

## Maintenance of Gains in Relationship and Individual Functioning Following the Online OurRelationship Program

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In the United States, more than 40% of marriages end in divorce and more than one third of intact marriages are distressed. Unfortunately, only a minority of couples seek couple therapy to improve their relationships. Online interventions, with their increased reach and reduced costs, offer the potential to improve relationships nationwide. The online OurRelationship program has been shown in previous nationwide studies to improve relationship and individual functioning. The present study examined whether initial gains in the OurRelationship program were maintained in the following year and whether the extent of maintenance varied across important demographic and individual factors. In this study, 151 distressed heterosexual couples (302 individuals) who were randomized to the OurRelationship program were assessed 3 and 12 months following the intervention. Initial gains in relationship satisfaction, relationship confidence, and negative relationship quality were maintained through 12 months; positive relationship quality significantly im-

proved over follow-up. Furthermore, couples maintained their initial gains in depressive symptoms, perceived health, work functioning, and quality of life; anxious symptoms continued to significantly decrease over follow-up. Finally, there was no evidence that historically underserved groups—racial/ethnic minorities, lower income couples, or rural couples—experienced greater deterioration. In fact, Hispanic couples reported continued improvement in relationship confidence and negative relationship quality in the 12 months following the program. The ability of the OurRelationship program—an 8-hour, primarily self-help program—to create long-lasting improvements in distressed relationships indicates it may have the potential to improve the lives of distressed couples on a broad scale.

*Keywords:* relationship satisfaction; marriage; internet; online; intervention

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RELATIONSHIP DISTRESS IS A PERVERSIVE and intractable issue. Without intervention, dissatisfied couples on average will continue to struggle or deteriorate (Baucom, Hahlweg, & Kuschel, 2003). Furthermore, the negative effects of relationship dissatisfaction reach beyond the romantic dyad. Individuals who are unhappy in their relationship report worse mental health (Whisman, 2007), worse physical health (Robles, Slatcher, Trombello, & McGinn, 2013), and poorer functioning both socially and at work (Whisman & Uebelacker, 2006). Children of

distressed couples are likewise negatively impacted by relationship distress (e.g., O'Leary & Vidair, 2005). In order to combat the many negative effects of relationship distress, couple therapy has been widely validated in the literature but underutilized by distressed couples. Meta-analyses of couple therapy report medium effect sizes (e.g.,  $d = 0.585$ ; Shadish & Baldwin, 2005); however, only 19% of intact couples seek therapy (Whisman, Beach, & Snyder, 2008), and prior to divorce, fewer than 40% of couples seek therapy (Johnson et al., 2002).

To increase the reach of evidence-based couple interventions, scholars have developed online programs adapted from validated, in-person approaches. A meta-analysis of flexibly delivered relationship education (RE) courses revealed that blended programs, which combine both self-directed methods such as workbooks or audio recordings with traditional methods such as phone calls or classes with an educator or paraprofessional, are effective in improving relationship quality ( $d = 0.43$ ) and increasing communication skills ( $d = 0.72$ ; McAllister, Duncan, & Hawkins, 2012). However, these interventions have not targeted distressed couples.

Due to lower burden on professional time, blended and self-help programs have the capacity to reach more distressed couples than can traditional therapy alone. Indeed, a survey of cohabiting, engaged, or married heterosexual individuals indicated that both distressed and nondistressed individuals identified a relationship-focused website as the most likely source of help seeking in the future, more so than going to couple therapy together or doing a DVD and workbook with their partner (Georgia & Doss, 2013). Therefore, it is critical that researchers work to develop online programs that suit the needs of distressed couples. One such program, the OurRelationship program, is an 8-hour-long web-adapted version of Integrative Behavioral Couple Therapy (IBCT; Christensen, Wheeler, Doss, & Jacobson, 2014) that combines online modules and videoconferencing calls with a paraprofessional coach. A nationwide randomized controlled trial showed that, compared to couples in a waitlist control group, the program produced medium effects in relationship functioning (e.g., satisfaction  $d = 0.69$ ) and smaller effects in individual functioning such as depression ( $d = 0.50$ ) and perceived health ( $d = 0.23$ ) by the end of the program (Doss et al., 2016). However, it is unclear how these changes are maintained over follow-up.

#### MAINTENANCE OF GAINS IN IN-PERSON COUPLE INTERVENTIONS

##### *Changes Over Follow-up*

Following couple therapy, there is evidence of both maintenance and deterioration of gains. In the largest

study of in-person couple therapy to date comparing IBCT to traditional behavioral couple therapy (TBCT), participants reported large gains in relationship satisfaction during treatment (within group Cohen's  $d = 0.86$ ; Christensen et al., 2004). However, analyses of change during the first 2 years following therapy revealed participants in both groups experienced an initial steep decline in satisfaction (a loss of 3.8 DAS points for IBCT and a loss of 5.9 DAS points for TBCT) followed by a gradual increase in satisfaction during the remainder of the 2-year follow-up (a gain of 2.7 DAS points in IBCT and 2.5 DAS points in TBCT), with IBCT showing significantly but not dramatically better maintenance than TBCT (Christensen, Atkins, Baucom, & Yi, 2010; Christensen, Atkins, Yi, Baucom, & George, 2006). Across studies, a meta-analysis of marriage and family therapy reported an average effect size of  $d = 0.52$  over follow-up, slightly smaller than  $d = 0.65$  at posttreatment (Shadish & Baldwin, 2003). While these results are generally promising for couple therapy, many couples do not have the time or means to afford a lengthy course of in-person treatment.

Brief, RE or assessment and feedback interventions for couples have also been evaluated over follow-up and show mixed results. One meta-analysis of experimental studies reported improvements in both relationship quality ( $d = 0.31$ ) and communication ( $d = 0.45$ ; Hawkins, Blanchard, Baldwin, & Fawcett, 2008) over 3- to 6-month follow-ups. Eighty-two percent of RE programs with follow-up durations of at least a year indicated that couples were able to maintain their relationship satisfaction (Halford & Bodenmann, 2013). Since these reviews were published, several other notable studies of RE have been published. Couples in the Marriage Checkup, a brief assessment, feedback, and skills-building intervention reported significantly greater intimacy ( $d = .36$ ) and nonsignificant improvements in satisfaction and acceptance 18 months after the initial intervention (Cordova et al., 2014). Additionally, a 4-year follow-up of couples in the Couple CARE program, a DVD-based relationship education program, found significant intervention effects on relationship satisfaction at 6 months ( $d = 0.47$ ), but not at 12 months or later (Halford et al., 2017).

There have been limited studies of the long-term effects of RE programs on individual functioning—and the existing studies yield mixed results. The Couple CARE program did not significantly improve mental health compared to the control group either during the intervention or over 4-year follow up (Halford et al., 2017). Likewise, in the large-scale Building Strong Families study, RE programs for unmarried parents had no effect on depressive symptoms at 36-month follow-up (Wood et al.,

2012). However, in the large Supporting Healthy Marriage study, women but not men reported significant decreases in psychological distress compared to the control group at 30-month follow-up (Cohen's  $d = -0.09$ ; Lundquist et al., 2014).

#### *Prediction of Changes Over Follow-up*

Understanding what predicts changes over follow-up will facilitate directing couples to the appropriate resources based on their initial presentation. Demographic characteristics are often studied as predictors of treatment outcome. For in-person therapy, being married longer and being employed are inconsistently associated with better outcomes at follow-up (Baucom, Atkins, Simpson, & Christensen, 2009; Baucom, Atkins, Rowe, Doss, & Christensen, 2015; Snyder, Mangrum, & Wills, 1993). For RE programs, a meta-analysis of low-income couples found participants with longer relationship length improved marginally more than couples with shorter relationship length. Additionally, an investigation into couples in the Supporting Healthy Marriage Project found that pretreatment sociodemographic risk, operationally defined as less education, unemployment, or receiving public assistance among other indicators, did not predict gains in relationship satisfaction at 30 months (Williamson, Altman, Hsueh, & Bradbury, 2016). A second study found that risk did predict satisfaction over follow-up such that high-risk couples declined at a slower rate than low-risk couples (Williamson et al., 2015).

The extent to which couples continue to improve or maintain their gains over follow-up is also dependent on initial levels of relationship functioning. In a sample of in-person couple therapy, number of steps towards divorce predicted treatment gains over follow-up such that more steps toward divorce was associated with a greater likelihood of being separated at 5-years posttreatment (Baucom et al., 2015). Couples who enter RE distressed have greater potential for improvement than initially satisfied couples; however, the results are inconsistent as to how this predicts changes over follow-up for couples participating in in-person RE. A meta-analysis of RE for low-income couples found that a greater percentage of the sample initially in the distressed range was associated with larger effects at posttreatment (Hawkins & Erickson, 2015); unfortunately, follow-up analyses were not included. Recent RE studies that have examined whether initial satisfaction predicts changes over follow-up have yielded mixed results, with some studies showing RE was more effective for unhappier couples (Halford et al., 2017; Quirk, Strokoff, Owen, France, & Bergen, 2014) while other studies found that initial satisfaction did not moderate intervention effects

(Trillingsgaard, Fentz, Hawrilenko, & Cordova, 2016).

#### MAINTENANCE OF GAINS IN ONLINE INTERVENTIONS

Although online interventions for relationships show promising outcomes at posttreatment, it is unclear if those effects will be maintained over a longer period of time. However, given that most web-based programs have a lower intervention dose than in-person programs, it is possible that web-based programs will see higher rates of relapse.

#### *Changes Over Follow-up*

To our knowledge, the only follow-up study of online RE programs is for the ePREP program. In this study, couples' initial improvements in physical and psychological aggression were maintained over 1-year follow-up (Braithwaite & Fincham, 2014). In online programs for individual problems, three different implementations of online cognitive behavioral therapy found effects were maintained for significant improvements for insomnia (Ritterband et al., 2017), mild to moderate depression (Ruwaard et al., 2009), and panic symptoms (Ruwaard, Broeksteeg, Schrieken, Emmelkamp, & Lange, 2010) for a year or more.

#### *Prediction of Changes Over Follow-up*

To our knowledge, there are no studies that attempt to predict change over follow-up for an online relationship-focused intervention. In studies of online programs for individual difficulties, a meta-analysis of self-directed Internet cognitive behavioral therapy (iCBT) for depression found none of the tested demographic participant characteristics significantly predicted effects during the intervention (the meta-analysis did not examine prediction during follow-up; Karyotaki et al., 2017). Additionally, one study of a web-based CBT treatment for depression found that pretreatment level of depressive symptoms was positively correlated with improvements over follow-up and medication use was negatively correlated with reduction of depressive symptoms during follow-up (Ruwaard et al., 2009). Unfortunately, individual participant characteristics such as race, ethnicity, or SES were not tested as predicting variables of outcomes over follow-up. Further work is needed to understand if these web-based interventions are equally effective for all groups, especially as increased funding is directed towards online programs.

#### CURRENT STUDY

The present study had two primary aims. First, we sought to examine whether gains in relationship functioning observed during the OurRelationship program were maintained in the year following the

intervention. Based on follow-up results from in-person couple therapy and the limited body of research on online relationship and individual interventions, we expected that couples' initial gains during the OurRelationship program on both relationship and individual variables would be maintained in the year following the intervention.

Second, we sought to examine whether maintenance or deterioration of program effects would differ across important demographic and individual characteristics. One of the purported advantages of online interventions is their potential for broad reach—especially to serve individuals who are underserved by in-person interventions. If historically-underserved populations (e.g., ethnic or racial minorities, low-income individuals, or rural individuals) were less able to maintain the gains obtained in the program, it would place important limitations on the ability of the program to effectively serve those populations. In contrast, if all groups were able to maintain their gains—or if currently underserved groups demonstrated superior maintenance—it would point to the utility of web-based interventions to reduce current disparities in services available to those populations. Additionally, we investigated whether individuals' initial level of difficulty in individual functioning (e.g., depression, anxiety) would predict their ability to maintain those gains in those domains in the following year.

## Methods

### PARTICIPANTS

A total of 151 heterosexual couples (302 individuals) were randomly assigned to complete the intervention. (An additional 149 couples were randomized to a waitlist control group but they were not assessed during the follow-up period [Doss et al., 2016]; thus, they are not included in the present study.) Eighty-one percent of couples were married, 4.2% were engaged, and 14.8% were cohabiting but were not engaged or married. Couples had been together for an average of 9.8 years ( $SD = 8.7$  years) and most had children (74.5%). Participants were mostly in their 30's (range = 21–65 years;  $M = 37.1$  years;  $SD = 9.3$  years) and were generally representative of the United States. They largely identified as Caucasian, non-Hispanic (76%), with 18% identifying as African American, 10% as Hispanic, 2.6% as Asian American, 1% as American Indian, 1% as Pacific Islander, and 5% as other. Thirty percent of participants had a high school diploma or GED equivalent, 19.8% had an associate's degree or vocational training, 28.8% had a bachelor's degree, and 21.1% had graduate or doctoral training. Most were employed full-time (63.3%), with 11.8% employed part-time, 11.8% as full-time home-

makers, 5.1% working as full-time students, and 8% unemployed. Average household income was \$96,439 ( $mdn = \$65,000$ ), with 30.9% of couples reporting household incomes below 200% of the national poverty line.

### PROCEDURES

To be eligible for the study, couples had to be in a heterosexual married, engaged, or cohabiting relationship (of at least 6 months duration). Furthermore, their relationship had to be distressed, defined as both partners scoring less than 0.5 SD—or one partner scoring less than 1.0 SD—below the population mean. All participants had to be between the ages of 21 and 64 (inclusive), live in the United States, and deny moderate-to-severe levels of suicidal ideation and injury or fear resulting from intimate partner violence in the past three months.

This research was supported. Eligible couples were asked to complete approximately 7 hours of online materials comprised of three phases. In the first phase, couples received feedback about strengths and weaknesses in their relationship, which was designed to help them pick a relationship problem on which to focus for the remainder of the program. In the second phase, couples developed a *DEEP* Understanding—or how natural Differences, hidden Emotions, External stress, and Patterns of communication created or exacerbated their relationship problem. Finally, in the third phase, couples considered which parts of the problem were more appropriate to accept and which were more appropriate to change; they then worked to develop specific solutions. Each member of the couple generally completed the online activities on their own; however, at the end of each phase, both members of the couples came together for a conversation where the program displayed what they had written. The online activities were supplemented by four, 15-minute calls of coach support at the time of enrollment and throughout the program. Coaches were graduate-level students trained in the intervention. (See Doss et al., 2016, for a detailed description of recruitment, intervention procedures, and eligibility criteria.)

During the follow-up period, participants were asked to complete assessments 3 and 12 months after estimated program completion (5 and 14 months after randomization). Participants were paid \$25 in gift cards for completing each follow-up assessment. As an additional incentive, following completion of their final assessment at 12 months, participants received emailed feedback on their responses. They were also offered the opportunity to schedule a call with their coach to discuss this feedback; however, very few couples scheduled those calls. All

procedures were approved by the institutional review board at the University of Miami.

#### MEASURES

All participants completed baseline measures of relationship and individual functioning, and were re-assessed at approximately 2, 5, and 8 weeks following initial assessment, and again at 3- and 12-months postintervention.

##### *Relationship Satisfaction*

The 16-item version of the Couples Satisfaction Index (CSI-16; Funk & Rogge, 2007) was used to measure global relationship satisfaction. Participants rated how much they agreed with questions such as: "In general, how satisfied are you with your relationship?" Mean Cronbach's alpha for each time point was 0.97 for the present sample (range = 0.96 to 0.98).

##### *Positive and Negative Relationship Quality*

Participants were asked to rate four positive and four negative aspects of their relationship using The Positive and Negative Relationship Quality scale (PNRQ; Fincham & Rogge, 2010). Items were rated on a Likert scale from 0 (*not at all*) to 6 (*extremely*). In the present study, reliability was excellent for each assessment point for both relationship positives (mean Cronbach's alpha = 0.95 [range = 0.94 to 0.96]) and negatives (mean Cronbach's alpha = 0.95 [range = 0.93 to 0.97]).

##### *Relationship Confidence*

A two-item version of the Confidence Scale (Rhoades, Stanley, & Markman, 2009) was used to measure relationship confidence: "I believe we can handle whatever conflicts will arise in the future" and "I feel good about our prospects to make this relationship work." In this study, reliability for each assessment point was excellent (Cronbach's alpha = 0.93 [range = 0.91 to 0.96]).

##### *Depression*

The 10-item version of the Center for Epidemiologic Studies—Depression (CES-D 10; Cole, Rabin, Smith, & Kaufman, 2004) is a well-validated measure of depression. Items were rated on a 4-point Likert scale. Scores ranged from 0 to 30, with scores greater than 11 considered at risk for clinical depression (Cole et al., 2004). Mean Cronbach's alpha in the present sample = 0.83 (range = 0.79 to 0.85).

##### *Anxiety*

The Generalized Anxiety Disorder 7-item (GAD-7; Spitzer, Kroenke, Williams, and Löwe, 2006) is a well-validated measure of GAD based on DSM-IV symptom criteria. Scores range from 0 to 21, with scores greater than 9 indicating moderate anxiety. In this sample, the GAD-7 demonstrated excellent

reliability for each time point (Cronbach's alpha = 0.93 [range = 0.92 to 0.95]).

##### *Perceived Health*

Participants were asked to rate their perceived health over the last 4 weeks using a single item from the Quality of Life–Brief (WHO; WHOQOL Group, 1998): Responses were rated using a 5-point Likert scale from 1 (*very dissatisfied*) to 5 (*very satisfied*) for the following question: "How satisfied are you with your health?" In the present study, scores below 4 (*satisfied*) were coded as indicative of problematic individual functioning.

##### *Work Functioning*

Work functioning was measured using the following item on a scale from 1 (*excellent*) to 5 (*poor*): "Please rate your ability to function at work. If you do not work outside the home, please rate your ability to complete household tasks." The item was reverse scored such that higher scores indicated better work functioning, with scores below 3 (*good*) used in the present study as indicative of possible impairment in work functioning.

##### *Quality of Life*

Participants rated their subjective quality of life using a single item from the Quality of Life–Brief (WHO; WHOQOL Group, 1998). Responses were rated using a 5-point Likert scale from 1 (*very poor*) to 5 (*very good*) for the following question: "How would you rate your quality of life?" In the present study, scores below 4 (*good*) were considered indicative of potentially problematic individual functioning.

#### MISSING DATA

At the 3-month assessment, 25% of participants had missing data and, at the 12-month assessment, 21% of participants had missing data. Seventeen percent of participants had missing data at both the 3- and 12-month assessments. A series of multilevel logistic regressions indicated that missing data at either of the assessments was not significantly related to relationship status at the beginning of the intervention (married or not), relationship status at the follow-up assessment (together or broken-up/separated/divorced), amount of change during the intervention, education, race, ethnicity, income, or rural location. However, missing data at either 3- or 12-month assessments was significantly higher in those who did not complete the intervention [ $b = 1.811$ ;  $OR = 6.119$  (2.279-16.431),  $t = 3.626$ ,  $p < .001$ ]. Therefore, noncompletion was grand-mean centered and entered as a control variable in all analyses so that trajectories of change would represent the average change for all couples, not just those that completed

the program. To account for the missing data, all analyses were conducted using multiple imputation and Full-Information Maximum Likelihood (FIML).

#### DATA ANALYSIS

To obtain estimates of change, we simultaneously estimated separate linear slopes of change during the intervention and during follow-up using piecewise (or spline) models and two-rate coding suggested by Raudenbush and Bryk (2002). Thus, in Level 1, we centered the intercept at the end of the intervention and entered as predictors: (a) time in weeks prior to the end of the intervention (as negative numbers; to capture change during the intervention); (b) time in weeks following the intervention (as positive numbers; to capture change over follow-up); and (c) whether the relationship was intact or separated (grand mean centered; to obtain estimates for the average couple regardless of relationship status). At Level 2, gender was grand-mean centered and entered as a predictor of the intercept and both time parameters (to determine whether intercepts or slopes varied across gender). A random effect was retained for the intercept only. Finally, at Level 3, noncompletion of the program was grand-mean centered and entered as a predictor of the intercept and both slopes (so that estimates of change were intent-to-treat analyses, not completer analyses). Random effects were

estimated for the intercept and both slopes. To predict amount of change, the analyses described above were rerun with the putative predictor entered as a predictor of the intercept and both slopes. Initial level of the dependent variable and education level were entered as predictors in Level 2; all other predictors were entered in Level 3. All predictors were entered into separate models.

#### Results

By the 12-month assessment, 84% of couples were still together and 6% of couples had broken up, separated, or divorced; we were unable to determine relationship status for the remaining 10% of couples ( $n = 15$  couples).

#### CHANGE OVER FOLLOW-UP

The first aim of this study was to determine whether couples were able to maintain the gains they achieved during the intervention in the subsequent 12 months. Raw means and standard deviations are present in Table 1.

#### Relationship Functioning

As reported elsewhere (Doss et al., 2016), relationship satisfaction, relationship confidence, and negative relationship quality all significantly improved during the program (all  $p < .001$ ; within-group  $|d| = 0.64$  to  $0.93$ ); positive relationship quality did not significantly change (within-group  $d = -0.01$ ). In the 12

Table 1  
Means and Standard Deviations of Measures Over Time

		Pre-program	Post-program	3 months	12 months
<i>Relationship Functioning</i>					
Satisfaction	<i>Men</i>	39.93 (13.87)	53.39 (14.73)	53.56 (17.20)	53.67 (17.79)
	<i>Women</i>	33.23 (14.88)	47.27 (17.53)	48.73 (20.31)	49.35 (19.64)
Confidence	<i>Men</i>	8.57 (2.40)	10.06 (1.97)	9.72 (2.48)	9.66 (2.77)
	<i>Women</i>	7.31 (2.73)	9.21 (2.68)	8.91 (3.39)	9.01 (3.13)
Negatives	<i>Men</i>	10.62 (6.12)	6.72 (5.70)	7.21 (6.42)	7.20 (6.72)
	<i>Women</i>	13.09 (5.75)	8.19 (6.46)	8.14 (7.04)	7.23 (6.30)
Positives	<i>Men</i>	17.38 (4.54)	17.38 (4.57)	17.39 (4.93)	18.26 (4.59)
	<i>Women</i>	16.29 (5.17)	16.18 (4.92)	16.47 (5.53)	16.93 (5.54)
<i>Individual Functioning</i>					
Depressive Symptoms	<i>Men</i>	8.67 (5.46)	5.66 (4.27)	5.97 (5.05)	5.90 (5.13)
	<i>Women</i>	10.73 (6.60)	6.22 (5.21)	6.78 (5.68)	6.47 (5.66)
Anxious Symptoms	<i>Men</i>	7.10 (5.02)	4.28 (4.25)	4.01 (4.27)	3.63 (4.64)
	<i>Women</i>	8.89 (5.75)	5.47 (4.75)	4.90 (4.58)	4.77 (5.07)
Quality of Life	<i>Men</i>	3.25 (0.91)	3.84 (0.71)	3.91 (0.79)	3.84 (0.88)
	<i>Women</i>	3.13 (1.03)	3.84 (0.79)	3.89 (0.83)	3.97 (0.82)
Perceived Health	<i>Men</i>	3.24 (1.04)	3.64 (1.01)	3.49 (1.09)	3.38 (1.15)
	<i>Women</i>	3.15 (1.10)	3.42 (1.11)	3.42 (1.18)	3.47 (1.08)
Work Functioning	<i>Men</i>	3.97 (0.99)	4.16 (0.78)	4.09 (0.76)	4.21 (0.82)
	<i>Women</i>	3.64 (1.00)	3.91 (0.86)	3.87 (0.86)	4.00 (0.90)

Note. SDs are in parentheses. Additional time points were used in the present study to model change in relationship functioning during the program; these means and standard deviations are available in Doss et al. (2016).

months following the program, couples experienced neither significant improvements nor deteriorations in the three domains that evidenced gains during the program (satisfaction, confidence, negatives; within-group  $d$  over follow-up = -0.11 to 0.08). However, positive relationship quality, which did not improve during the program, showed significant increases over the follow-up period ( $b = 0.025, t = 3.613, p < .001$ , within-group  $d = 0.17$ ). Maintenance of relationship functioning variables did not significantly differ by gender. Full results are presented in Table 2.

*Individual Functioning*

Consistent with previous analyses (Doss et al., 2016), participants experienced significant improvements during the program in depressive symptoms, anxious symptoms, work functioning, quality of life, and perceived health (all  $p < .001$ ; within-group  $|d| = 0.23$  to  $0.67$ ). In both the full sample and in individuals who began the program in the clinical or problematic range in these areas (as defined in the Methods section), participants were able to maintain their gains over follow-up in depressive symptoms, work functioning, quality of life, and perceived health. Furthermore, within the full sample, anxious symptoms continued to significantly decrease in the year following the program ( $b = -0.015, t = -2.703, p = .008$ , within-group  $d = -0.12$ ); the pattern was the same for individuals who began the program with a clinical level of anxious symptoms ( $b = -.017$ ) but did not reach significance due to the smaller sample size. Results in both the full sample and the sample with initial

difficulties were generally similar across genders. Indeed, the only significant gender difference was that, within the subsample who began the study reporting difficulties in quality of life, men experienced significantly more deterioration than women over the follow-up period ( $b = -0.007, t = -2.181, p = 0.030$ , Cohen's  $d = -0.34$ ). Full results are presented in Table 3.

PREDICTION OF CHANGES OVER FOLLOW-UP

The second aim of this study was to determine whether maintenance of gains over follow-up varied as a function of race (Black or not), ethnicity (Hispanic or not), household income, rural location, education, and relationship length. Additionally, given previous findings that initial levels of difficulties predicted amount of gains during the program (Doss et al., 2016), we sought to determine whether values of the construct at the beginning of the intervention affected maintenance of gains over follow-up.

*Relationship Functioning*

Couples where one or both individuals reported they were Hispanic experienced significantly larger improvements during follow-up in relationship confidence ( $b = 0.023, t = 2.963, p = .004$ ) and negative relationship quality ( $b = -0.040, t = -2.083, p = .039$ ). Results from the remaining analyses revealed no significant prediction of maintenance during follow-up across the seven predictors or four dependent variables (a total of 28 analyses). Predictions of change over the follow-up period are presented in Table 4; full results for the entire models are available from the authors.

Table 2  
Changes in Relationship Functioning During Treatment and Follow-up

	<i>b</i>	95% <i>CI</i>	<i>t</i> -ratio	<i>p</i> -value	Within-group <i>d</i>
<i>Relationship Satisfaction (CSI-16)</i>					
Treatment	1.884	[1.615, 2.153]	13.703	<0.001	0.93
Follow-up	0.027	[-0.015, 0.069]	1.280	0.203	0.08
<i>Relationship Confidence</i>					
Treatment	0.198	[0.155, 0.241]	8.980	<0.001	0.64
Follow-up	-0.006	[-0.013, 0.001]	-1.597	0.112	-0.11
<i>Positive Relationship Quality</i>					
Treatment	-0.010	[-0.086, 0.066]	-0.250	0.803	-0.01
Follow-up	0.025	[0.012, 0.038]	3.613	<0.001	0.17
<i>Negative Relationship Quality</i>					
Treatment	-0.600	[-0.703, -0.497]	-11.455	<0.001	-0.73
Follow-up	-0.007	[-0.021, 0.007]	-0.945	0.346	-0.04

Note. "Follow-up" represents change that occurred from the end of treatment through the 1-year follow-up assessment. Interactions between gender and both change during treatment and follow-up were non-significant in all cases.  $df = 149$  for all analyses.

Table 3  
Changes in Individual Functioning During Treatment and Follow-up

	Full Sample					Participants Experiencing Initial Problems <sup>a</sup>						
	<i>b</i>	95% <i>CI</i>	<i>t</i> -ratio	<i>df</i>	<i>p</i> -value	Within-group <i>d</i>	<i>b</i>	95% <i>CI</i>	<i>t</i> -ratio	<i>df</i>	<i>p</i> -value	Within-group <i>d</i>
<i>Depression Symptoms – CESD</i>												
Treatment	-0.495	[-0.596, -0.384]	-9.044	149	<0.001	-0.61	-1.140	[-1.316, -0.964]	-12.689	78	<0.001	-2.06
Follow-up	-0.002	[-0.014, 0.010]	-0.397	149	0.692	0.04	-0.004	[-0.027, 0.019]	-0.371	78	0.711	-0.06
<i>Anxiety Symptoms – GAD7</i>												
Treatment	-0.435	[-0.523, -0.347]	-9.702	149	<0.001	-0.57	-0.837	[-1.002, -0.672]	-9.936	81	<0.001	-1.73
Follow-up	-0.015	[-0.026, -0.004]	-2.703	149	0.008	-0.12	-0.017	[-0.040, 0.006]	-1.402	81	0.163	-0.28
<i>Work Functioning</i>												
Treatment	0.032	[0.015, 0.049]	3.635	149	<0.001	0.23	0.133	[0.106, 0.160]	9.514	85	<0.001	1.59
Follow-up	0.001	[-0.002, 0.004]	1.004	149	0.298	0.07	0.003	[-0.002, 0.008]	1.353	85	0.178	0.28
<i>Quality of Life</i>												
Treatment	0.093	[0.074, 0.112]	9.848	149	<0.001	0.67	0.152	[0.130, 0.174]	13.877	114	<0.001	1.69
Follow-up	0.001	[-0.001, 0.003]	1.233	149	0.220	0.07	0.002 <sup>b</sup>	[-0.001, 0.005]	1.523	114	0.130	0.17
<i>Perceived Health</i>												
Treatment	0.033	[0.016, 0.050]	3.820	149	<0.001	0.31	0.088	[0.067, 0.109]	8.149	112	<0.001	0.97
Follow-up	-0.001	[-0.004, 0.002]	-0.751	149	0.454	-0.10	0.004	[0.000, 0.008]	1.943	112	0.054	0.35

*Note.* "Follow-up" represents change that occurred from the end of treatment through the 1-year follow-up assessment. <sup>a</sup> Individuals who were categorized in the clinical or problematic range at the beginning of the intervention; see text for cutoffs used for each construct. <sup>b</sup> There was a significant Follow-up × Gender interaction where men deteriorated significantly more than women over follow-up [*b* = 0.007 (0.001, 0.013), *p* = 0.030].

### Individual Functioning

Individuals who began the program with better quality of life (*b* = -0.002, *t* = -2.008, *p* = .044) and better perceived health (*b* = -0.006, *t* = -3.909, *p* < .001) experienced significantly fewer gains over follow-up in those domains than those individuals who began the program with difficulties in these domains. None of the remaining prediction analyses were significant (a total of 35 analyses). Predictions of changes over the follow-up period are presented in Table 5; full results for the entire models are available from the authors.

### Discussion

The results of the present study indicate that the OurRelationship program can create meaningful and lasting improvement for those experiencing serious relationship problems. Significant improvements in relationship satisfaction, relationship confidence, and negative relationship quality experienced during the program were maintained for at least a year. Notably, although positive relationship quality did not significantly improve during the program, it significantly improved in the 12 months following the program. Furthermore, initial gains in individual functioning—depressive and anxious

symptoms as well as perceived health—were also maintained through 1 year; indeed, anxiety symptoms continued to significantly improve over follow-up. Moreover, there was no evidence that historically underserved groups—racial/ethnic minorities, lower income couples, or rural couples—experienced greater deterioration. In fact, Hispanic couples reported continued improvement in relationship confidence and negative relationship quality in the 12 months following the program. Implications of these results are discussed below.

### MAINTENANCE OF GAINS FOR 12 MONTHS

The ability of an 8-hour, primarily self-help program to create long-lasting improvements in distressed relationships is notable. With only 37% of divorcing couples seeking help for their relationship before divorce (Johnson et al., 2002) and an additional 31% of intact couples reporting relationship distress (Whisman et al., 2008), the OurRelationship program has the potential to improve the lives of many distressed couples.

### Reasons for Maintenance

Three aspects of the OurRelationship program may facilitate maintenance of gains in the year

Table 4  
Prediction of Change in Relationship Functioning Over Follow-up

Predictors	<i>b</i>	95% <i>CI</i>	<i>t-ratio</i>	<i>df</i>	<i>p</i>
<i>Relationship Satisfaction (CSI-16)</i>					
Initial Satisfaction	-0.001	[-0.003, 0.002]	-0.414	1562	0.679
African American	-0.014	[-0.122, 0.094]	-0.245	148	0.807
Hispanic	0.086	[-0.016, 0.188]	1.649	148	0.101
Low Income	-0.046	[-0.139, 0.047]	-0.971	148	0.333
Rural	0.054	[-0.036, 0.144]	1.184	148	0.238
Education	0.000	[-0.031, 0.031]	0.002	1569	0.998
Relationship Length	0.001	[-0.003, 0.006]	0.573	148	0.567
<i>Relationship Confidence</i>					
Initial Confidence	-0.001	[-0.004, 0.002]	-0.676	419	0.500
African American	-0.004	[-0.022, 0.014]	-0.418	148	0.677
Hispanic	0.023	[0.008, 0.039]	2.963	111	0.004
Low Income	-0.006	[-0.021, 0.009]	-0.757	148	0.451
Rural	0.009	[-0.010, 0.027]	0.917	142	0.361
Education	-0.002	[-0.008, 0.005]	-0.506	602	0.613
Relationship Length	0.000	[-0.001, 0.001]	-0.513	148	0.609
<i>Positive Relationship Quality</i>					
Initial Positivity	0.000	[-0.002, 0.003]	0.314	1562	0.753
African American	-0.012	[-0.050, 0.026]	-0.607	148	0.545
Hispanic	0.021	[-0.003, 0.044]	1.748	148	0.083
Low Income	-0.005	[-0.038, 0.028]	-0.297	148	0.767
Rural	0.009	[-0.033, 0.050]	0.420	148	0.675
Education	0.005	[-0.005, 0.015]	0.944	622	0.346
Relationship Length	0.001	[0.000, 0.002]	0.967	148	0.335
<i>Negative Relationship Quality</i>					
Initial Negativity	-0.001	[-0.004, 0.001]	-1.052	1562	0.293
African-American	0.020	[-0.016, 0.056]	0.678	148	0.499
Hispanic	-0.040	[-0.078, -0.002]	-2.083	148	0.039
Low Income	-0.012	[-0.042, 0.018]	-0.808	148	0.421
Rural	-0.029	[-0.064, 0.005]	-1.679	148	0.095
Education	0.001	[-0.011, 0.012]	0.086	1307	0.931
Relationship Length	-0.001	[-0.003, 0.001]	-0.687	148	0.493

following the intervention. First, it may be that the OurRelationship program, with its reduced access barriers, is reaching couples earlier in the distress process—before a focused relationship problem infects the rest of the relationship. Indeed, our initial hypothesis was that the OurRelationship program would serve as a secondary prevention, intervening after problems developed but before serious distress ensued (Doss, Benson, Georgia, & Christensen, 2013). Although couples in the present study were equally distressed on a global measure of relationship satisfaction at pretreatment as were couples presenting to in-person couple therapy (e.g., Christensen et al., 2004), couples seeking relationship help online may be doing so in a moment of crisis rather than at the end of a prolonged period of distress. In support of this idea, couples in the Christensen et al. (2004) clinical trial of in-person couple therapy had to meet distress

criteria repeatedly over several weeks in order to qualify for the study rather than just once in the current study. In addition, couples presenting to the OurRelationship program but randomly assigned to the waitlist control group significantly improved in relationship satisfaction (within-group  $d = 0.28$ ); in contrast, couples seeking in-person couple therapy who are randomly assigned to a control group generally do not experience relationship improvement (within-group  $d = -0.06$ ; Baucom et al., 2003). Second, change may be more durable because improvements experienced during the OurRelationship program are achieved without extensive scaffolding from a therapist and occur within the more naturalistic context of couples' homes. Finally, OurRelationship's focus on developing more tolerant conceptualizations of relationship problems rather than on rule-governed changes may make improvements more durable.

Table 5  
Prediction of Change in Individual Functioning Over Follow-up

Predictors	<i>b</i>	95% <i>CI</i>	<i>t-ratio</i>	<i>df</i>	<i>p</i>
<i>Depression Symptoms - CESD</i>					
Initial Depression	0.000	[-0.003, 0.002]	-0.408	384	0.683
African-American	-0.009	[-0.039, 0.020]	-0.625	148	0.533
Hispanic	0.026	[-0.005, 0.057]	1.616	148	0.108
Low Income	-0.013	[-0.039, 0.012]	-1.033	148	0.303
Rural	0.005	[-0.021, 0.030]	0.364	148	0.716
Education	-0.004	[-0.015, 0.006]	-0.827	387	0.409
Relationship Length	0.001	[0.000, 0.002]	1.896	148	0.060
<i>Anxiety Symptoms – GAD7</i>					
Initial Anxiety	0.000	[-0.003, 0.002]	-0.255	384	0.799
African-American	0.008	[-0.020, 0.035]	0.552	148	0.582
Hispanic	0.004	[-0.024, 0.032]	0.289	148	0.773
Low Income	-0.021	[-0.043, 0.001]	-1.832	148	0.069
Rural	0.006	[-0.015, 0.028]	0.585	148	0.559
Education	0.002	[-0.007, 0.010]	0.421	387	0.674
Relationship Length	0.001	[0.000, 0.002]	1.462	148	0.146
<i>Work Functioning</i>					
Initial Work Functioning	0.003	[0.000, 0.006]	1.966	270	0.050
African-American	0.000	[-0.007, 0.008]	0.076	148	0.940
Hispanic	0.001	[-0.007, 0.008]	0.132	148	0.895
Low Income	0.003	[-0.003, 0.008]	1.035	148	0.302
Rural	-0.002	[-0.009, 0.005]	-0.602	148	0.548
Education	0.000	[-0.002, 0.002]	0.178	387	0.859
Relationship Length	0.000	[0.000, 0.000]	-0.198	148	0.843
<i>Quality of Life</i>					
Initial Quality of Life	-0.002	[-0.004, 0.000]	-2.028	265	0.044
African-American	-0.001	[-0.007, 0.006]	-0.247	148	0.806
Hispanic	0.003	[-0.003, 0.009]	0.895	142	0.372
Low Income	-0.002	[-0.007, 0.002]	-0.952	148	0.342
Rural	0.000	[-0.006, 0.006]	-0.105	148	0.916
Education	0.000	[-0.002, 0.002]	-0.021	257	0.983
Relationship Length	0.000	[0.000, 0.000]	-0.989	148	0.324
<i>Perceived Health</i>					
Initial Perceived Health	-0.006	[-0.009, -0.003]	-3.909	384	<0.001
African-American	0.001	[-0.009, 0.010]	0.116	148	0.908
Hispanic	0.002	[-0.008, 0.012]	0.445	148	0.657
Low Income	0.003	[-0.005, 0.010]	0.734	148	0.464
Rural	-0.002	[-0.011, 0.006]	-0.496	82	0.621
Education	0.001	[-0.001, 0.004]	0.929	387	0.353
Relationship Length	0.000	[0.000, 0.000]	1.081	148	0.281

Indeed, couples in IBCT, the acceptance-based couple therapy on which the OurRelationship program is based, experienced only minimal deteriorations in the year following treatment (within-group  $d = -0.04$ ; Christensen et al., 2006). Also supporting the durability of these types of changes, a brief conflict reappraisal intervention prevented declines in multiple domains of marital quality a year later (Finkel, Slotter, Luchies, Walton, & Gross, 2013).

*Increases in relationship positives.* Although most domains of relationship and individual functioning demonstrated maintenance in the year following the program, positive relationship quality significantly improved during this period. This improvement is notable because: (a) the program included more of a focus on reducing negatives than increasing positives and (b) positive relationship quality did not significantly improve during the intervention. It may be

that an initial reduction in negatives (i.e., conflict about the selected problem, global negative relationship quality) paved the way for the global positive relationship quality to improve in subsequent months. If the program helped couples overcome their central relationship problem, it makes sense that they would then be able to recapture some of the positives (e.g., time together, sex) they may have stopped because of negativity. However, it should be noted that the magnitude of the total improvement from pre-intervention through follow-up was very small (within-group  $d = 0.16$ ), especially compared to the magnitude of decreases in relationship negatives during that same period (within-group  $d = -0.77$ ); therefore, more should be done to strengthen positives aspects of the relationship.

#### MINIMAL PREDICTION OF MAINTENANCE FROM BASELINE CHARACTERISTICS

In this study, we took an exploratory approach to prediction of maintenance, conducting 63 analyses without controlling for experiment-wide error. Analyses yielded four significant predictors of maintenance; based on chance alone, one would expect three significant predictors with Type I error set at 0.05. Therefore, the most notable finding from the prediction analyses was the overall general lack of significant findings.

#### *Demographic Characteristics*

Results indicated that underserved groups had equal or superior maintenance of gains as nonunderserved groups. The general lack of differential maintenance in the 12 months following the program mirrors the lack of differential change during the program for these groups (Georgia, Roddy, Nowlan, & Doss, in press). The one exception to this pattern was Hispanic couples. During the program, Hispanic couples experienced significantly greater gains in perceived health and quality of life but significantly smaller gains in relationship confidence (Georgia et al., in press). However, in the 12 months following the program, Hispanic couples experienced significantly greater improvements in relationship confidence and negative relationship quality—offsetting their smaller initial gains during the program.

Given that the effects of the OurRelationship program were generally not significantly different for underserved couples over the long term, the program has the potential to reduce health disparities in receipt of relationship interventions. For example, African American (Boyd-Franklin, 2003), low income, and rural couples (Johnson et al., 2002) are all less likely to receive couple therapy before getting divorced; Hispanic couples are less likely to receive mental health care services in

general (Luca, Blossnich, Hentschel, King, & Amen, 2015), which likely extends to receipt of couple therapy.

*Initial difficulties.* Maintenance of gains also tended not to significantly differ across initial levels of difficulties in relationship or individual functioning. For seven of the nine domains of functioning examined in the present study, participant's level of distress in that domain was unrelated to the extent to which they were able to maintain those gains. In two domains—perceived health and quality of life—individuals who began the program with greater difficulties experienced significantly better maintenance than those with fewer initial difficulties.

This pattern of findings is notable because it suggests that participants who stand to benefit most from these programs—those with the greatest initial needs—are equally likely (or perhaps even more likely) to benefit from the program over the long term. Indeed, paired with findings that gains during the program were significantly larger for individuals who started the program with greater difficulties in depressive symptoms and poor quality of life (Doss et al., 2016), relationship interventions such as the OurRelationship program seem to be especially indicated for individuals who have both relationship and individual difficulties. The present results are also consistent with a growing body of literature indicating that relationship interventions more broadly may be especially indicated for couples who have more initial difficulties or are at higher risk for developing difficulties (e.g., Halford et al., 2017; Hawkins & Erickson, 2015).

#### LIMITATIONS AND FUTURE DIRECTIONS

Despite the strengths of this study, there are several limitations that should be noted. The primary limitation is that the waitlist control group was allowed access to the intervention after 2 months (the end of the initial treatment period); therefore, there was no control group during the follow-up period. Therefore, it is not possible to say what the trajectories of change over follow-up would have looked like in the absence of the intervention. It is possible that waitlisted couples would have recovered on their own (without the intervention), that they would have continued to deteriorate over the 12-month period, or that they would have experienced no change. However, other studies with a mixture of distressed and nondistressed couples have generally found that waitlisted couples do not significantly change in relationship functioning over a 12-month period (e.g., Cordova et al., 2014; Trillingsgaard et al., 2016), suggesting that the superior outcomes observed at the end of the

program (Doss et al., 2016) would continue to be observed as much as a year following the program. A second limitation of the present study is that it only utilized three assessment points to assess change over follow-up—precluding detailed examinations of different shapes of change and whether the shape of change varied by pretreatment characteristics. Third, 17% of participants did not provide data at either follow-up assessment, precluding modeling of their changes over follow-up; furthermore, these participants were more likely to also have not completed the intervention. While we undertook statistical approaches to protect the results against bias (multiple imputation, controlling for intervention completion), it is possible that these statistical adjustments did not fully adjust the results for the missing data. Fourth, predictions of changes over follow-up were underpowered to detect small differences between groups; with larger samples of underrepresented groups, differences in maintenance of gains may be detected. Fifth, the single-item measure of work functioning was created for this study and likely does not fully capture functioning across a variety of work settings (employment, education, home) or functioning in those who are unemployed. Finally, this study lacked a measure of observed communication—a common outcome in RE programs.

In future studies, the results of the present study could be expanded in several ways. Although the demographic groups examined here did not generally differ significantly in their maintenance of gains over follow-up, this question should be explored in larger and more diverse samples. Furthermore, there was significant unexplained variability in follow-up trajectories; future studies should explore predictors of maintenance of gains over follow-up other than demographic factors. Additionally, examinations of mechanisms of maintenance in the year following the intervention would yield useful insights into how the program could be strengthened in subsequent iterations.

## CONCLUSION

Based on the results of this study, self-help programs like OurRelationship appear to offer an exciting opportunity to expand the menu of services available for distressed couples—either in combination with in-person services or independent from them. Traditionally, RE programs have been conceptualized as helping happy couples prevent relationship deterioration. When offered as part of premarital education—one of the more common forms of formal RE in the United States (Johnson et al., 2002)—this conceptualization likely holds. However, when RE is offered more broadly, approximately one quarter to one half

of couples report their relationships are distressed or experiencing difficulties (Bradford, Hawkins, & Acker, 2015). Therefore, programs like OurRelationship could be offered as a supplement to typically group-based RE to help distressed couples focus on their pressing relationship problems.

Programs like OurRelationship also overcome barriers of other types of interventions for distressed couples. Because of their online and self-help nature, couples have more flexibility about when, and from where, they are completed—making it easier for couples to accommodate work, childcare, or other demands. Indeed, couples report seeking relationship help from self-help books (Doss, Rhoades, Stanley, & Markman, 2009) and from the Internet (Georgia & Doss, 2013; Trillingsgaard, 2017) at higher rates than from in-person services. Additionally, because the coach calls are heavily scripted, provide supportive accountability, and only solidify skills/changes initiated by the self-help materials, they do not require the skill of a licensed therapist. As a result, programs like OurRelationship can be provided relatively inexpensively and delivered across state lines—two of the primary barriers to widespread implementation of telehealth interventions (Doss, Feinberg, Rothman, Roddy, & Comer, 2017).

Taken together, results of this study highlight the durability and generalizability of effects of the OurRelationship program. As a result, the program seems to have the potential to improve the lives of distressed couples on a broad scale and reduce disparities in access to effective relationship interventions.

## Conflict of Interest Statement

Drs. Doss and Christensen hold the intellectual property of the OurRelationship program and could gain royalties from any future commercialization of this intellectual property.

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