2018-03-23

Completion of a Stand-Alone Versus Coach-Supported Trial of a Web-Based Program for Distressed Relationships

Karen Rothman
University of Miami, karen.rothman1@gmail.com

UNIVERSITY OF MIAMI

COMPLETION OF A STAND-ALONE VERSUS COACH-SUPPORTED TRIAL OF A WEB-BASED PROGRAM FOR DISTRESSED RELATIONSHIPS

By

Karen Rothman

A THESIS

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Master of Science

Coral Gables, Florida

May 2018

UNIVERSITY OF MIAMI

A thesis submitted in partial fulfillment of
the requirements for the degree of
Master of Science

COMPLETION OF A STAND-ALONE VERSUS COACH-SUPPORTED TRIAL OF A WEB-BASED PROGRAM FOR DISTRESSED RELATIONSHIPS

Karen Rothman

Approved:

_____
Brian D. Doss, Ph.D.
Associate Professor of Psychology

_____
Michael H. Antoni, Ph.D.
Professor of Psychology

_____
Yui Matsuda, Ph.D.
Assistant Professor of Nursing
and Health Studies

_____
Guillermo Prado, Ph.D.
Dean of the Graduate School

ROTHMAN, KAREN (M.S., Psychology)

(May 2018)

Completion of a Stand-Alone Versus Coach-Supported Trial of a Web-Based Program for Distressed Relationships

Abstract of a thesis at the University of Miami.

Thesis supervised by Associate Professor of Psychology Brian D. Doss.
No. of pages in text. (39)

The web-based program for distressed couples, OurRelationship (OR), has been found to significantly improve relationship and individual functioning. However, the program's provision of paraprofessional coach support presents significant limitations to program dissemination and implementation. In an effort to further examine the role of coach support, the present study sought to assess program completion of the OR program with varying levels of paraprofessional support. Using an interrupted time series design, the current study aimed to compare completion rates of those who enrolled in a trial of OR with no coach support (n = 529 couples) to completion rates of a previous trial of OR in which couples were randomized to receive either one (n = 179 couples) or four (n = 177 couples) calls with a coach. Results revealed that individuals were significantly less likely to complete the OR program when they were not provided a coach than they were when provided with either one or four coach calls. Analyses of moderators of completion rates revealed that a coach was equally helpful across most demographic factors and measures of baseline relationship and individual functioning. However, Hispanic individuals experienced greater differences, and those with depressive symptoms experienced fewer differences, between the coach and no-coach trials. The findings

highlight the growing need for online intervention researchers to develop and test alternate types of program support for participants who do not have access to a coach.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

Chapter 1: Introduction

Relationship difficulties are among the leading causes of distress in individuals seeking mental health treatment (Foran, Whisman, & Beach, 2015), and are reported by nearly one third of intact couples in the United States at any given time (Whisman, Beach, & Snyder, 2008). Relationship distress is positively associated with depressive symptoms, poor physical health, and increased mortality, as well as increased incidence of anxiety, mood, and substance use disorders with medium to moderate effect sizes (Robles, Slatcher, Trombello, & McGinn, 2014; Schonbrun & Whisman, 2010). On the other hand, relationship satisfaction is consistently related to life satisfaction (r = .42 across 13 studies; Heller, Watson, & Ilies, 2004) and bi-directionally impacts cardiovascular health and immune function, with effect sizes in the small range (Be, Whisman, & Uebelacker, 2013; Robles et al., 2014). Such impacts indicate that the prevalence of relationship distress conveys important public health concerns.

In-Person Couple Therapy

Meta-analyses have revealed that in-person couple therapy is efficacious in treating relationship distress (see Fischer, Baucom, & Cohen, 2016 for a review). For example, Emotionally Focused Couple Therapy (EFCT) is an empirically supported therapy model based on adult attachment theory that seeks to identify and change patterns of negative affect and distancing behaviors between distressed romantic partners. A meta-analysis of EFCT for distressed couples revealed a large mean overall effect size (d = 1.28; Johnson, Hunsley, Greenberg, & Schindler, 1999). Behaviorally-based couple therapies such as Cognitive Behavioral Couple Therapy (CBCT) and Traditional Behavioral Couple Therapy (TBCT) directly target behavior change and communication skills. A meta-analysis by Shadish and Baldwin (2003) revealed little

variability between TBCT and CBCT, with a medium effect size of $d = .59$. Similarly, Integrative Behavioral Couple Therapy (IBCT) encourages couples to practice emotional acceptance and gain a deep understanding of their behavioral and communicative patterns, and has a within-group effect size of $d = .86$ (Christensen, Wheeler, Doss & Jacobson, 2014). At 5-year follow up, relationship improvements from TBCT and IBCT remained despite initial drops in satisfaction within the first two years (within-group $d =$ 1.03 and 0.92 for IBCT and TBCT, respectively; Christensen, Atkins, Baucom & Yi, 2010).

Couple therapy may also elicit important health benefits to distressed couples. For example, Crane and Christenson (2012) found that couples who attended marital and family therapy saw up to a 30% decrease in their number of medical visits post-therapy. Moreover, Law & Crane (2000) found that individuals considered "high utilizers of health care" (characterized by having over four medical visits in a six-month period) were able to decrease their frequency of medical visits by up to 50% after receiving couple or family therapy. These findings were further supported by Madsen, Tomfohr-Madsen, and Doss (2016), who found that military veterans who completed couple therapy had fewer subsequent medical visits, even at 12-month follow up. As such, couple therapy likely serves to decrease national healthcare costs.

Despite these known benefits, there are substantial limitations to the reach of couple therapy. Most notably, in spite of the prevalence of relationship distress, the majority of married couples (81%) do not seek services (Johnson et al., 2002). In addition, according to a longitudinal study of newlywed couples by Doss, Rhoades, Stanley, and Markman (2009), of the 36% of couples who sought help within their first

five years of marriage, only 38% sought couple therapy. Within couples, female partners are more likely to seek professional help from a therapist, while men are only more likely to seek couple therapy if they believe their relationship is likely to end in divorce (Doss et al., 2009; Johnson et al., 2002; Stewart, Bradford, Higginbotham & Skogrand, 2016).

Web-based Interventions for Distressed Couples

To increase the reach of interventions for high-risk couples, investigators have begun to examine the effectiveness of web-based interventions for relationship distress, given their success in extending reach of in-person therapy for depressive and anxiety disorders (Muñoz et al., 2016). Perhaps the most notable online program for relationship distress, the OurRelationship program (OR), is comprised of three phases of online material with supplemental coach support. Couples are supported in the completion of these online materials in four, 15-minute calls with a paraprofessional coach that occur at the time of enrollment and at the end of each of the three phases (Doss et al., 2016). Coaches are graduate students trained on the background of the intervention and are instructed to follow a pre-written script for each of the four calls.

In a recent nationwide randomized controlled trial of 300 couples, OR significantly improved relationship and individual functioning compared to a wait-list control group (Doss et al., 2016). Specifically, couples who completed OR experienced significant gains in relationship satisfaction (Cohen's $d = 0.69$) and relationship confidence ($d = 0.47$). Further, compared to the wait-list control group, couples in OR improved significantly on depressive and anxiety symptoms ($d = 0.50$ and $d = 0.21$, respectively), work functioning ($d = 0.19$), quality of life ($d = 0.18$), and perceived health ($d = 0.23$). Notably, 86% of individuals who completed the study fell in the relationally

distressed range at the beginning of the program. The majority of participants completed the entire program (86%) and an additional 5% completed two-thirds of the program. Six percent of couples completed the first phase only, and three percent dropped out after enrollment prior to completing the first phase.

Despite the many positive implications of OR's findings, the integration of one hour of coach support (spread across four 15-minute calls) presents significant limitations to the program, such as the economic costs of hiring, training, and supervising coaches. Additionally, the provision of a coach increases program duration compared to self-guided educational or preventive programs, and burdens program users when trying to coordinate their availability with their coach. Together, these burdens impact overall reach of the program, thus limiting the breadth of dissemination and implementation. Therefore, research is needed to investigate the effectiveness of web-based interventions without support from a therapist or coach.

Role of Coach Support in Web-Based Interventions

When considering web-based interventions, an important distinction is whether the program design is stand-alone, automated, or supported. In stand-alone and automated designs, users progress through program content entirely on their own without the support of a therapist or paraprofessional coach (Muñoz et al., 2016). Both designs tend to range in delivery method (e.g. website versus smart phone app) and extent of personalization (Muñoz et al., 2016). However, unlike stand-alone designs, automated designs provide algorithm-based supportive feedback to its users (Mohr, Cuijpers, & Lehman, 2011). The complexity of this automated feedback can range from standardized reminder emails to unique feedback based on personal information that users provide

throughout the program. In contrast, stand-alone designs feature no supportive feedback or automated reminders, with its users relying exclusively on the content and usability of the program. For example, self-guided relationship education websites such as TwoOfUs.org and CoupleConnection.net provide couples with information and advice on commonly reported relationship issues without any personalized content (Stewart, Bradford, Higginbotham, & Skogrand, 2016).

Conversely, supported designs incorporate professional or paraprofessional support to augment the user's experience, typically via email, text, phone, or videoconference call. Supported programs may utilize licensed therapists, paraprofessional coaches, or trained staff members to deliver the human support component of the intervention. Further, support can be given either on an individual couple level or on a general level for technology assistance.

Program completion. According to the "supportive accountability" model introduced by Mohr et al. (2011), the implementation of user support provides individuals with a degree of motivation and personal accountability to complete web-based programs. On the whole, online interventions with some component of human support or automated personalized feedback tend to improve program adherence and completion compared to stand-alone designs (Mohr et al., 2011). Further, an online CBT-based intervention for social anxiety found that coach support was positively associated with program adherence (Dryman, McTeague, Olino, & Heimberg, 2017). A meta-analysis of depression and anxiety programs tested before 2013 indicated that the inclusion of human support, automated feedback, progress monitoring, and reminder emails each

independently impacted program completion (Cowpertwait & Clarke, 2013). Currently there is no research directly comparing the effects of each type of program support.

As technology has improved and programs have become more complex, the necessity of human contact may be reduced. Indeed, recent studies of web-based interventions for depression, anxiety, and eating disorders have found that supported programs with human support do not significantly improve completion rates more than automated programs with highly sophisticated, algorithm-based feedback (Aardoom et al., 2016; Dear et al., 2015; Kelders, Bohlmeijer, Pots, & van Gemert-Pijnen, 2015; Titov et al., 2015). If the need for human support can be reduced, the cost effectiveness and ease of implementation of online programs can be further improved (Schueller, Tomasino, & Mohr, 2017).

Specific to couples, Roddy, Nowlan, and Doss (2016) found a significant difference in completion rates of a brief version of OR between an automated condition and a supported condition with a paraprofessional coach ($\chi^2(1) = 8.814$, $p = .003$), such that coach support improved completion rates (71.2% compared to 42.3% without coach support). Because couples in the automated condition only received standardized automated email reminders to complete program material, it is likely that less complex automated feedback is insufficient at improving program completion and adherence. Such discordant findings indicate the need to better understand the relationship between types of user support and program completion rates.

As such, a subsequent randomized controlled trial of OR was launched to assess the effects of user support quantity on completion rates—comparing completion rates of those who received four calls with a coach during the program (categorized as high

support) to those who only received one call with a coach (categorized as low support; Roddy, Rothman, & Doss, under review). Overall, those who received four calls were significantly more likely to complete the entire program (66.4%) compared to individuals who received one call [36%; χ^2 (1) = 65.618, p <.001]. Similarly, significantly more participants in the high support condition versus the low support condition completed at least two thirds of the program [through the Understand phase; 69% vs. 45% respectively; χ^2 (1) = 21.085, p <.001], which has been previously defined as the minimum viable dose of the intervention (Doss, Benson, Georgia, & Christensen, 2013).

Predictors of Program Completion for Web-Based Couple Interventions

Participant demographics and symptom severity may serve as important predictors of program completion for web-based interventions. Understanding which users are most likely to complete online couple interventions would inform program implementation and any need for intervention tailoring. Furthermore, knowing which couples might benefit more or less from the added support of a coach would allow researchers to improve program dissemination and the cost-effectiveness of program implementation. Currently, there is a relative dearth of studies that address predictors of program completion for web-based interventions, let alone couple-specific programs. Moreover, findings from the few studies that *do* consider predictors are largely inconsistent and thus inconclusive.

A recent meta-analysis of online interventions for adults with post-traumatic stress disorder found that gender, education, ethnicity, and income did not significantly differ between those who completed a program and those who dropped out prematurely (Kuester, Niemeyer, & Knaevelsrud, 2016). Dissimilarly, an automated CBT-based

intervention for alcohol reduction in problem drinkers revealed that female gender and high educational achievement modestly predicted better program outcomes at post-intervention (Riper et al., 2008). Within relationship programs (Doss et al., 2016), results from the OR program indicate that African American and Hispanic couples were significantly more likely to drop out of the program and low-income couples were marginally less likely to complete the program than were non-minority and middle- to high-income couples (Georgia, Roddy, Nowlan, & Doss, under review).

Keuster et al. (2016) found conflicting evidence as to whether age significantly predicts greater program completion or whether it plays no significant role. In a supported online program designed for university students with mild-to-moderate depression and anxiety, researchers found that older age significantly predicted program completion (Wojtowicz, Day, & McGrath, 2013). Furthermore, results from an online behavioral intervention to improve physical health found that younger age significantly predicted dropout (Schulz et al., 2012). There is also evidence to suggest that other individual-level variables may predict program completion. Price, Gros, McCauley, Gros, and Ruggiero (2012) found that the strongest predictor of program completion for an online mental health intervention designed for victims of a natural disaster was positive endorsement of prior mental health treatment. Further, Wojtowicz et al. (2013) found that greater self-efficacy over one's ability to finish an online program significantly predicted program completion.

Symptom severity may also influence one's likelihood of completing web-based interventions, though the directionality of that influence is uncertain. Several studies have found that higher initial symptomology or severity levels were predictive of lower

likelihood of program completion. For example, Titov and colleagues (2008) found that participants who dropped out of an automated online intervention for anxiety and depressive disorders had higher pre-test measures of depression, suggesting that less severe cases were better able to complete the program without therapist or coach assistance. Additionally, in a supported online intervention for couples coping with a diagnosis of breast cancer, a more severe cancer prognosis was predictive of lower program completion rates (Fergus et al., 2014). In contrast, other studies of both supported and automated interventions have found that those with greater symptom severity were actually *less* likely to drop out of web-based programs for insomnia and anxiety disorders (Kuester et al., 2016; Hebert, Vincent, Lewycky & Walsh, 2010; Schneider, Mataix-Cols, Marks & Bachofen, 2005; Strom, Pettersson & Andersson, 2004). Other programs have even found no effects of initial symptom severity on treatment outcomes, neither in web-based programs for PTSD (Kuester et al., 2016), an automated alcohol reduction program for problem drinkers (Riper et al., 2008) nor in a supported program for college students with depression and anxiety (Wojtowicz et al., 2013). In summary, it is evident that the roles of participant demographics, individual factors, and symptom severity on program completion are not yet determinable.

Present Study

The current study sought to examine the role of coach contact in web-based couple interventions using a no-coach trial of OR. By exploring a stand-alone program as a viable option for distressed couples, researchers may better address the concern of reach, availability, and desirability of couple therapy services.

The first aim of the study was to compare completion rates of those who enrolled in a version of OR without a coach with completion rates of a coach-supported trial of OR with two levels of support – one call (low support) and four calls (high support). It was hypothesized that completion rates would be significantly different between the two trials, such that completion rates without a coach would be lower than those with a coach.

The second aim of the present study was to identify baseline moderators of differences in program completion when the online intervention was provided with and without coach support. Identification of moderators that differentiate individuals or couples who especially benefit from coach support could assist in the tailoring of web-based couple interventions to a multitude of populations. For example, knowledge that a particular couple is equally likely to complete a program with or without a coach would assist in efforts to reduce the costs associated with providing the program to that couple. To test this aim, pre-intervention demographics, relationship functioning (e.g., relationship satisfaction and relationship confidence), and individual functioning (e.g., depression and anxiety) were analyzed as moderators of differential completion of the no-coach program versus both conditions of the coach-supported program. Female gender, older age, higher educational achievement, Caucasian, non-Hispanic ethnic identity, greater income, higher baseline relationship satisfaction and confidence, and fewer baseline depressive and anxiety symptoms were hypothesized to predict smaller differences in completion rates between the coach-supported and no-coach versions of the program.

Chapter 2: Method

Participants

Coach-supported trial. A total of 356 heterosexual couples were enrolled in a randomized controlled trial of OR with two level of coach support: low support (featuring one coach call; n = 179) and high support (featuring four coach calls; n = 177). Couples were predominantly Caucasian, non-Hispanic (72.8%), in their 30's (M = 33.8; SD = 8.4), relationally distressed (M = 37.0; SD = 17.2), had on average 14.7 years of education, were fully employed (64.9%), and made an average individual income of $46,382 (*Range* = 0 – $400,000; *Mdn* = $35,000). This trial ran from May 4, 2014 to March 31, 2015. See Roddy et al. (under review) for a full description of participant characteristics.

No-coach trial. From April 5, 2015 to May 22, 2016, couples signing up for the OurRelationship program were permitted to access the online materials but were not provided a coach. A total of 529 heterosexual couples (1,058 individuals) were enrolled in the no-coach trial of OR. Couples were either married (71.9%), engaged (11.8%), or cohabiting for at least 6 months (16.3%). Couples tended to be highly distressed (M = 8.51; SD = 7.14) and had been together for an average of 7.8 years (*Mdn* = 6.1; SD = 6.9 years). Participants ranged in age from 18-65 years old (M = 33.6, SD = 8.4 years) and were largely Caucasian, non-Hispanic (79.0%), with 15.2% identifying as African American, 11.6% as Hispanic, 2.5% as Asian, 1.7% as American Indian, 0.5% as Pacific Islander, and 7.7% as other. Because participants were able to indicate more than one racial/ethnic background, percentages sum to over 100%. Participants were generally well educated, with an average of 14.5 years of education (SD = 2.45). The majority of participants were employed full-time (68.0%), with 10.6% of participants reporting part-

time employment, 8.6% identifying as full-time homemakers, 5.9% identifying as full-time students, and 7.0% reporting that they were unemployed. Average individual income was $44,736 (*Range* = 0 – $850,000; *Mdn* = $30,000).

Between-group differences. Across the 10 demographic and baseline characteristics examined in the present study, only race and relationship confidence significantly differed between the two samples. Specifically, the coach-supported trial was comprised of significantly greater African American participants than the no-coach trial ($t = -2.97$, $p < .01$), and participants in the no-coach trial had significantly lesser confidence in their relationship at baseline compared to those in the coach-supported trial ($t = -1.98$, $p < .05$).

Procedure

Across trials, couples found out about the program through organic online searches, social media, and word of mouth. Interested participants completed an online informed consent form and brief screening questionnaire to determine study eligibility. Couples were excluded from participation if they were: outside the age range of 18-65; were not heterosexual; endorsed plans to divorce; endorsed intimate partner violence resulting in injury or fear of their partner; were not cohabiting for at least 6 months, engaged, or married; were without access to broadband internet; or scored greater than 0.5 standard deviations below the community mean on relationship satisfaction (Funk & Rogge, 2007). In addition, the coach-supported trial (but not the no-support trial) excluded those who endorsed current suicidal ideation and infidelity within the last three months. Across trials, couples were not paid to complete the program or research

assessments. Both trials were approved by the University of Miami institutional review board.

Individuals who were eligible for the coach-supported program were contacted by program staff and were randomized to low or high coach support conditions. In contrast, eligible participants in the no-coach program were asked to contact program staff if they wished to enroll in the study. Across trials, participants were then emailed a detailed description of the intervention with instructions to create an account and begin the program. In the no-coach program, participants received no other contact. In the coach trial, couples in the high support condition had four 15-minute calls with their coach: one at the time of enrollment and one following each of the three program phases. Couples in the low support condition had only one 15-minute call with their coach after completion of the first phase (see Roddy et al., under review for more information on the coach-supported program).

In both samples, the program consisted of three phases of online material. First, in the Observe phase, couples chose one or two central problems (called the "core issue(s)") in their relationship to focus on throughout the two-month course (Doss et al., 2013). After working individually to brainstorm their core issue(s), couples came together at the end of the Observe phase to have a structured conversation. In this conversation, the program displayed what they each selected as their core issue and guided the couple through a structured conversation where they chose one or two issues to work on during the program. Next, in the Understand phase, partners worked through the online materials separately to develop a "*DEEP*" understanding of how their respective *D*ifferences, *E*motional reactions, *E*xternal stressors, and *P*atterns of communication impact their core

issue(s). Partners received tailored feedback throughout (e.g., how the user and partner each scored on a personality inventory) and were prompted to write about how those domains applied to their specific relationship. At the end of the Understand phase, couples came together to have another structured conversation where the program displayed what they had each written in their individual activities. Finally, in the Respond phase, couples worked separately to decide on changes they would each agree to make in order to improve their core issue(s). At the end of the Respond phase, couples had a final structured conversation to share the ideas they came up with and agree on ways to improve the core issue(s) together.

Measures

Across trials, all participants completed baseline measures of relationship and individual functioning.

Demographic information. Participants completed a screening questionnaire with questions related to age, gender, ethnicity, race, level of education, individual income, relationship status, and relationship length. Income, age, and years of education were treated as continuous variables.

Relationship satisfaction. The four-item version of the Couple Satisfaction Index (CSI; 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?” Scores range from 0 to 21, with higher scores indicating more satisfaction, with scores lower than 13.5 indicating clinical distress. Cronbach’s alpha for the present sample was very good (0.93).

Relationship confidence. Relationship confidence was measured using a two-item Likert-type scale adapted from Rhoades, Stanley, and Markman (2009) designed to assess the degree of confidence in one's relationship trajectory. Participants were asked "I believe we can handle whatever conflicts will arise in the future," and "I feel good about our prospects to make this relationship work." Questions were measured using a 7-point Likert scale, with higher scores indicating greater confidence. Cronbach's alpha for the present sample was 0.86.

Depression. The 10-item version of the Center for Epidemiological Studies—Depression (CES-D) Scale (Cole, Rabin, Smith, & Kaufman, 2004) was used to measure depressive symptoms. Scores range from 0 to 30, with higher scores indicating more depressive symptoms. Cronbach's alpha = 0.84.

Anxiety. The Generalized Anxiety Disorder-7 (GAD-7) is a seven-item scale used to measure DSM-IV symptoms of GAD (Spitzer, Kroenke, Williams, & Lowe, 2006). Scores range from 0 to 21, with higher scores signifying more anxiety symptoms. A score of greater than 9 was indicative of moderate anxiety. In the present study, Cronbach's alpha = 0.91.

Program completion. Throughout the program, couples entered information into the online activities within the website. A participant was identified as completing a phase if they entered information into the last activity in that phase. Across trials, those who completed the program through the second phase of the intervention were considered as having had a "meaningful" dose of the intervention and classified as completers in the present study. This classification is concordant with previous

descriptions of the OurRelationship program, given that the majority of the active intervention occurs during the second phase (Doss et al., 2013).

Missing Data

A total of 885 couples (N = 529 in the no-coach trial; N = 356 in the coach-supported trial) were included in analyses. Information on whether participants completed the program was available for all participants across both trials. In the no-coach trial, between 0.30% and 0.80% of Aim 2 data were missing at baseline assessment. No baseline data were missing in the coach-supported trial.

Data Analysis & Power

Aim 1. Completion rates were compared across the two trials of OR using longitudinal multilevel logistic regression using HLM 7.1 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011), as program completion was modeled as a dichotomous variable. Because the coach-supported trial immediately preceded the no-coach trial, an interrupted time series design (Shadish, Cook, & Campbell, 2003) was used to assess for change in intercept and slope at the point when the coach-supported program ended and the no-coach trial began. At level 1, a general intercept term and a gender term (0 = Female, 1 = Male, grand mean centered) were modeled. At level 2, two slope terms, and a second intercept term were modeled. At level 2, the general intercept, which captured the completion rates in the trial with a coach, was allowed to vary across couples. The second intercept term at level 2 captured the primary construct of interest, which is the sudden change in completion rates between the coach-supported and no-coach trials. The first slope term modeled global changes in completion rates over time across both trials (irrespective of whether they received a coach or not), with time operationalized as the

number of days before or after the no-coach trial began. The second slope term modeled gradual changes in completion rates between the coach-supported trial and the no-coach trial, with time operationalized as the number of days following initiation of the no-coach trial (days before the no-coach trial were coded as zero; Raudenbush & Bryk, 2002). The following equation was run twice—once to compare completion between the high coach-support versus no-coach conditions, and again to compare completion between the low coach-support versus no-coach conditions:

Level 1:

$$\text{COMPLETION}_{ij} = \pi_{0j} + \pi_{1j}*(GENDER_j)$$

Level 2:

$$\pi_{0j} = \beta_{00} + \beta_{01}*(INTERCEPT\_MOD_j) + \beta_{02}*(SLOPE_j) + \beta_{03}*(SLOPE\_MOD_j) + r_{0j}$$
$$\pi_{1jk} = \beta_{10} + \beta_{11}*(INTERCEPT\_MOD_j) + \beta_{12}*(SLOPE_j) + \beta_{13}*(SLOPE\_MOD_j)$$

The study was powered to detect a difference in probability of program completion of 7.0% with an alpha of .05 and statistical power at the .80 level, assuming the average rate of program completion of the coach-supported trial (57%; Roddy et al., under review).

Aim 2. To test whether pre-intervention demographics, relationship functioning, and individual functioning moderated differential completion rates between the no-coach and the high- and low-support conditions, two-level longitudinal multilevel logistic regression models were constructed using HLM 7.01, nesting individuals within couples (Raudenbush et al., 2011). Consistent with the previous aim, an interrupted time series design was used to assess moderation of differential rates of program completion between the no-support and the high- and low-support interventions.

At level 1, an intercept term, gender (0 = Female, 1 = Male, grand mean centered), and the predictor variable of interest (grand mean centered) were modeled. A total of ten predictors were entered at level 1, with a separate analysis conducted for each variable: gender (0 = Female, 1 = Male), age, educational achievement, individual income, whether or not participants were African American or Hispanic (0 = non-African American, 1 = African American; 0 = non-Hispanic, 1 = Hispanic), pre-intervention relationship functioning (relationship satisfaction and relationship confidence), and pre-intervention individual functioning (depression and anxiety). Each of the ten analyses were run 1) to predict differential completion between the high coach-support versus no-coach conditions, and 2) to predict differential completion between the low coach-support versus no-coach conditions, totaling 20 moderation analyses altogether. Consistent with the previous aim, two slope terms, and a second intercept term were modeled at level 2 for the general intercept, gender, and each predictor term. At level 2, the general intercept was allowed to vary to permit completion status to vary within couples. An example equation can be found below:

Level 1:

$$\text{COMPLETION}_{ij} = \pi_{0jk} + \pi_{1jk} *(GENDER_j) + \pi_{2jk} *(PREDICTOR_j)$$

Level 2:

$$\pi_{0j} = \beta_{00} + \beta_{01} *(INTERCEPT\_MOD_j) + \beta_{02} *(SLOPE_j) + \beta_{03} *(SLOPE\_MOD_j) + r_{0j}$$
$$\pi_{1jk} = \beta_{10} + \beta_{11} *(INTERCEPT\_MOD_j) + \beta_{12} *(SLOPE_j) + \beta_{13} *(SLOPE\_MOD_j)$$
$$\pi_{2jk} = \beta_{20} + \beta_{21} *(INTERCEPT\_MOD_j) + \beta_{22} *(SLOPE_j) + \beta_{23} *(SLOPE\_MOD_j)$$

Chapter 3: Results

Program Completion

Completion rates of those who enrolled in the no-coach trial were compared with those who enrolled in the coach-supported trial. Response frequencies were calculated based on whether a participant was identified as having completed each phase of the stand-alone program. Overall, 6.1% of participants in the no-coach trial completed the program, compared to 66.1% in the high-support trial and 36.0% in the low-support trial. A detailed diagram of program completion rates for the no-coach trial can be found in Figure 1.

Compared to completion rates of the program with high coach support, completion rates evidenced a significant, immediate decrease when couples no longer received a coach (b = -2.677; SE = 0.350; t = -7.647; OR = 0.07, 95% CI = 0.04—0.14; p <.001). Similarly, compared to rates of program completion in the low coach-support program, there was a significant and immediate decrease in program completion when couples were no longer provided a coach (b = -1.982; SE = 0.344; t = -5.763; OR = 0.14, 95% CI = 0.07—0.27; p <.001). There were no significant gradual changes in completion rates either overall or following the transition to the no-coach condition.

Moderation Analyses

Moderation analyses were conducted by assessing the interaction (see β_{21} in equation on page 18) between the intercept modification term, capturing the change from the coach-supported programs to the no-coach program, and the predictor variable of interest. Initial prediction analyses revealed a trend towards significance for gender as a moderator of program completion upon the discontinuation of both high coach support

(b = 0.383, SE = 0.224, t = 1.712, p = .087) and low coach support (b = 0.308, SE = 0.183, t = 1.685, p = .092). In both cases, men were somewhat (but not significantly) less affected by the lack of a coach compared to women. To ensure that subsequent moderation analyses were not affected by this trend towards gender differences in completion, gender was retained as a control variable in all subsequent moderation analyses.

Subsequent analyses revealed that ethnicity significantly moderated the magnitude of the immediate change in program completion such that those who identified as Hispanic were more negatively impacted by the lack of coach support from both the high support (b = -3.985, SE = 0.786, t = -5.069, p < .001) and low support conditions (b = -2.049, SE = 0.821, t = -2.497, p = .013). Depression also significantly moderated the magnitude of changes in program completion once individuals no longer received a coach; however, contrary to expectations, higher levels of depressive symptoms predicted smaller decreases in the transition from the high-support to the no-support trial (b = 0.084, SE = 0.040, t = 2.081, p = .038). Specifically, depressive symptoms were non-significantly negatively related to likelihood of completion in the high-coach trial (b = -0.040, p = 0.25) and significantly positively related to the likelihood of completion in the no-coach trial (b = .044, p = .034). However, there was no significant difference in the likelihood of program completion between those in the no-coach trial and those in the low-support coach trial based on pre-intervention ratings of depression (p = .963). All remaining variables were non-significant moderators of differential program completion between both coach-supported trials and the no-coach trial (see Table 1).

Chapter 4: Discussion

The current study aimed to elucidate the role of coach support in the OurRelationship program. In an effort to address the concern of reach, availability, and desirability of couple therapy services, completion rates of a no-coach trial of the OurRelationship program were compared with those of a previous coach-supported trial in which couples received either a single coach call or four coach calls. As previously reported by Roddy et al. (under review), the difference in completion rates between the low-coach condition and high-coach conditions was significant such that high coach contact yielded better completion than low coach contact. In the present study, when these differences in completion rates were compared to the no-coach trial of OR, results revealed that couples who received at least some coach support completed the program at a significantly higher rate compared to couples who received no coach support. Thus, the initial hypothesis that completion rates would be significantly different between the two trials, such that completion rates without a coach would be lower than those with a coach, was supported.

The current findings reveal that those who seek online help for relationship discord are less likely to complete web-based programs that contain no elements of coach or therapist support. Therefore, researchers should prioritize examining how best to support couples who are progressing through online programs without a coach. One way to support couples is to include automated reminders or other ways to hold couples responsible for completing the online content. Coach automation typically includes features such as email or text reminders to complete program content, and may also utilize in-program feedback personally tailored to the user (Cowpertwait & Clarke,

2013). While there continues to be debate in the field over which support method (human versus automated) is superior in achieving high rates of program completion, the evidence is clear that automated program support yields better completion rates than no support (Mohr et al., 2011). As such, future versions of the OurRelationship program (and other online couple programs) should investigate the effectiveness of an automated version of the program, which could include in-program feedback, progress monitoring, and email and text-based reminders to complete material. Such automated feedback could help participants feel more supported throughout their time in the program, and thus increase their likelihood of completing it.

Predicting Completion

The current study also examined whether certain couples were particularly well-suited to a no-coach version of OR based on demographic and pre-intervention factors. Results revealed that differential program completion between coach-supported and no-coach programs was not significantly moderated by participants' age, race, education, individual income, or baseline relationship satisfaction, relationship confidence, or anxiety symptoms. This lack of moderation replicated the previous finding that differential rates of program completion between low support and high support conditions did not differ by couples' household income status (below versus above the federal poverty line) or by racial minority status (African American versus non-African American; Roddy et al., under review). However, the current study failed to replicate an earlier finding from the original, high-support trial of OR that couples with household income below 200% of the federal poverty line had significantly lower completion rates than did higher income couples (Georgia et al., under review). Indeed, in the present

study, only three of the 20 moderation analyses were significant (described below) – and, given an alpha level of 0.05, one of these three significant findings would be expected to result from chance. Thus, it can be concluded that most couples – regardless of demographic factors or pre-intervention functioning – benefit from having at least some amount of coach support when receiving an intervention with no integrated automated support.

However, two factors were significant moderators of differences in completion rates between the coach-supported and no-coach versions of the online program. First, the current study revealed that Hispanic ethnicity significantly predicted a larger immediate decrease in program completion rates at the end of both the high and low coach-supported trials. This difference is consistent with findings from the original trial of the OR program that revealed that Hispanic couples are significantly less likely to complete the intervention compared to Caucasian, non-Hispanic couples (Georgia et al., under review). However, Hispanic ethnicity did not moderate completion rates between the high- and low-coach conditions (Roddy et al., under review). Taken together, this pattern of results suggests that it may be especially important to provide Hispanic couples with coach support but that minimal levels of coach support may be sufficient to boost completion rates.

To better understand why Hispanic couples tended to see greater drops in program completion once a coach was no longer offered, several factors must be considered. Overall, Hispanic couples in the United States face disproportionate rates of minority stress while simultaneously experiencing increased mental health stigma compared to Caucasian, non-Hispanic couples (De Luca, Blosnich, Hentschel, King, & Amen, 2016).

As a result, Hispanic couples are more likely to prematurely drop out from therapy (De Luca et al., 2016) as well as the OurRelationship program (Georgia et al., under review) compared to non-Hispanic couples. But why is provision of a coach especially effective in helping Hispanic couples complete the OurRelationship program? It is possible that logistical barriers such as poor access to internet, familiarity with technology, buy-in to web-based treatment programs, and language may have been responsible for the current findings and that Hispanic couples happen to be particularly at risk of facing these barriers (Jang, Johnson, D'Eramo-Melkus, & Vorderstrasse, 2017). Therefore, it is likely that the provision of a coach may have allowed Hispanic couples in the coach-supported trial to overcome some of these barriers. In particular, it is possible that the direct face-to-face contact between couple and coach via videoconference call bolstered treatment buy-in to the coach-supported programs by providing a more personalized experience for the couple. Additionally, because one of the responsibilities of the coach in the supported versions of the program is to provide couples with technical assistance as needed (either via email or during a call), couples could have more easily overcome their difficulties with internet connection and/or navigating the website. Therefore, future research should prioritize comparing different levels or types of coach support (or potentially other forms of support such as automated support) within Hispanic populations.

The second significant moderator of the magnitude of program completion with and without a coach was depressive symptoms. The literature on depression and treatment adherence to couple therapy supports a negative association between depressive symptoms and adherence to treatment (Beach & Cassidy, 1991), and consistently demonstrates that therapists play a particularly important role in in-person couple therapy

when at least one partner is experiencing depression (Whisman & Beach, 2015). Partners who suffer from depression tend to require more support because of the amotivational and anhedonic nature of the disorder (Ebert & Baumeister, 2017). When considering stand-alone internet-based treatments for depression, some researchers have noted that depressed patients reported these programs to be difficult and, at times, impersonal. More specifically, patients felt that their particular symptoms and disorder necessitated professional guidance and extrinsic motivation to engage in the program material (Ebert & Baumeister, 2017). As one of the goals of providing a coach in the OurRelationship program is to help couples tailor online content to the specifics of their relationship, we expected individuals with depressive symptoms to especially benefit from having a coach. Indeed, taken together, previous research would seem to suggest that participants with depressive symptoms would be less likely to complete the OurRelationship program without the support of a coach.

Therefore, the current finding that higher levels of depressive symptoms predicted *smaller* decreases in program completion during the transition from the high-support to the no-support trial was unexpected. One possible (post-hoc) explanation is that individuals with depressive symptoms had poorer alliance with their coaches and did not derive as much benefit from the coach calls as those without depressive symptoms. Alternatively, perhaps the need to coordinate completion of activities with pre-arranged coach calls created unintended barriers to completion. For example, participants with depressive symptoms may have been more likely to complete online activities in a single sitting when there was no obligation to stop to coordinate with an upcoming coach call. Finally, it is possible that given the socially-isolating nature of depression, individuals

with depressive symptoms may feel uncomfortable discussing personal and sensitive matters with a coach, and therefore be more likely to complete a program that does not have a coach.

To place the magnitude of this unexpected relationship between depressive symptoms and rates of program completion in context, however, the following consideration should be noted. Given the large overall differences in completion rates between the high-support and no-support trials, an individual with clinically-significant levels of depressive symptoms is still more likely to complete the program when provided a coach than when not provided a coach. Thus, although depressive symptoms seem to minimize the benefit of a coach, they do not entirely eliminate it. Future studies may wish to further explore the mechanisms of this moderation effect and whether other types of psychopathology impede program completion in a variety of coach-supported versus non-coach supported programs. Until it is replicated, this unexpected finding should be interpreted with caution.

Limitations & Conclusions

The present study was the first of its kind to investigate the role of multiple levels of coach support within an online program for relationship distress. The current findings imply that web-based interventions without automated reminders or coach support may not be suitable for distressed relationships. Furthermore, results indicate that this conclusion is applicable across baseline factors, with the possible exception of those with depressive symptoms, and is especially applicable to Hispanic couples. While these findings are informative, a number of limitations must be considered.

It is important to note that differences in completion rates that we have attributed to changes in coach support may have been caused in part by differences attributable to other methodological features of the study. First, eligibility for the no-coach program differed slightly from the coach-supported program in that the no-coach program did not exclude for suicidal ideation or infidelity within the past three months. However, only 16 participants were excluded from the coach-supported trial due to this criterion (Roddy et al., under review); therefore, this difference is unlikely to explain the observed differences between the trials. Second, while participants in both trials had to complete two online surveys to be eligible, there was a difference in how eligible couples officially enrolled in the program. In the coach-supported trial, eligible participants were contacted by program staff; in contrast, in the no-coach intervention, participants were instructed to email project staff. Therefore, couples in the no-coach trial had to exhibit slightly more self-motivation to enroll. Third, it is important to note the baseline differences between coach-supported and no-coach samples in African American racial identity and baseline levels of relationship confidence. However, these differences are unlikely to bias the estimates of differential completion rates because these variables were not significant moderators of differential program completion between coach-supported and no-coach programs

Future research may wish to assess program effect sizes for the limited subsample of couples who were able to complete the program without a coach. This examination would help determine if an unsupported version of the OR program is an effective treatment option for a subset of distressed couples. Because those who completed a brief, automated version of OR saw significant gains in relationship satisfaction (Roddy et al.,

2016), it is possible that those who complete the no-coach program might also see significant increases in relationship satisfaction. Additionally, future research could explore whether variables not examined in the present study, such as relationship commitment, relationship investment, and readiness to change may moderate the impact of coach contact on program completion.

The present study confirms the need for further investigation into possible methods for improving program completion of online couple interventions when there is no accompanying coach support. Indeed, before concluding that live coach support is necessary for online couple interventions, one must consider the possibility that more individuals may have completed the no-coach trial had the program have automated its coach support rather than entirely eliminating it. Further investigations of automated support will therefore advance our understanding of the type and quality of support couples require in order to complete online relationship programs. Achieving the proper balance between coach support and program completion will serve to improve both the cost-effectiveness and dissemination of the program.

References

Aardoom, J. J., Dingemans, A. E., Spinhoven, P., van Ginkel, J. R., de Rooij, M., & van Furth, E. F. (2016). Web-based fully automated self-help with different levels of therapist support for individuals with eating disorder symptoms: A randomized controlled trial. *Journal of Medical Internet Research*, *18*(6), e159. doi:10.2196/jmir.5709.

Be, D., Whisman, M. A., & Uebelacker, L. A. (2013). Prospective associations between marital adjustment and life satisfaction. *Personal Relationships*, 20, 728-739. doi:10.1111/pere.12011.

Beach, S. R., & Cassidy, J. F. (1991). The marital discord model of depression. *Comprehensive Mental Health Care*, *1*(2), 119-136.

Christensen, A., Atkins, D. C., Baucom, B., & Yi, J. (2010). Marital status and satisfaction five years following a randomized clinical trial comparing traditional versus integrative behavioral couple therapy. *Journal of Consulting and Clinical Psychology, 78*(2), 225-35. doi:10.1037/a0018132.

Christensen, A., Wheeler, J. G., Doss, B. D., & Jacobson, N. S. (2014). Couple distress In D. Barlow (Ed.), *Clinical handbook of psychological disorders: A step-by-step treatment manual* (5th ed.) (pp. 704-728). New York, NY: The Guilford Press.

Cole, J. C., Rabin, A. S., Smith, T. L., & Kaufman, A. S. (2004). Development and validation of a Rasch-derived CES-D short form. *Psychological Assessment, 16*(4), 360-372. doi:10.1037/1040-3590.16.4.360.

Cowpertwait, L., & Clarke, D. (2013). Effectiveness of web-based psychological interventions for depression: A meta-analysis. *International Journal of Mental Health and Addiction*, *11*(2), 247-268. doi:10.1007/s11469-012-9416-z.

Crane, D. R., & Christenson, J. D. (2012). A summary report of the cost-effectiveness of the profession and practice of marriage and family therapy. *Contemporary Family Therapy*, 34, 204–216. doi:10.1007/s10591-012-9187-5.

De Luca, S. M., Blosnich, J. R., Hentschel, E. W., King, E., & Amen, S. (2016). Mental health care utilization: How race, ethnicity and veteran status are associated with seeking help. *Community Mental Health Journal*, *52*(2), 174-179. doi:10.1007/s10597-015-9964-3

Dear, B.F., Staples, L.G., Terides, M.D., Karin, E., Zou, J., Johnston, L., Gandy, M., Fogliati, V.J., Wootton, B.M., McEvoy, P.M., & Titov, N. (2015). Transdiagnostic versus disorder-specific and clinician-guided versus self-guided internet-delivered treatment for generalized anxiety disorder and comorbid disorders: A randomized controlled trial. *Journal of Anxiety Disorders. 36*, 63-77. doi:10.1016/j.janxdis.2015.09.003.

Doss, B. D., Benson, L. A., Georgia, E. J., & Christensen, A. (2013). Translation of integrative behavioral couple therapy to a web-based intervention. *Family Process*, *52*(1), 139-153. doi:10.1111/famp.12020

Doss, B. D., Cicila, L. N., Georgia, E. J., Roddy, M. K., Nowlan, K. M., Benson, L. A., & Christensen, A. (2016). A randomized controlled trial of the web-based OurRelationship program: Effects on relationship and individual functioning. *Journal of Consulting and Clinical Psychology*, *84*(4), 285-296. doi:10.1037/ccp0000063

Doss, B.D., Rhoades, G.K., Stanley, S.M., & Markman, H.J. (2009). Marital therapy, retreats, and books: The who, what, when, and why of relationship help-seeking. *Journal of Marital and Family Therapy*, *35*(1), 18-29. doi:10.1111/j.1752-0606.2008.00093.x

Dryman, M. T., McTeague, L. M., Olino, T. M., & Heimberg, R. G. (2017). Evaluation of an open-access CBT-based internet program for social anxiety: Patterns of use, retention, and outcomes. *Journal of Consulting and Clinical Psychology*. doi:10.1037/ccp0000232

Ebert, D. D., & Baumeister, H. (2017). Internet-based self-help interventions for depression in routine care. *JAMA Psychiatry*, *74*(8), 852-853. doi:10.1001/jamapsychiatry.2017.1394

Fergus, K. D., McLeod, D., Carter, W., Warner, E., Gardner, S. L., Granek, L., & Cullen, K. (2014). Development and pilot testing of an online intervention to support young couples' coping and adjustment to breast cancer. *European Journal of Cancer Care*, *23*(4), 481-492. doi:10.1111/ecc.12162

Fischer, M.S., Baucom, D. H., & Cohen, M. J. (2016). Cognitive-behavioral couple therapies: Review of the evidence for the treatment of relationship distress, psychopathology, and chronic health conditions. *Family Processes*, *55*(3), 423-442. doi:10.1111/famp.12227.

Foran, H. M., Whisman, M. A., & Beach, S. H. (2015). Intimate partner relationship distress in the DSM-5. *Family Process*, *54*(1), 48-63. doi:10.1111/famp.12122.

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: Increasing precision of measurement for relationship satisfaction with the couples satisfaction index. *Journal of Family Psychology, 21*(4), 572-583. doi:10.1037/0893-3200.21.4.572

Georgia, E. J., Roddy, M. K., Nowlan, K. M., & Doss, B. D. (*under review*). Effectiveness of the OurRelationship program for underserved couples.

Hebert, E.A., Vincent, N., Lewycky, S., & Walsh, K. (2010). Attrition and adherence in the online treatment of chronic insomnia. *Behavioral Sleep Medicine*, *8*(3), 141-150. doi:10.1080/15402002.2010.487457

Jang, M., Johnson, C., D'Eramo-Melkus, G., & Vorderstrasse, A. (2017). Participation of racial and ethnic minorities in technology-based interventions to self-manage type 2 diabetes: A scoping review. *Journal of Transcultural Nursing.,* 1043659617723074. doi: 10.1177/1043659617723074

Johnson, C. A., Stanley, S. M., Glenn, N. D., Amato, P. R., Nock, S. L., Markman, H. J., & Dion, M. R. (2002). *Marriage in Oklahoma: 2001 baseline statewide survey on marriage and divorce* (S02096OKDHS). Oklahoma City, OK: Department of Human Services.

Johnson, S. M., Hunsley, J., Greenberg, L., & Schindler, D. (1999). Emotionally focused couples therapy: Status and challenges. *Clinical Psychology: Science and Practice 6*(1), 67-77. doi:10.1093/clipsy/6.1.67

Kelders, S.M., Bohlmeijer, E.T., Pots, W.T.M., & van Gemert-Pijnen, J.E. (2015). Comparing human and automated support for depression: Fractional factorial randomized controlled trial. *Behaviour Research and Therapy*, *72*, 72-80. doi:10.1016/j.brat.2015.06.014.

Kuester, A., Niemeyer, H., & Knaevelsrud, C. (2016). Internet-based interventions for posttraumatic stress: A meta-analysis of randomized controlled trials. *Clinical Psychology Review*, *43*1-16. doi:10.1016/j.cpr.2015.11.004

Law, D. D., & Crane, D. R. (2000). The influence of marital and family therapy on health care utilization in a health maintenance organization. *Journal of Marital and Family Therapy, 26*(3), 281–291. doi:10.1111/j.1752-0606.2000.tb00298.x.

Madsen, J. W., Tomfohr-Madsen, L. M., & Doss, B. D. (2016). The impact of couple therapy on service utilization among military veterans: The moderating roles of pretreatment service utilization and premature termination. *Family Process*, doi:10.1111/famp.12234

Mohr, D. C., Cuijpers, P., & Lehman, K. (2011). Supportive accountability: A model for providing human support to enhance adherence to eHealth interventions. *Journal of Medical Internet Research*, *13*(1), 136-146. doi:10.2196/jmir.1602

Muñoz, R. F., Bunge, E. L., Chen, K., Schueller, S. M., Bravin, J. I., Shaughnessy, E. A., & Pérez-Stable, E. J. (2016). Massive open online interventions: A novel model for delivering behavioral-health services worldwide. *Clinical Psychological Science 4*(2), 194-205. doi:10.1177/2167702615583840

Price, M., Gros, D. F., McCauley, J. L., Gros, K. S., & Ruggiero, K. J. (2012). Nonuse and dropout attrition for a web-based mental health intervention delivered in a post-disaster context. *Psychiatry: Interpersonal And Biological Processes*, *75*(3), 267-284. doi:10.1521/psyc.2012.75.3.267

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks: Sage Publications.

Raudenbush S. W., Bryk A. S., Cheong Y. F., Congdon R. T., du Toit M. (2011). *HLM 7: Hierarchical linear and nonlinear modeling.* Chicago, IL: Scientific Software International.

Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2009). Couples' reasons for cohabitation associations with individual well-being and relationship quality. *Journal of Family Issues, 30*(2), 233-258. doi:10.1177/0192513x08324388

Riper, H., Kramer, J., Keuken, M., Smit, F., Schippers, G., & Cuijpers, P. (2008). Predicting successful treatment outcome of web-based self-help for problem drinkers: Secondary analysis from a randomized controlled trial. *Journal of Medical Internet Research, 10*(4):e46. doi:10.2196/jmir.1102.

Roddy, M. K., Nowlan, K. M., & Doss, B. D. (2016). A randomized controlled trial of coach contact during a brief online intervention for distressed couples. *Family Process*, doi:10.1111/famp.12262

Roddy, M. K., Rothman, K., & Doss, B. D. (in preparation). A randomized controlled trial of varying levels of coach support in an online intervention for relationship distress.

Robles, T. F., Slatcher, R. B., Trombello, J. M., & McGinn, M. M. (2014). Marital quality and health: A meta-analytic review. *Psychological Bulletin, 140*(1), 140-187. doi:10.1037/a0031859

Schneider, A.J., Mataix-Cols, D., Marks, I.M., & Bachofen, M. (2005). Internet-guided self-help with or without exposure therapy for phobic and panic disorders. *Psychotherapy and Psychosomatics*, *74*(3), 154-164. doi:10.1159/000084000

Schonbrun, Y. C., & Whisman, M. A. (2010). Marital distress and mental health care service utilization. *Journal of Consulting and Clinical Psychology, 78*, 732–736. doi:10.1037/a0019711

Schueller, S. M., Tomasino, K. N., & Mohr, D. C. (2017). Integrating human support into behavioral intervention technologies: The efficiency model of support. *Clinical Psychology: Science and Practice*, *24*(1), 27-45. doi:10.1111/cpsp.12173

Schulz, D. N., Schneider, F., de Vries, H., van Osch, L. M., van Nierop, P. M., & Kremers, S. J. (2012). Program completion of a web-based tailored lifestyle intervention for adults: Differences between a sequential and a simultaneous approach. *Journal of Medical Internet Research*, 14(2), 56-74. doi:10.2196/jmir.1968

Shadish, W. R., & Baldwin, S. A. (2003). Meta-analysis of MFT interventions. *Journal of Marital and Family Therapy*, *29*(4), 547-570. doi:10.1111/j.1752-0606.2003.tb01694.x

Shadish, W. R., Cook, T.D., Campbell, D. T. (2003). Quasi-experiments: Interrupted time-series designs. In R. MacCoun (Ed.), *Experimental and Quasi-Experimental Designs for Generalized Causal Inference* (pp. 171 - 206). Boston, MA: Houghton Mifflin.

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder - The GAD-7. *Archives of Internal Medicine, 166*(10), 1092-1097. doi:DOI 10.1001/archinte.166.10.1092

Stewart, J. W., Bradford, K., Higginbotham, B. J., & Skogrand, L. (2016). Relationship help-seeking: A review of the efficacy and reach. *Marriage & Family Review*, *52*(8), 781-803. doi:10.1080/01494929.2016.1157559

Titov, N., Andrews, G., Choi, I., Schwencke, G., & Mahoney, A. (2008). Shyness 3: randomized controlled trial of guided versus unguided Internet-based CBT for social phobia. *Australian and New Zealand Journal of Psychiatry*, *42*(12), 1030-1040. doi:10.1080/00048670802512107

Titov, N., Dear, B. F., Staples, L. G., Terides, M. D., Karin, E. Sheehan, J., Johnston, L., Gandy, M., Fogliati, V. J., & Wootton, B. M. (2015). Disorder-specific versus transdiagnostic and clinician-guided versus self-guided treatment for major depressive disorder and comorbid anxiety disorders: A randomized controlled trial. *Journal of Anxiety Disorders*, *35*, 88-102. doi:10.1016/j.janxdis.2015.08.002

Whisman, M. A., & Beach, S. R. H. (2015). Couple Therapy and the Treatment of Depression. In Gurman, A. S., Lebow, J., & Snyder, D. K. Clinical handbook of couple therapy, (5th ed.). New York, NY: Guilford Press. ISBN 9781462513925

Whisman, M. A., Beach, S. R., & Snyder, D. K. (2008). Is marital discord taxonic and can taxonic status be assessed reliably? Results from a national, representative sample of married couples. *Journal of Consulting and Clinical Psychology*, *76*(5), 745-755. doi:10.1037/0022-006X.76.5.745

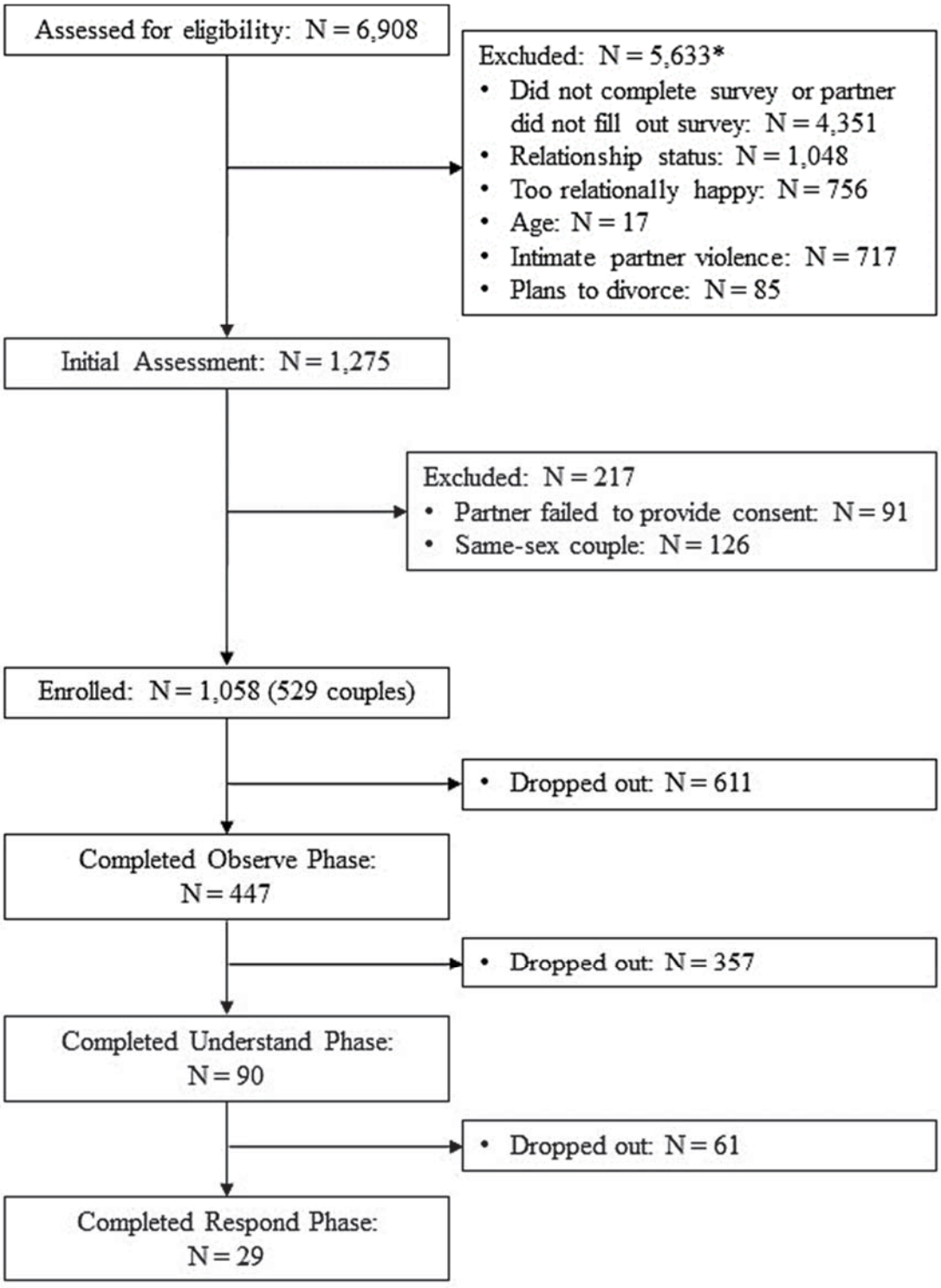
Wojtowicz, M., Day, V., & McGrath, P. J. (2013). Predictors of participant retention in a guided online self-help program for university students: Prospective cohort study. *Journal of Medical Internet Research*, *15*(5), 136-145. doi:10.2196/jmir.2323

Table 1. *HLM Results for Moderators of Program Completion*

	b	*SE*	*t*	*p*	*OR*	*95% CI*
			No-coach Trial versus Full Coach Trial			
Demographic Moderators						
Gender	0.383	0.224	1.712	.087	1.467	(0.945, 2.278)
Age	-0.053	0.042	-1.255	.210	0.948	(0.873, 1.030)
Race	-0.190	0.685	-0.277	.782	0.827	(0.215, 3.176)
Ethnicity	-3.985	0.786	-5.069	<.001	0.019	(0.004, 0.087)
Education	-0.107	0.209	-0.510	.610	0.899	(0.596, 1.356)
Individual Income	0.025	0.040	0.645	.519	1.026	(0.949, 1.109)
Pre-Intervention Functioning Moderators						
Depressive Symptoms	0.084	0.040	2.081	.038	1.087	(1.005, 1.176)
Anxious Symptoms	0.042	0.043	0.974	.331	1.043	(0.958, 1.136)
Relationship Satisfaction	-0.008	0.067	-0.123	.902	0.992	(0.869, 1.132)
Relationship Confidence	-0.049	0.079	-0.616	.538	0.953	(0.816, 1.112)
			No-coach Trial versus Low Coach Trial			
Demographic Moderators						
Gender	0.308	0.183	1.685	.092	1.360	(0.950, 1.947)
Age	-0.030	0.037	-.822	.412	0.970	(0.902, 1.043)
Race	-0.105	0.665	-0.158	.875	0.900	(0.244, 3.325)
Ethnicity	-2.049	0.821	-2.497	.013	0.130	(0.026, 0.646)
Education	-0.256	0.176	-1.457	.146	0.774	(0.548, 1.093)
Individual Income	0.013	0.052	0.260	.795	1.014	(0.916, 1.122)
Pre-Intervention Functioning Moderators						
Depressive Symptoms	-0.002	0.035	-0.047	.963	0.998	(0.932, 1.069)
Anxious Symptoms	-0.024	0.038	-0.643	.520	0.976	(0.907, 1.051)
Relationship Satisfaction	0.080	0.065	1.223	.222	1.083	(0.953, 1.231)
Relationship Confidence	0.002	0.074	0.024	.981	1.002	(0.866, 1.159)

Note: HLM – hierarchical linear modeling; *SE* – standard errors. *OR* – odds ratios. Values represent terms for Predictor Variable by Intercept_Mod interaction.

Figure 1. *Consort Diagram*



Consort diagram of participation in no-coach trial. Completion rates were calculated at the individual level. *Individuals could be counted in more than one category of exclusion.

Appendix A

Relationship Satisfaction – Couples Satisfaction Index 4-item Measure

Question:	**Answer choices:**
1. Please indicate the degree of happiness, all things considered, of your relationship.	0 – Extremely Unhappy 1 – Fairly Unhappy 2 – A Little Unhappy 3 – Happy 4 – Very Happy 5 – Extremely Happy 6 – Perfect
2. I have a warm and comfortable relationship with my partner.	0 – Not at all true 1 – A little true 2 – Somewhat true 3 – Mostly true 4 – Almost completely true 5 – Completely true
3. How rewarding is your relationship with your partner?	0 – Not at all 1 – A little 2 – Somewhat 3 – Mostly 4 – Almost completely 5 – Completely
4. In general, how satisfied are you with your relationship?	0 – Not at all 1 – A little 2 – Somewhat 3 – Mostly 4 – Almost completely 5 – Completely

Relationship Confidence

Question:	**Answer choices:**
1. I believe we can handle whatever conflicts will arise in the future.	1 – Strongly disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly agree
2. I feel good about our prospects to make this relationship work for a lifetime.	1 – Strongly disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly agree

Depression – Center for Epidemiologic Studies Depression Scale 10-item Measure

Instructions: Below is a list of the ways you might have felt or behaved. Please rate how often you have felt this way during the past week.

Question:	**Answer choices:**
1. I was bothered by things that usually don't bother me.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
2. I felt that I could not shake off the blues even with the help from my friend or family.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
3. I felt that I was just as good as other people.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
4. I had trouble keeping my mind on what I was doing.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
5. I felt that everything I did was an effort.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
6. I felt hopeful about the future.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
7. I felt my life had been a failure.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
8. I felt fearful.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
9. I felt lonely.	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)
10. People were unfriendly	0 – Rarely or none of the time (less than 1 day) 1 – Some or a little of the time (1-2 days) 2 – Occasionally or a moderate amount (3-4 days) 3 – Most or all of the time (5-7 days)

Anxiety - GAD-7

Instructions: Over the last 2 weeks, how often have you been bothered by the following problems?

Question:	**Answer choices:**
1. Feeling nervous, anxious or on edge	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
2. Not being able to stop or control worrying	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
3. Worrying too much about different things	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
4. Trouble relaxing	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
5. Being so restless that it is hard to sit still	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
6. Becoming easily annoyed or irritable	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day
7. Feeling as if something awful might happen	0 – Not at all 1 – Several days 2 – More than half the days 3 – Nearly every day