlated. As shown in Table 2, statistical tests of all such comparisons were significant. However, given that small changes in the chi-square value can be statistically significant, changes in the CFI and other stand-alone measures of fit constitute a more practical and less stringent way of assessing loss of fit than do changes in the value of the chi-square (Marsh et al., 1988). Comparisons across different models involving the CFI and RMSEA indexes revealed large differences in fit between Model 1 and Model 3 and between Model 2 and Model 3 but almost no difference in fit between Model 3 and Model 4. The critical comparison between Model 1 and Model 4 revealed that Model 4 had a substantially improved fit, as predicted.

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TABLE 2: Fit Indexes for Each Model With Both the Perceived Relationship Quality Components (PRQC) Inventory and the Previously Developed Perceived Relationship Quality Scales: Study 1

Model	*SBS* χ^2	df	p	*Robust CFI*	*RMSEA*	*Comparison*	χ^2 *Change*	df *Change*	p *for* χ^2 *Change*
New PRQC scale									
Null	3381	153							
Model 1 (single factor)	879	135	<.001	.65	.22	Models 1 and 3	644	15	<.001
Model 2 (six uncorrelated factors)	717	135	<.001	.72	.17	Models 2 and 3	482	15	<.001
Model 3 (six correlated factors)	235	120	<.001	.95	.08	Null and Model 3	3146	33	<.001
Model 4 (six first-order factors, one second-order factor)	259	129	<.001	.94	.08	Models 3 and 4	24	9	<.01
						Models 1 and 4	620	6	<.001
Previous scales									
Null	3528	153							
Model 1 (single factor)	645	135	<.001	.80	.16	Models 1 and 3	369	15	<.001
Model 2 (six uncorrelated factors)	1159	135	<.001	.60	.21	Models 2 and 3	883	15	<.001
Model 3 (six correlated factors)	276	120	<.001	.94	.10	Null and Model 3	3252	33	<.001
Model 4 (six first-order factors, one second-order factor)	354	129	<.001	.91	.11	Models 3 and 4	78	9	<.001
						Models 1 and 4	291	6	<.001

NOTE: SBS χ^2 = Satorra-Bentler scaled chi-square; CFI = comparative fit index; RMSEA = root mean square error of approximation.

The same analysis strategy was used to assess the success of each model in fitting the data from the six established scales. The results are shown in Table 2. As can be seen, the single-factor model (Model 1) produced a relatively poor fit. The second model (Model 2) also produced a poor fit. The results for Model 3, in which all factors were allowed to correlate, produced a reasonably good fit, much better than the first two models. The results for the higher-order model (Model 4) also revealed a reasonably good fit, with a CFI greater than .90, although the chi-square remained significant and the RMSEA exceeded .08. Again, the crucial comparison between Model 1 and Model 4 revealed a superior fit for Model 4. This difference in fit, however, was substantially less than the same comparison involving the new PRQC scale. The full results for Model 4 are shown in Figure 3. As can be seen, the first- and second-order loadings all were consistently high and positive (ranging from .60 to .95) and were significant at the $p < .05$ level.[4]

Discussion

To summarize, the data supported our predictions concerning the fits of the models shown in Figure 1. Model 1, which assumed that the observed indicator variables (scale items) all tapped a single, unidimensional construct reflecting global perceived relationship quality, did not fit the data. Model 2, which assumed that the six perceived relationship quality components are independent and uncorrelated constructs, also provided a poor fit. As expected, Model 4 provided a much better fit than did Model 1 and Model 2. In Model 4, the six perceived relationship quality components (satisfaction, commitment, intimacy, trust, passion, and love) all loaded on one second-order factor (global perceived relationship quality) but the components also formed semi-independent, lower-level factors.

This pattern of findings was similar for both the new PRQC Inventory and the set of established scales that had been designed to assess each of the six perceived relationship quality constructs (although the results were somewhat more clear-cut for the data involving the PRQC Inventory). The somewhat less clear-cut results for the established scales was expected given that the these scales contain items whose content conceptually strays across perceived relationship quality domains instead of remaining sharply focused on the particular construct being assessed.

One noteworthy feature of the findings is that the individual items on the PRQC Inventory obtained consistently high loadings on each relevant first-order factor (see Figure 2). In fact, the loadings were very similar to the first-order loadings found for the previously developed scales (see Figure 3) even though the observed variables for the established scales should have had an advantage in terms of reliability because each indicator variable in the established scales was a summed score derived from 2 to 5 items (the total number of items in each established scale ranged from 7 to 13).

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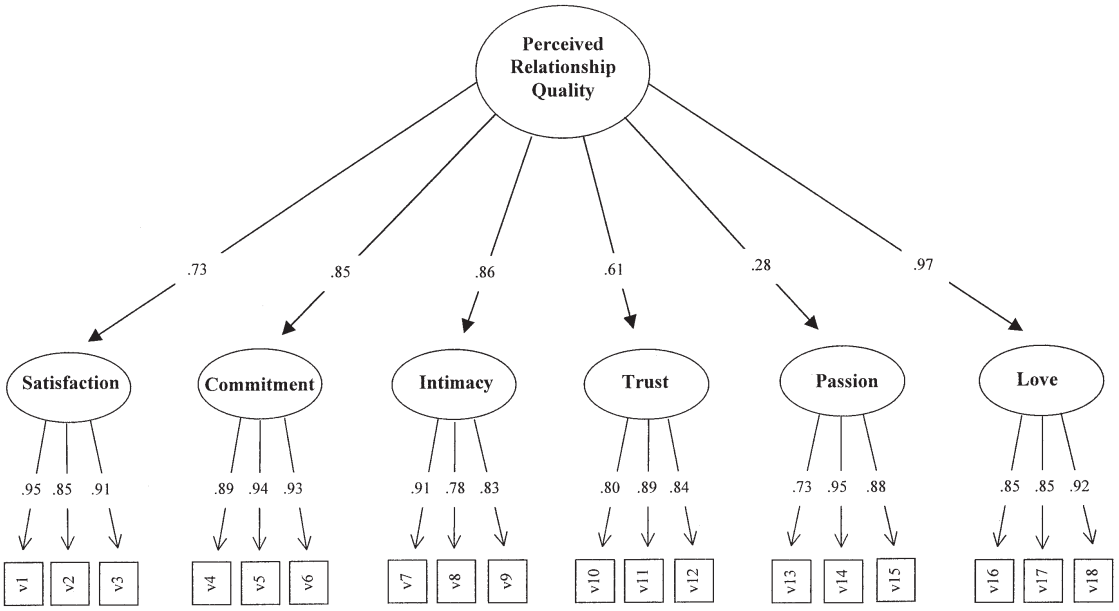

Figure 2 A confirmatory factor analysis, with first-order and second-order factors, of the Perceived Relationship Quality Components (PRQC) Inventory: Study 1.

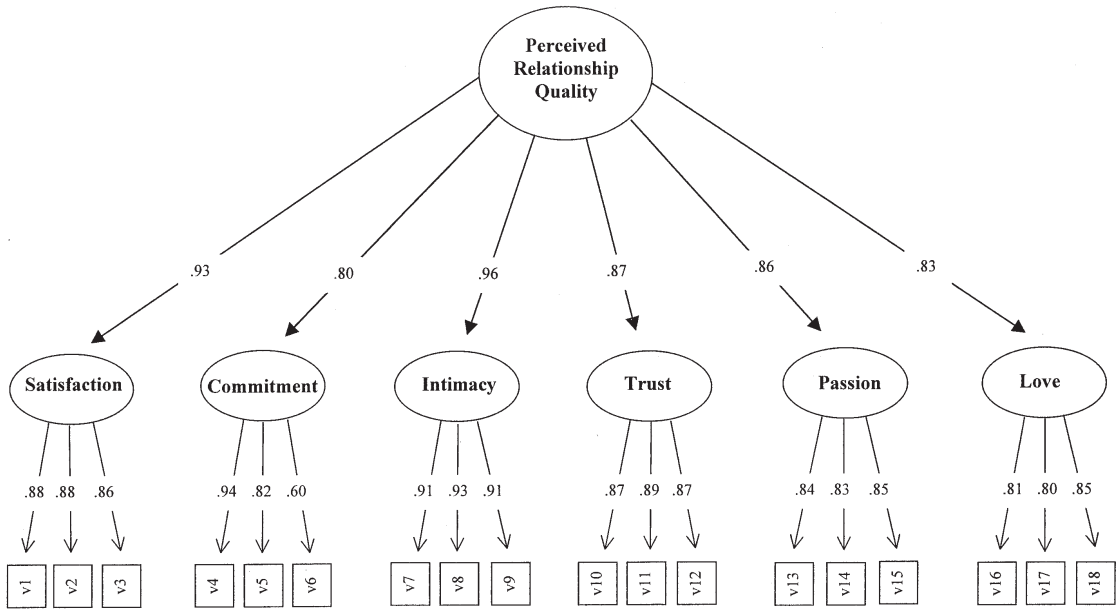

Figure 3 A confirmatory factor analysis, with first-order and second-order factors, of the previously developed perceived relationship quality scales: Study 1.

STUDY 2

The sample in Study 1 consisted of individuals involved in relatively long-term and stable relationships. In Study 2, we wanted to test whether the confirmatory factor analysis results for the PRQC Inventory would generalize to a different sample of individuals in the very early stages of dating relationships. We reasoned that if the same results replicated across such different samples, then the robustness of the higher-order model would be better established. In addition, we wanted to test whether the results would replicate across men and women.

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TABLE 3: Correlations Among the Six Component Scores of the Perceived Relationship Quality Components (PRQC) Inventory, Alphas, Means, and Standard Deviations: Study 2

Variable	*Satisfaction*	*Commitment*	*Intimacy*	*Trust*	*Passion*	*Love*
Satisfaction	—	.71	.65	.58	.29	.66
Commitment		—	.68	.38	.27	.78
Intimacy			—	.47	.55	.66
Trust				—	.14	.48
Passion					—	.22
Love						—
Mean	5.65 (1.18)	5.40 (1.51)	5.35 (1.18)	6.12 (0.96)	5.14 (1.42)	4.97 (1.4)
Alpha	.91	.96	.86	.78	.86	.89

NOTE: Means and standard deviations were derived from summed scores for each scale, after converting all summed scores to a 7-point scale. Standard deviations are in parentheses. All correlations are significant at the $p < .05$ level, except for the .14 correlation between passion and trust.

TABLE 4: Fit Indexes for Each Model for the Perceived Relationship Quality Components (PRQC) Inventory: Study 2

Model	*SBS* χ^2	df	p	*Robust CFI*	*RMSEA*	*Comparison*	χ^2 *Change*	df *Change*	p *for* χ^2 *Change*
New PRQC scale									
Null	1694	153							
Model 1 (single factor)	600	135	<.001	.53	.20	Models 1 and 3	415	15	<.001
Model 2 (six uncorrelated factors)	277	135	<.001	.86	.17	Models 2 and 3	92	15	<.001
Model 3 (six correlated factors)	185	120	<.001	.93	.08	Null and Model 3	1509	33	<.001
Model 4 (six first-order factors, one second-order factor)	216	129	<.001	.91	.08	Models 3 and 4	31	9	<.01
						Models 1 and 4	386	6	<.001

NOTE: SBS χ^2 = Satorra-Bentler scaled chi-square; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Method

Participants. Sixty-five women and 35 men, who were students attending the University of Canterbury in New Zealand, participated in this study. Participants were selected if they reported they had been dating their current partner (in a heterosexual relationship) for 4 weeks or less. This criterion was used to guarantee a sample of people involved in newly formed relationships. The mean age of the sample was 20.90 years ($SD = 4.60$). The mean length of time dating was 3.15 weeks ($SD = .91$). None of the participants were in relationships with other people in the sample.

Results

Descriptive results. Means, standard deviations, and intercorrelations among the PRQC scales are shown in Table 3. The results were similar to Study 1; the perceived relationship quality component ratings were somewhat negatively skewed and positively correlated (mean $r = .42$, range = .14 to .78). All six relationship component subscales had good internal reliability coefficients, consistent with the results of Study 1 (see Table 3).

Confirmatory factor analysis. The same analysis strategy used in Study 1 was initially applied in Study 2. The results, shown in Table 4, were similar to those of Study 1. When the observed variables were loaded on a single factor (Model 1), a poor fit was obtained, with a high RMSEA and a low CFI. The second model (Model 2) produced a better fit, but the fit indexes remained relatively poor. As before, Models 3 and 4 (see Figure 1) attained the best fits, with RMSEAs of .08 and CFI indexes greater than .90. Comparisons involving Model 4 with Model 1 and Model 3 were not as strong as in Study 1, but they revealed the same pattern of results: a large difference in fit between the final higher-order model (Model 4) and the model in which all items loaded on one factor (Model 1) and a relatively small difference in fit between Model 4 and Model 3 (in which all factors were correlated).

The full results for the Model 4 analysis (excluding the error and disturbance terms) are shown in Figure 4. All of the first-order loadings were high and positive (ranging from .64 to .99), and the second-order loadings were also positive and generally high (ranging from .35 to .88). As in Study 1, passion had the lowest second-

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TABLE 5: Factorial Invariance Across the Two Samples for the Perceived Relationship Quality Components (PRQC) Inventory

Model	χ^2	df	p	*CFI*	*RMSEA*	χ^2 *Increase Over Model A*	p χ^2 *Increase*
Model A: six first-order factors and one second-order factor	587	258	<.001	.93	.06	—	—
Model B: Model A plus first-order factor loadings set to equality	599	270	<.001	.93	.06	12	>.80
Model C: Model B plus second-order factor loadings set to equality	605	276	<.001	.93	.06	18	>.80
Model D: Model C plus factor disturbance terms set to equality	618	282	<.001	.93	.06	31	>.30
Model E: Model D plus variable error terms set to equality	676	300	<.001	.92	.06	89	<.01

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

TABLE 6: Factorial Invariance Across Sex for the Perceived Relationship Quality Components (PRQC) Inventory

Model	χ^2	df	p	*CFI*	*RMSEA*	χ^2 *Increase Over Model A*	p χ^2 *Increase*
Model A: six first-order factors and one second-order factor	619	258	<.001	.92	.07	—	—
Model B: Model A plus first-order factor loadings set to equality	638	270	<.001	.92	.07	19	>.05
Model C: Model B plus second-order factor loadings set to equality	643	276	<.001	.92	.07	24	>.10
Model D: Model C plus factor disturbance terms set to equality	653	282	<.001	.92	.07	34	>.05
Model E: Model D plus variable error terms set to equality	676	300	<.001	.92	.07	57	>.05

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

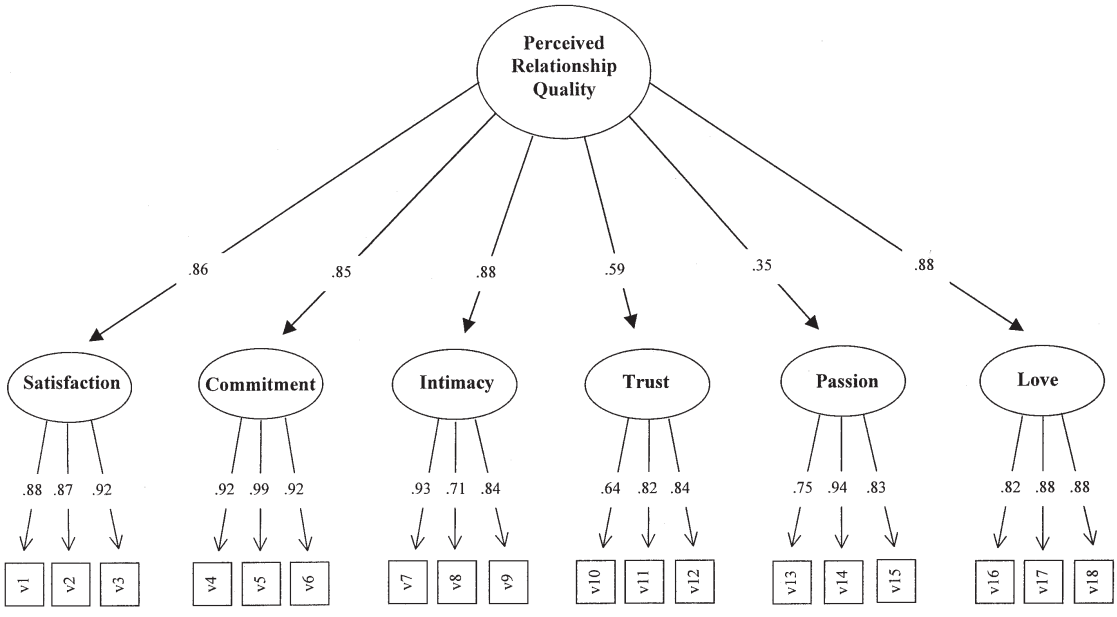

Figure 4 A confirmatory factor analysis, with first-order and second-order factors, of the Perceived Relationship Quality Components (PRQC) Inventory: Study 2.

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order loading (.35, which was nevertheless significant at $p < .001$). All of the first- and second-order factor loadings were significant at $p < .05$.

Replication of the factor structure across the studies and across sex. The degree to which the factor structure of Model 4 (six first-order factors loading on one second-order factor) was the same across the two different samples was tested using multiple sample confirmatory factor analysis in combination with a sequential strategy (Bryne, 1994). This approach first assesses the base model (six first-order factors loading on one second-order factor) across the two samples, with no equality constraints on any of the paths. In other words, one set of fit indexes is produced representing the fit for both samples considered simultaneously. Equality constraints across pairs of paths in the two samples are then systematically added and the loss of fit is examined based on changes in the CFI and the chi-square (acknowledging that fit can only decrease from that found in the base model).

The results of these analyses are reported in Table 5. When the first-order (Model B) and second-order (Model C) loadings were set to be equal, the fit of the overall model hardly changed, indicating that the paths were very similar across the two samples. In Model D, the factor disturbance terms were set to be equal. Once again, the fit changed very little, indicating strong replication across the samples. Only in the final step (Model E), when the variable error-terms were set equal, did the increase in the chi-square attain significance. However, even in this last step, the CFI revealed only a small drop from .93 to .92 and the RMSEA remained at .06. These results indicate substantial replication across the two samples.

Finally, we repeated the same replication analysis across two samples of men and women, which we obtained by combining the data for the sexes from Study 1 and Study 2 (n men = 108, n women = 192). The results are shown in Table 6. As can be seen, there was excellent replication of the results at every stage of the procedure.

Discussion

Using a sample of participants in the early stages of dating, the confirmatory factor analytic results in Study 2 were virtually identical to the equivalent analyses in Study 1, which used a sample of individuals in more long-term relationships. The postulated model of six perceived relationship quality factors loading on one second-order factor reflecting global perceived relationship quality achieved a good fit, and a much superior fit compared to a model in which relationship quality was assumed to consist of one general factor. Moreover, multiple sample comparisons established that the higher-order factorial structure replicated well across the two samples and across samples of men and women.

GENERAL DISCUSSION

This research used confirmatory factor analyses to compare and test three basic models of how six perceived relationship quality components are structurally related and perhaps cognitively represented: satisfaction, commitment, intimacy, trust, passion, and love. The first and simplest model (Model 1) proposed that relationship evaluations are driven by a general attitude toward the partner/relationship. The second model (Model 2) posited that the six perceived relationship quality components operate independently. The last model (Model 4) proposed that judgments in different evaluative domains are relatively consistent indicators of one's general attitude toward the partner/relationship but that judgments in these different domains also are made, to some extent, independently.

As predicted, the results revealed poor fits for the first two models (Models 1 and 2). However, as expected, a relatively good fit emerged for the last model (Model 4), in which all six perceived relationship quality factors loaded on a single second-order factor of global perceived relationship quality. Moreover, the Study 2 results replicated the pattern of results for the PRQC data from Study 1, and Model 4 replicated well across men and women in both samples.

In short, the results clearly do not support the view that perceived relationship quality is a unidimensional construct that governs individual evaluative judgments along a simple positive-negative dimension. Instead, they are consistent with a more complex picture in which people tend to be relatively consistent in their assessments of their partners/relationships across different evaluative domains but that they also tend to evaluate their partners/relationships somewhat variably across different domains. We previously described some hypothetical examples of how domain-specific judgments might vary, such as individuals who rate their relationships as being high on commitment and trust but low on passion or individuals who love their partner but lack trust. Our findings suggest that such patterns are not only intuitively plausible but also that they may commonly occur.

In terms of the cognitive structure of relationship quality judgments, the results are consistent with two general cognitive models. Both models stress that people typically should bring their judgments into balance based on the strong motivation to attain cognitive coherency (Read & Miller, 1994). A classic connectionist approach would assume that all elements in a cognitive system would simultaneously influence one another until a state of stability is reached (see Smith, 1996).

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Such a model would not need to postulate a higher-order node, such as perceived relationship quality. In contrast, a standard social cognitive approach might postulate the existence of a stored higher-order attitude that would exert top-down pressure on the individual evaluative domains. The confirmatory factor analysis results cannot distinguish between these two accounts, but they do support a model in which evaluative consistency is cognitively assessed both within and between evaluative domains.

The fact that the results for the PRQC Inventory items provided a slightly better fit to Model 4 than did the items from existing scales also was consistent with our expectations. Indeed, given the extent of item overlap among the six previously developed scales, we were frankly rather surprised that they also confirmed the higher-order model. The results, taken together, offer robust evidence against the simple unidimensional hypothesis of how relationship evaluations are stored or structured and in favor of the more complex higher-order model we have described.

Usefulness of the PRQC Inventory

The PRQC Inventory has some advantages as a research tool. The individual three-item subscales are brief, are reliable, and possess high face validity as measures of perceptions of specific evaluative domains in close relationships. As a measure of global perceived relationship quality, however, we would recommend using only the best exemplars of the six relationship quality components: Items 1, 4, 7, 10, 13, and 16 (see the appendix). The reason for this is simply that the three items measuring each component are (intentionally) rather redundant. When aggregated, these six items had good internal reliability in both Study 1 (alpha = .88, item-total *r*s ranged from .48 to .77) and in Study 2 (alpha = .85, item-total *r*s ranged from .45 to .80).

We do not claim that the PRQC Inventory will necessarily be the appropriate scale to use in all research contexts. The deciding factor should be what the researcher is intending to measure. If researchers want to use self-report measures to assess relationship evaluations (particularly in specific domains), then the brief scales embodied in the PRQC should be fine. On the other hand, if researchers want to measure a single construct (e.g., trust) in a more expansive and multifaceted fashion, then Boon and Holmes's (1990) trust scale may be preferable. Extending the point further, a more complete assessment of a given relationship quality construct might require examining actual behavior or additional objective indicators of the construct. A complete theory of passion or intimacy, for example, might require developing measures of these constructs that include not only self-reports but also behavioral measures and perhaps peer-report measures.

From a social psychological angle, however, it makes theoretical sense to make two important distinctions. First, self-reports are not equivalent to objective measures of behavior. Second, there are different kinds of self-reports. At the most basic level, Fletcher and Kininmonth (1992) have argued that relationship scales need to distinguish between self-reports concerned with specific relationships and self-reports concerned with beliefs or attitudes toward relationships in general. When assessing self-reports concerned with specific relationships, researchers may need to further distinguish between (a) evaluations of the sort used in the PQRC Inventory and (b) self-reports of relationship behavior. A surprising amount of published research has reported significant correlations between self-report measures of relationships that ostensibly assess distinct constructs but that, on further analysis, contain enough item-overlap problems to raise serious questions about the interpretability of the results (Fincham & Bradbury, 1987; Fletcher & Kininmonth, 1992).

Interpretations and Caveats

We made the simplifying assumption that all of the perceived relationship quality components loaded equally on one overarching second-order global construct. The moderate to high loadings that emerged for the second-order perceived relationship quality factor across two samples and two different sets of scales corroborate this assumption. More complex models are, of course, possible. For example, the six components could load on two midlevel constructs, which in turn could load on the final higher-order construct. However, it is unlikely that more complex models would provide better fits than Model 4 given that Model 4 came very close to the maximum possible fit as specified by Model 3 in Figure 1.

The one construct that did not load as highly on overall perceived relationship quality, compared to the other relationship quality components, was passion (as measured by the PRQC). Passion had lower second-order loadings on perceived relationship quality in both the sample of individuals involved in longer-term relationships (Study 1, factor loading of .28) and those involved in the early stages of dating (Study 2, factor loading of .35). It is important to note that these results were not simply produced by greater unreliability of the passion items. The first-order loadings for passion were high and similar to those obtained with the other perceived relationship quality components (see Figures 2 and 4).

This pattern supports the widely held view that there is a fundamental distinction between passionate love (intense, sexual, arousing) and companionate love (inti-

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macy, affection) (see Hatfield & Walster, 1978). It also is consistent with Sternberg's (1986) argument that commitment and intimacy (and, arguably by extension, trust, love, and satisfaction) might follow a different sequence of development than does passion. Sternberg's argument raises the possibility that the developmental stage of a relationship ought to influence the weighting and subsequent pattern of correlations among different perceived relationship quality components. However, several other factors also might influence the way in which particular perceived relationship quality components are related to overall perceptions of relationship quality, including general relationship orientations such as attachment styles (Bartholomew & Horowitz, 1991), an individual's ideal standards (Fletcher, Simpson, Thomas, & Giles, 1999), and available alternatives to the current relationship (Johnson & Rusbult, 1989; Simpson, 1987).

Our results also are consistent with research examining the structure and overlap among folk concepts such as commitment, love, trust, and so forth (Fehr, 1988; Hassebrauck, 1997). For example, Fehr's (1988) work has shown that love and commitment are overlapping lay concepts that have some features in common but that also have some unique characteristics. In interpreting previous theories of love or other theories concerned with any relationship quality components—trust, commitment, passion, and so forth—it is important to discern whether the models being proposed either (a) simply describe the semantic and cognitive structures as they exist in the perceptions of laypersons (as we do in this research) or (b) supervene on relationship phenomena as they are experienced and described by individuals. For example, Sternberg's (1986) triangular theory of love claims that love consists of three elements—passion, commitment, and intimacy. It is not clear whether Fehr's (1988) research, or the research reported here, are inconsistent with Sternberg's (1986) theory. The reason is that Sternberg's theory is proposed as a scientific account of the nature of love, treating love as a hypothetical construct (defined by the researcher) rather than strictly as a representation of how laypeople perceive love. Thus, even if Sternberg's theory is correct or plausible, this does not necessarily imply that the perceptions and experiences of laypeople should be fully consistent with all of its predictions (see Fletcher, 1995).

Finally, we make no claim that the perceived relationship quality constructs we have identified encompass the full range of possible components. Other important evaluative domains might include romance, conflict, and compatibility. However, our method of scale construction makes the addition of more components a relatively straightforward matter.[5] The construction of measures should not be conceived of as a single-iteration enterprise. Rather, it is an activity that should be responsive to the constant interplay between new empirical findings and theory development and refinement. Thus, scales should be continuously evaluated for changes and refinements (cf. Cronbach & Meehl, 1955).

Conclusions

Despite its limitations, this research makes some important and novel contributions. First, it demonstrates that a range of perceived relationship quality components (satisfaction, commitment, intimacy, trust, passion, and love) are domain-specific and quasi-independent constructs but that these lower-level constructs are also the building blocks of higher-level, global evaluations of the partner/relationship. Second, perceived relationship quality does not appear to be a completely unidimensional construct that drives all evaluative judgments along a simple positive-negative dimension. Measurement and theoretical issues are tightly interwoven in (social) psychology. This research exemplifies this point in an illuminating fashion.

APPENDIX

The Perceived Relationship Quality Component (PRQC) Inventory consists of 18 items. Each perceived relationship quality component is assessed by three questions. Each statement is answered on a 7-point Likert-type scale (ranging from 1 = *not at all* to 7 = *extremely*). Instructions are to rate the current partner and relationship on each item. Component categories are shown as subheadings (which are omitted when the scale is administered).

Relationship Satisfaction

1. How satisfied are you with your relationship?
2. How content are you with your relationship?
3. How happy are you with your relationship?

Commitment

4. How committed are you to your relationship?
5. How dedicated are you to your relationship?
6. How devoted are you to your relationship?

Intimacy

7. How intimate is your relationship?
8. How close is your relationship?
9. How connected are you to your partner?

Trust

10. How much do you trust your partner?
11. How much can you count on your partner?
12. How dependable is your partner?

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Passion

13. How passionate is your relationship?
14. How lustful is your relationship?
15. How sexually intense is your relationship?

Love

16. How much do you love your partner?
17. How much do you adore your partner?
18. How much do you cherish your partner?

NOTES

1. We chose to use Lund's (1985) commitment scale instead of Sternberg's (1986) commitment scale because Lund's scale is more face valid than is Sternberg's. In contrast, we saw little difference between Sternberg's passion scale and Hatfield and Sprecher's (1986) passionate love scale. Both scales have very similar items and they correlate highly (r = .82 in a study by Acker & Davis, 1992).

2. The items were divided into three groups for each scale by proceeding from the top of each scale (as the items were originally published). Items were divided as evenly as possible into three groups. For example, Items 1 to 4, 5 to 8, and 9 to 13 from Rubin's (1973) love scale were summed to produce the three indicator variables of love. This method of combining items should not have affected the results unduly given the high loadings obtained on the first-order constructs (see Figure 3). However, to test the possibility that our method of combining items might have influenced the results, we combined the items into three groups for each construct, selecting the items randomly within each scale. The results were very similar to those reported.

3. The correlation matrices for all the items (involving both sets of scales) and for the Study 2 confirmatory factor analysis are available from the first author on request.

4. We also tested Sternberg's (1986) model in which love is the label for a higher-order construct that loads on the three lower-order factors of commitment, passion, and intimacy. The results for both the old and new scales were the same, showing good support for Sternberg's model, namely, the fits for the higher-order model were good (Perceived Relationship Quality Component [PRQC] Inventory comparative fit index [CFI] = .92; previous scale's CFI = .95) and were significant improvements from models in which the individual indicator variables loaded directly onto one factor (PRQC scale's CFI = .61; previous scale's CFI = .78). These results were more supportive of Sternberg's model than the confirmatory factor analysis results reported by Whitely (1993), which used Sternberg's scales.

5. In a recent longitudinal study of early dating relationships, we extended the PRQC Inventory to include a three-item scale assessing romance (Fletcher, Simpson, Thomas, & Giles, 2000). A confirmatory factor analysis of the expanded scale revealed a good fit, comparable with the results in these two studies. The additional subscale also had excellent internal reliability and good loadings on the second-order factor of perceived relationship quality.

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