KAY BRADFORD, J. WADE STEWART, BRIAN J. HIGGINBOTHAM, AND LINDA SKOGRAND
Utah State University

The Perceived Relationship Knowledge Scale: An Initial Validation

The rationale, development, and initial validation of the Perceived Relationship Knowledge Scale (PRKS), a brief six-item instrument designed to measure central aspects of perceptions of relationship knowledge, are described in this article. To test the instrument's psychometric properties, two studies were conducted: an exploratory study with a small clinical sample (n = 54; Study 1), and the second with a sample of participants in a statewide relationship education initiative (n = 2,183; Study 2). In both studies, exploratory factor analyses yielded a single-factor structure. Maximum-likelihood confirmatory factor analyses in Study 2 indicated good internal consistency and good model fit. Analyses of construct validity in both studies indicated that the PRKS measures relationship knowledge in psychometrically expected ways, and that the instrument discriminates low versus high levels of perceived relationship knowledge. The use of the instrument is described and research implications are discussed.

Couple relationship education (CRE) formats have become increasingly varied. A relatively common feature of CRE is a focus on relationship knowledge and skill acquisition (Markman & Halford, 2005). Brief formats are also becoming common. However, brief or low-intensity CRE may not create immediate behavior change, and its subsequent impact on behavior may be commensurately narrow and modest. Because gains in relationship knowledge may be an indicator of future behavior change, perceptions of relationship knowledge is an intermediate outcome variable that may be relatively more sensitive to short-term change. Thus, a measure of knowledge may be especially appropriate for use in brief CRE and other brief couple interventions.

The purpose of this study is to describe an instrument designed to assess relationship knowledge, the Perceived Relationship Knowledge Scale (PRKS), and to test its psychometric properties. *Perceived relationship knowledge* in this study is conceptualized as the respondents' assessments of their individual knowledge, awareness, and understanding of interpersonal interactions that nurture healthy couple relationships. We discuss the construct of relationship knowledge principally in the context of couple relationship education. The measure's items reflect basic content of CRE programs, including effective listening, conflict resolution, problem solving, closeness, friendship, and spending time together.

Couple Relationship Education

CRE has expanded over the past decade. Increased funding in the United States has contributed to this expansion (Hawkins et al.,

Department of Family, Consumer, and Human Development at Utah State University, 2705 Old Main, Logan, UT 84322–2705 (k.bradford@usu.edu).

2009), including the Deficit Reduction Act of 2005 which made $150 million dollars in grants available annually to support healthy marriage and responsible fatherhood programs. There is evidence that CRE is effective in helping couples improve their relationship quality and communication. In a meta-analysis of 117 studies, Hawkins, Blanchard, Baldwin, and Fawcett (2008) found CRE had an effect size on relationship quality ranging from $d = .24$ to .36, whereas the effect sizes on communication skills ranged from $d = .36$ to .54. Low-dosage programs (1 – 8 hours) had lower effect sizes in the areas of relationship quality and communication when compared with medium-dosage programs (9 – 20 hours): $d = .18$ for relationship quality and $d = .21$ for communication. Although low-dosage programs produced lower effect sizes than the medium-dosage programs, the benefits included financial practicality and the potential to raise awareness of CRE and ultimately attract more participants (Hawkins, Carroll, Doherty, & Willoughby, 2004).

Despite this evidence, there is debate about the efficacy of CRE, particularly among minority and low-income (typically high stress) participants (Johnson, 2012, 2013). Most agree, however, that an empirical approach is needed. Scholars have noted that CRE outcome variables are often limited in range and have recommended that a broader array of variables be examined (Hawkins et al., 2008). Low-dosage CRE may be less likely to have an immediate impact on behavior but may have impact on intermediate phenomena such as relationship knowledge; this is especially likely if the curriculum emphasizes understanding of healthy relationship interactions, for example. Intermediate impact of light-dosage programming might be detected in terms of perceptions of relationship knowledge. Part of this rationale is that behavioral constructs are different from knowledge: communication and relationship quality are at least somewhat rooted in behavior, whereas relationship knowledge is primarily cognitive by nature. Likewise, couple communication and marital quality give essential information about behavioral processes in couple relationships that knowledge does not. Because of its role in relationship patterns, relationship knowledge (i.e., knowledge, awareness, and understanding of interpersonal interactions that nurture healthy couple relationships) is a potentially promising outcome variable to measure in couple interventions. Knowledge may play an intermediate role in couple functioning, as discussed through the lens of prevention science.

Intervention Theory and Relationship Knowledge

Intervention theory is rooted in prevention science. It is posited that protective factors increase people's resistance to dysfunction and, conversely, exposure to multiple risk factors can have cumulatively negative effects (Coie et al., 1993; Vaterlaus, Allgood, & Higginbotham, 2012). Protective factors (e.g., individual traits, environmental attributes) may mitigate problems either directly or indirectly, whereas dysfunction is often the result of many risk factors (Coie et al., 1993). An aim of intervention theory is simply to increase protective factors and decrease risk factors and to specify the mechanisms by which these factors work. Hawkins et al. (2004) asserted that relationship skills work in conjunction with "a good understanding about healthy marriage and attitudes that foster it" (p. 548). Thus, CRE focuses on factors that support healthy marriages, such as relationship knowledge and understanding.

The preventative framework considers intermediate outcomes and processes, not just those that are long term (Coie et al., 1993), and the evolution of healthy and unhealthy behavior, thought, and affect (Coie et al., 1993) – such as understanding, knowledge, and awareness. Adequate functioning in any relationship requires the competent use of knowledge across time (Duck, 1993). Relationships are, in part, a combination of interpersonal interactions and the cognitive activity of the interactants (Andersen, 1993; Fraley & Shaver, 2000). Through a process of cognitions and accompanying interactions, individuals are theorized to acquire knowledge and thereby develop schemata, which are knowledge structures based on prior experience. Relational schemata shape an individual's prototype (i.e., one's own subjective notion) of what it means to be a spouse or partner. Thus, dysfunction in couple relationships may be reduced, in part, by intervening at the level of knowledge. This description of knowledge is largely subjective and process based, in that a person's knowledge structures are based on patterned thoughts and interactions.

Relationship Knowledge and Relationship Quality

Relationship knowledge includes relational awareness, understanding, and cognitive change (Halford, Markman, Kline, & Stanley, 2003). In their comprehensive framework of marriage education, Hawkins et al. (2004) identified relationship knowledge as a crucial component of CRE, situating knowledge (i.e., awareness, understanding, relational attitudes) among relationship skills, motivations, and virtues. Based on the interplay of cognitive processes and interpersonal interactions (Andersen, 1993), relationship skills rest on a foundation of knowledge structures: that is, of internal working models that stem from repeated interactions (Fraley & Shaver, 2000). Thus, relationship knowledge has a considerable degree of subjectivity that is important to accommodate in a measure. In this scale, we do not purport to measure "objective" relationship knowledge because of its subjectivity intrapsychically and in relationships. However, we attempted to balance such subjectivity (i.e., personal perceptions of relationship knowledge) with a degree of objectivity, by measuring perceived knowledge of skills that past research has shown to be important to healthy relationships. The content is discussed under item development and testing.

Relational knowledge has been shown to affect the attributions and expectations in relationships (Planalp, 1987). Specific knowledge concerning couple communication is vital in many models of therapy (e.g., Gurman & Jacobson, 2002), and in various education programs (Butler & Wampler, 1999; Halford et al., 2003). Relationship awareness (i.e., thinking about and talking about the relationship), for example, has been linked to relationship satisfaction (Acitelli, 1992). Gottman's (1999) method of couple therapy uses knowledge to teach couples about building friendship and conflict resolution. Furthermore, accurate information and knowledge is important to the success of intimate relationships (Gottman & Silver, 1999; Larson, 2000, 2003; Parrott & Parrott, 2006).

Conversely, there is evidence that inaccurate relationship knowledge can contribute to lower levels of marital quality. Cognitions affect behaviors in close relationships (Karney, McNulty, & Bradbury, 2000), and several measures have been developed to measure dysfunctional beliefs and their effect on behaviors (see Baucom, Epstein, Rankin, & Burnett, 1996; Fletcher & Kininmonth, 1992; Knee, 1998). However, these instruments typically focus on negative cognitive attributions and schemata, rather than on awareness and understanding of positive relational processes. Although relationship knowledge is a primary component in relationship education and presumably plays an important role in couple relationships, there are very few instruments that measure an individual's knowledge (awareness, understanding) of healthy aspects of intimate relationships. In light of the short-term nature of many current relationship education offerings (i.e., single-session seminars, work-place presentations, etc.), relationship knowledge is a potentially important variable to measure.

Item Development and Testing

The PRKS was created in response to a need for an instrument that would measure short-term outcomes appropriate for brief, single-event, and multiple-event CRE in a statewide healthy relationship initiative. We reasoned that low-dosage interventions might influence knowledge, but that the behavioral impact might be small, at least in the short-term.

Literature was reviewed to determine areas most important to relationship well-being. Generally, CRE curricula typically include content such as listening skills, problem-solving skills, conflict resolution or management, handling differences, positive expression of affection, and marital virtues (Halford, 2011; Hawkins & Ooms, 2010). In a curriculum assessment guide, the U.S. Administration for Children and Families (ACF) included the aforementioned variables as "minimum required content" (Hauer et al., 2008). Similarly, content areas that are featured in the PRKS include the following: listening skills, settling disagreements and solving problems, deepening love, and characteristics and aspects of healthy relationships such as friendship and spending time together. The ACF curriculum guide also included "advised content areas" that also overlap with the content of the PRKS instrument, including (a) problem solving (building consensus, exploring solutions), (b) sharing activities and spending time together as a couple, (c) teamwork and collaboration as a couple (the "us" or "we" as a couple;

Hauer et al., 2008, p. 10), and (d) caring and empathy, appreciation or soothing behaviors (i.e., deepening love, friendship).

Based on literature such as Gottman's observational research on couple processes (e.g., Driver, Tabares, Shapiro, & Gottman, 2012), national data on marital strengths (Olson, Olson-Sigg, & Larson, 2008), and common components of couple therapy (Gurman & Jacobson, 2002), the following variables were selected: effective listening, which is a key component of communication (e.g., Scuka, 2005); conflict resolution (e.g., Cummings, Goeke-Morey, & Papp, 2003), problem-solving (Scuka, 2005); closeness, operationalized as deepening a loving relationship (see Gottman, 1999); friendship (e.g., Fowers, 2000); and couple time together (e.g., Doherty, 2001). Six items were generated to assess knowledge of a total of six topics, rather than perceptions of behavioral patterns. Typically, the creation of a new measure includes the generation of a more extensive item pool, but in this project the items were intentionally kept relatively general and few in number in an effort to maximize their relevance to a wide range of CRE programming. Moreover, limited space on the survey did not allow for the generation (and thus testing) of further items. In terms of content validity, we readily acknowledge there are many other important aspects of knowledge regarding couple functioning that might also be measured, and that the instrument measures some core constructs but does not represent the universe of possible items. Our purpose here was to provide an initial test of the reliability and validity of core items of perceived relationship knowledge.

Method

To test the properties of these items, analyses were conducted on data collected from two samples: first, from an exploratory study of a small clinical sample (Study 1); and second, from a large sample of participants in a statewide CRE initiative (Study 2). We tested the instrument's internal reliability and construct validity, including its discriminant validity.

Study 1 Participants

Participants in this clinical sample consisted of 30 couples ($N = 60$) recruited for a relationship check-up. Each couple received $20 as compensation. Three couples were excluded due to large amounts of incomplete data, leaving 27 couples ($n = 54$). Of these, 50% were female and 50% male, with 72.7% married, 6.7% living together, and 21.7% seriously dating or engaged. Most were White (98.3%). The mean age for men was 30.6 ($SD = 11.7$) and 28.3 ($SD = 11.3$) for women, and the median annual income level was $39,000.

Study 1 Measures

To test aspects of the instrument's construct validity, scores from several other relationship measures were used. PRKS scores were correlated with relationship satisfaction, couple communication, relationship virtues, and risk for violence to test convergent and divergent validity. In addition, relationship satisfaction was used as a grouping variable by which to test divergent validity.

Relationship Knowledge. The PRKS was used to measure perceived knowledge regarding healthy behaviors in intimate relationships with six items: "my knowledge of how to listen effectively to a spouse/partner," "my awareness of how to settle disagreements well," "my understanding of how to solve problems and reach compromise," "my understanding of ways to deepen a loving relationship," "my knowledge of ways to have a strong friendship with a spouse/partner," and "my awareness of the importance of spending time together." Ratings were on a 4-point scale (*was/is poor, was/is fair, was/is good,* and *was/is excellent*). A posttest-then-retrospective-pretest evaluation (Marshall, Higginbotham, Harris, & Lee, 2007) was used, in which participants rated their knowledge on "what you knew BEFORE and now AFTER the program." This design was used to accommodate different CRE formats, and also to avoid "response shift bias," in which pretest ratings may be inflated (Rohs, 1999). These analyses report analyses of the retrospective pre- and postintervention data.

Marital Quality. The six-item Quality of Marriage Index (QMI; Norton, 1983) was used to measure the couples' overall relational quality. It has five items such as "we have a good marriage" and "my relationship with my partner makes me happy." These items are scored on a 7-point

Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The sixth item asks the couple to rate their relationship on a 10-point scale ranging from *very unhappy* to *perfectly happy*. Analyses yielded alpha levels of .95 for men and for women.

Relationship Satisfaction. The three-item Kansas Marital Satisfaction Scale (KMS; Schumm et al., 1986) was used to measure relationship satisfaction. These three items measure satisfaction with "… your husband/wife as a spouse (partner)," "… your marriage (relationship)," and "… your relationship with your husband/wife (partner)" using a 7-point Likert-type scale ranging from 1 (*extremely dissatisfied*) to 7 (*extremely satisfied*). The KMS has established test-retest reliability at .71 (Mitchell, Newell, & Schumm, 1983). With regard to internal consistency, alpha levels were .93 for men and .97 for women.

Couple Communication. Eight items from the Couple's Pre-counseling Inventory (Stuart & Stuart, 1983) were used to measure couple communication. Items included "my partner/spouse listens attentively when I speak" and "my partner communicates affection by words as well as touch." Participants responded using a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*always*). Alpha levels were .86 for men and .93 for women.

Intimate Partner Violence. The Intimate Justice Scale (IJS; Jory, 2004) was used to measure risk for intimate partner violence in both samples. Ten of the scale's 15 items were used, including items such as "my partner is too possessive or jealous," "my partner never admits when he or she is wrong," and "sometimes my partner hurts me." Individuals responded using a 5-point Likert-type scale ranging from 1 (*I do not at all agree*) to 5 (*I strongly agree*). The IJS showed convergent validity with the Conflict Tactics Scale, ranging from $r = .51$ to .77 (Jory, 2004). Alpha levels in the current data were .91 for men and .88 for women.

Relationship Virtues. Two subscales of the Marital Virtues Profile (Hawkins, Fowers, Carroll, & Yang, 2006) were used to measure relational virtues: other-centeredness and generosity. Other-centeredness (six items) contains several constructs including fairness, understanding,

and sacrifice. Generosity (seven items) encompasses other constructs such as forgiveness, acceptance, and appreciation. These two subscales account for 13 of the instrument's 24 items, with alpha levels ranging from .79 to .84 (Hawkins et al., 2006). Items included "my partner recognizes when I am feeling that things are unfair in our relationship," "my partner is able to look past my short comings," and "my partner is familiar with my likes and dislikes," measured on a 6-point Likert-type scale ranging from 1 (*almost never*) to 6 (*almost always*). Alpha levels were .90 for men and .96 for women.

Study 2 Participants

This statewide sample of 2,183 were participants in CRE in 22 counties (76% of the state's total). The majority of the 137 CRE events were one-time classes or activities (about 54%), but all programs included topics such as effective communication, enhancing friendship in intimate relationships, managing conflict, and characteristics of healthy relationships. No incentives were given. The structure and procedures of the statewide CRE initiative is discussed elsewhere (Bradford, Higginbotham, & Skogrand, 2014).

The participants in this initiative filled out a two-page survey upon completing the CRE event, or at the last session of a multisession event. The participants were 57% female and 43% male. Most were married (78%), with 22% of these in remarriages. Of the remaining participants, 12% were single, 6% dating, and 4% cohabiting. The mean age was 37 ($SD = 12.7$), with a mean annual income level just above $39,000. In terms of race and ethnicity, 86% were White, 10% Latino, 1% African American, 1% Asian or Pacific Islander, 1% Native American, and 1% identified as Other. The mean number of children was three. Approximately 48% had no previous relationship education.

Study 2 Measures

In the statewide CRE initiative, relationship knowledge was measured using the PRKS (see previous description), relationship satisfaction was measured using the KMS (Schumm et al., 1986; see previous description) with alpha levels of .96 for men and .98 for women. Risk for intimate partner violence was measured using the IJS (Jory, 2004; see previous description). In the

statewide sample, IJS alpha levels were .90 for men and .89 for women.

Results

Study 1

Reliability. In many cases (but not all), data in this study came from married or paired partners. Thus, analyses were completed separately for men and women to achieve independence of data (Kenny, Kashy, & Bolger, 1998) in this exploratory factor analysis. Factor analytic and reliability results are reported in Table 1. Principal components exploratory factor analysis (EFA) was used with promax rotation. Due to the small sample size, we consulted recommendations in terms of the minimum ratio of *N* to the number of variables being analyzed, *p*. In previous literature, recommendations have ranged between 3 to at least 10 (MacCallum, Widaman, Zhang, & Hong, 1999). The ratio of sample size to variables examined in this study is 4.5 (i.e., 27 in each analysis with a total of six items). Although adequate by liberal recommendations (three to six), this ratio is lower than the most conservative recommendation (10), thus confirming the importance of a second study with a larger sample.

EFA relies on the data to test item intercorrelations without prespecifying the number or content of the items that make up the construct. EFA for men and women, using "retrospective pre" and "post" data, each yielded one factor. The eigenvalues calculated in these analyses indicate the variance in all items accounted for by the factor, and thus, the eigenvalue indicates the explanatory importance of the factor(s). By contrast, low eigenvalues (e.g., below 1) contribute little to the explanation of variance of a factor and are typically ignored. Each analysis yielded only one eigenvalue higher than 1 and items loaded on one factor, indicating (in each test) a one-factor solution. Eigenvalues in each analysis ranged between 3.24 and 4.28, and explained between 54% to 71.3% of the variance. Factor loadings ranged between .60 and .91, with a median of .82. To test factor reliability, Cronbach's alpha tests were calculated. Results indicated that the factor was reliable in each test (i.e., for men and women, pre and post), with Cronbach's alpha levels ranging between .83 and .92.

Validity. A modest test of construct validity was conducted by calculating bivariate correlations of PRKS scores (post) with conceptually related (not parallel) variables: relationship satisfaction, and negative couple interactions. We hypothesized that PRKS scores would correlate with other measures of relationship functioning, and expected positive correlations with relationship quality (QMI), marital satisfaction (KMS), and communication (to test convergent validity), and negative correlations with risk for violence (IJS; to test divergent validity). Bivariate correlations are presented in Table 2. As expected, scores of relationship knowledge correlated positively with marital quality, relationship satisfaction, communication, marital virtues, and negatively with risk for intimate violence.

Study 2

Data from this sample came from attendees who were single but in relationships, from married attendees who came alone, and from married partners. Attendance procedures did not allow us to identify couples, and so no couple identification was possible. For that reason, analyses were run separately for men and women to achieve independence of data (Kenny et al., 1998). When couples can be paired, a desirable alternative is to model men's and women's data simultaneously with error terms correlated by gender (Kenny, Kashy, & Cook, 2006).

Reliability. Factor analytic results are reported in Table 3. We again used EFA to rely on the data to test item intercorrelations without prespecifying the number of items that comprise constructs. However, we also wanted to use confirmatory factor analysis (CFA) to evaluate the relationships between the observed items and the factor(s) in terms of goodness of fit, and also to test for measurement invariance. Thus, to conduct both EFA and CFA and to provide a degree of cross-validation (Hurley et al., 1997), we split the large sample, randomly assigning one half to each subsample, and ran EFA using one half and CFA with the other.

Exploratory Factor Analysis. Results from the EFA for men and women are reported in Table 3. As in Study 1, EFA scores from the retrospective pre and post each yielded one factor, with eigenvalues ranging between 3.41 and 3.72, explaining between 56.8% to 61.9%

Table 1. *Study 1 Principal Components Exploratory Factor Analysis: Factor Loadings and Alpha Level*

Item	Men (n = 27)		Women (n = 27)	
	Retrospective		Retrospective	
	Pre	Post	Pre	Post
1. My knowledge of how to listen effectively to a spouse/partner.	.69	.72	.82	.87
2. My awareness of how to settle disagreements well.	.65	.85	.80	.83
3. My understanding of how to solve problems and reach compromise.	.79	.82	.87	.84
4. My understanding of ways to deepen a loving relationship.	.82	.66	.91	.81
5. My knowledge of ways to have a strong friendship with a spouse/partner.	.70	.81	.82	.69
6. My awareness of the importance of spending time together.	.75	.84	.86	.60
Eigenvalue	3.24	3.72	4.28	3.65
% of variance	54.0	62.0	71.3	60.9
α	.83	.88	.92	.87

Table 2. *Study 1 Bivariate Correlations of Perceived Relationship Knowledge Scale Scores and Relationship Variables*

	1	2	3	4	5	6
1. Relationship knowledge	1	.68**	.73**	.81**	.80**	−.70**
2. Marital quality (Norton)	.67**	1	.86**	.77**	.79**	−.79**
3. Marital satisfaction (KMS)	.63**	.91**	1	.72**	.71**	−.68**
4. Communication	.47**	.69**	.75**	1	.81**	−.80**
5. Marital virtues	.53*	.77**	.73**	.76**	1	−.89
6. Risk for intimate violence	−.42*	−.70**	−.71**	−.50**	−.68**	1
Score (Men)	3.23	36.01	17.10	3.97	56.25	27.13
(*SD*)	(.51)	(7.68)	(3.63)	(.62)	(8.90)	(9.22)
Score (Women)	3.21	36.01	17.06	3.88	54.50	24.97
(*SD*)	(.53)	(8.03)	(3.58)	(.76)	(12.47)	(9.34)

Note: KMS = Kansas Marital Satisfaction Scale. Women's coefficients are on top right (n = 27); men's coefficients are on bottom left (n = 27).

*p < .05 (2-tailed), **p < .01 (2-tailed).

of the variance. Factor loadings ranged between .56 and .83 with a median of .79; Cronbach's alpha levels ranged between .83 and .88. Thus, results in both studies suggest each item is reliable. In addition, EFA analyses were performed with a subsample of unmarried men (n = 182) and women (n = 361) to examine possible differences in factor structure among those who self-described as single, cohabitating, or dating as compared to married participants. These results were very similar (i.e., single eigenvalues 3.39 – 3.70, explaining between 58% – 61% of the variance), suggesting that the instrument properties were similar for this subsample.

Confirmatory Factor Analysis. We then conducted a test using maximum-likelihood CFA using AMOS (version 21; Arbuckle, 2012). CFA

is typically used once the factor structure is tentatively determined by EFA (Hurley et al., 1997). CFA tests the extent to which the correlation matrix of an EFA can be reproduced and has the additional benefit of indicating how well the data fit the specified model. Acceptable model fit is indicated by a comparative fit index of .90 or greater, and a root mean square error of approximation (RMSEA) of .06 or less (Hu & Bentler, 1999). In CFA, model fit indices are reported rather than reliability coefficients. Standardized factor loadings of .40 and higher are considered to be reliable when the sample size exceeds 150 participants (Stevens, 1996).

The CFA results are reported in Table 4. The range of item-total correlations was .55 to .91 with a median of .73, suggesting that the intercorrelations for each item were well within

Table 3. *Study 2 Principal Components Exploratory Factor Analysis: Factor Loadings and Alpha Levels*

| | Men (*n* = 444) | | Women (*n* = 633) | |
| | Retrospective | | Retrospective | |
Item	Pre	Post	Pre	Post
1. My knowledge of how to listen effectively to a spouse/partner.	.80	.78	.79	.78
2. My awareness of how to settle disagreements well.	.79	.77	.79	.75
3. My understanding of how to solve problems and reach compromise.	.80	.79	.83	.81
4. My understanding of ways to deepen a loving relationship.	.78	.76	79	.80
5. My knowledge of ways to have a strong friendship with a spouse/partner.	.83	.80	.82	.79
6. My awareness of the importance of spending time together.	.67	.73	.66	.71
Eigenvalue	3.63	3.57	3.68	3.59
% of variance	60.4	59.5	61.3	59.8
α	.87	.86	.88	.87

Table 4. *Confirmatory Factor Analyses: Maximum-Likelihood Factor Loadings and Model Fit*

| | Men (*n* = 501) | | Women (*n* = 605) | |
| | Retrospective | | Retrospective | |
Item	Pre	Post	Pre	Post
1. How to listen effectively.	.70	.70	.82	.69
2. How to settle disagreements well.	.68	.57	.62	.55
3. How to solve problems.	.91	.75	.71	.89
4. Ways to deepen a relationship.	.76	.77	.79	.80
5. Ways to have a strong friendship.	.82	.84	.85	.83
6. Importance of spending time together.	.69	.65	.56	.57
Model fit indices				
df	4	2	2	2
χ^2	2.56	.87	.55	2.14
p	.634	.646	.759	.343
Comparative Fit Index	1.00	1.00	1.00	1.00
Root mean square error of approximation	.005	.000	.000	.011

the acceptable range. In addition, the model fit indices for this test were robust, with high comparative fit indices (CFIs; all were 1.00), low RMSEA coefficients (.011 or lower), and nonsignificant chi-squared and *p* values ($\chi^2 = 2.56$ or lower, and *p* = .343 or higher). These results confirmed that a one-factor solution fit the data well in each analysis and also verified the reliability of the six items. These results established configural invariance, testing the same structure across groups and getting similar outcomes. In addition, we tested further for measurement invariance to explore possible differences in coefficients for men versus women. We tested scalar (strong) invariance by equating factor loadings and intercepts. The model fit was good, considering sample size ($\chi^2 = 28.325$, *p* = .008, CFI = .995, RMSEA = .033). In terms of model comparison, there was no significant difference between the unconstrained and equivalent (constrained) model ($\chi^2 = 2.17$, *p* = .825). This test result suggests that the instrument measured perceived knowledge consistently for men and women in this sample. However, given the presence of correlated error, the test of invariance indicates a trend but should not be interpreted as conclusive.

Validity. Construct validity was again examined by correlational tests of convergence

Table 5. *Study 2 Bivariate Correlations of Perceived Relationship Knowledge Scale Scores and Relationship Variables (Community Sample;* N = *2,183)*

	1	2	3
1. Relationship knowledge	1	.34**	−.28**
2. Marital satisfaction (Kansas)	.27**	1	−.57**
3. Risk for intimate partner violence	−.26**	−.43**	1
Score (Men)	3.28	17.39	19.51
(*SD*)	.51	4.26	8.74
Score (Women)	3.34	16.33	18.5
(*SD*)	.45	17.39	19.51

Notes. Women's coefficients are on top right (*n* = 1,238); men's coefficients are on bottom left (*n* = 945).

**p < .01 (2-tailed).

and divergence of PRKS scores (post) with conceptually related (but not parallel) variables including marital satisfaction (KMS) and intimate partner violence (IJS). The other measures tested in Study 1 were not available in these data. We again hypothesized that PRKS scores would correlate positively with marital satisfaction and negatively with risk for violence. Bivariate correlations are presented in Table 5. As expected, means scores of relationship knowledge were significantly and positively correlated with marital satisfaction, and negatively with risk for intimate violence. The strength of these correlations, however, was less than those in Study 1.

Discriminant Validity. We tested how well this instrument differentiated respondents at varying levels of relationship knowledge. We hypothesized that PRKS scores should consistently vary among participants who have relatively lower versus higher levels of relationship satisfaction. To test this, we grouped participants into three different levels of relationship satisfaction (KMS), dividing the sample roughly into thirds according to the sample's distribution of scores, with a mean of 7 being the highest possible: *low-medium satisfaction* (1 – 5.99), *medium-high satisfaction* (6.0 – 6.49), and *high satisfaction* (6.5 – 7.0). One-way ANOVAs were run separately to account for dependence of data. These results are reported in Table 6.

PRKS scores were found to vary consistently among participants with relatively lower versus

higher levels of relationship satisfaction. A significant main effect was found between groups for men, $F(2, 810) = 45.84$, $p < .001$, as well as for women, $F(2, 978) = 81.23$, $p < .001$. Tukey's HSD post-hoc analyses at the item level showed significant differences between all groups in all items, with the sole exception of the last item for men (time together). As expected, those in the lowest marital satisfaction group had significantly lower relationship knowledge scores on each item, and those in the medium-high marital satisfaction group had significantly lower knowledge scores than those in the high satisfaction group. The one exception to this pattern was on the sixth item for men (time together). On this sixth item, the standard deviation for men in the first low-medium group was roughly three times that of any other.

DISCUSSION

The purpose of this study was to describe and test the psychometric properties of the PRKS. The results of the two studies produced initial evidence of the internal reliability and construct validity of the six-item PRKS. Each test yielded a single factor that was reliable for both men and women, and the CFA results (Study 2) confirmed a good fit of the data to the specified model. Validity analyses suggested that the instrument performs in psychometrically sound and expected ways. Convergent and divergent validity was observed in correlations of PRKS scores with other measures of couple functioning that yielded zero-order correlation coefficients according to hypothesized directions. The bivariate coefficients in Study 1 were high, but those in Study 2 were somewhat lower than expected. The test of discriminant validity showed the PRKS differentiates low versus high levels of perceived relationship knowledge. In terms of relationship satisfaction, all PRKS item means differed significantly among groups of low-medium satisfaction, medium-high satisfaction, and high satisfaction. This was the case for men and women, with the exception of the last item for men.

Instrument Use

Relationship knowledge may be a useful variable for practitioners to consider inasmuch as it has been found to be an important component of couple functioning (e.g., Acitelli, Douvan,

Table 6. *Post Hoc Tukey's Analyses of Perceived Relationship Knowledge Scale (PRKS) Means by Relationship Satisfaction for Men and Women*

PRKS Item	Relationship Satisfaction Level		
	Low-Medium ($n = 437$)	Medium-High ($n = 663$)	High ($n = 556$)
1. How to listen effectively	2.95 (.59)[a]	3.16 (.52)[b]	3.40 (.57)[c]
	3.08 (.57)[a]	3.24 (.51)[b]	3.51 (.56)[c]
2. How to settle disagreements	2.85 (.66)[a]	3.08 (.58)[b]	3.27 (.56)[c]
	2.91 (.63)[a]	3.10 (.57)[b]	3.38 (.54)[c]
3. How to solve problems	2.94 (.63)[a]	3.13 (.55)[b]	3.39 (.57)[c]
	2.97 (.61)[a]	3.18 (.55)[b]	3.43 (.56)[c]
4. Deepen a loving relationship	3.11 (.70)[a]	3.28 (.66)[b]	3.51 (.53)[c]
	3.25 (.62)[a]	3.41 (.56)[b]	3.62 (.52)[e]
5. Have a strong friendship	3.10 (.61)[a]	3.26 (.61)[b]	3.58 (.51)[c]
	3.25 (.62)[a]	3.46 (.55)[b]	3.64 (.49)[c]
6. Importance of spending time	3.48 (2.76)[a]	3.52 (.57)[a]	3.71 (.48)[a]
	3.45 (.57)[a]	3.64 (.51)[b]	3.80 (.43)[c]
Overall PRKS Mean	3.08 (.65)[a]	3.23 (.43)[b]	3.48 (.38)[c]
	3.16 (.45)[a]	3.34 (.40)[b]	3.57 (.39)[c]

Notes. Women's coefficients are on the second line for each item. Means with differing superscripts [a, b, c] differed significantly group to group, $p < .001$.

& Veroff, 1993; Gottman, 1999). Furthermore, leading CRE scholars have indicated "even when they focus primarily on relational skills, most programs still teach participants some basic knowledge and attitudes about marriage" (Hawkins et al., 2004, p. 548). This measure captures perceptions of relationship knowledge relative to content areas important to relationship health.

A recent review revealed the majority of CRE studies evaluate primarily for relationship quality, communication quality, and relationship satisfaction (Markman & Rhoades, 2012). For high- and moderate-dosage programs, these outcomes can be influenced and measured. However, the effect of low-dosage CRE on these variables is not as clear (Hawkins, Stanley, Blanchard, & Albright, 2012). Given extant research, one might conclude that CRE, as a brief intervention, is not effective in decreasing relationship dissolution and is a misguided policy to strengthen relationships (cf., Johnson, 2012). Proponents of CRE, on the other hand, point to the need for a broader array of measured outcome variables (Hawkins et al., 2008) and the assessment of mediating variables (Halford et al., 2003). The PRKS can be used as both.

As a research tool, the PRKS could be used in studies of "who receives it" (Hawkins et al., 2004, p. 555). There has been speculation regarding who utilizes CRE and whether groups benefit differentially (e.g., low income vs. middle-class, racial and ethnic minorities vs. majority, remarried vs. cohabitating couples vs. first marriages, etc.). Some have questioned whether programs developed primarily for White, middle-class couples can be effective with diverse audiences (Ooms & Wilson, 2004). Others suggest there may be a "selection effect," in that CRE participants have a greater commitment or desire to make the relationship work (Stanley, 2001). Although there has been research in the last decade to examine these possibilities (cf. Hawkins & Fackrell, 2010), it has not involved systematic comparative assessments of participants knowledge of healthy relationship skills. Understanding "who" is looking for "what" would help CRE practitioners know "how" to market their CRE.

A related use of the PRKS is that of a screening tool. It is plausible that within different groups (e.g., ethnicity, gender, marital status, etc.) there could be as much, if not more, variation in relational knowledge as between groups. As compelling as group-specific CRE may sound, there are practical considerations in program delivery. For some agencies it may not be feasible to offer different CRE programs

to different types of participants. When this is the practical reality, there may be value in considering public education as a model. Rather than separating groups by income, gender, or ethnicity, students might be placed in classrooms according to their level of knowledge. As a screening tool used in conjunction with more comprehensive needs assessments, the PRKS could be used to identify baseline levels of relationship knowledge and inform recommended services. Those who score low could be encouraged to attend a high-dosage CRE program. Those who score high could be pointed to self-directed programs or given resources for specific areas of concern or interest. This approach would be consistent with intervention theory's aim of increasing protective factors (Coie et al., 1993).

As a research tool, the PRKS could be used to assess the mediating role of knowledge on traditional or targeted CRE outcomes such as relationship quality or stability. Several researchers have considered potential mediators including self-regulation (Halford et al., 2003). Knowledge could likewise influence the effects of CRE. The transtheoretical model of change (Prochaska & Norcross, 2001) provides an illustration of the role of knowledge in behavior change. Prochaska and Norcross (2001) proposed that there are several stages of behavior change that rely on awareness and knowledge of one's problems. In the contemplation stage "people are aware that a problem exists and are seriously thinking about overcoming it but have not yet made a commitment to take action" (p. 443). As the individual passes from the contemplation stage to the preparation stage, the individual moves into a combination of contemplation and small behavioral changes before reaching the action stage (Prochaska & Norcross, 2001). It may be possible that gaining more knowledge could help individuals move from one stage to the next. Future research using the PRKS can now test this possibility.

Limitations

The psychometric properties of the PRKS should be considered in light of the limitations of these two studies. Despite relatively sound reliability and validity, the results are not conclusive. According to some (but not all) recommendations, the clinical sample ($n = 54$) was too small to adequately test reliability using EFA. With regard to validity, Study 2 had fewer variables, which limited our ability to test convergent validity. It is possible that the modest correlations indicate a stronger relationship between relationship knowledge and relationship functioning among clinical couples versus nondistressed couples, or possibly that the scale taps somewhat separate aspects of relationships. With regard to content validity, item generation was limited to a review of the literature highlighting components central to couple functioning. Six items cannot reflect all facets important to couple relationships. The amount of variance explained in the EFA analyses was adequate, but testing more items might better reflect knowledge and explain more variance. Future research might include focus groups or even a Delphi study to generate and test a more comprehensive range of items.

The PRKS is self-report, and as such, it suffers from limitations common to self-report instruments; including social desirability bias and the inaccuracy of self-report in general (Wilson & Nisbett, 1978). Moreover, as Halford (2011) pointed out, self-report measures typically do not identify key risk factors; this instrument is no exception. Due to the need to measure central aspects of relationship knowledge, the topics of each of the six items are stated only generally, and (purposively) not specifically. Despite the relative consistency of these results, it is likely that any one item might have diverse meanings among different respondents. Still, the psychometrically sound results both in terms of reliability and validity suggest that the PRKS captures a construct that relates meaningfully and consistently to relational health.

References

Acitelli, L. K. (1992). Gender differences in relationship awareness and marital satisfaction among young married couples. *Personality and Social Psychology Bulletin, 18*, 102–110. doi:10.1177/0146167292181015

Acitelli, L. K., Douvan, E., & Veroff, J. (1993). Perceptions of conflict in the first year of marriage:

How important are similarity and understanding? *Journal of Social and Personal Relationships*, *10*, 5–19. doi:10.1177/0265407593101001

Andersen, P. A. (1993). Cognitive schemata in personal relationships. In S. Duck (Ed.), *Individuals in relationships* (pp. 87–120). Thousand Oaks, CA: Sage.

Arbuckle, J. L. (2012). *AMOS (version 21)*. Chicago, IL: SPSS Inc.

Baucom, D. H., Epstein, N., Rankin, L. A., & Burnett, C. K. (1996). Assessing relationship standards: The Inventory of Specific Relationship Standards. *Journal of Family Psychology, 10*, 72–88. doi:10.1037/0893-3200.10.1.72

Bradford, K., Higginbotham, B. J., & Skogrand, L. (2014). Healthy relationship education: A statewide case study and outcome evaluation. *Marriage and Family Review. 50*, 93–106. doi:10.1080/01494929.2013.851057

Butler, M. H., & Wampler, K. S. (1999). A meta-analytic update of research on the couple communication program. *American Journal of Family Therapy, 27*, 223–227. doi:10.1080/019261899261943

Coie, J. D., Watt, N. F., West, S. G., Hawkins, J. D., Asarnow, J. R., Markman, H. J., … Shure, M. B. (1993). The science of prevention: A conceptual framework and some direction for a national research program. *American Psychologist*, *48*, 1013–1022. doi:10.1037/0003-066X.48.10.1013

Cummings, M. E., Goeke-Morey, M. C., & Papp, L. M. (2003). Children's responses to everyday marital conflict tactics in the home. *Child Development, 74*, 1918–1929. doi:10.1046/j.1467-8624.2003.00646.x

Doherty, W. J. (2001). *Take back your marriage: Sticking together in a world that pulls us apart*. New York, NY: Guilford.

Driver, J., Tabares, A., Shapiro, A. F., & Gottman, J. M. (2012). Couple interaction in happy and unhappy marriages: Gottman laboratory studies. In F. Walsh (Ed.), *Normal family processes* (4th ed., pp. 57–77). Logan, UT: Utah State University, Department of Family, Consumer, and Human Development.

Duck, S. (1993). *Individuals in relationships: Understanding relationship processes series* (Vol. 1). Thousand Oaks, CA: Sage.

Fletcher, G. J. O., & Kininmonth, L. (1992). Measuring relationship beliefs: An individual differences scale. *Journal of Research in Personality, 26*, 371–397. doi:10.1016/0092-6566(92)90066-D

Fowers, B. J. (2000). *Beyond the myth of marital happiness*. San Francisco, CA: Jossey-Bass.

Fraley, R. C., & Shaver, P. R. (2000). Adult romantic attachment: Theoretical developments, emerging controversies, and unanswered questions. *Review of General Psychology, 4,* 132–154. doi:10.1O37//1089-2680.4.2.132

Gottman, J., & Silver, N. (1999). *The seven principles for making marriage work*. New York, NY: Crown.

Gottman, J. M. (1999). *The marriage clinic: A scientifically based marital therapy*. New York, NY: Norton.

Gurman, A. S., & Jacobson, N. S. (2002). *Clinical handbook of couple therapy* (3rd ed.). New York, NY: Guilford.

Halford, W. K. (2011). *Marriage and relationship education: What works and how to provide it*. New York, NY: Guilford.

Halford, W. K.., Markman, H. J., Kline, G., & Stanley, S. M. (2003). Best practice in couple relationship education. *Journal of Marital and Family Therapy, 29*, 385–406. doi:10.1111/j.1752-0606.2003.tb01214.x

Hauer, J., McDowell, L., Andrews, B., Swanson, L., Marr, P., & Minor, B. (2008). *Marriage education curriculum assessment guide*. Administration for Children and Families. Retrieved from http://archive.acf.hhs.gov/healthymarriage/pdf/acf2009_curriculum_assessment_guide.pdf.

Hawkins, A. J., Blanchard, V. L., Baldwin, S. A., & Fawcett, E. B. (2008). Does marriage and relationship education work? A meta-analytic study. *Journal of Consulting and Clinical Psychology, 76*, 723–734. doi:10.1037/a0012584

Hawkins, A. J., Carroll, J. S., Doherty, W. J., & Willoughby, B. J. (2004). A comprehensive framework for marriage education. *Family Relations, 53*, 547–558. doi:10.1111/j.0197-6664.2004.00064.x

Hawkins, A. J., & Fackrell, T. A. (2010). Does relationship and marriage education for lower-income couples work? A meta-analytic study of emerging research. *Journal of Couple & Relationship Therapy: Innovations in Clinical and Educational Interventions, 9*, 181–191. doi:10.1080/15332691003694927

Hawkins, A. J., Fowers, B. J., Carroll, J. S., & Yang, C. (2006). Conceptualizing and measuring a construct of marital virtues. In S. Hofferth & L. Casper (Eds.), *Handbook of measurement issues in family research* (pp. 67–83). Mahwah, NJ: Erlbaum.

Hawkins, A. J., & Ooms, T. (2010). *What works in marriage and relationship education? A review of lessons learned with a focus on low-income couples*. Washington, DC: Healthy Marriage Resource Center.

Hawkins, A. J., Stanley, S. M., Blanchard, V. L., & Albright, M. (2012). Exploring programmatic moderators of the effectiveness of marriage and relationship education programs: A meta-analytic study. *Behavior Therapy, 43*, 77–87. doi:10.1016/j.beth.2010.12.006

Hawkins, A. J., Wilson, R. F., Ooms, T., Nock, S. L., Malone-Colon, L., & Cohen, L. (2009). Recent government reforms related to marital formation, maintenance, and dissolution in the United States: A primer and critical review. *Journal of Couple & Relationship Therapy: Innovations in Clinical and Educational Interventions, 8*, 264–281. doi:10.1080/15332690903049265

Hurley, A. E., Scandura, T. A., Schriescheim, C. A., Brannick, M. T., Seers, A., Vandenberg, R. J., & Williams, L. J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior, 18,* 667–683. doi:10.1002/(SICI)1099-1379(199711)18:6<667::AID-JOB874>3.0.CO;2-T

Johnson, M. D. (2012). Healthy marriage initiatives: On the need for empiricism in policy implementation. *American Psychologist, 67*, 296–308. doi:10.1037/a0027743

Johnson, M. D. (2013). Optimistic or quixotic? More data on marriage and relationship education programs for lower income couples. *American Psychologist, 68,* 111–112. doi:10.1037/a0031793

Jory, B. (2004). The Intimate Justice Scale: An instrument to screen for psychological abuse and physical violence in clinical practice. *Journal of Marital and Family Therapy, 30*, 29–44. doi:10.1111/j.1752-0606.2004.tb01220.x

Karney, B. R., McNulty, J. K., & Bradbury, T. N. (2000). Cognition and the development of close relationships. In M. S. Clark & G. J. O. Fletcher (Eds.), *Blackwell handbook of social psychology, Vol. 2: Interpersonal processes* (pp. 32–59). Oxford, England: Blackwell Publishers Limited.

Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., pp. 233–265). New York, NY: McGraw-Hill.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis.* New York, NY: Guilford.

Knee, C. R. (1998). Implicit theories of relationships: Assessment and prediction of romantic relationship initiation, coping and longevity. *Journal of Personality and Social Psychology, 74*, 360–370. doi:10.1207/S15327957PSPR0701_3

Larson, J. H. (2000). *Should we stay together?* San Francisco, CA: Jossey-Bass.

Larson, J. H. (2003). *The great marriage tune-up book: A proven program for evaluating and renewing your relationship*. San Francisco, CA: Jossey-Bass.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4,* 84–99. doi:10.1037/1082-989X.4.1.84

Markman, H. J., & Halford, W. K. (2005). International perspectives on couple relationship education. *Family Process, 44,* 139–146. doi:org/10.1111/j.1545-5300.2005.00049.x

Markman, H. J., & Rhoades, G. K. (2012). Relationship education research: Current status and future directions. *Journal of Marital and Family Therapy, 38*, 169–200. doi:10.1111/j.1752-0606.2011.00247.x

Marshall, J., Higginbotham, B., Harris, V., & Lee, T. (2007). Assessing program outcomes: Rationale and benefits of posttest-then-retrospective-pretest designs. *Journal of Youth Development: Bridging Research and Practice, 2*(1). Retrieved from http://nae4a.memberclicks.net/assets/documents/JYD_070201_final.pdf

Mitchell, S. L., Newell, G. K., & Schumm, W. R. (1983). Test–retest reliability of the Kansas Marital Satisfaction Scale. *Psychological Reports, 53*, 545–546.

Norton, R. (1983). Measuring marital quality: A critical look at the dependent variable. *Journal of Marriage and the Family*, *45*, 141–151. doi:10.2307/351302

Olson, D. H., Olson-Sigg, A., & Larson, P. J. (2008). *The couple checkup.* Nashville, TN: Thomas Nelson.

Ooms, T., & Wilson, P. (2004). The challenges of offering relationship and marriage education to low-income populations. *Family Relations, 53*, 440–447. doi:10.1111/j.0197-6664.2004.00052.x

Parrott, L., & Parrott, L. (2006). *Saving your marriage before it starts: Seven questions to ask before (and after you marry).* Grand Rapids, MI: Zondervan.

Planalp, S. (1987). Interplay between relational knowledge and events. In R. Burnett, P. McGhee, & D. D. Clarke (Eds.), *Accounting for relationships: Explanation, representation and knowledge* (pp. 175–191). London, England: Methuen.

Prochaska, J. O., & Norcross, J. C. (2001). Stages of change. *Psychotherapy, 38*, 443–448. doi:10.1037/0033-3204.38.4.443

Rohs, F. R. (1999). Response shift bias: A problem in evaluating leadership development with self-report pretest-posttest measures. *Journal of Agricultural Education, 40,* 28–37. doi:10.5032/jae.1999.04028

Schumm, W. R., Paff-Bergen, L. A., Hatch, R. C., Obiorah, F. C., Copeland, J. E., Meens, L. D., & Bugaighis, M. A. (1986). Concurrent and discriminant validity of the Kansas Marital Satisfaction Scale. *Journal of Marriage and the Family, 48*, 381–388. doi:10.2307/352405

Scuka, R. F. (2005). *Relationship enhancement therapy: Healing through deep empathy and intimate dialogue.* New York, NY: Routledge

Stanley, S. M. (2001). Making a case for premarital education. *Family Relations, 50,* 272–280. doi:10.1111/j.1741-3729.2001.00272.x

Stevens, J. (1996). *Applied multivariate statistics for the social sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.

Stuart, R. B., & Stuart, F. M. (1983). *Couple's pre-counseling inventory*. Champaign, IL: Research Press.

Vaterlaus, J. M., Allgood, S. M., & Higginbotham, B. J. (2012). Stepfamily education booster sessions. *Social Work with Groups, 35,* 150–163. doi:10.1080/01609513.2011.599017

Wilson, T. D., & Nisbett, R. E. (1978). The accuracy of verbal reports about the effects of stimuli on evaluations and behavior. *Social Psychology*, *40*, 118–131.