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Intervening to Strengthen Intimate Relationships:
Moderators and Mediators in Three Randomized Controlled Trials

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Psychology

by

Hannah Camille Williamson

2017

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ABSTRACT OF THE DISSERTATION

Intervening to Strengthen Intimate Relationships:
Moderators and Mediators in Three Randomized Controlled Trials

by

Hannah Camille Williamson

Doctor of Philosophy in Psychology

University of California, Los Angeles, 2017

Professor Thomas Bradbury, Chair

Although intimate relationships are a rewarding experience for many, others struggle to maintain healthy and lasting partnerships. This is especially true of couples living with low-incomes, who experience adverse relationship outcomes, such as divorce and dissatisfaction, at a disproportionate rate. Despite the need for effective interventions to prevent negative outcomes for lower-income couples and their families, the existing literature is equivocal on the most effective ways to intervene. Using data taken from three randomized controlled trials, the three studies in this dissertation project serve to test existing models of intervention, focusing on enhancing our knowledge of how these interventions operate and for whom they work best. Study 1 examines whether intervention effects vary systematically as a function of risk in three theoretically distinct preventive programs. Results indicate that treatment effects varied as a function of risk,

and more so with variables capturing relational risk factors than individual risk factors. High-risk couples (e.g., couples with lower levels of baseline commitment and satisfaction) tended to decline less rapidly in satisfaction than low-risk couples following treatment. Study 2 examines whether intervention effects on relationship satisfaction are mediated by observational assessments of relationship communication and whether any such effects are moderated by couples' pretreatment risk. Results indicate that couples who received the intervention reported higher average satisfaction at 30 months than control couples, regardless of their level of pretreatment risk, but only higher risk couples experienced an improvement in observed communication. Contrary to prediction, treatment effects on satisfaction were not mediated by improvements in communication. Finally, Study 3 examines the effects of job-related and school-related interventions on 3-year marriage rates, and whether relational or financial factors mediate this effect. Results indicate that marriage rates decreased, from 17% to 10%, among couples in which men participated in school-related interventions. Mediation analyses indicate that school-related interventions reduce the amount of time men spend with their child and the amount of money they contribute to their household, reducing marriage rates in turn. Together, these studies help refine our understanding of how to best improve relationship outcomes through preventive programs.

The dissertation of Hannah Camille Williamson is approved.

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2017

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TABLE OF CONTENTS

I.	Introduction	1
II.	Study 1: Risk moderates the outcome of relationship education: A randomized controlled trial	
	A. Introduction	12
	B. Method	17
	C. Results	22
	D. Discussion	27
	E. Tables	33
	F. Figures	38
	G. Footnotes	40
III.	Study 2: Effects of relationship education on couple communication and satisfaction: A randomized controlled trial with low income couples	
	A. Introduction	41
	B. Method	46
	C. Results	55
	D. Discussion	59
	E. Tables	65
	F. Figures	68
	G. Footnotes	69
IV.	Study 3: Education and job-based interventions for unmarried couples living with low incomes: Benefit or burden?	
	A. Introduction	71
	B. Method	75
	C. Results	80
	D. Discussion	83
	E. Tables	91
	F. Figures	96
	G. Footnotes	99
V.	Conclusion	100
VI.	References	106

LIST OF TABLES

Table 1.1. Description and descriptive statistics of study variables	33
Table 1.2. Correlations among moderator variables	35
Table 1.3. Omnibus tests, treatment contrasts, and simple slopes of individual risk moderators for each treatment group	36
Table 1.4. Omnibus tests, treatment contrasts, and simple slopes of individual risk moderators for each treatment group	37
Table 2.1. Equivalence of groups at baseline	65
Table 2.2. Descriptive statistics and comparison of lower- and higher-risk groups	66
Table 2.3. Correlations and descriptive statistics for all variables in model	67
Table 3.1. Coefficients from logistic regressions and t values from propensity score matches for 66 baseline covariates	91
Table 3.2. Descriptive information about propensity score matching process	94
Table 3.3. Marriage rates of couples in which the father participated in the education intervention, by subgroups	95

LIST OF FIGURES

Figure 1.1. Two examples of moderation when couples are collapsed across treatments.	38
Figure 1.2. An example of moderation within a single treatment.	39
Figure 2.1. Structural equation model testing communication behavior as a mediator of intervention effects on relationship satisfaction in lower-risk and higher-risk groups.	68
Figure 3.1. Three-year marriage rates for men and women who did and did not receive job assistance and education interventions.	96
Figure 3.2. The negative association between educational interventions and 30-month marriage rates is mediated by reductions in fathers' daily contact with the child and fathers' financial support of the child after 15 months.	97
Figure 3.3. Job assistance decreased the likelihood of father's daily contact with their children, but did not have an effect on any other potential mediator.	98

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INTRODUCTION

As one of the most universal and consequential of all human experiences, intimate relationships confer profound economic, physical, and psychological benefits for adults and any children they may be raising (e.g., Amato, 2000; Horn, Xu, Beam, Turkheimer, & Emery, 2013). However, many people are unable to maintain steady intimate relationships and reap these benefits; the lifetime divorce rate for first marriages is currently estimated at 40 to 50% (Kennedy & Ruggles, 2014), and nonmarital unions dissolve at an even higher rate (Cherlin, 2009). Individuals who divorce are more likely to experience negative outcomes such as deterioration in their physical and emotional well-being, increases in drug and alcohol use, and compromised performance in the workplace (Forthofer, Markman, Cox, Stanley, Kessler, 1996; Kiecolt-Glaser & Newton, 2001; Rhule-Louie & McMahon, 2007; Simon, 2002). Additionally, children in these families are at elevated risk for psychological disorders, physical illnesses, and poorer performance in school (Amato, 2001; Troxel & Matthews, 2004; Sturge-Apple, Davies & Cummings, 2006). The costs of divorce are also borne at the societal level; as families dissolve, one or both parents often rely upon government programs to support themselves. Current estimates suggest that relationship dissolution costs American taxpayers in excess of \$30 billion dollars annually in the form of welfare, childcare, and food stamps (Schramm, 2006).

The individual and societal costs of relationship dissolution are clearly far-reaching, but these findings mask the more troubling fact that relationship distress and dissolution are more common and more consequential among couples living with social and economic disadvantage. Low-income couples have a higher incidence of nonmarital child-bearing, are more likely to end cohabiting relationships, are less likely to enter into marriage (even when they have a child together), and when they do marry they report lower levels of relationship satisfaction and are more likely to divorce (Cherlin, 2009; Karney, Garvan, & Thomas, 2003; Bramlett & Mosher,

2002). These trends toward relationship instability in low-income couples result in a high incidence of single-parent headed households who are living in poverty.

Because of the high prevalence of relationship distress and dissolution and their associated costs, state and federal governments have invested in developing and disseminating interventions to prevent relationship dissolution, particularly for low-income couples. Since 2000, federal and state policies have provided nearly \$1 billion toward the delivery of relationship education programs targeted primarily at low-income couples (Hawkins & VanDenBerghe, 2014; Manning, Brown, Payne, & Wu, 2014). During the development of these initiatives policymakers and evaluators turned to the relationship science literature to determine what type of intervention should be used to help stabilize the relationships of low-income couples. Unfortunately, at the time, scant attention had been paid to low-income couples – no studies of relationship education for low-income couples were conducted prior to 2000 (Hawkins & Erickson, 2014). Thus, policymakers had to rely on the broader literature on marriage, a literature based almost exclusively on economically stable Caucasian couples, to understand how relationships change and to develop interventions that would offset risk for adverse relationship outcomes among couples living with lower incomes.

Brief History of Communication and Relationship Education

The basic scientific paradigm for studying marriage was pioneered by Harold Raush, Gerald Patterson, Robert Weiss, John Gottman and others in the 1970s, who discovered that the manner in which partners communicate with each other is a reliable correlate of their reports of relationship satisfaction. In the ensuing decades the idea that partners must treat each other well in order to maintain satisfying relationships became an integral part of many theories of intimate relationships (e.g., Social Learning Theory; Jacobson & Margolin, 1979), and a large body of

work emerged over subsequent decades to enhance assessment of couple communication and to refine understanding of how communication covaried with relationship outcomes. Early studies used cross-sectional data to show that the way in which partners communicate with each other (particularly their affective expressions) reliably distinguished satisfied couples from those who reported dissatisfaction with their marriages (e.g., Gottman et al., 1976). As relationship science advanced, longitudinal studies became more common, and communication was studied as a predictor of future outcomes, with studies tending to show that positive behaviors lead to greater satisfaction and stability while negative behaviors foreshadowed dissatisfaction and divorce (e.g., Karney & Bradbury, 1995). Though incomplete – e.g., the possibility that communication skills were themselves a consequence of pre-existing relationship distress had not been fully explored -- these initial results lead to the development of preventive relationship interventions which sought to teach couples basic communication skills prior to the onset of relationship distress; this work was predicated on the assumption that improvements in communication skills would forestall normative declines in relationship satisfaction thought to characterize the first several years of marriage.

Subsequent studies of relationship functioning expanded their scope by measuring relationship processes at multiple waves and collecting relationship outcome data many years later, and newly-developed skill-based relationship education programs began to be tested in randomized controlled trials. As researchers began to follow couples over longer periods of time, however, compelling evidence for a robust and straightforward link between communication and relationship outcomes did not emerge. For example, husbands' negativity was shown to predict positive change in wives' satisfaction but was unrelated to their own satisfaction (Heavey, Layne, & Christensen, 1993); more negative communication predicted

slower, not faster, declines in satisfaction (Karney & Bradbury, 1997; Markman, Rhoades, Stanley, Ragan, & Whitton, 2010); and positive communication was shown to be unrelated to relationship satisfaction over time (e.g., Markman et al., 2010). While other studies certainly were consistent with the basic notion that more positivity and less negativity were beneficial for relationships (e.g., Johnson et al., 2005; Pasch & Bradbury, 1998), inconsistent findings proved common and were at odds with basic assumptions of social learning theory.

In parallel fashion, difficulties arose in demonstrating that skills-focused preventive interventions might prevent adverse relationship outcomes. For example, focusing only on the most widely studied and disseminated of these programs, the Prevention and Relationship Enhancement Program (PREP; Markman, Stanley, & Blumberg, 1994), post-intervention increases in positivity and decreases in negativity predicted decreased relationship distress for men, whereas for women increased positivity predicted *increased* relationship distress (Schilling, Baucom, Burnett, Allen, & Ragland, 2003); neither positive communication nor negative communication post-intervention were related to the development of relationship distress (Stanley, Rhoades, Olmos-Gallo, & Markman, 2007), and post-intervention negativity declined for couples who received PREP in a religious or university setting, but only in the religious condition did positivity increase, whereas positivity decreased post-intervention in the university condition. Despite these differences in their communication outcomes, relationship satisfaction remained stable for couples in both conditions over the same period (Laurenceau, Stanley, Olmos-Gallo, Baucom, & Markman, 2004). While most studies were limited in key respects (e.g., comparison groups often failed to control for placebo effects; follow-up intervals were rarely longer than one or two years following intervention), meta-analysis of relationship

education programs does reveal effect sizes on the magnitude of $d = .30$ to $.36$ for changes in relationship quality (Hawkins, Blanchard, Baldwin, & Fawcett, 2008).

Relationship Education for Low-Income Couples

With a clear need to address the risky outcomes of low-income couples, and with a limited evidence base for doing so, interventions were adapted for this population while retaining the basic emphasis on modifying communication skills. Foremost among these efforts was the Healthy Marriage Initiative (HMI), a federally funded policy initiative that was comprised primarily of two large-scale randomized controlled trials of relationship education for low-income couples. These two studies, the Supporting Healthy Marriage project (SHM) and the Building Strong Families project (BSF) provided the first and most powerful tests of whether the prevailing relationship education model would work for low-income couples.

SHM targeted married couples with low incomes (within 200% of the federal poverty level) who were raising a child together. Across eight sites, 6,298 couples were randomized to the intervention or control conditions. Assessments conducted 12 and 30 months after randomization demonstrated that couples assigned to the intervention condition reported higher levels of relationship satisfaction than couples in the control group. These effects were small in magnitude ($d = .13$ at both time points) and did not eventuate in greater relationship stability, as the intervention had no effect on whether couples stayed married or divorced (Hsueh et al., 2012; Lundquist et al., 2014).

BSF differed from SHM by targeting low-income unmarried couples who were expecting a baby or had a baby younger than three months of age. The program was offered at twelve sites in seven states to 5,102 couples who were initially randomized to intervention or control conditions. Follow-ups conducted at 15 and 36 months post-randomization found that the

intervention did not increase marriage rates, and did not improve their relationship quality compared to the no treatment control group. At 36 months post-treatment the picture worsened; the couples who received the intervention were actually slightly less likely to be romantically involved and/or living together (Wood et al., 2010; Wood et al., 2012).

Exporting the relationship education model that was developed with middle-class couples directly to low-income couples thus proved unsuccessful for reducing the high incidence of relationship instability in this population. A recent meta-analysis of studies of relationship education for low-income couples conducted between 2000 and 2014 supports this conclusion, yielding an overall effect size across 38 studies of $d = .06$ (Hawkins & Erickson, 2014), a very small effect that is substantially lower than the $d = .30$ to $.36$ effect size found for relationship education when provided to middle-class couples. With this dissertation I propose that one way to advance interventions for couples living with low incomes is to determine conditions under which couples might respond especially well or poorly to intervention and, where possible, to identify mechanisms by which even small effects are being generated. As research and policy begins to shift away from exclusively skill-based models of relational change (e.g., Lavner & Bradbury, 2017; Johnson, 2012), work on moderators and mediators provides one useful path for identifying new frameworks that can guide future intervention efforts.

The Current Dissertation

The three studies that comprise this dissertation move beyond testing the main effects of relationship education on low-income couples to examine moderators, mediators, and alternative, non-skill-based interventions. These three studies use longitudinal data collected within the context of three randomized controlled trials of relationship education, including subsamples

from the SHM and BSF studies, and together they are intended to refine understanding of how existing approaches are inadequate and how new intervention strategies might be devised.

Study 1: Risk moderates the outcome of relationship education: A randomized controlled trial

The first study in this set examines whether there are subgroups of couples for whom relationship education is more and less effective. The larger literature on relationship education has been surprisingly silent on this issue, in large part because *primary prevention* of relationship distress has been the overriding goal in most of this work. Inconsistent findings in this literature, noted above, highlight the possibility that diverse forms of risk are moderating treatment effects, and identification of moderators would strengthen the case for *secondary or indicated prevention* efforts directed at selected couples (see Bradbury & Fincham, 1990; Bradbury & Lavner, 2012). Moderators evaluated in the first study include individual risk factors (income, education, race, parental divorce, childhood family discord, alcohol use, trait anger, and depression) and relational risk factors (satisfaction, communication, hostile conflict, emotional support, empathy, commitment, physical aggression, and relationship problems). These risk factors may moderate intervention effects in two main ways. On one hand, couples at elevated risk for distress and dissolution may have the most to gain from an intervention, but the very nature of the risks couples possess might limit the gains they are able to achieve. Couples who readily revert to anger and defensiveness in the face of conflict, for example, might be excellent candidates for training in communication and emotional regulation, yet these same interactional deficits might also constrain their ability to benefit from such training. On the other hand, couples who are at low risk for adverse outcomes may have less room to improve their communication skills because they are already functioning at a high level, but their low level of risk may indicate that

they have more interpersonal skills upon which training can capitalize. In this case, the low-risk couples would be more likely to learn new skills and to implement the skills under challenging circumstances later in their relationship.

Additionally, three theoretically distinct interventions are tested to determine whether a match between content of the intervention and pre-treatment risk factors affect outcomes. For example, couples reporting high levels of conflict may respond well to virtually any intervention that focuses on communication, or they may respond primarily to interventions that target conflict management directly. Initial research is consistent with this latter possibility: low-risk couples benefit more from less intensive, relatively unstructured interventions, whereas high-risk couples benefit more from intensive, structured interventions that teach specific skills (Halford, Sanders, & Behrens, 2001).

Study 2: Effects of relationship education on couple communication and satisfaction: A randomized controlled trial with low income

Using data from the SHM project described earlier, the second study in this dissertation reports on the largest known randomized trial ever conducted with married couples, testing the key assertion that skill-based interventions generate improvements in couple communication, which in turn slow rates of relationship deterioration. This study also tests whether demographic risk moderates the intervention-to-communication-to-relationship satisfaction links. Adopting this ‘moderated mediation’ approach may hold particular promise, as it tests two distinct paths involved in the effectiveness of the intervention. Testing the intervention-to-communication path clarifies the extent to which specific domains of couple communication can be enhanced by relationship education, and whether this effect is different for lower vs higher-risk couples. Even if interventions are shown to produce reliable and lasting effects on communication, these

intervention-to-behavior effects are of limited practical importance unless improvements in communication translate into better relationship outcomes. Because the effect of improved communication on relationship satisfaction is theoretically important but largely unproven, testing this link in the context of a mediational framework is a key aim of this study.

Study 3: Education and job-based interventions for unmarried couples living with low incomes: Benefit or burden?

Finally, the third study in this dissertation moves away from provision of relationship skills to focus on an alternative pathway to improving relationship outcomes: improving economic capital. Stabilizing vulnerable families by targeting their financial prospects finds broad support in prominent psychological models of contextual influences on development and social relationships (e.g., Belsky, 1984; Bronfenbrenner, 1986; Conger & Elder, 1994; Karney & Bradbury, 1995) and in associated empirical findings. For example, among those transitioning to parenthood, unmarried couples report less formal education, lower incomes, and higher unemployment rates than married couples (McLanahan, 2009b), and they identify financial instability as their biggest obstacle to marriage (Gibson-Davis, Edin, & McLanahan, 2005; Edin, 2000). Given that these economic concerns pose an acute burden on low-income unmarried couples, who see them as the top barrier to marriage, the current study focuses on couples who are unmarried, have a new baby together, and are living in poverty, to examine whether participating in a job training program or receiving higher education (e.g., GED classes) increases the likelihood of marriage.

Though it is theoretically and empirically plausible that economic interventions will yield benefits for couples and families, there is mounting evidence that calls this assumption into question. Economic deprivation compromises cognitive processes, judgment, and decision-

making, and interventions that demand effort and adaptation from low-income individuals may carry costs in the short term that vulnerable families must absorb before realizing any longer-term benefits (see Gennetian & Shafir, 2015; Mani, Mullainathan, Shafir, & Zhao, 2013; Shah, Mullainathan, & Shafir, 2012). For example, the time and effort involved in completing an educational degree or job-training program may come at the expense of parenting, working to support the family, maintaining the relationship, and supporting one's partner as a parent and wage-earner. As a consequence, work- and school-related interventions for lower-income new parents could create, and draw attention to, incompletely fulfilled family responsibilities, paradoxically reducing rather than increasing marriage rates. To test the possibility that the educational interventions could bring unexpected costs, this study also tests whether the effect is mediated by relational factors (daily contact with child, partner perceptions of parenting quality, judgments of relationship satisfaction) and/or economic factors (i.e., earned income, financial support of child).

Summary

Over the past decade, recognition that low-income couples face distinct challenges as they try to maintain their relationships has grown, and it has become clear that existing intervention frameworks which were developed on middle-class couples cannot simply be applied to low-income couples. The need to develop effective interventions to stabilize low-income couples is therefore clear, but how to do so is not yet known. Although existing interventions produce small effects on the whole for low-income couples, it is still possible that (a) there are parts of these interventions or subgroups of couples for whom they are very effective and (b) entirely new approaches will need to be developed and tested.

The three studies that comprise this dissertation attempt to address this problem by moving the field toward a better understanding of how interventions function with low-income couples. The first study examines subgroups of couples who might benefit more or less from relationship education, and whether a match between intervention content and baseline risk improves treatment outcomes. The second study tests whether the presumed mechanism of change in preventive interventions, observed communication, is a mediator of relationship education outcomes, and whether the intervention-to-communication and communication-to-satisfaction paths are moderated by risk. The third study, tests whether addressing financial strain, in the form of educational and employment-based interventions, can improve relationship outcomes for high-risk unmarried couples. Together, these studies will enhance our knowledge about how to improve and stabilize low-income couples, and will point out new directions for basic and applied research, with the ultimate goal of ensuring that all couples are able to thrive in their relationships.

Study 1

Risk moderates the outcome of relationship education: A randomized controlled trial

Motivated by evidence that roughly 43% of first marriages end within fifteen years (Bramlett & Mosher, 2002) and that as many as 33% of all remaining couples are unhappily married (Whisman, Beach, & Snyder, 2008), relationship scientists have sought to determine whether educational interventions can prevent these adverse outcomes. Randomized controlled trials of these interventions, whether in the form of relatively small single-site studies (for a meta-analysis, see Hawkins, Blanchard, Baldwin, & Fawcett, 2008) or large-scale multi-site projects (e.g., Lundquist et al., 2014), typically yield small effects on relationship satisfaction that dissipate with time. Although some scholars interpret these findings as evidence that current intervention paradigms have outlived their utility for preventing relationship dysfunction (e.g., Bradbury & Lavner, 2012; Johnson, 2012), an alternative possibility is that interventions work particularly well for some couples while yielding few benefits for others (e.g., Petch, Halford, Creed, & Gamble, 2012). This study aims to clarify whether there are identifiable risk factors that differentiate between couples who do and do not benefit from preventive interventions, using data from couples randomly assigned to receive one of three preventive interventions and followed three years post-treatment.

Prevailing approaches to relationship education favor unselected or primary prevention, whereby all couples in a given catchment area or experimental condition receive essentially the same intervention, regardless of their background or risk for relationship problems. This approach assumes that couples with strong relationships will learn new ways to preserve their strengths, while couples at elevated risk for later difficulties will improve in their relationship or decline more slowly in relationship satisfaction than they would in the absence of intervention.

As primary prevention assumes that all couples are able to benefit from preventive programs, albeit to varying degrees and in different ways, widespread dissemination of interventions is viewed as appropriate and desirable. However, the possibility remains that couples vary widely in whether they will benefit from preventive intervention. If high-risk couples benefit from an intervention while low-risk couples fail to benefit, for example, then resources devoted to the latter group might be shifted to the riskier group, thereby generating a broader impact on relationship outcomes. Under a secondary or selective prevention model, therefore, resources would be better deployed by targeting interventions to selected couples identified by the nature and extent of the risk factors that they bring to their marriage (see Halford, 2011, p. 66). Although primary prevention tends to be the current strategy of choice, modest results from controlled trials indicate that it may be timely to clarify how risk moderates intervention effects.

Risk may moderate intervention effects in two main ways. On one hand, couples at elevated risk for distress and dissolution may have the most to gain from an intervention, but the very nature of the risks couples possess might limit the gains they are able to achieve. Couples who readily revert to anger and defensiveness in the face of conflict, for example, might be excellent candidates for training in communication and emotional regulation, yet these same interactional deficits might also constrain their ability to benefit from such training. On the other hand, couples who are at low risk for adverse outcomes may have less room to improve their communication skills because they are already functioning at a high level, but their low level of risk may indicate that they have more interpersonal skills upon which training can capitalize. In this case, the low-risk couples would be more likely to learn new skills and to implement the skills under challenging circumstances later in their relationship.

Which of these alternatives proves to be most tenable may depend upon the type of risk

under consideration. Distress and divorce are foreshadowed by a range of factors in longitudinal studies, including personality traits (Karney & Bradbury, 1995), experiences in the family of origin (e.g., DiLillo et al., 2009), and stress and social disadvantage (Cutrona et al., 2011). Basic research of this sort provides an important foundation for understanding how specific forms of risk may affect treatment outcomes, and a few studies have focused specifically on enduring vulnerabilities, or risk factors that are essentially stable characteristics that individuals would bring to any relationship. Three studies conceptualized high-risk couples as those in which the wife's parents divorced or the husband witnessed physical aggression between his parents; these studies yielded conflicting results. In one case, high-risk couples achieved better outcomes than low-risk couples (Halford, Sanders & Behrens, 2001), whereas two studies reported no difference in outcomes as a function of risk status (Halford & Wilson, 2009; Markman, Rhoades, Stanley, & Peterson, 2013). A fourth study defined risk solely as the presence or absence of parental divorce and found no difference in relationship outcomes between the high- and low-risk groups two years after treatment (Van Widenfelt, Hosman, Schaap, & van der Staak, 1996).

In contrast to studies that define risk in terms of enduring personal vulnerabilities, others conceive of risk as a characteristic of the relationship itself. Four studies of relationship education have adopted this approach in examining moderators of treatment outcome. One study classified couples as low- or high-risk on the basis of their self-reported communication, conflict resolution, and marital satisfaction (Barton, Futris, & Bradley, 2012), and demonstrated that high-risk couples had greater improvements than low-risk couples on a wide range of relationship outcomes four weeks post-treatment. In a study in which negative communication and physical aggression were considered as pre-treatment risk factors, higher levels on both factors were associated with *higher* rates of divorce for couples who received a preventive

intervention (Markman et al., 2013). In a third study, risk was defined as low relationship satisfaction and high levels of depressive symptoms; here, couples with a high-risk husband benefited more from intervention than couples with a low-risk husband (Schilling et al., 2003). Finally, a study examining various relational risk factors, including dyadic coping, communication, and conflict, found that couples who were low on these skills at pre-treatment benefitted more from treatment than couples with better skills (Bodenmann, Hilpert, Nussbeck, & Bradbury, 2014). These studies lend support to the viability of selective interventions with at-risk couples, yet they leave open important questions about which dimensions of risk are most informative in identifying couples most likely to benefit from preventive interventions.

This study aims to build on the existing literature by examining possible moderating effects of several relatively stable and enduring risk factors (i.e., parental divorce, childhood family discord, education, race, income, alcohol use, trait anger, and depression) and several risk factors that are specific to the relationship (i.e., satisfaction, communication, hostile conflict, emotional support, empathy, commitment, physical aggression, and relationship problems). As maintaining or improving relationship satisfaction is the primary goal of relationship interventions, these risk factors will be tested as moderators of three-year post-treatment trajectories of relationship satisfaction.

In evaluating possible effects of various moderators on treatment outcomes, it is important to recognize that a given moderator might either operate identically across all types of interventions, or differently depending the focus of the intervention. For example, couples reporting high levels of conflict may respond well to virtually any intervention that focuses on communication, or they may respond primarily to interventions that target conflict management directly. Initial research is consistent with this latter possibility: Low-risk couples benefit more

from less intensive, relatively unstructured interventions, whereas high-risk couples benefit more from intensive, structured interventions that teach specific skills (Halford et al., 2001). We build on this work first by testing how moderators operate for relationship education in general (i.e., collapsing across treatment types), then by testing whether moderators operate in similar or different ways across distinct intervention types by comparing two 15-hour skill-based interventions (Prevention and Relationship Enhancement Program or PREP, Markman, Stanley, & Blumberg, 1994 and Compassionate and Accepting Relationships through Empathy or CARE, Rogge et al., 2002) against a low-intensity intervention designed to increase relationship awareness (RA) without relationship skills training.

Extending a prior study of the main effects of these interventions (see Rogge et al., 2013), we address four questions in this study, all subsumed under the broader aim of clarifying whether primary or secondary prevention is more promising for relationship education programs. First, are treatment outcomes moderated by pre-treatment risk factors? The absence of moderating effects would suggest that primary prevention strategies should be continued (if couples benefit equally from relationship intervention) or discontinued (if couples experience no benefits or iatrogenic effects equally), while the presence of moderating effects would highlight the value of selecting couples on the basis of risk. Although prior research is inconsistent on this point, we believe there is sufficient evidence in the couples literature and in the larger literature on preventive trials (e.g., Howe, Reiss, & Yuh, 2002) to hypothesize that intervention effects will vary systematically as a function of baseline risk factors.

Second, are the predicted moderating effects stronger for individual risk factors or for relational risk factors? We hypothesize that relational risk factors would be more likely than individual risk factors to moderate treatment outcomes, based on similar moderating effects

detected in couples therapy (e.g., Baucom, Atkins, Simpson & Christensen, 2009) and based on the view that preventive interventions are designed specifically to address relational processes rather than personal vulnerabilities (Halford & Bodenmann, 2013).

Third, who will benefit most from intervention—low-risk couples (who have strong relationships and greater capacities to incorporate new skills into their repertoires) or high-risk couples (who have a greater need to learn new skills and more to gain from doing so)? Prior research (e.g., Bodenmann et al., 2014) suggests that high-risk couples will benefit more than their low-risk counterparts; low-risk couples will be closer to their ceiling for optimal functioning whereas high-risk couples will have more opportunities for improvement and will find those improvements to be rewarding and valuable for future relationship maintenance.

Finally, from which specific treatments, if any, do high- and low-risk couples benefit the most? Following Halford et al. (2001), and given the difference in intensity and duration between the skill-building interventions (i.e., CARE and PREP) and the RA intervention, we predict that high-risk couples will benefit more from CARE or PREP than from RA whereas couples relatively low in risk will benefit equally from all three interventions.

Method

Participants

Participants were 174 engaged or newlywed couples. Men averaged 29.3 years of age ($SD = 4.8$) and 15.2 years of education ($SD = 3.8$), with modal incomes between \$30,000 and \$50,000; 94% were employed. Women averaged 27.9 years of age ($SD = 4.9$) and 15.4 years of education ($SD = 4.5$), with modal incomes between \$30,000 and \$50,000; 84% were employed. Most participants were Caucasian (55%), with 21% Latino, 11% Asian, 5% African American, and 8% “other.” At the screening interview, 80% of these couples were engaged to be married; they participated an average of 6.8 months ($SD = 4.0$) prior to their weddings. The remaining

couples had been married an average of 3.2 months ($SD = 2.7$) at the screening. At the time of screening, most couples (72%) had been cohabiting for an average of 2.6 years ($SD = 2.0$).

Forty-two couples (24%) had children, 18 of whom were from a previous relationship.

Procedure

Recruitment and screening. Recruitment has been described in detail previously (Rogge et al., 2002). Following IRB-approved procedures, one spouse from each couple was screened via a telephone interview to obtain informed consent and to assess interest, eligibility, demographics, and relationship satisfaction. Eligibility requirements were (a) both partners consented to participate, (b) both partners were fluent in English, (c) the couple was engaged to be married in the next year or married fewer than six months, (d) partners were starting first marriages, and (e) the couple was not distressed (by the interviewee's report). Distressed couples received appropriate referrals. Eligible couples received questionnaires (pre-treatment, T0) with consent forms in separate envelopes and written instructions to not share or discuss their responses. Couples completing T0 ($n = 183$) were no different from couples who did not ($n = 155$) on relationship satisfaction, couples counseling, presence of children at marriage, and proportion of Asian spouses. There were fewer couples with an African-American partner among couples who completed T0 (6%) compared to those who did not complete T0 (15%), $\chi^2(1) = 7.6, p < .01$.

After completing T0, couples were randomly assigned to CARE, PREP, RA, or a No Treatment control condition and were scheduled by telephone for the workshops. Six couples assigned to CARE or PREP with work or commute schedules that prohibited attendance at the weeknight sessions accepted our invitation to participate in the RA condition. Fifty-two couples received CARE, 45 received PREP, 33 received RA, and 44 were in the control group.

Sufficient follow-up data for the outcome variable (relationship satisfaction) was not available for the control group to support moderation analyses; those participants were excluded from these analyses, leaving the 130 couples in the three treatment conditions as focus of this study.

Treatment Conditions

PREP. A psychoeducational program designed to strengthen relationships by teaching couples communication skills, PREP includes 16 lectures on a range of topics (e.g., problem-solving, time outs, and commitment; Markman et al., 1994); a forgiveness module was excluded to minimize overlap with CARE. Couples completed numerous exercises designed to practice PREP skills. Central to PREP is the Speaker-Listener technique, which slows the pace of communication by ensuring that one spouse's point of view is accurately reflected before moving on to discuss the partner's point of view; in many of the exercises couples discussed various topics while using the speaker-listener technique. The developers of the PREP program personally trained three of the graduate students who delivered PREP in this study.

CARE. CARE aims to strengthen relationships by teaching couples supportive and empathic skills (Rogge et al., 2002). Based on Integrative Behavioral Couples Therapy (IBCT; Jacobson & Christensen, 1996), CARE includes 16 lectures covering a core set of acceptance-based skills. As with PREP, lectures were interspersed with exercises designed to help couples practice new skills. CARE emphasizes skills designed to enhance empathy, compassion, and acceptance. Building on IBCT, couples were encouraged to use the language of acceptance (e.g., focusing on understanding one's partner, making soft disclosures; reframing) when discussing relationship problems, individual problems, and relationship transgressions. Couples also learned how to join empathically to tackle problematic interaction patterns.

RA. Developed for this study, the five-session RA condition was designed to heighten

partners' awareness of their relationship and the importance of regular relationship maintenance. Rather than teach couples new skills, RA drew partners' attention to current behavior in their relationship and encouraged them to decide for themselves if their behavior was constructive or destructive. During an on-campus presentation, small groups of couples were informed about the importance of relationship awareness and maintenance, and they were introduced to the idea that regular every day events—particularly those captured in commercial films—could be used as prompts to accomplish these goals. Couples then watched a movie, *Two for the Road* (Donen, 1967), in which a couple revisits earlier scenes from their marriage and recounts the joys and difficulties they experienced. In separate rooms, each couple then followed instructions for 50-60 minute semi-structured discussions in which they addressed the themes of this film (including conflict, support, stress, and forgiveness) and how they could reflect on these themes in their own relationship. Coaches intervened minimally in the discussions and primarily focused couples on the task, encouraged partners to engage the questions thoughtfully, and answered questions. Couples then received a list of 47 movies with an intimate relationship as a major plot focus with instructions to watch one movie per week at home for the next month and to discuss the same set of open-ended questions following each movie. Couples completed and returned a questionnaire for each movie they watched; rental costs for movies were reimbursed.

Treatment Implementation

Treatment format. Groups of three to six couples completed CARE and PREP workshops in an initial 6-hour weekend session followed by three weekly 3-hour evening sessions, for a total of 15 hours over a span of one month. Groups of 10-15 couples completed RA workshops in a single on-campus 4-hour session and 4 weekly home sessions. RA participation was assessed by weekly telephone calls, and couples provided brief notes on the

movies and their semi-structured discussions that were returned weekly to the project in self-addressed, stamped envelopes. Doctoral students in clinical psychology with at least two years of clinical training led the workshops. Advanced undergraduate research assistants served as coaches for the CARE and PREP exercises. Coach training and supervision, treatment adherence and satisfaction with treatment are detailed elsewhere (Rogge et al., 2002).

Treatment dropout. Of the 130 couples, 27 attended fewer than 3 sessions, primarily because of time and travel constraints. Dropouts were evenly distributed across treatments; 8 couples withdrew from CARE, 10 from PREP, and 9 from RA ($\chi^2(2) = 1.8, ns$). Repeated measures ANOVAs with partners treated as a within-subject factor (and χ^2 analyses) indicated that withdrawing couples were very similar to completers. However, withdrawers had slightly lower levels of education ($M = 15.2$ years, $SD = 3.0$) compared to completers ($M = 16.4$ years, $SD = 3.1$), $F(1, 128) = 5.7, p < .02, \eta^2 = .04$ and withdrawers had more children ($M = 2.6, SD = 1.4$ among couples with children) than completers ($M = 1.7, SD = 0.6$), $F(1, 27) = 5.5, p < .03, \eta^2 = .17$. Following an intent-to-treat paradigm, these couples were retained in outcome analyses.

Attrition. Of the 130 couples, seven in CARE, eight in PREP, and three in RA provided no follow-up data; they were evenly distributed across conditions, $\chi^2(2) = 1.2, p < .55, \phi = .10$. Repeated measures ANOVAs with partners treated as a within subject factor and χ^2 analyses indicated that the couples who failed to provide follow up data were not significantly different from couples who provided follow up data on any measure.

Measurement

Participants completed the Marital Adjustment Test (Locke & Wallace, 1959) one month before treatment (T0) on the first day of intervention (T1), and 6, 12, 24, and 36 months following the end of treatment (T2-T5, respectively). Coefficient alpha ranged from .67 to .75

with a median of .71 for men and .70 for women. Moderators were assessed at T0. Sample items, psychometric data, and descriptive statistics for all moderator variables are shown in Table 1.1. Couples received \$25 for each assessment except for T1.

Analytic Plan

Analyses were conducted in Stata version 12.1 using the xtmixed procedure. To address the first research question of whether pre-treatment risk factors moderate treatment outcomes in general the data were fit with a three-level model in which repeated measurements over time were modeled at Level 1 (using a slope-intercept format and centering time at the start of treatment), individual partners (i.e., moderator variables) were modeled at Level 2, and dyads were modeled at Level 3. To address whether risk factors moderate differentially across treatment conditions, interaction terms for the three treatment conditions (with CARE coded as the reference group) were added to Level 3, with trajectories allowed to vary across treatment conditions. Intercepts were treated as random effects at Level 2 and slopes were treated as random effects at Level 3.

$$\text{Level 1} \quad \text{Relationship Satisfaction} = \beta_0 + \beta_1(\text{Time}) + E$$

$$\text{Level 2} \quad \beta_0 = \beta_{00} + \beta_{01}*(\text{Moderator}) + r_0$$

$$\beta_1 = \beta_{10} + \beta_{11}*(\text{Moderator})$$

$$\text{Level 3} \quad \beta_{00} = \beta_{000} + \beta_{001}*(\text{PREP}) + \beta_{002}*(\text{RA})$$

$$\beta_{01} = \beta_{010} + \beta_{011}*(\text{PREP}) + \beta_{012}*(\text{RA})$$

$$\beta_{10} = \beta_{100} + \beta_{101}*(\text{PREP}) + \beta_{102}*(\text{RA}) + U_{11}$$

$$\beta_{11} = \beta_{110} + \beta_{111}*(\text{PREP}) + \beta_{112}*(\text{RA}) + U_{12}$$

Results

Descriptive Statistics

Correlations for all moderator variables are presented in Table 1.2. The average

correlation between the individual and relational moderator variables was $r = .16$ for husbands and $r = .13$ for wives, indicating that these two types of moderators are relatively distinct. The average correlation among the individual moderators was $r = .14$ for husbands and $r = .12$ for wives. Correlations among relational moderators averaged $r = .36$ for husbands and $r = .35$ for wives; thus the relational moderators shared more variance than did the individual moderators.

Changes in Relationship Satisfaction

Relationship satisfaction declined over time (T0-T5 MAT scores for men: 119.4, 120.4, 118.0, 117.6, 105.4, 105.3, with *SDs* ranging from 19.0 to 20.4; T0-T5 MAT scores for women: 120.2, 119.6, 120.7, 121.2, 109.1, 106.6, with *SDs* ranging from 18.7 to 22.1). These declines occurred across all treatment conditions (Overall: $\beta = -5.4$, $p < .001$, CARE: $\beta = -6.2$, $p < .001$, PREP: $\beta = -5.1$, $p < .001$, RA: $\beta = -5.1$, $p < .001$) to comparable degrees (all $ps > .10$).

To determine whether changes in satisfaction differed as a function of risk, the individual and relational risk variables were tested as moderators of relationship satisfaction slopes, first with all three interventions combined and then with the interventions considered separately.¹

Associations Between Risk and Declines in Satisfaction: Effects Across Interventions

Individual Risk Factors as Moderators. Analysis of the eight individual risk factors, presented in the omnibus test column in Table 1.3, yielded one significant effect: Couples reporting higher levels of alcohol use declined more quickly in relationship satisfaction compared to couples reporting lower levels of alcohol use. Thus, high levels of alcohol use appear to restrict couples' ability to benefit from these relationship interventions (see Figure 1.1).

Relational Risk Factors as Moderators. Results for the eight relational risk factors, presented in the omnibus test column in Table 1.4, yielded two significant effects. In the first effect, risky couples—specifically, couples with lower levels of pre-treatment relationship

satisfaction— declined more slowly than couples who entered the study with higher levels of relationship satisfaction. The second relational effect operated in the opposite direction. When risk was marked by high levels of pre-treatment physical aggression, risky couples declined more rapidly in their satisfaction compared to couples with low pre-treatment levels of physical aggression (see Figure 1.1). In much the same way that alcohol use appears to constrain treatment benefits, so too does baseline relational aggression.

Associations Between Risk and Declines in Satisfaction: Effects Within Interventions

Individual Risk Factors as Moderators. We next considered whether associations between a given risk factor and declines in satisfaction differed within the three interventions to which couples were randomized.² With regard to the eight individual risk factors, race was the only variable that functioned differently in different treatment conditions; these results are shown in the treatment contrast column and the boxed column in Table 1.3. Specifically, white couples assigned to the CARE condition experienced slower declines in relationship satisfaction compared to non-white couples. Satisfaction slopes for couples in RA and PREP were not moderated by any of the individual risk factors.

Relational Risk Factors as Moderators. Four of eight relational risk factors moderated treatment outcomes differentially across the three interventions. In all four instances, higher-risk couples fared better than their lower-risk counterparts; the treatment contrast column and boxed columns in Table 1.4 provide details. Specifically, couples who were initially *lower* on four key indices of relationship functioning—satisfaction, effective communication, emotional support, and commitment—experienced slower declines in satisfaction than did couples with higher scores on these variables. One of these effects, for effective communication, occurred in the PREP group, indicating that couples receiving PREP experience slower declines in satisfaction

to the extent that their baseline communication is relatively ineffective. The remaining three effects occurred in the CARE condition, indicating that couples receiving CARE experience slower declines in satisfaction to the extent that their initial reports of satisfaction, emotional support, and commitment are relatively low.³ Figure 1.2 shows how commitment moderates effects within CARE, illustrating how highly committed couples in this group experience steep declines in satisfaction while less committed couples receiving the same intervention experience flatter declines; couples in PREP and RA, by comparison, decline at roughly the same rate regardless of initial commitment. Finally, all couples in the RA condition, regardless of their baseline score on any relational risk factor, declined to comparable degrees in satisfaction.

Pair-wise Comparisons of Simple Slopes: Effects Between Interventions

Results to this point address the extent to which couples' baseline variability in risk relates to change in satisfaction, across all interventions and within a particular intervention. Our final set of analyses makes explicit comparisons between interventions at specified levels of risk, testing the hypothesis that high-risk couples would experience better outcomes when assigned to a skill-based intervention (i.e., CARE or PREP) compared to couples assigned to the RA intervention, whereas low-risk couples would respond in similar ways across all three interventions. To test this prediction, the simple slopes within the five significant moderators were compared between each treatment condition; subscripts within the boxed results in Tables 1.3 and 1.4 indicate which comparisons are statistically reliable.

Race. Results for race, the single individual-level risk factor that moderated treatment outcomes, were not consistent with predictions. Although satisfaction slopes were comparable across all three interventions for white couples, non-white couples had significantly *faster* declines in satisfaction in CARE ($\beta = -7.5, p < .001$) compared to PREP ($\beta = -7.0, p < .001$; pair-

wise comparison coefficient = 3.0, $p = .003$) and compared to RA ($\beta = -7.0, p < .001$; pair-wise comparison coefficient = 2.7, $p = .006$).

Satisfaction. Couples at elevated risk on the basis of their pre-treatment levels of satisfaction had similar outcomes across the three treatment conditions, whereas couples with relatively high baseline levels of satisfaction (i.e., low risk) had different outcomes depending on which intervention they received. In the CARE condition, these couples declined 7.8 points in satisfaction, which was significantly more than low-risk couples in PREP ($\beta = -5.7, p < .001$; pair-wise comparison coefficient = 2.0, $p = .048$) and RA ($\beta = -4.9, p < .001$; pair-wise comparison coefficient = 2.8, $p = .004$).

Commitment. Results for commitment were similar to those obtained for satisfaction. Couples who were at high risk on pre-treatment commitment had equivalent outcomes across the three interventions, but couples at low risk on commitment declined in satisfaction faster if they received CARE ($\beta = -7.4, p < .001$) compared to RA ($\beta = -4.7, p < .001$; pair-wise comparison coefficient = 2.7, $p = .007$).

Communication. Communication yielded a different pattern of results, as couples at low risk on communication were, as predicted, similar in their outcomes across all three interventions. Couples with risky communication declined less steeply in relationship satisfaction if they received PREP ($\beta = -3.8, p < .001$) rather than CARE ($\beta = -7.0, p < .001$; pair-wise comparison coefficient = 3.2, $p = .004$); for these couples the predicted contrasts between either PREP and RA or CARE and RA were not significant.

Emotional Support. Finally, although pre-treatment emotional support was a significant moderator of outcomes, the pair-wise comparisons of simple slopes revealed no significant differences across treatments for low- and high-risk couples.

Discussion

Relationship education programs yield reliable but small effects on relationship outcomes, raising new questions about whether intervention effects might be stronger or weaker depending on the risk factors that people bring to their marriage. We aimed to address these questions by collecting data on individual and relational risk factors from 130 couples in their first marriages, randomizing those couples to receive one of three interventions, and collecting self-reports of relationship satisfaction for three years after treatment. Satisfaction declined on average, and to comparable degrees across intervention conditions. (See Rogge et al., 2013, for additional details.)

With regard to our four main hypotheses, we showed first that changes in satisfaction are indeed moderated by baseline risk factors, consistent with the views that (a) a sole focus on treatment main effects is likely to obscure meaningful variability in treatment response and that (b) there may be advantages to screening couples on the basis of risk prior to participation in relationship education programs. Second, and more specifically, relational risk factors were more likely than individual risk factors to differentiate couples' changes in satisfaction following intervention. Five of eight relational risk factors showed evidence of moderation—relationship satisfaction, effective communication, emotional support, commitment, and, in the omnibus test, physical aggression (see Table 1.4)—consistent with predictions and with findings from the couples' therapy literature (e.g., Baucom et al., 2009). Conversely, among the eight individual risk factors, only race and alcohol use showed evidence of moderation, and the effect for race appears to be due specifically to poor performance by non-white couples in the CARE condition (discussed below; see Table 1.3). The absence of moderator effects for the six remaining individual risk factors suggests that the effects of relationship education may generalize across a range of important sociodemographic and trait variables, including parental divorce, childhood

family discord, education, income, trait anger, and depressive symptoms. This study thus adds to a growing body of work suggesting that parental divorce status does not moderate treatment outcomes (Halford & Wilson, 2009; Markman et al., 2013; Van Widenfelt et al., 1996), while expanding this idea to underscore the relative importance of immediate, relationship-based factors over more distal influences as treatment moderators.

Drawing attention to the apparent effect of relational risk factors is important, yet it leaves open the critical question of whether it is low- or high-risk couples who are most likely to benefit from treatment. Prior studies conducted over shorter intervals than ours (Barton, Futris, & Bradley, 2012; Bodenmann et al., 2014; Schilling et al., 2003) led us to the third hypothesis that high-risk couples would benefit more from intervention than their low-risk counterparts. This prediction was partially correct. Contrary to prediction, better treatment outcomes were obtained with couples low in alcohol use and physical aggression (that is, with low-risk couples; see Table 1.3 and Figure 1.1). Consistent with prediction, better outcomes were obtained with couples low in baseline satisfaction (that is, high-risk couples; see Table 1.4). Both types of findings lend support to selected or secondary prevention strategies, while suggesting two distinct ways to prevent relationship distress: The former finding argues for the development of specialized interventions on focal or acute problems (such as alcohol use and aggressive outbursts) that are likely to undermine intervention effects and relationships, while the latter argues that couples relatively low in satisfaction are especially likely to benefit from interventions that are already commonly available. This provides an empirical basis for devoting intervention resources to couples with specific risk profiles, a position that is reinforced by evidence that couples who are highest in baseline satisfaction actually respond better in the low-intensity RA intervention than the more intensive multi-session skill-building provided by PREP

and CARE (see Table 1.4).

Finally, because the manner in which a given moderator operates can vary with the intervention program under consideration, we tested whether the association between a given risk factor and changes in satisfaction was different across interventions. Though all three interventions performed quite similarly across levels of risk for nearly all of the individual and relational moderators (see Tables 1.3 and 1.4), potentially important exceptions emerged. Specifically, non-white couples in the CARE group declined faster than white couples in the PREP and RA groups; couples reporting high levels of satisfaction and commitment who were assigned to the CARE group declined faster than couples in the RA group (see Figure 1.2); and couples reporting ineffective communication—that is, high-risk couples—experienced steeper slopes in the CARE condition than in the PREP condition. These findings demonstrate that there are meaningful differences in how couples respond even to different skill-based programs, and although the benefits attained by poor communicators in PREP are not surprising in light of this program's emphasis on teaching practical skills in communication and problem-solving, this finding suggests that it may prove fruitful to match interventions to specific skill deficits or domains of risk. Additional credence for this point comes from the finding that couples low in emotional support respond better to CARE than couples high in emotional support, as CARE prioritizes skill training in supportive interactions. Once again our findings highlight the value of selected or secondary prevention, as the least effective communicators receiving PREP declined less in satisfaction over the course of the study (slope = -3.8) than the most effective communicators (slope = -6.2; see Table 1.4).

Extending this point further, we see that the skill-based CARE intervention appeared to have an iatrogenic effect on low-risk couples compared to the RA intervention. Couples who

were at low risk on pre-treatment relationship satisfaction and commitment declined *more quickly* in satisfaction when they received CARE compared to RA. Echoing results of a 4-year study reported by Halford et al. (2001), this again supports a shift toward secondary intervention strategies, suggesting that couples who are already happy and secure in their relationship are better served by a self-guided, low-intensity intervention that allows them to use existing skills than by an intensive skill-building intervention that is designed to alter a behavioral repertoire that is already sustaining their partnership.

Interpretation of the present results should take into account the strengths of this study—assessment of a wide range of risk factors; an experimental design that includes randomization of couples to three theoretically distinct interventions; six assessments of satisfaction over three years—while recognizing important shortcomings. First, we relied exclusively on self-report data; observational data, though costly, might provide a different perspective on the key relational risk factors studied here. Second, the sampling procedures used here may have affected which variables emerged as moderators. Nearly half of the couples in this study were non-white, for example, and race moderated treatment outcomes. Broader sampling of populations with more risk, including couples with greater social, personal, and economic disadvantage, may reveal a different pattern of moderation. Third, our analysis of risk did not take into account possible actor and partner effects on relationship satisfaction, owing to a relatively small sample size and insufficient grounds for making predictions. Future studies are needed to disentangle contributions of husbands' and wives' risk factors to one another's outcomes, and the present findings suggest that substance use and aggression may be good starting points for such analyses. Finally, although our ability to detect effects is at least comparable to that of other university-based efficacy studies, we cannot rule out the possibility

that null findings (e.g., the relative absence of effects with individual risk factors) are due to a lack of power. All results, but particularly those within a single treatment condition where power was lowest, require replication before they can be held with confidence.

Given that several of our findings support continued pursuit of moderators of couples' educational interventions, our study implies that appropriate targeting of high-risk couples will require a better conceptualization of risk. We have highlighted a number of factors that appear to be markers of risk, and present results suggest that characterizing couples on the basis of interpersonal variables holds particular promise. Nevertheless, additional research is needed to understand how those risk factors interact, and how they combine to affect intervention outcomes, especially over time (see Halford & Bodenmann, 2013, for an extended discussion of mediating effects in couple education programs). For example, future studies could adopt methodology from the scale development literature to determine which risk factors combine to form the most predictive baseline risk index.

A further implication of our work is that meta-analyses and review papers that aggregate across couples and interventions are likely overlooking meaningful between-couple differences in response to treatments. To advance understanding of how relationship interventions are operating, empirical studies are needed that go beyond an examination of main effects to include a consideration of couple- and treatment-based moderators. A more complete articulation of the diverse forms of relational risk would enable selection of couples most in need of preventive services, and most likely to benefit from them. At the same time, development of comprehensive but efficient assessment packages would facilitate careful and systematic study of between-couple and between-study variability in risk.

By randomizing couples to three theoretically distinct active treatment conditions, we

were able to demonstrate that a given moderator does not operate uniformly across all interventions. Had this study only included PREP, for example, we could have reasonably concluded that self-reported communication is the only relational risk factor that moderates treatment outcomes. Instead, we demonstrated that additional factors (including satisfaction, emotional support, and commitment) moderate different treatments, and that matching level of risk to treatment may improve outcomes. At the same time, future studies will need to reconcile the viability of matching couples to interventions with our finding that effects of our low-intensity RA intervention were not moderated by any risk factors, while yielding effects on satisfaction that were indistinguishable from the CARE and PREP interventions. Additional studies are needed to replicate these findings, of course, yet the present findings allow us to argue that future studies will benefit from comparisons between different kinds of skill interventions, and between interventions with and without active skill-training elements.

We conclude by noting that, while we did detect important patterns in moderator effects, even under the best of conditions spouses nevertheless declined significantly and substantially in their judgments of relationship satisfaction. Greater appreciation of the assets and liabilities that couples bring to marriage will help to promote healthier relationships, yet the pronounced downward trends observed even for low-risk treated couples highlight the continuing need for new types of interventions that enable couples to exploit their strengths while circumventing the challenges that intimate partners routinely confront.

Table 1.1 Description and descriptive statistics of study variables

Construct	Items	Sample Item	Coding	Alpha		Mean (<i>SD</i>)	
				Husband	Wife	Husband	Wife
Individual Risk Factors							
Parental Divorce	1	“Are your parents divorced or separated?”	0 = <i>no</i> , 1 = <i>yes</i>	--	--	.40†	.40†
Family Discord	15	“I had a very unhappy childhood”	0 = <i>false</i> , 1 = <i>true</i>	.82	.83	6.0 (3.8)	6.9 (3.8)
Education	1	“How many years of education have you completed?”	By years; e.g., 12= <i>high school completed</i>	--	--	15.2 (3.8)	15.3 (4.2)
Race	1	“What is your racial identity?”	0 = <i>non-White</i> , 1 = <i>White</i>	--	--	.40†	.40†
Income	1	“What was your personal income last year, before taxes?”	0 = \$0 - \$9,999, 6 = \$50,000+	--	--	4.5 (1.5)	3.6 (1.5)
Alcohol Use	20	“How often has the quality of your work (at home, school, or on the job) suffered because of drinking?”	0 = <i>never</i> , 4 = <i>4 or more times in past year</i>	.81	.78	24.7 (6.5)	22.7 (4.8)
Trait Anger	38	“I tend to get angry more frequently than most people.”	1 = <i>totally false</i> , 5 = <i>totally true</i>	.87	.84	124.5 (17.6)	121.8 (15.0)
Depressive Symptoms	20	“I am so sad or unhappy that I can't stand it.”	Varies by item	.80	.81	5.6 (4.5)	7.0 (5.5)

Relational Risk Factors

Relationship Satisfaction	15	“Do you confide in your partner?”	Varies by item	.72	.70	119.4 (20.4)	120.2 (19.3)
Effective Communication	7	“Both members try to discuss the problem.”	1 = <i>very unlikely</i> , 9 = <i>very likely</i>	.81	.82	49.2 (11.2)	50.0 (11.0)
Hostile Conflict	15	“I yell or shout at my partner.”	1 = <i>never</i> , 5 = <i>usually</i>	.87	.91	29.4 (8.9)	32.5 (10.3)
Emotional Support	7	“Said he/she would feel the same way in my situation.”	1 = <i>once in past two weeks</i> , 7 = 7+ <i>times in past two weeks</i>	.84	.83	18.2 (13.6)	18.6 (13.2)
Relationship Empathy	12	“Before criticizing my partner, I try to imagine how I would feel if I were in his/her place.”	1 = <i>does not describe me well</i> , 5 = <i>describes me very well</i>	.82	.81	16.9 (5.9)	17.0 (5.6)
Commitment	12	“My marriage is clearly part of my future life plans.”	1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>	.77	.72	6.1 (0.6)	6.1 (0.7)
Physical Aggression	4	“Have you pushed, shoved, or slapped your partner?”	0 = <i>never</i> , 6 = <i>20 Times +</i>	.75	.63	4.7 (1.3)	4.4 (0.9)
Marital Problems	12	“Friends;” “Money management”	1 = <i>not a problem</i> , 11 = <i>major problem</i>	.81	.77	2.9 (1.4)	2.8 (1.3)

Note. Alcohol Use = Alcohol Use Inventory (Wanberg, Horn, & Foster, 1977), Trait Anger = Multidimensional Anger Inventory (Siegel, 1986), Depressive Symptoms = Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), Relationship Satisfaction = Marital Adjustment Test (Locke & Wallace, 1959), Effective Communication = Communication Patterns Questionnaire (Christensen & Sullaway, 1984), Hostile Conflict = Conflict subscale of the Marital Coping Inventory (Bowman, 1990), Physical Aggression = Conflict Tactics Scale-Revised (Strauss et al., 1996), Marital Problems = Marital Problem Inventory (Geiss & O’Leary, 1981), Emotional Support = Support in Intimate Relationships Rating Scale (Dehle, Larsen, & Landers, 2001). † indicates percentage of responses coded as 1 (for Parental Divorce 1 = yes; for Race 1 = white).

Table 1.2. Correlations among moderator variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Parental Divorce	.16*	.40**	.01	.06	-.04	.07	.07	.13	.02	-.02	-.06	-.03	-.02	-.02	.12	.01
2. Family Discord	.49**	.04	.11	-.14	-.22*	.09	-.23*	.21*	-.17	-.16	.06	-.01	-.20*	-.23*	.12	.20*
3. Education	-.02	-.01	.12	-.01	.17*	.01	-.01	-.02	-.09	-.06	-.05	-.04	-.05	.08	-.08	.04
4. Race	-.03	.02	.07	.57**	-.12	.21	.03	.09	.07	.08	-.06	.03	.14	.16	-.08	-.02
5. Income	-.22*	-.15	.26*	.04	.36**	-.19*	.13	-.28**	.09	.10	-.05	-.10	.05	-.08	-.17*	-.10
6. Alcohol Use	.03	.11	-.12	.14	-.05	.54**	-.11	.16	-.10	-.32**	.23*	.02	-.18*	-.01	.37**	.32**
7. Trait Anger	-.10	-.34**	-.04	-.07	.06	-.21*	.16*	-.32**	.21*	.28**	-.45**	-.09	.35**	.13	-.15	-.32**
8. Depressive Symptoms	.13	.38**	-.10	.02	-.13	.21*	-.55**	.10	-.27**	-.23*	.26*	.04	-.26**	-.14	.11	.37**
9. Relationship Satisfaction	-.02	-.04	-.01	.07	-.01	-.36**	.15*	-.19*	.53**	.69**	-.46**	.24*	.36**	.51**	-.35**	-.69**
10. Effective Communication	-.18*	-.18	.02	.17*	.13	-.48**	.25*	-.19*	.61**	.68**	-.66**	.26*	.50**	.27*	-.50**	-.69**
11. Hostile Conflict	.17*	.20*	.17*	-.06	.01	.37**	-.48**	.27*	-.37**	-.59**	.43**	-.11	-.57**	-.19*	.26*	.54**
12. Emotional Support	.13	.22*	.11	-.03	-.13	.02	-.02	.09	.27**	.22*	-.18*	.20*	.11	.25*	-.03	-.09
13. Relationship Empathy	-.02	-.11	.02	.07	.01	-.25*	.33**	-.20*	.27**	.45**	-.54**	.23*	.05	.25*	-.15	-.42**
14. Commitment	.08	-.09	-.01	-.02	-.22*	-.16	.21*	-.10	.50**	.33**	-.19*	.22*	.21*	.34**	-.04	-.37**
15. Physical Aggression	.05	-.01	.03	.02	-.10	.22*	-.17*	.21*	-.25*	-.38**	.42**	.01	-.22*	-.19*	.44**	.47**
16. Marital Problems	.07	.20*	.01	-.08	-.03	.43**	-.42**	.41*	-.68**	-.65**	.57**	-.23*	-.33**	-.46**	.30**	.50**

Note. Husband correlations are presented above the diagonal; wife correlations are presented below the diagonal; correlations between husbands and wives are presented on the diagonal. $N = 130$ husbands and 130 wives. * $p < .05$, ** $p < .001$

Table 1.3. Omnibus tests, treatment contrasts and simple slopes of individual risk moderators for each treatment group

Moderator	Omnibus Test	Treatment Contrast	CARE	PREP	RA
Parental Divorce		2.3			
Interaction term	0.1		-0.1	0.1	-1.5
No: Simple Slopes	-5.4		-6.2	-3.9	-4.5
Yes: Simple Slopes	-5.5		-6.2	-4.9	-4.7
Childhood Family Discord		5.0			
Interaction term	0.6		-0.1	0.3*	-0.1
Low: Simple Slopes	-5.7		-5.8	-6.1	-4.9
Mean: Simple Slopes	-5.6		-6.2	-5.0	-5.1
High: Simple Slopes	-5.4		-6.6	-3.9	-5.3
Education		0.2			
Interaction term	-0.9		-0.1	-0.1	-0.1
Low: Simple Slopes	-5.1		-5.7	-4.8	-4.4
Mean: Simple Slopes	-5.4		-6.1	-5.0	-5.0
High: Simple Slopes	-5.6		-6.6	-5.2	-5.6
Race		8.6*			
Interaction term	0.1		2.1*	-1.3	-1.5
Non-White: Simple Slopes	-5.5		-7.5 ₂₃	-4.3 ₁	-4.3 ₁
White: Simple Slopes	-5.4		-5.4	-5.6	-5.8
Income		2.6			
Interaction term	1.6		0.7*	-0.1	0.4
Low: Simple Slopes	-5.9		-7.3	-4.9	-5.7
Mean: Simple Slopes	-5.4		-6.3	-5.0	-5.1
High: Simple Slopes	-5.0		-5.2	-5.0	-4.6
Alcohol Use		0.3			
Interaction term	-2.8**		-0.1	-0.2*	-0.1
Low: Simple Slopes	-4.7		-5.4	-5.5	-4.7
Mean: Simple Slopes	-5.6		-6.2	-9.1	-5.2
High: Simple Slopes	-6.4		-7.0	-9.1	-5.7
Trait Anger		1.0			
Interaction term	-0.2		-0.1	-0.1	0.1
Low: Simple Slopes	-5.4		-5.9	-5.0	-5.6
Mean: Simple Slopes	-5.4		-6.2	-5.1	-5.1
High: Simple Slopes	-5.5		-6.5	-5.1	-4.7
Depressive Symptoms		1.5			
Interaction term	1.3		0.1	0.1	-0.1
Low: Simple Slopes	-5.8		-6.8	-5.7	-4.9
Mean: Simple Slopes	-5.4		-6.2	-5.1	-5.2
High: Simple Slopes	-5.0		-5.5	-4.5	-5.6

Note. Low = -1 SD, High = +1 SD. All simple slopes are significantly different from zero. For Parental Divorce and Race the Omnibus Test statistic is χ^2 , for all others it is z. For Treatment Contrast the test statistic is χ^2 . Boxes indicate significant moderators within significant treatment contrasts. Subscripts indicate significant simple slopes pair-wise comparisons; 1 = CARE, 2 = PREP, 3 = RA. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1.4. Omnibus tests, treatment contrasts and simple slopes of relational risk moderators for each treatment group

Moderator	Omnibus Test	Treatment Contrast	CARE	PREP	RA
Relationship Satisfaction		6.2*			
Interaction term	-2.7**		-0.1**	-0.1	0.1
Low: Simple Slopes	-4.5		-4.1	-4.2	-5.4
Mean: Simple Slopes	-5.3		-5.9	-5.0	-5.2
High: Simple Slopes	-6.1		-7.8 ₂₃	-5.7 ₁	-4.9 ₁
Effective Communication		6.6*			
Interaction term	0.1		0.1	-0.1*	0.1
Low: Simple Slopes	-5.5		-7.0 ₂	-3.8 ₁	-5.8
Mean: Simple Slopes	-5.5		-6.3	-5.0	-5.2
High: Simple Slopes	-5.5		-5.7	-6.2	-4.7
Hostile Conflict		0.2			
Interaction term	-1.6		-0.1	-0.1	-0.1
Low: Simple Slopes	-4.7		-5.2	-4.4	-4.7
Mean: Simple Slopes	-5.2		-5.6	-5.1	-5.2
High: Simple Slopes	-5.7		-6.0	-5.8	-5.7
Emotional Support		6.8*			
Interaction term	-1.8		-0.1**	-0.1	0.1
Low: Simple Slopes	-4.7		-4.5	-4.3	-6.1
Mean: Simple Slopes	-4.8		-4.7	-4.5	-5.9
High: Simple Slopes	-4.9		-4.9	-4.6	-5.8
Relationship Empathy		2.9			
Interaction term	-1.7		-0.2*	-0.1	0.1
Low: Simple Slopes	-4.9		-5.2	-4.4	-5.4
Mean: Simple Slopes	-5.4		-6.2	-5.0	-5.1
High: Simple Slopes	-5.9		-7.1	-5.7	-4.8
Commitment		6.5*			
Interaction term	-1.9		-1.9*	-1.6	0.7
Low: Simple Slopes	-5.0		-5.0	-4.1	-5.6
Mean: Simple Slopes	-5.5		-6.2	-5.1	-5.2
High: Simple Slopes	-6.1		-7.4 ₃	-6.1	-4.7 ₁
Physical Aggression		3.2			
Interaction term	-3.3***		-1.3***	-0.3	-0.9
Low: Simple Slopes	-5.0		-4.6	-4.8	-4.2
Mean: Simple Slopes	-5.5		-6.2	-5.1	-5.3
High: Simple Slopes	-6.4		-7.8	-5.4	-6.4
Marital Problems		0.2			
Interaction term	-0.6		-0.2	-0.1	-0.3
Low: Simple Slopes	-5.1		-5.8	-4.8	-4.6
Mean: Simple Slopes	-5.3		-6.0	-5.0	-5.1
High: Simple Slopes	-5.5		-6.2	-5.2	-5.5

Note. Low = -1 SD, High = +1 SD. All simple slopes are significantly different from zero. For Omnibus Test the test statistic is z . For Treatment Contrast the test statistic is χ^2 . Boxes indicate significant moderators within significant treatment contrasts. Subscripts indicate significant simple slopes pair-wise comparisons; 1 = CARE, 2 = PREP, 3 = RA. * $p < .05$, ** $p < .01$, *** $p < .001$.

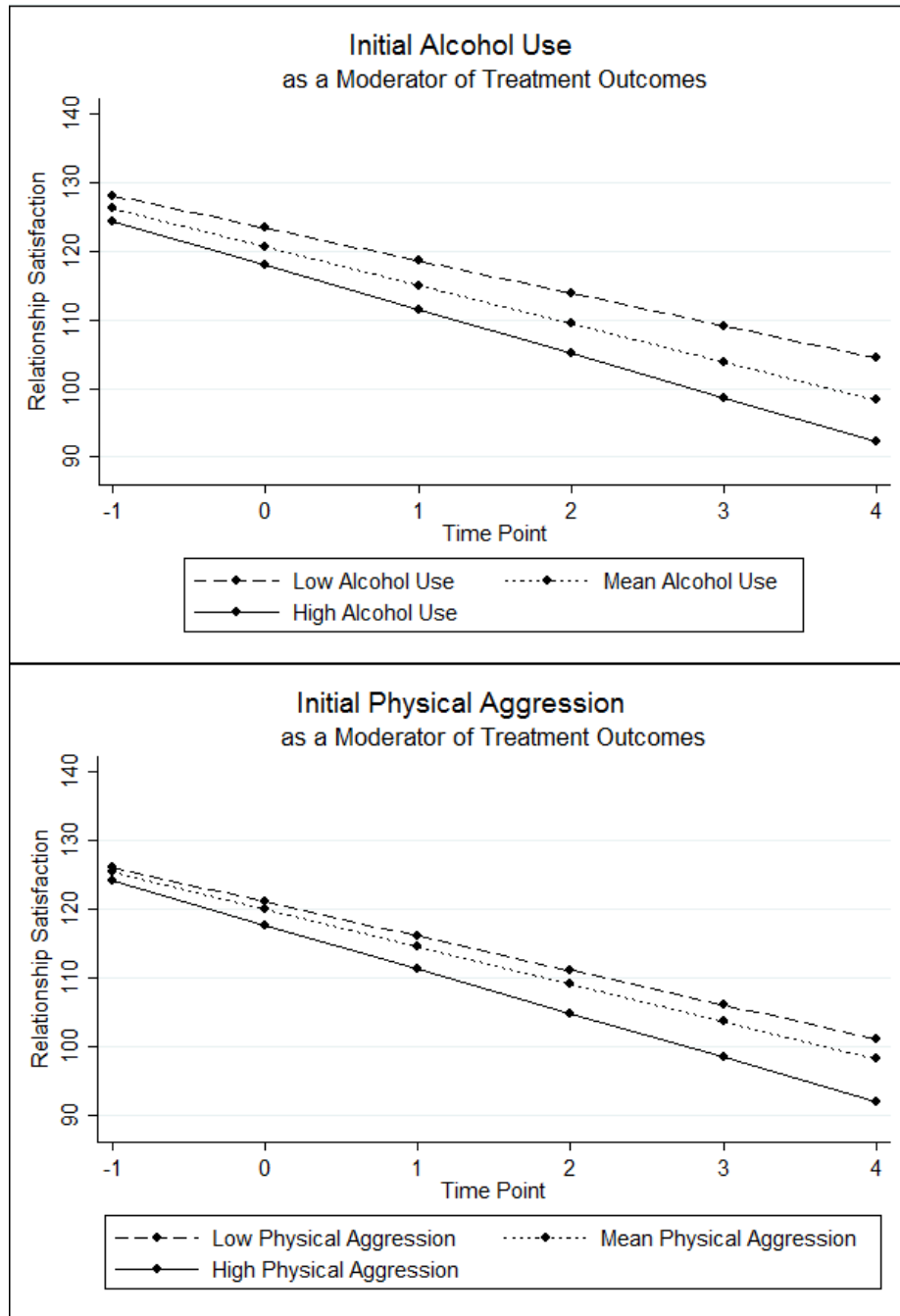


Figure 1.1. Two examples of moderation when couples are collapsed across treatments. In the top panel, couples reporting higher levels of alcohol use decline in relationship satisfaction more quickly post-treatment than couples with lower levels of alcohol use. In the bottom panel, couples reporting higher levels of physical aggression decline more quickly in satisfaction following treatment than couples with lower levels of physical aggression.

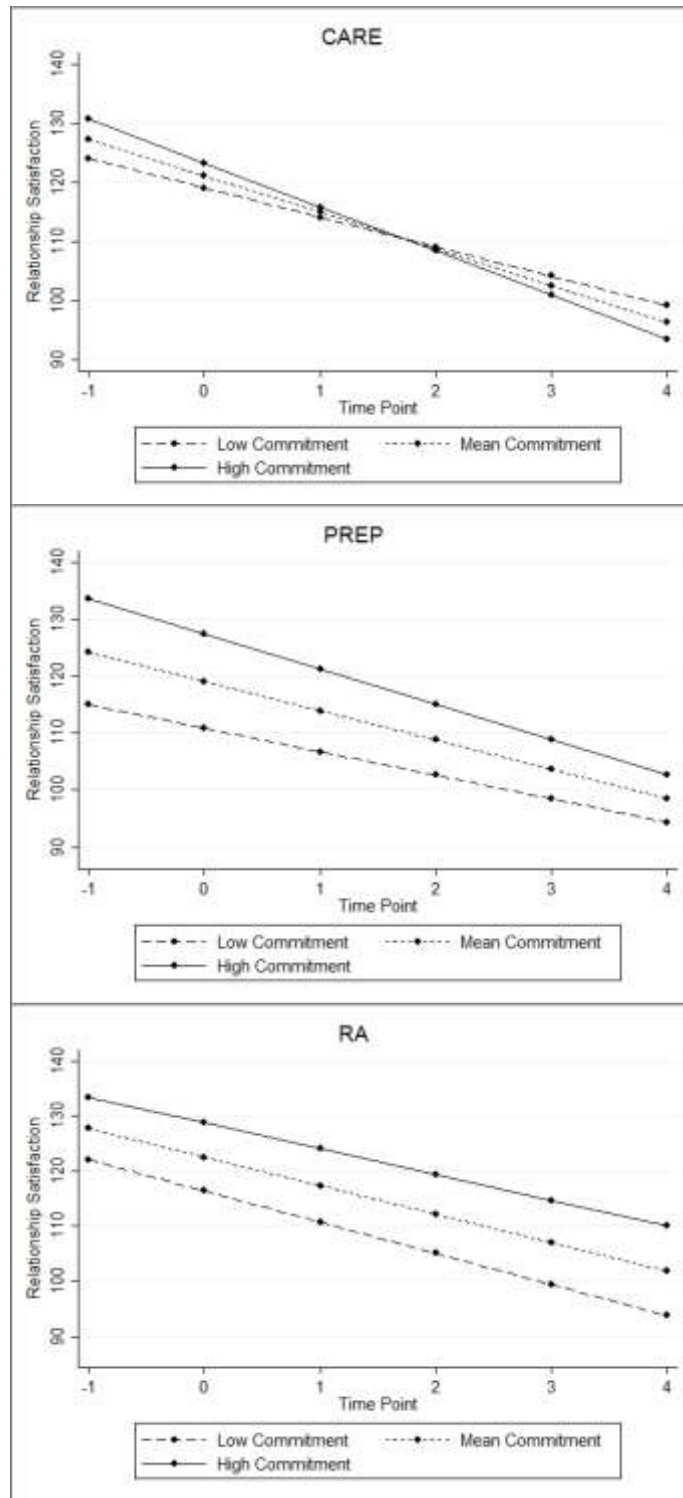


Figure 1.2. An example of moderation within a single treatment. In CARE (top), couples reporting high levels of commitment decline more rapidly in satisfaction than all other couples receiving CARE. In PREP (middle) and RA (bottom), couples reporting different levels of pre-treatment commitment all decline in satisfaction at the same rate. Note that all slopes differ from zero and that only slopes in the CARE condition differ significantly from each other.

Footnotes

¹Aggregate indices of normalized individual and relational risk variables were also evaluated. Although the 8 individual risk variables did not form a reliable index for women or men (alpha < .26), the 8 relational risk variables did (alpha = .84 for women, .83 for men). This index did not moderate outcomes when all interventions were combined, when interventions were separated and compared, or when different levels of risk were compared within interventions.

²Because analysis of all 16 risk factors in combination with all 3 treatments may lead to spurious findings, we adopted the more conservative approach of interpreting significant within intervention differences only when the overall treatment contrasts, shown in Tables 3 and 4, were significant. Whereas the omnibus tests summarized above capture associations between a specific risk factor and changes in satisfaction over time, these treatment contrasts test whether the intervention conditions produced differences in these associations between risk and outcome.

³As Table 2 indicates, these are not independent effects; at T0, correlations among satisfaction, emotional support, and commitment range from .22 to .51, with a median of .26, $p < .05$.

Study 2

Effects of relationship education on couple communication and satisfaction: A randomized controlled trial with low income couples

Roughly half of all first marriages end in separation or divorce, elevating rates of economic, physical, and psychological difficulties for all family members and creating additional emotional and academic challenges for any children involved (e.g., Amato, 2001; Kiecolt-Glaser & Newton, 2001; Troxel & Matthews, 2004). The many interventions undertaken to promote healthy relationships commonly target the behaviors partners exchange when discussing important issues and demands in their relationship, and meta-analytic summaries demonstrate beneficial but small effects of these preventive interventions on relationship quality 6- to 12-months following treatment (Hawkins, Blanchard, Baldwin, & Fawcett, 2008). Anticipating the next generation of preventive interventions for couples, scholars have argued for extending follow-up intervals to test the durability of these effects; for sampling in diverse, low-income populations so that beneficial effects with couples at elevated risk for relationship distress might be tested; and, most notably, for examining specific interpersonal processes to identify mediators of treatment effects (e.g., Bradbury & Lavner, 2012; Halford, 2011; Halford & Bodenmann, 2013). The present study aims to address these gaps by testing whether observed communication behavior mediates the 30-month effects of relationship education among couples living with low incomes, and whether these effects are different for couples with lower versus higher levels of demographic risk within this population.

Low-income couples merit special consideration in efforts to prevent distress and dissolution, as they experience lower levels of relationship satisfaction (Karney, Garvan, & Thomas, 2003) and markedly higher divorce rates (Bramlett & Mosher, 2002) compared to

couples with higher incomes, while also reporting fewer positive interactions (Fein, 2004) and more problems with issues such as finances, drinking and drug use, infidelity, and friends (Trail & Karney, 2012). Recognizing this need, the Administration for Children and Families (a division of the U.S. Department of Health and Human Services) launched the Healthy Marriage Initiative in 2001, funding projects to help couples gain greater access to marriage education services and thereby acquire the skills and knowledge believed necessary for sustaining a healthy marriage. The Supporting Healthy Marriage (SHM) Project, the largest experimental study of married couples funded under this initiative, implemented and tested programs designed to help economically disadvantaged, married parents strengthen their relationship, with the ultimate goal of helping them create a healthy home environment for their children. Given that relationship distress is disproportionately high in this segment of the population, and that 97% of all preventive intervention studies involve white, middle-class samples (Hawkins et al., 2008), SHM promises to fill a critical gap in our understanding of disadvantaged families.

Relationship skills education, offered to couples in small-group settings, formed the central component of the SHM program. Interventions were adapted from cognitive-behavioral programs developed for use with middle-class couples, with specific modules emphasizing effective communication, conflict management, and social support. Assessments conducted 12 and 30 months after randomization demonstrated that couples assigned to the intervention condition reported higher levels of relationship satisfaction than couples in the control group ($d = .13$ at both time points; Hsueh et al., 2012; Lundquist et al., 2014). Although these effects were small, they suggest that relationship education may hold promise for strengthening the marriages of low-income couples, and they raise new questions about how these effects arise and for whom they exist. Clarifying how preventive interventions improve relationships is of theoretical as

well as practical significance: if interventions produce effects that are not mediated by communication, then the value of communication skills training would be diminished and other intervention targets might be pursued; if intervention effects are mediated by communication, then interventions might be expanded to improve those domains of communication where effects are strongest. Using data from the SHM project to distinguish between these possibilities, the present analyses are the first to address the central hypothesis that SHM interventions exert their effect on relationship satisfaction through couple communication.

A long tradition of basic research supports the focus on effective communication in educational interventions, and emerging evidence indicates that the unique challenges faced by low-income couples, including financial strain and living in unsafe neighborhoods, covary with less observed warmth and more observed negativity (Cutrona et al., 2003; Williamson, Karney, & Bradbury, 2013). This pattern of communication foreshadows adverse relationship outcomes (e.g., Johnson et al., 2005) and is therefore a central target of relationship interventions. Yet because the interactions of low-income couples may be, at least in part, a reflection of the circumstances in which they live, changing communication as a means of improving relationship quality may be an especially difficult task. In this regard, delivering interventions to couples living with low incomes epitomizes a ‘high risk, high reward’ undertaking, promising to strengthen intimate bonds in the face of circumstances that can conspire to undermine them.

The larger literature on preventive interventions with couples provides mixed evidence on whether interventions reliably improve couple communication. In one of the largest and most rigorous studies conducted to date, 217 couples either received treatment as usual or 12 hours of intensive communication skills training, in either a university setting or in a religious setting; 12 months later their interactions were coded for positive and negative communication (Laurenceau

et al., 2004). Husbands in the two active intervention conditions displayed more positive behaviors than husbands in the control group, but this expected pattern did not extend to wives' positive behavior or to the negative behaviors of either partner. More generally, a meta-analysis of 13 experimental studies and 26 quasi-experimental studies with post-assessment and follow-up data on communication skills demonstrated intervention effects at post-assessment, which fell to nonsignificance at the follow-up assessment (Hawkins et al., 2008), suggesting immediate gains in communication performance that were not sustained. Thus, while preventive interventions for couples are nearly uniform in their aim to enhance dyadic interaction processes, the inconsistency of study results highlights the need for additional work that clarifies the extent to which specific domains of couple communication can be enhanced by relationship education.

Even if interventions are shown to produce reliable and lasting effects on communication, these intervention-to-behavior effects are of limited practical importance unless improvements in communication translate into better relationship outcomes. Few intervention studies address this important behavior-to-satisfaction link, and existing work is equivocal, sometimes indicating that increases in positive communication are detrimental for relationships (Schilling et al., 2003), that decreases in negative communication do not benefit relationships (Stanley et al., 2007), and even that increases in negative communication can be beneficial for relationships (Bodenmann, Bradbury, & Pihet, 2009). Thus, despite widely-held theoretical assumptions that learning the skills associated with healthy relationships “will lead to immediate enhancement of couple functioning and prevent future relationship problems ... in general [these assumptions] have not been put to the empirical test” (Wadsworth & Markman, 2012, p. 99). Because the effect of improved communication on relationship satisfaction is theoretically important but largely unproven, testing this link in the context of a mediational framework is a key aim of the current

study.

Evaluation of communication as a possible mediator of treatment effects is complicated by the possibility that relationship education may not work equally well for all couples. For example, couples who are at higher risk for relationship distress and dissolution, based on their pre-treatment demographics (Amato, 2014; Halford, Sanders, & Behrens, 2001) and relationship characteristics (Williamson et al., 2015), experience better outcomes compared to lower-risk couples. This pattern of results is noteworthy, as it suggests that couples who are most in need of preventive intervention may also be those most likely to benefit from that intervention. Studies of risky populations are now needed to replicate this basic finding while also disentangling two possible ways in which treatment status might interact with sociodemographic risk to predict treatment outcome. That is, interventions might yield stronger results for higher-risk couples because these couples improve more in their communication behavior (i.e., risk might moderate intervention-to-communication effects, in the sense that higher-risk couples might have more to learn from the intervention), or because otherwise comparable improvements in communication might have a greater impact on satisfaction for these couples as compared to lower-risk couples (i.e., risk might moderate communication-to-satisfaction effects, in the sense that higher-risk couples might show a greater tendency to align their subsequent judgments of satisfaction with the quality of their improved communication). In the first scenario, higher-risk couples would show greater improvements in communication after receiving the intervention, compared to lower-risk couples, and this higher level of skill acquisition should yield greater improvements in relationship satisfaction. In the second scenario, higher-risk and lower-risk couples would improve their communication to the same degree, but these improvements in communication would lead to more improvement in satisfaction among higher-risk than lower-risk couples. To

build on the promising findings that higher-risk couples appear to benefit more from relationship education, the present study aims to determine whether this effect arises primarily because pre-treatment risk moderates the intervention-to-communication pathway or the communication-to-satisfaction pathway.

In sum, the current study uses data from 1,034 low-income couples who participated in the larger SHM program evaluation to test whether (a) observed communication behavior measured 12 months following randomization mediates the effect of relationship education on relationship satisfaction 30 months following randomization and (b) whether the paths in this mediational configuration are themselves moderated by pre-treatment indices of sociodemographic risk. We hypothesize that, compared to control couples, intervention couples will be less negative, more positive, and more effective in their communication at 12 months, which will in turn be associated with higher levels of relationship satisfaction at 30 months. While we leave open the question of whether pretreatment risk will exert effects specifically on intervention-to-communication and/or communication-to-satisfaction paths, prior research with disadvantaged couples (e.g., Amato, 2014) does allow us to make the more general prediction that when such effects do arise they will be stronger for higher-risk than lower-risk couples.

Method

Participants

The present sample of 1,034 couples is a subset of the 6,298 couples who were recruited between February 2007 and December 2009 as part of the Supporting Healthy Marriage (SHM) Project, which was sponsored by the Office of Planning, Research and Evaluation in the Administration for Children and Families, Department of Health and Human Services. Eighty-three percent of these couples were married when they enrolled in the program, for an average of 8.4 years ($SD = 6.9$). Unmarried couples had been together for an average of 5.2 years ($SD =$

4.7). All couples had children or were expecting a child; couples had two children on average. Men's mean age was 34.3 ($SD = 8.7$) and women's mean age was 31.8 ($SD = 7.5$). Seventy four percent of men had a high school diploma and 76% of women had a high school diploma. The modal income bracket was \$35,000 to \$39,999, with 40% of couples' incomes at or below 100% of federal poverty level (FPL) and 41% between 100% and 200% of FPL. Ten percent of couples were African American, 21% were Caucasian, 48% were Hispanic, and 21% were of another race or the spouses differed in racial backgrounds.

Procedure

Recruitment and screening. The SHM study was implemented at eight sites in seven different states. Each site was responsible for recruiting and enrolling approximately 800 couples over the course of two years. Sites were allowed to develop their own recruitment techniques, based upon the resources and needs of their programs, using four main strategies: cultivating partnerships with local social service, government, community, and faith-based organizations for outreach and referrals, including programs within the host agency; finding opportunities to talk directly with couples about the program, often through referral partners or at community events; launching targeted mass-media campaigns; and encouraging currently enrolled couples to refer family and friends.

Across sites, couples were eligible to participate if: both spouses agreed to participate; couples reported an annual income below \$50,000 (or \$60,000 in some sites); both partners were 18 or older; couples were expectant parents or parents of a child under 18 who lived in their home; both partners understood the language in which SHM services were offered (English, or in some locations, Spanish); partners gave no indication of relationship violence; and couples reported being married⁵. Some sites also had more stringent criteria (e.g., enrolling only

expectant parents; see Miller Gaubert et al., 2010 for details). Couples were randomized either to the treatment condition, in which they would participate in the SHM program (detailed below), or to the control condition, in which couples were unable to participate in any SHM activities but could still access other services in their communities

Treatment condition. The SHM program consisted of three parts: curriculum-based relationship and marriage education skills workshops in small groups, supplemental activities, and family support services. Local program sites (e.g., community-based multiservice organizations, large local institutions, and stand-alone for-profit organizations; see Miller Gaubert et al., 2010, for details) implemented each of these three components in a different manner depending upon their resources and existing programming.

Local sites were allowed to choose curricula for their relationship skills workshops that fit the SHM program model and reflected the needs and characteristics of the couples to be served. All of the selected curricula focused on common themes such as understanding marriage, commitment, trust, conflict management, promoting positive connections and intimacy, strengthening support networks, coping with external circumstances, and parenting (for information on how curricula were selected and adapted, see Knox & Fein, 2009). *Within Our Reach* (adapted from the Prevention and Relationship Enhancement Program, or PREP; Stanley & Markman, 2008) was used in three sites. *Loving Couples, Loving Children* (adapted from Bringing Baby Home) was used in two sites (Loving Couples Loving Children, Inc., 2009). The *Becoming Parents Program* (based on PREP and adapted from an earlier version of Becoming Parents; Jordan, Stanley & Markman, 1999) was used in two sites. *For Our Future, For Our Family* (adapted from Practical Application of Intimate Relationship Skills, or PAIRS; Gordon, DeMaria, Haggerty, & Hayes, 2007) was used in one site. These four curricula offer 24 – 30

hours of programming, which local sites were free to deliver however they chose. For example, some sites chose to start participants with a full-day Saturday workshop, followed by weekly sessions, while others delivered the curriculum in a series of 9 – 15 weekly sessions.

In addition to the relationship skills workshops, supplemental activities offered couples opportunities to attend educational events (e.g., seminars on financial management and parenting), participate in social events (e.g., date nights, family outings), practice skills from the workshops, and build networks with other couples in the program. After the workshops ended, these supplemental activities were the primary service component and were offered until a couple's one-year anniversary of program enrollment.

Finally, couples were paired with a family support staff member who had three goals: to maintain contact with couples to facilitate their participation in the other two program components; to help couples reduce family stressors and address family needs by linking them to community resources; and to reinforce key workshop themes in personal meetings with couples.

Using the full sample of SHM couples, analyses comparing all local program sites on relationship satisfaction and communication assessed 12 and 30 months after intervention revealed no reliable differences or consistent patterns (Lundquist et al., 2014, p. 43); in the present analyses data were therefore collapsed across program sites.

Among the 1,034 couples in the present study, couples enrolled in the intervention group participated in 20.5 (SD = 9) hours or 72.7% (SD = 30.4%) of group curricula on average. This is more than the typical participant in relationship education, who receives 12 hours on average according to a recent meta-analysis (Hawkins, Stanley, Blanchard, & Albright, 2012). Following an intent-to-treat analysis paradigm, all couples assigned to the treatment condition were retained in the analyses, regardless of the extent of the services they actually received.

Follow-up assessments. A follow-up telephone interview was conducted separately with husbands and wives about 12 months after couples enrolled in the program. At this time a subsample of 1,222 intervention couples and 1,227 control couples were randomly selected to participate in an observational data collection paradigm. An equal number of couples (306) in each of the local sites were identified and invited to participate in the videotaped observations; couples with infants and with preadolescent and adolescent children were oversampled. A total of 1,511 couples (749 from the intervention group and 762 from the control group) agreed to participate in the observational data collection, and 1,397 provided usable data. Participants reported on their relationship satisfaction in a second follow-up telephone interview, conducted separately with husbands and wives, about 30 months after couples enrolled in SHM. Of the 1,397 couples who provided observational data at the 12-month follow-up, 1,034 also completed the 30 month follow-up; the current analyses use these 1,034 couples.

Behavioral Observation. Couples were visited in their homes by trained interviewers who conducted three 7-minute videotaped discussions with the couple, for a total behavioral sample of 21 minutes. Discussions took place in a location of the couples' choosing (usually a dining room or living room) that would enable them to talk privately and without interruption. Partners were seated at a ninety-degree angle to allow them to interact normally while remaining visible to the single camera positioned in front of them. The first two discussions used procedures designed to assess social support behaviors (Pasch & Bradbury, 1998). One randomly chosen spouse was asked to "talk about something you would like to change about yourself" while the partner was instructed to "be involved in the discussion and respond in whatever way you wish." Spouses were instructed to avoid selecting or discussing topics that were sources of tension or difficulty within the relationship. After a short break, a second

discussion was held that was identical to the first discussion, with the roles reversed. Common topics included losing weight, making a career change, and dealing with stress. For the third interaction, which was designed to assess problem-solving behaviors, partners were asked to identify a topic of disagreement in their relationship and to then devote 7 minutes working toward a mutually satisfying resolution of that topic. Common topics included management of money, chores, communication, and spending time together as a couple.

Videotapes were scored by 29 trained coders using the Iowa Family Interaction Rating Scales (IFIRS; Melby et al., 1998). Coders – 11 of whom were native Spanish speakers – coded only in their native language. Most of the discussions (68%) took place in English, 30% took place in Spanish, and 2% were in a combination of English and Spanish. Coders participated in 10 hours of training per week for 3 months and were required to pass written and viewing tests at an 80% accuracy level before coding tapes. The criterion scores used to judge coder accuracy were determined by expert coders at the Institute for Social and Behavioral Research at Iowa State University, where the IFIRS was developed. During the coding process, coders also participated in two hours of continuing training each week, which consisted of a variety of structured activities (e.g., coding a tape as a group and watching examples of specific codes) designed to minimize drift and to ensure continued fidelity to the IFIRS codes.

Coders viewed each of the interaction tasks three or four times using the Noldus Observer XT coding software, using the built-in capabilities to note behaviors of both spouses. When they had completed viewing an interaction, coders used their recorded notations to tabulate the frequency and intensity of each type of behavior and used this information to assign a score for each spouse for each code, using criteria from the IFIRS coding manual (Melby et al., 1998).

To assess reliability, 20% of the videos were randomly assigned to be coded by 2 coders

chosen at random from the entire pool of coders. The scores of the two coders were compared, and any scores that were discrepant by more than one point were resolved by both coders working together. Thus the final set of scores used in analyses for the reliability tapes included scores that matched across the two coders during their initial individual coding (when codes were off by one point, the score from the randomly designated “primary coder” was used); discrepant scores were replaced by the scores from the second joint coding. Factor analysis was used to reduce the IFIRS codes to three scales, and the resulting factors closely match those obtained using the IFIRS with another large study of diverse couples sampled from low-income neighborhoods (Williamson et al., 2011).

Measures

Communication. An *effective* communication scale was created by averaging an individual’s scores on the assertiveness, listener responsiveness, communication, effective process, disruptive process (reverse coded), denial (reverse coded), and avoidant codes (reverse coded). An effectiveness score was calculated for each of the three discussion tasks, which were then averaged to form final effectiveness scores. Coefficient α was .78 for husbands and .79 for wives. Inter-rater reliability, as measured by the intraclass correlation coefficient (ICC) was .67 for husbands and .69 for wives. A *negative* communication scale was created by averaging an individual’s scores on the angry coercion, contempt, hostility, and verbal attack codes. A negativity score was calculated for each of the three discussion tasks, which were then averaged to form final negativity scores. Coefficient α was .77 for husbands and .80 for wives. ICC was .65 for husbands and .71 for wives. Finally, a *positivity* scale was created by averaging an individual’s scores on the warmth/support, humor/laugh, positive mood, group enjoyment, and physical affection codes. A positivity score was calculated for each of the three discussion tasks,

which were then averaged to form final positivity scores. Coefficient α was .68 for husbands and .70 for wives. ICC was .68 for husbands and .68 for wives.

Relationship Satisfaction. Participants' overall satisfaction with their relationship was assessed at baseline and 30-months with an eight-item scale. Sample items include: "I can count on my spouse to be there for me" and "We enjoy doing ordinary day-to-day things together" and were coded on a 4-point scale, with 1 = *strongly disagree* and 4 = *strongly agree*. One item, "How happy are you with your marriage?" was coded on a 7-point scale, with 1 = *completely unhappy* and 7 = *completely happy*. Items were summed to form the scale score for each participant; 35 was the maximum possible score. Coefficient α was .85 for husbands and .87 for wives at baseline and .80 for husbands and .84 for wives at 30-months.

Risk Index. Sociodemographic risk was assessed using a 10-item index based closely on a risk index developed in a similar sample by Amato (2014). Couples were given 1 point for the presence of each of the following items; 1) either partner was under the age of 23, 2) husband had less than a high school education, 3) wife had less than a high school education, 4) husband was unemployed, 5) wife was unemployed, 6) couple's income was below the poverty line, 7) husband was receiving public assistance, 8) wife was receiving public assistance, 9) husband reported no one to help in an emergency, and 10) wife reported no one to help in an emergency. Actual values on the risk index ranged from 1 to 9 (out of 10 possible), with a mean of 4.4 and a median of 4. Couples with scores of 4 or below were classified as lower-risk and couples with scores above 4 were classified as higher-risk.

Evaluation of Missing Data

Comparison of the 1,034 couples retained for analysis with the larger SHM sample of 6,298 couples indicated that subsample couples were older (husbands' $d = .24$, wives' $d = .26$),

married for a longer period ($d = .24$), and more likely to have children ($d = .19$). Models in which these variables were controlled failed to yield interpretable results, but bivariate correlations between these variables and all variables in our primary models were weak (range = $|.01$ to $.15|$, median $r = |.07|$). Similarly small effects suggested that subsample couples were less likely to be below the federal poverty level ($d = .08$) but *more* likely to be Hispanic ($d = .12$); there were no differences in education, the risk index, the proportion of couples who were black, or the proportion of couples who were white. Couples in the subsample were also slightly more satisfied at baseline than those in the SHM sample (husbands' $d = .16$, wives' $d = .13$).

Among the full set of couples who provided observational data at 12 months, comparison of the 1,034 with 30-month satisfaction data and the 363 who failed to provide 30-month satisfaction data yielded similar differences, for age (husbands' $d = .19$, wives' $d = .14$), years of marriage ($d = .25$), number of children ($d = .09$), and baseline satisfaction (husbands' $d = .22$, wives' $d = .24$). The subsample providing 30-month data had slightly lower scores on the risk index ($d = .19$) and were less likely to be below the federal poverty level ($d = .29$), but were *more* likely to be Hispanic ($d = .12$); there were no differences in education, or proportions of white and black couples.

Although these effects are generally small in magnitude, there is a consistent pattern for the sample of 1,034 couples to be older, have more children, and be married longer than the full SHM sample and the observed subsample not providing 30-month satisfaction data. Nevertheless, these variables do not correlate substantially with baseline satisfaction or behavioral data. These 1,034 couples are also more satisfied than the larger SHM sample and the observed sample without 30-month satisfaction, thus limiting generalizability to those samples; therefore, as we note below, baseline satisfaction is controlled in our main models.

Analytic Plan

Analyses were conducted in SAS version 9.4, using the CALIS procedure to fit latent variable structural equations models (SEM) and obtain maximum likelihood estimates of model coefficients. SEM was used because (a) it allows for the creation of latent variables using multiple measured variables as indicators, which accounts for the measurement error in each of the observed variables, thereby yielding more accurate regression coefficients, and (b) because it can account for the interdependence between spouses that is inherent in dyadic data.

Receipt of the intervention was modeled as a dichotomous observed variable. Because of the interdependence in communication behavior, each communication variable was modeled as a couple-level latent factor underlying husbands' and wives' individual scores, with the path to the wives' individual-level construct from each of these latent factors fixed at one to resolve scale indeterminacy. Error terms of the three communication constructs were allowed to covary within the same respondent. Finally, relationship satisfaction was modeled as two couple-level latent factors (baseline and 30-months) underlying husbands' and wives' individual scores on relationship satisfaction. Error terms of relationship satisfaction were allowed to covary between baseline and 30-months within spouses (i.e., a covariation path between husband baseline and 30-month satisfaction and a covariation path between wife baseline and 30-month satisfaction). Controlling for baseline levels of satisfaction allows for us to test whether the intervention and communication are associated with changes in relationship satisfaction over time.

Results

Equivalence of Treatment and Control Conditions

As shown in Table 2.1, couples in the treatment and control conditions were equivalent on ten of eleven sociodemographic variables. The only characteristic on which couples in the treatment and control conditions differed was percent of African American couples, with 8.3% in

the intervention and 11.1% in the control condition ($\chi^2(1) = 4.52, p = .033$). This difference was deemed negligible, however, as the associated effect size was small ($d = .05$), and as overall SHM effects did not vary systematically by race or ethnicity (Lundquist et al., 2014, p. 45). Average relationship satisfaction scores were between 26.3 and 27 across husbands and wives, and intervention and control groups (out of a possible score of 35) with SDs ranging from 5.1 to 5.8, indicating that couples had room for improvement in relationship functioning.

Comparison of Lower- and Higher-Risk Groups

As shown in Table 2.2, the lower-risk and higher-risk groups differed on all ten variables included in the risk index, as expected. Notably, the lower-risk group still had the presence of some risk factors, including an unemployment rate of 13% among husbands, and nearly half of couples receiving public assistance (husbands = 39%, wives = 45%). The higher-risk group, however, had a very high level of risk, with a 39% unemployment rate among husbands and nearly all couples receiving public assistance (husbands = 89%, wives = 91%).

Descriptive Statistics and Bivariate Correlations

As shown in Table 2.3, the main study variables correlated in expected directions. Husbands' and wives' relationship satisfaction scores correlated at $r = .45$ (baseline) and $r = .50$ (30-months), both $p < .001$; correlations between the observed communication variables ranged from $r = .55$ to $r = .82$, with all $p < .001$. Among husbands, correlations between communication variables ranged from $r = .16$ to $r = .48$, with all $p < .001$. Among wives, correlations between communication variables ranged from $r = .17$ to $r = .52$, with all $p < .001$. Baseline and 30-month satisfaction scores covaried reliably with communication codes in all instances ($r = .09$ to $r = .26$, all $p < .01$), lending support to the validity of the behavioral samples.

Risk Index as a Moderator

We first tested whether the model was moderated by risk and should therefore be examined separately for the two risk groups. The model described above was fit to the two risk groups, with all parameters allowed to vary across the two groups. This model fit very well; $\chi^2(44) = 51.35, p = .21, SRMR = .022, RMSEA = .018, CFI = .998$. Next a model was fit with the two risk groups constrained to be equal; $\chi^2(88) = 127.58, p = .004, SRMR = .058, RMSEA = .029, CFI = .989$. A chi-square difference test indicated that constraining the groups to be equal significantly degraded the fit of the model; $\chi^2(44) = 76.23, p = .002$. This indicates that the full model does not operate the same way in the lower- and higher-risk groups, and therefore the results of these two groups should be considered separately, to determine which elements of the model differ between the groups.

Lower-risk Group

Prior to adding mediator variables to the model for lower-risk couples, the direct effect of the intervention on relationship satisfaction was tested. The direct effect was significant ($\beta = .08, p = .04$), indicating that lower-risk couples who received the intervention had higher levels of relationship satisfaction at 30 months compared to couples in the control condition.

Figure 2.2 presents the tested structural equation model, with standardized path coefficients. All loadings for the indicators of latent constructs (not shown) were statistically significant at $p < .001$ and were at least moderate in magnitude (ranging from .56 to .93). Baseline relationship satisfaction was associated with communication and 30-month satisfaction in the expected directions (effectiveness, $\beta = .30, p < .001$; negativity, $\beta = -.24, p < .001$; positivity, $\beta = .42, p < .001$; 30-month relationship satisfaction, $\beta = .64, p < .001$).

As shown by the path coefficients *below* each path in the model presented in Figure 2.2, the intervention was not associated with observed effectiveness ($\beta = .01, p = .79$), negativity ($\beta =$

.02, $p = .74$), or positivity ($\beta = .05$, $p = .24$) at 12 months. Observed communication was also not associated with changes in relationship satisfaction: effectiveness ($\beta = -.04$, $p = .62$), negativity ($\beta = -.15$, $p = .06$), and positivity ($\beta = .01$, $p = .97$).

After adding the three communication variables to the model, the direct effect of intervention on relationship satisfaction remained significant ($\beta = .09$, $p = .047$).

Higher-risk Group

Prior to adding mediator variables to the model for higher-risk couples, the direct effect of the intervention on relationship satisfaction was tested. The direct effect was significant ($\beta = .14$, $p = .006$), indicating that higher-risk couples who received the intervention had higher levels of relationship satisfaction at 30 months than couples in the control condition.

Figure 2.2 presents the tested structural equation model, with standardized path coefficients. All loadings for the indicators of latent constructs (not shown) were statistically significant at $p < .001$ and were at least moderate in magnitude (ranging from .51 to .95). Baseline relationship satisfaction was significantly associated with communication and 30-month satisfaction in the expected directions (effectiveness, $\beta = .25$, $p < .001$; negativity, $\beta = -.25$, $p < .001$; positivity, $\beta = .32$, $p < .001$; 30-month relationship satisfaction, $\beta = .67$, $p < .001$).

As shown by the path coefficients *above* each path in the model presented in Figure 2.2, the intervention was associated with higher levels of observed effectiveness ($\beta = .14$, $p = .011$) and lower levels of observed negativity ($\beta = -.13$, $p = .015$) at 12 months, but was not associated with observed positivity ($\beta = .01$, $p = .99$). Observed communication was not associated with change in relationship satisfaction from baseline to 30-months: effectiveness ($\beta = -.19$, $p = .08$), negativity ($\beta = -.15$, $p = .11$), and positivity ($\beta = .08$, $p = .24$).

After adding the three communication variables to the model, the direct effect of

intervention on relationship satisfaction remained significant ($\beta = .16, p = .003$).⁴

Discussion

Although strong and enduring relationships are known to promote the health and well-being of adults and their children, these benefits remain out of reach for many couples, particularly those living with low incomes (e.g., Bramlett & Mosher, 2002). As relationship distress and dissolution can compromise the welfare of children and perpetuate the cycle of poverty (e.g., Amato, 2001), strengthening and stabilizing relationships has emerged as a goal for policy-makers, raising critical questions about the most effective strategies for assisting couples living with socioeconomic disadvantage. In an attempt to build upon findings obtained with communication-based interventions implemented primarily with white, middle-class couples, the present study used a subsample of couples from the larger SHM Project to determine whether 30-month intervention effects reported previously (Lundquist et al., 2014) were mediated by positive and negative communication behaviors, assessed via direct observation 12 months after treatment, and whether intervention-to-communication and communication-to-behavior paths in this mediated model were themselves moderated by pre-treatment indices of sociodemographic risk. The 1,034 couples were racially diverse, had room to improve in their baseline relationship satisfaction scores, and reported modal household incomes between \$35,000 and \$40,000.

The present findings add new information to our understanding of the effects that relationship education programs produce and the conditions under which those effects arise. First, this study demonstrates that communication-based interventions delivered to couples living with low-incomes can improve relationship satisfaction (for lower-risk and for higher-risk couples) and observed communication (for higher-risk couples only). As the higher-risk couples in this sample were experiencing substantial economic and social challenges—66% were living in poverty, 90% were receiving public assistance, and 80% reported they had no one to turn to

for help in an emergency (see Table 2.2)—these results hold promise for the view that relationship-focused interventions can strengthen seriously disadvantaged couples and families. Where we might have expected that couples with more resources might have been better positioned to improve their communication following intervention, reliable intervention-to-communication effects were evident only among the riskier couples in the SHM sample. One possible explanation for this result is that higher-risk couples had poorer communication initially compared to their lower-risk counterparts (cf. Williamson et al., 2013), leaving higher-risk couples with more room for improvement in their communication. Thus, some deficiencies in couple communication may not be an impediment to improvement and may instead facilitate such improvement. Notable too is the finding that higher-risk couples improved in observed negativity and effectiveness, but not in positivity. This may reflect program content, in that the behavioral, rule-based curricula evaluated here place relatively heavy emphasis on effective down-regulation of negative affect (e.g., taking time-outs; using ‘I’ statements to reduce negative reciprocation; solving conflicts constructively). While the importance of behavioral change in these domains should not be diminished, interventions prioritizing prosocial behavior, humor, and affection may hold greater potential for improving couples’ positive behavioral repertoires.

Second, although interventions did yield improvements in relationship satisfaction across levels of pre-treatment risk, these effects were not mediated by improvements in communication. Even among higher-risk couples, for whom behavioral effects were evident, communication and change in satisfaction were unrelated (see Figure 2.1, right side). These results are surprising as they run counter to prediction and are at odds with the broader premise of social learning theory that improvements in relationship satisfaction typically necessitate shifting couples away from mutually punitive, coercive exchanges. Importantly, bivariate correlations between observed

communication at 12 months and relationship satisfaction at 30 months were significant and in the expected directions (Table 2.3), indicating that the observational codes were capturing meaningful interpersonal processes. Our finding that reliable intervention-to-satisfaction effects are not mediated by communication suggests that intervention couples are basing their judgments of relationship satisfaction on factors other than the processes typically observed in structured interaction tasks, possibly including a renewed sense of togetherness in the relationship, a feeling that daily stresses and strains are shared with and understood by the partner, or a greater sense of cooperation in parenting or in other domains that confront low-income couples (e.g., discrimination, financial problems; Trail & Karney, 2012). Given that treated couples did improve in their judgments of relationship satisfaction, greater specification of mediating pathways that extend beyond traditional problem-solving and social support tasks could identify new targets in interventions for couples living with low incomes.

Interpretation of these findings is tempered by a few important considerations. Most notably, the no-treatment control group employed in this study fails to control for placebo effects; the mere act of participating together in an intervention may account for at least some of the variance in the effects reported here. Active control groups are rare in the relationship education literature, yet a recent randomized controlled trial reported by Rogge et al. (2013) indicates that a 1-session relationship awareness intervention with couples produces effects on divorce rates and relationship satisfaction scores that are indistinguishable from those obtained with the Prevention and Relationship Enhancement Program; this program formed the basis for the intervention delivered in five sites in the current study, highlighting the need for caution in interpreting the present findings and the need for future studies with active controls. Second, the current study used the subsample of participants from the SHM program who provided data at all

three time points. This reduced subsample was consistently older, more established, and more satisfied in their relationships than couples who did not provide complete data, thus limiting generalizability of our findings. Recognition that couple characteristics affect participation rates, perhaps more so than demographic risk indicators, could help inform retention efforts in future studies of this sort. More critically, missing data analyses indicated that intervention effects on effective communication fell to marginally significant among higher-risk couples in the full observational sample (see Footnote 3), highlighting the possibility that intervention effects on couple behavior are limited to negative forms of communication. Additionally, the interrater reliability for the observational behavioral codes was modest (.65 - .71), indicating that these results should be interpreted with caution, and should be replicated with other coding systems. Finally, although couples in the intervention condition reported higher levels of 30-month relationship satisfaction than couples in the control group, we cannot conclude that adverse outcomes were prevented in substantial numbers. To the extent that the average couple in the control group remained in the satisfied range of relationship functioning, claims that the intervention prevented relationship distress are unwarranted. Instead, the present findings are consistent with the assertion that the interventions studied here appear to have produced small effects on satisfaction over 30 months relative to a no-treatment control condition in a sample of established couples.

Several implications follow from this study. First, the fact that only the higher-risk couples saw improvements in communication, and that these changes did not lead to improvements in relationship satisfaction, casts doubt on the theoretical and practical emphasis on changing overt and observable interaction behaviors as a viable strategy for strengthening relationships. These findings, which corroborate prior difficulties in intensive efforts to change

couple communication (e.g., Laurenceau et al., 2004), raise the possibility that acceptance rather than change of partner behavior (which has emerged as a viable approach in couples' therapy; see Christensen et al., 2010) could be adapted for use in relationship education interventions, particularly among lower-risk couples, who saw no improvements in communication.

Second, the interpersonal dynamics and life circumstances of low-income couples are only beginning to be understood, yet two independent studies using the same coding system as that employed here demonstrate that variability in either observed anger/hostility (Williamson et al., 2013) or observed warmth/support (Cutrona et al., 2003) correlates with subjective and census-based estimates of stress and strain in couples' lives. In the current shift toward investigating and promoting the well-being of couples living with low incomes, expanding causal models to focus intently on income-related burdens (e.g., job instability, chronic stress of poverty, discrimination, poor health care, lack of educational opportunities for children) may produce key insights into how improvements in relationships can be instigated and sustained. At the same time, policy-oriented studies undertaken to ease these burdens for large segments of the population (e.g., by improving housing mobility to reduce racial segregation; e.g., Ludwig et al., 2012) could expand their reach by assessing intervention effects on couple and family outcomes.

A final implication of the present study is that observational analysis of couple interactions, as either an outcome or as a mediator of treatment, should be undertaken with caution. Although the theoretical gains derived from our nonsignificant communication-to-satisfaction results are incalculable, particularly when coupled with the high degree of power available to detect intervention effects, the practical costs associated with collecting and coding these data cannot be ignored. While we remain convinced that close analysis of couple interaction data is essential for understanding the complex pathways that connects personal and

environmental risk factors to eventual distress and dissolution years later, the absence of intervention-to-communication effects (for low-risk couples) and the absence of communication-to-satisfaction effects (for all couples) in the present study indicates that communication does not routinely change following intervention and that measureable changes in satisfaction are possible in the absence of program-related changes in communication.

Table 2.1. Equivalence of groups at baseline

	Intervention	Control	Contrast	Effect Size
Number of couples	519	515		
Age	32.8 (7.5)	33.3 (7.8)	$t(1) = -1.06$	.07
High School Diploma	51.4%	49.8%	$\chi^2(1) = 0.49$	.02
Household Income Below 200% FPL	80.6%	80.6%	$\chi^2(1) = 0.01$	-.01
Caucasian	21.3%	20.8%	$\chi^2(1) = 0.08$	.01
Hispanic	49.3%	46.1%	$\chi^2(1) = 2.13$	.03
African American	8.3%	11.1%	$\chi^2(1) = 4.52^*$	-.05
Other Race/Ethnicity	20.8%	22.0%	$\chi^2(1) = 0.45$	-.01
Married	81.6%	84.4%	$\chi^2(1) = 2.17$	-.04
Years in Marriage or Partnership	7.3 (6.2)	7.8 (6.9)	$t(1) = -1.08$	.08
Number of Children	2.2 (1.4)	2.2 (1.4)	$t(1) = 0.71$	.01
Husband Relationship Satisfaction	27.0 (5.1)	26.7 (5.3)	$t(1) = -0.94$	.06
Wife Relationship Satisfaction	26.3 (5.7)	26.8 (5.8)	$t(1) = 1.37$	.09

Note. $N = 1,034$ couples. Effect Size = Cohen's d for t-tests and phi coefficients for chi-squared analyses.

* $p < .05$.

Table 2.2. Descriptive statistics and comparison of lower- and higher-risk groups

	Lower-Risk	Higher-Risk	Contrast	Effect Size
Number of couples	531	503		
Either spouse under age 23	9%	20%	$\chi^2(1) = 24.8^{***}$	.16
Husband no high school diploma	9%	44%	$\chi^2(1) = 159.1^{***}$	.39
Wife no high school diploma	8%	42%	$\chi^2(1) = 167.2^{***}$	.40
Husband unemployed	13%	39%	$\chi^2(1) = 77.8^{***}$	.29
Wife unemployed	36%	76%	$\chi^2(1) = 143.3^{***}$	.40
Couple income under poverty line	14%	66%	$\chi^2(1) = 282.3^{***}$	.53
Husband on public assistance	39%	89%	$\chi^2(1) = 280.8^{***}$	.52
Wife on public assistance	45%	91%	$\chi^2(1) = 256.8^{***}$	.50
Husband reports no one to help in emergency	56%	82%	$\chi^2(1) = 83.7^{***}$	.29
Wife reports no one to help in emergency	47%	78%	$\chi^2(1) = 108.9^{***}$	.33
Husband baseline relationship satisfaction	27.0 (5.2)	26.7 (5.8)	$t(1) = 1.1$	.05
Wife baseline relationship satisfaction	26.7 (5.7)	26.4 (5.8)	$t(1) = 1.0$	.05
Husband 30-month relationship satisfaction	30.2 (3.9)	30.5 (3.3)	$t(1) = -.957$	.06
Wife 30-month relationship satisfaction	29.8 (4.4)	29.5 (4.4)	$t(1) = .826$	.05

Note. $N = 1,034$ couples. Effect Size = Cohen's d for t-tests and phi coefficients for chi-squared analyses.

*** $p < .001$

Table 2.3. Correlations and descriptive statistics for all variables in model.

	1	2	3	4	5	Mean	SD
1) Effectiveness	.55***	-.52***	.39***	.13***	.09**	5.8	0.8
2) Negativity	-.48***	.58***	-.17***	-.10**	-.16***	1.4	0.6
3) Positivity	.38***	-.16***	.82***	.26***	.19***	2.0	0.7
4) Baseline Satisfaction	.16***	-.19***	.18***	.45***	.43***	26.5	5.7
5) 30-month Satisfaction	.12***	-.16***	.15***	.43***	.50***	29.7	4.4
Mean	5.6	1.2	2.0	26.9	30.4		
SD	0.8	0.4	0.7	5.2	3.6		

Note. $N = 1,034$ wives and 1,034 husbands. Results for wives are above the diagonal, and results for husbands are below the diagonal. Correlations between wives' and husbands' scores are on the diagonal, in bold.

* $p < .05$, ** $p < .01$, *** $p < .001$.

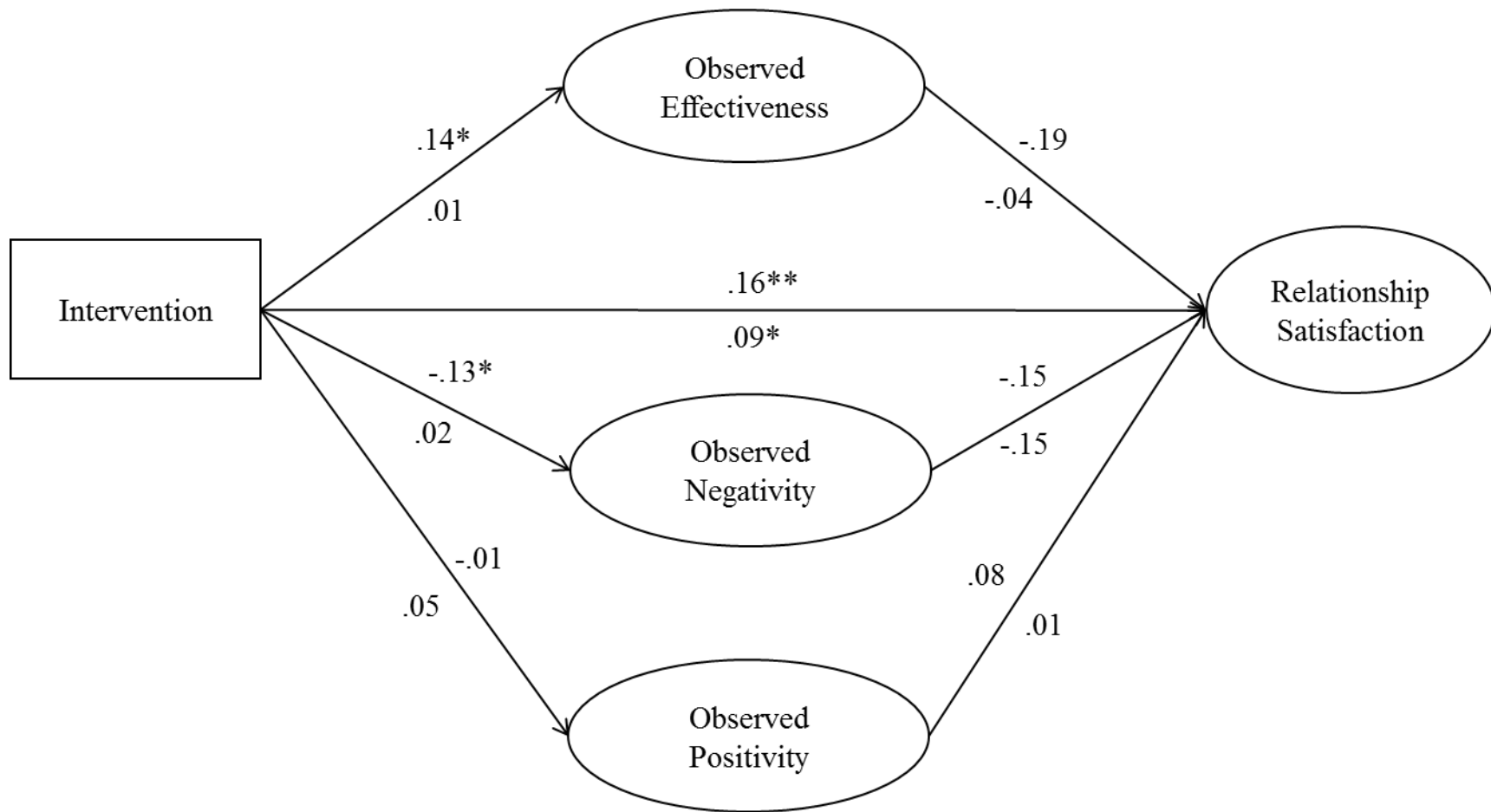


Figure 2.1. Structural equation model testing communication behavior as a mediator of intervention effects on relationship satisfaction in lower-risk and higher-risk groups.

Note. Standardized factor loadings are presented. Results for the higher-risk group are presented *above* the paths; results for the lower-risk group are presented *below* the paths. Baseline relationship satisfaction and indicator variables of latent factors are not shown.

$N = 1,034$ couples, $\chi^2(44) = 51.35, p = .21, CFI = .99, SRMR = .02, RMSEA = .02. *p < .05, **p < .01.$

Footnotes

¹Although couples were required to be married at the time of enrollment, proof of marriage was not requested. Couples were asked to report their marital status at the 12-month assessment, where it was discovered that 81% of all SHM couples, and 83% of couples in the present analyses, were married at the time of enrollment (Miller Gaubert et al., 2012).

²Although the average couple received more than 70% of the intervention, we also sought to clarify whether intervention effects would be strengthened when the 13% of couples who received less than 25% and the 21% of couples who received less than 50% were removed. This was not the case, as the results presented here remained unchanged, for higher- and lower-risk couples receiving > 25% and > 50% of the intervention.

³As noted in the Method section, 363 couples provided behavioral data at 12 months but did not provide satisfaction data at 30 months. These couples were slightly less effective and more negative as communicators than our 1,034 couples (median $d = .15$) but no less positive (median $d = .08$). To evaluate whether this loss of data influenced our findings, we re-ran only the intervention-to-communication portion of our models, for all lower- and higher-risk couples who provided behavioral data at 12 months ($N = 1,397$). Results for five of the six paths remained unchanged; the path for effectiveness changed slightly to the point where it was only marginally significant for higher-risk couples ($p < .06$).

⁴As noted in the Method section, codes extracted from the problem-solving and social support tasks were averaged to create the communication variables used in the model. To test whether the results differed when codes from social support and problem-solving tasks were considered separately, we re-ran the model for the two types of discussion tasks. Of the 14 paths, three differences emerged. Among lower-risk couples, negativity was significantly associated with lower satisfaction only in the problem-solving task. Among higher-risk couples, the intervention

was significantly associated with decreased negativity, and effectiveness was significantly associated with decreased satisfaction only in the social support model. However, none of these paths were significantly different from each other in pair-wise comparisons across models (all p s $> .5$). The main conclusions therefore remain the same across all three models: the intervention to satisfaction path was stronger for higher-risk than lower-risk couples, the intervention affected communication only among higher-risk couples, and communication did not mediate the effect of the intervention on satisfaction.

⁵Support for this point comes from the 12-month observational data collected from untreated control couples in this study. Specifically, compared to untreated couples with lower scores on the pretreatment risk index, untreated couples with higher risk scores were reliably less positive, less effective, and more negative in their communication (with t ranging from $|2.37$ to $6.69|$ and p ranging from $< .018$ to $< .001$).

⁶Observed positivity and negativity were correlated at $r = -.16$ for husbands and $r = -.17$ for wives (see Table 2.3), suggesting some independence in these aspects of couples' behavioral interactions.

Study 3

Education and job-based interventions for unmarried couples living with low incomes:

Benefit or burden?

The percentage of children born to unmarried parents has increased sharply over the last half century, from 5% of births in 1960 to 41% of births in 2013 (Child Trends, 2015). Although approximately 82% of unwed parents are romantically involved at the time of birth and express a strong desire to marry, only 15% do so by the time their child is 5 years old (McLanahan, 2009a). Many of these couples live in poverty when their child is born and their children, in turn, are more likely than poor children of married parents to encounter a host of cognitive, emotional, and social problems, and to live in poverty as adults (Amato, 2005; McLanahan, 2009a). Stabilizing these partnerships is a central element in government-sponsored efforts to improve the outcomes of children born to unmarried parents, and towards this end more than \$600 million has been invested in programs designed to encourage couples to consider longer-term commitments (Manning, Brown, Payne, & Wu, 2014). Unfortunately, large-scale randomized controlled tests of these relationship-focused programs have proven to be ineffective for increasing marriage rates and relationship stability (Wood, Moore, Clarkwest, & Killewald, 2014; see Cowan & Cowan, 2014 for a discussion of other outcomes), highlighting instead the need to target couples' economic capacities directly in order to promote family stability (Johnson, 2012).

Stabilizing vulnerable families by targeting their financial prospects finds broad support in prominent psychological models of contextual influences on development and social relationships (e.g., Belsky, 1984; Bronfenbrenner, 1986; Conger & Elder, 1994; Karney & Bradbury, 1995) and in associated empirical findings. For example, among those transitioning to parenthood, unmarried couples report less formal education, lower incomes, and higher

unemployment rates than married couples (McLanahan, 2009b), and they identify financial instability as their biggest obstacle to marriage (Gibson-Davis, Edin, & McLanahan, 2005; Edin, 2000). Removing this obstacle with education, job training, and job placement interventions does indeed alter trajectories of family formation, as enhanced financial standing enhances earnings and asset accrual of low-income individuals and, in turn, increases marriage rates (see Schneider, 2015, for a review). Though promising, the immediate relevance of this evidence for stabilizing poor families remains uncertain: because individuals are the unit of analysis in these prior studies, we can only conclude that improved earning potential increases the chances that an individual will marry *any* partner. Left unanswered is the critical question of whether it is possible to improve the financial prospects of unmarried new parents *as a unit* and, in turn, provide their child with a more stable family setting. The present study addresses this question, with a specific focus on (a) whether education-based and employment-based interventions increase marriage rates among unmarried new parents living with low incomes and on (b) the economic and relational factors that might mediate any such associations.

Though it is theoretically and empirically plausible that economic interventions will yield benefits for couples and families, mounting evidence from psychological science points to a compelling alternative possibility. Virtually all aspects of human cognition have built-in limitations, of course (e.g., Baddeley, 1992; Luck & Vogel, 1997), and environmental stress further reduces these capacities (McEwen, 2012). To the extent that economic deprivation compromises cognitive processes, judgment, and decision-making, interventions that demand effort and adaptation from low-income individuals may carry costs in the short term that vulnerable families must absorb before realizing any longer-term benefits. Evidence for this possibility comes from a series of experimental and observational studies demonstrating

decreased cognitive performance among low-income individuals when faced with the prospect of a financial challenge (e.g., a large car repair bill, nearing the end of one's annual lump sum income; see Gennetian & Shafir, 2015; Mani, Mullainathan, Shafir, & Zhao, 2013; Shah, Mullainathan, & Shafir, 2012).

Extended to the problem of improving the welfare of young, unmarried parents living with low incomes, this alternative view suggests that imposing even well-intentioned demands upon an already taxed family system may compete with their more immediate priorities. For example, the time and effort involved in completing an educational degree or job-training program may come at the expense of parenting, working to support the family, maintaining the relationship, and supporting one's partner as a parent and wage-earner. Because poverty induces an understandable focus on acute needs at the expense of distant goals (Shah et al., 2012), decisions to marry among people living in poverty may pivot less on the uncertain long-range benefits of demanding interventions and more on how partners evaluate one another's contributions to pressing concerns arising within the family. As a consequence, work- and school-related interventions for lower-income new parents could create, and draw attention to, incompletely fulfilled family responsibilities, paradoxically reducing rather than increasing marriage rates. Indeed, there is preliminary evidence to suggest that educational gains made after entering into a relationship have a destabilizing effect on marriages, though this work was correlational and not experimental (Lyngstad, 2004; Tzeng & Mare, 1995).

The purpose of this study is to test (a) whether unmarried new parents' participation in job assistance or additional schooling increases or decreases their likelihood of marrying and (b) whether fulfillment of economic responsibilities (i.e., earned income, financial support of child) and relational roles (i.e., daily contact with child, partner perceptions of parenting quality,

judgments of relationship satisfaction) mediate any effects of educational interventions on marriage. If the rationale underlying federal educational and job-training programs for low-income couples is correct, individuals receiving these interventions should become better providers and be perceived by their mates as fulfilling key social roles within the family, thus *increasing* marriage rates above those of couples not receiving these interventions. In contrast, if educational and job-training interventions impose a burden on the limited resources of new parents living with low incomes, then these interventions will detract from fulfillment of immediate financial and family needs, *decreasing* marriage rates relative to those couples in which partners do not participate in these programs.

Testing these competing views requires longitudinal data collected from unmarried new-parent couples living with low incomes who received educational and employment interventions, along with control data from otherwise equivalent couples who did not receive these interventions. Data from the Building Strong Families program evaluation (BSF; Wood et al., 2012) are well-suited for this purpose. Comprised of more than 5,000 unmarried couples with low incomes who were either new parents or expecting a child, BSF was a randomized controlled trial testing the effects of relationship education programs on relationship formation; these interventions have been shown to have no effect on 3-year relationship outcomes (Wood et al., 2014). At the same time, large subsamples of BSF couples received education-based assistance (such as working toward a GED) and job-based assistance (such as a work training program), providing a valuable opportunity to examine whether these economic interventions stabilize families and how they might do so. Because individuals were not randomly assigned to education and job interventions, we use propensity score analysis, a commonly used statistical method for equating treatment and control groups outside of a randomized controlled trial design

(e.g., Austin, 2011; West et al., 2014), thus strengthening inferences about any effects of job- and school-related interventions on three-year marriage rates.

Method

Participants

The present sample is drawn from the Building Strong Families project (BSF; <http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/29781>), which was conducted from 2005-2011 by Mathematica Policy Research with funding from the Office of Planning, Research, and Evaluation in the U.S. Administration for Children and Families, Department of Health and Human Services. The sample consists of 5,102 heterosexual couples who were expecting a baby or had a baby in the preceding three months. Most participants were African American (52%), with Hispanic/Latino participants making up 20% of the sample and White participants making up 12% of the sample. Forty-eight percent of men had graduated from high school, 13% had a GED, and 34% had no high school degree. Fifty-three percent of women had graduated from high school, 8% had a GED, and 33% had no high school degree. Both partners had completed high school in 37% of couples. Women were 23.5 years old ($SD = 4.7$) and men were 25.8 years old ($SD = 6.1$). Forty-two percent of couples were comprised of at least one member below the age of 21. Men had a median annual income in the \$10,000-\$14,999 range; for women \$1-\$4,999 was the median annual income.

Procedure

Recruitment and screening. BSF was implemented in eight sites around the country, each of which enrolled between 342 and 1,010 couples (see Dion, Avellar, & Clary, 2010 for more details). Sites enrolled as many eligible couples as possible during their unique sample intake period (approximately two years), ending enrollment on a predetermined date (see Wood

et al., 2010 for more details). Couples were eligible to participate if (a) both members of the couple agreed to participate, were 18 years of age or older, understood the language in which BSF services were offered (English, and in some locations, Spanish), and gave no indication of relationship violence, and if (b) the couple were romantically involved, expecting a baby together or had a baby that was younger than three months old, and were unmarried at the time their baby was conceived. The current analyses excluded 348 couples who married between the time their baby was conceived and enrollment in the study, leaving 4,754 unmarried couples.

Follow-up assessments. A follow-up telephone interview was conducted separately with mothers and fathers about 15 months after couples enrolled in the program. Eighty-three percent of mothers and 72 percent of fathers responded to the 15-month survey; at least one parent responded in 4,425 couples (87% of all couples). A second follow-up telephone interview was conducted separately with mothers and fathers about 36 months after couples enrolled in the program. Eighty percent of mothers and 69 percent of fathers responded to the 36-month survey; at least one parent responded in 4,427 couples (85% of all couples).

Measures

Interventions. Participation in a school-based intervention since baseline was assessed at the 15-month follow-up by asking participants: “Have you taken any classes to finish high school, get a GED, or learn English?” Responses were coded such that 1 = *yes* and 0 = *no*. Participation in a job-based intervention since baseline was assessed with two questions at the 15-month follow-up. Participants responding “yes” to either “Have you participated in a job training program?” or “Have you participated in a program to help you find a job?” or to both would be coded 1 = *yes*. Participants who responded *no* to both items were coded 0.

Mediators

Relationship satisfaction. Relationship satisfaction at the 15-month follow-up was measured using a 6-item scale. Items were scored on a 4-point scale, with 1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, 4 = *strongly disagree*. All items were reverse coded then averaged to form the final score for each individual. Coefficient alpha was .83 for men and .83 for women. Sample items include: “[FATHER/MOTHER] and I enjoy doing even ordinary, day-to-day things together” and “[FATHER/MOTHER] listens to me when I need someone to talk to.”

Perception of partner’s parenting. This construct was measured with a 5-item scale that each participant answered about the child’s other parent. Items were scored on a 4-point scale, with 1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, 4 = *strongly disagree*. All items were reverse coded then summed to form the final score for each individual. Coefficient alpha was .88 for men and .90 for women. Example items include: “I am satisfied with the responsibility [FATHER/MOTHER] takes for raising [CHILD]” and “[FATHER/MOTHER] is the type of father/mother I want for [CHILD].”

Daily contact with child. Daily contact was measured with a single item at the 15-month follow-up that asked mothers and fathers “In the past month, how often [have/has] [you/FATHER] spent one or more hours a day with [CHILD]?” Response options included; “every day or almost every day,” “a few times a week,” “a few times in the past month,” “once or twice,” and “never.” If both partners responded “every day or almost every day” this item was coded as 1, any other response combination was coded as 0.

Financial support of child. This construct was measured with a single item given to mothers at the 15-month follow-up that asked “Parents deal with meeting the expenses of raising a child in different ways. When answering the next question, I’d like you to think about all the expenses associated with raising [CHILD] such as [his/her] food, clothing, medical expenses,

diapers, and any other costs of raising [him/her]. How much of the cost of raising [CHILD] does [FATHER] cover?" 1 = *little or none*, 2 = *less than half*, 3 = *about half*, 4 = *more than half*, 5 = *all or almost all*.

Income. Income at the 15-month follow-up was assessed through a series of questions. Respondents were first asked "Did you work for pay in the past month?" If they responded "no" their income was set to \$0. Participants responding "yes" were asked, "What were your total earnings in the past month, before taxes and other deductions, including tips, commissions, and overtime?" Respondents who reported that they did not know their exact income or did not want to report their income were asked to choose an income range (with options ranging from "Less than \$500" to "Between \$5500 and \$6000"). Each of these respondents was assigned the mean value of the range as their income.

Outcome

Marriage. To determine whether couples were married at the 36-month follow-up, both participants were asked: "Are you and [PARTNER] married, divorced, separated, or have you never been married to each other?" Two percent of couples disagreed on their marital status. Disagreements were handled by categorizing a couple as married only if both members of the couple reported that they were married.

Propensity Score Model

Sixty-six variables measured at baseline were entered into the propensity score model. This includes a dummy variable for initial randomization into the treatment or control groups, seven dummy variables representing the eight program sites and 29 variables for each partner, representing the following constructs: age, ethnicity, race, language spoken, education, current pregnancy status, whether pregnancy was planned, length of time couple has known each other,

whether the couple lives together, number of children the couple has together, number of children each partner has with another partner, employment status, amount of time unemployed, receipt of public assistance, depressive symptoms, social support available, attendance at religious services, relationship satisfaction, and attitudes about marriage and parenting. These variables were chosen because they were theorized to have influenced participation in the intervention and/or the outcome (West et al., 2014). Supplemental Table 1 available online provides the full list of covariates.

Analytic Plan

Propensity scores to estimate the likelihood of receiving the job assistance and education interventions, based upon the 66 baseline covariates, were calculated separately to test the effects of these two types of economic interventions independently. Propensity scores were calculated using the *pscore* command in Stata version 13.1, using logistic regression. Participants who received the intervention were matched with an individual who did not receive the intervention but had a very similar likelihood of having received the intervention, based on their propensity score. Matches were made using the *psmatch2* command (Leuven & Sianesi, 2003) using 1:1 nearest neighbor matching without replacement, with a caliper of .025.

After the four matched datasets were created (father education, father job assistance, mother education, and mother job assistance) traditional multivariate statistics were applied to test the research questions (Guo & Fraser, 2009). To examine whether couples who received the economic interventions were more likely to marry than couples who did not, tests of the difference between two independent proportions (Newcombe, 1998) were conducted to determine whether the proportion of couples who married by 36-months was significantly different between the intervention and control groups.

To test whether relational or financial mechanisms explain the effect of the economic intervention, a series of mediational analyses was conducted for the interventions which had a significant effect on the outcome, using linear and logistic regression. Indirect effects were calculated with bootstrapped confidence intervals to determine whether the indirect effect through each of the mediators was statistically reliable.

Results

Descriptive statistics

Of the 4,425 couples with data at the 15-month follow-up, 391 (7.7%) men and 574 (11.3%) women reported receiving education, and 823 (16.1%) men and 907 (17.8%) women reported receiving job assistance. Of the 4,427 couples with data at the 36-month follow-up, 854 (16.8%) couples reported that they were married at the 36-month follow-up.

Propensity score matching

To determine whether the propensity score matching successfully created matched pairs who were equivalent at baseline, a chi-square difference test was conducted comparing the treatment and control groups on the 66 covariates before and after matching. In all four of the propensity score calculations, the covariates were significantly different before matching and not significantly different after matching (Supplemental Table 2 available online presents chi-square statistics). Each of the 66 covariates was also individually tested after matching using a matched samples *t*-test to determine whether the treatment and control groups were significantly different. All *t* statistics were non-significant (see Supplemental Table 1 for all *t* statistics), indicating that the matching was successful and that matched pairs did not differ on any measured characteristic.

The majority of treatment cases were matched to a control case that was sufficiently

similar. However, a small number of treatment cases were “off support” indicating that there was not a control case with a propensity score within .025 of the propensity score of the treatment case. These cases (11 for mother education, 6 for father education, 35 for mother job assistance, and 7 for father job assistance; see Supplemental Table 2 available online for a summary) were excluded from analyses. The final sample sizes for analysis were: $n = 730$ for mother education, $n = 518$ for father education, $n = 1176$ for mother job assistance, and $n = 1132$ for father job assistance.

Likelihood of Marriage

Job Assistance Intervention. Couples in which the mother received a job assistance intervention (including job training and job search assistance) were no more likely to marry than couples who did not receive this intervention (15.5% vs. 14.8%, difference in proportions = .007, 95% CI [-.034, .048]). Similarly, no effect was found for couples in which the father received job assistance (17.5% vs. 15.9%, difference in proportions = .016, 95% CI [-.028, .059]).

Education Intervention. Couples in which the mother received an education intervention (including taking courses to finish high school, earn a GED, or learn English) were no more likely to marry than couples who did not receive this intervention (16.7% vs. 17.5%, difference in proportions = .008, 95% CI [-.047, .063]). However, couples in which the father received an education intervention were less likely to marry than those in which the father did not receive the education intervention (9.7% vs. 17.0%, difference in proportions = .073, 95% CI [.015, .132])¹. See Figure 1.

¹ To test whether the negative effect of father’s receipt of an educational intervention on marriage was specific to any subgroups, we tested whether age (one or both partners under 21 vs. both partners over 21), BSF random assignment status (program vs. control), participation in

Mediation

As couples in which the father received the education intervention were less likely to marry 3 years later, we tested whether this effect was accounted for by the proposed relational and financial mediators. Mediators were tested simultaneously, though the results remained unchanged when each mediator was tested individually.

Receipt of the education intervention was not associated with mother's relationship satisfaction ($\beta = -0.30, p = .76$), father's relationship satisfaction ($\beta = -0.32, p = .75$), mother's perception of father's parenting ($\beta = -1.22, p = .23$), and father's income ($\beta = -1.35, p = .18$) at 15-months. Similarly, 15-month mother relationship satisfaction ($\beta = 1.54, p = .12$), mother perception of father's parenting ($\beta = -0.01, p = .99$), and father income ($\beta = 0.34, p = .734$) were not associated with marriage at 36-months.

However, receipt of the education intervention was significantly negatively associated with father daily contact with the child ($\beta = -1.94, p = .05$) and father financial support of the child ($\beta = -2.13, p = .03$) at 15-months. These variables were significantly positively associated with marriage at 36-months ($\beta = 2.08, p = .04$; $\beta = 2.57, p = .01$) and the indirect effect of the education intervention on marriage through these two variables was significant (95% CI [-.053, -

group relationship education (participated vs. did not participate), mother's participation in an education intervention (participated vs. did not participate), and change in employment status (unemployed to employed vs. continued unemployed) moderated the effects. For all five variables, the proportion of couples in which the father received the educational intervention who went on to marry was not significantly different between the two groups. See Supplemental Table 3 for the proportions of couples who married in each group and the chi square statistics.

.001]; 95% CI [-.059, -.004]). Thus, men who were involved in the education intervention at baseline were less likely to see their child on a daily basis and contributed less to the financial needs of the child 15 months later, which led to a decreased likelihood of marrying the mother of their child by the 36-month follow-up. Figure 2 presents the full mediational model. Additionally, Supplemental Figure 1 available online presents the results of a mediational analysis of the effect of father's receipt of the job training intervention.

Discussion

By improving the economic potential of new parents living with low incomes, government programs aim to stabilize the relationships of unmarried couples, promote the well-being of their children and, ultimately, disrupt the cycle of poverty. Although economically vulnerable families are assumed to be capable of withstanding the short-term costs that these programs entail, emerging work in psychology offers the competing view that poverty limits the resources available to people living with low incomes, thwarting efforts to improve their longer-term financial standing. Building upon this perspective, we reasoned that participation in education-based programs (i.e. taking classes to finish high school, get a GED, or learn English) and job-assistance programs (i.e., participating in job training or job search assistance) might detract from partners' already-taxed economic and relational capacities, draw attention to these shortcomings, and paradoxically destabilize couple relationships. Thus we evaluated the competing predictions that education-based and employment-based programs could increase or decrease marriage rates, using a sample of unmarried new parents earning ~\$20,000 annually drawn from the larger Building Strong Families project.

Results demonstrate that men's and women's participation in job-based programs, and women's participation in an education-based intervention, failed to improve marriage rates.

Men's participation in an education-based intervention did affect marriage rates, however, reliably *reducing* their likelihood of marriage over three years. Mediation analyses suggest that this effect emerges because participation in the intervention interfered with two key avenues by which parents invest in their children, decreasing the amount of time and the amount of money these men were able to devote to raising their child (Thomson & McLanahan, 2012). Thus, the very vulnerabilities that make these families ideal candidates for economic interventions may inadvertently undermine their capacity to benefit from them.

Several considerations temper the conclusions we are able to draw from this analysis. First, we emphasize that couples in this study were not randomly assigned to the education and job interventions. Propensity scores (Austin, 2011) strengthened our ability to make causal claims, and allowed us to control for 66 baseline variables, yet the possibility remains that unmeasured variables could account for the observed findings. Nevertheless, some confidence can be gained from our use of a large and diverse sample, a 3-wave 3-year longitudinal design, and a clear and socially significant outcome measure. More critically, we did not observe any simple selection effects, whereby individuals' greater inclination to participate in interventions would eventuate in more benefits and higher marriage rates.

Second, the current study is comprised of young couples with relatively few years of formal education and very low incomes, all in the early stages of parenthood. The larger population that this group of families represents is an important focus of policy initiatives in the United States, yet we must caution that the effects observed here may not generalize to other couples, including unmarried parents with higher levels of social advantage and greater economic security. Generalizability is limited further by the fact that this study took place during a time of unprecedented economic upheaval in the United States (2005-2011), with downturns in

housing and employment that worsened the already-unambiguous income disparities between the wealthy and the poor (Piketty & Saez, 2014). These conditions might have suppressed marriage rates in this study, while also rendering any educational and job-training programs less effective or less attractive to participants and their partners. The broader implication is that family formation and stability are likely tied to these inequities and to the large-scale economic trends that drive them (Jacobsen & Mather, 2010). While our data cannot speak to these associations or how to mitigate them, our findings do suggest that optimizing the benefits produced by educational and job-related initiatives during parenthood will likely require understanding of the chronic demands that lower-income partners face and how these demands moderate the uptake of these initiatives.

Third, participants in this study were unmarried, and because marriage rates were the sole criterion variable of interest in this study, our findings cannot be extended to other important outcomes like relationship satisfaction or co-parenting. Marriage on average tends to provide partners and their children with a number of advantages compared to other family structures such as living with cohabiting parents or a single parent (e.g., Brown, 2004), and it was for this reason that facilitating transition to marriage was the overriding goal within the larger Building Strong Families project. We adopted this same goal within our analyses, but recognize at the same time that encouraging marriage might not be appropriate for all couples, and that other forms of relationships should not be treated as inferior or inadequate. Relationship status can be fluid, and cohabitation arrangements dynamic and complex, particularly among unmarried couples living with low incomes (e.g., Nepomnyaschy & Teitler, 2013). Assessments in BSF likely underestimated this heterogeneity, limiting the conclusions we could draw here about intervention effects but also highlighting the need for greater sensitivity in future studies to the

various forms that relationships can take among unmarried and disadvantaged populations.

Fourth, we cannot claim that the null and adverse effects identified here will generalize to other government programs with similar goals. These programs are themselves highly heterogeneous, and they were not sampled here in any systematic manner; other existing programs may well have yielded stronger effects on economic capacity and on relationship outcomes. Nevertheless, at minimum our work does suggest the need for caution before assuming that the intended beneficiaries of couple-directed programs have the time and resources needed to make lasting changes to their earning potential. The present findings do imply further that even interventions aimed primarily at individuals are likely to have ramifications for people close to that individual. We do not know whether the full range of such spill-over effects was considered when individuals were directed toward educational or job-training programs, but we would argue that the success of these programs may depend on a careful assessment of couples' unique strengths, goals, and opportunities. For example, some couples might thrive with both partners working or training for better jobs, some might prefer a traditional male-breadwinner model, while others still might function best with the female partner in the workforce while the male partner takes primary responsibility for childcare.

Fifth, this work is limited by a lack of pre-post data on whether the interventions successfully altered economic factors, such as job attainment and income. The absence of group differences on income at 15 months does suggest that interventions failed to generate their intended effects, but we cannot know whether this factor alone explains why programs failed to improve marriage rates. The possibility remains that programs that do generate sustained improvement in income or economic capacity for couples could offset the detrimental effects – that is, the short-term reductions in money and time available for one's family – imposed by the

interventions on the couple. Further research is needed to understand how stress and economic disadvantage impose limits on couples' capacities to incorporate new resources into their lives, how those limits might be managed or overcome, and whether doing so might promote family stability. Our data suggest, for example, that offering financial support in conjunction with education-based interventions (e.g., GED or ESL classes) could offset the demands that those interventions create for couples living with low incomes, perhaps leading to more stable unions. RCTs, even those relatively small in scale, could provide valuable information on whether this is a viable strategy.

Some specificity in interpreting our main findings comes from the absence of effects for women's participation in job-based and education-based interventions (16% vs. 15% marriage rates and 17% vs. 17%, respectively; see Figure 1) and for men's receipt of job-based assistance (18% vs. 16%). Why is it that only men's participation in education-based programs proved costly to eventual marriage rates? In other studies of unmarried couples with lower incomes, mothers have been identified as family gatekeepers, with authority to decide whether fathers will be involved with their child, live with the family, and enter into marriage (e.g., Edin, 2000). Mothers' decisions to marry are assumed to depend heavily on their perceptions of fathers' contributions to the household, especially fathers' financial contributions, in that mothers may disengage from fathers who are not able to provide financially for them and their children (Edin & Reed, 2005). Our mediational results are consistent with this view, in that the apparent effects of education-based interventions on marriage were mediated by men's financial contributions. Moreover, Edin (2000) argues that new mothers are disinclined to marry men judged to be inadequate providers, even if these men are otherwise acceptable as fathers and mates. In our study, partners of men participating in an education-based intervention did not experience lower

levels of relationship satisfaction, nor did they perceive fathers as worse parents; nevertheless, independent of these relational factors, mothers were reliably less likely to marry these men (Figure 2). This apparent salience of financial considerations in decisions to wed also may explain why we observed adverse effects for men's educational training but not for their job training: only the former reliably reduced the financial support fathers provided to their new family. This reduction in financial contributions to their child may be especially costly for nonresident fathers, whose ability to spend time with their child — the other factor that contributed to decreased marriage rates — seems predicated on their financial contributions (Carlson, VanOrman, Turner, 2016).

The absence of relationship satisfaction as a mechanism leading to marriage highlights possible differences in the relationship processes that low-income couples experience compared to more affluent couples. Among middle-class couples, relationship satisfaction reliably predicts later relationship status (Karney & Bradbury, 1995; cf. Lavner & Bradbury, 2012). Yet for low-income couples, partners likely weigh a host of other factors, including financial stability, employment, contributions to the household, and parenting (Gibson-Davis, Edin, & McLanahan, 2005) when making decisions about their relationship status. Future research on the extent to which judgments of satisfaction affect the progression of relationships of low-income couples will help determine the best ways to incorporate this factor into future interventions aimed at stabilizing relationships.

A number of alternative explanations could account for the results we report here. First, the decreased marriage rate we observed may reflect a delay in marrying rather than a decision not to marry at all. For example, if the men in this study have only recently completed educational programs, improvements in their economic capacity may not yet be apparent at the

time of our final assessment. Both partners may be waiting to see whether the intervention is going to pay off in terms of meeting the “economic bar” for marriage (Gibson-Davis, 2007), and a longer follow-up interval may have captured this effect. Alternatively, men who improve their economic prospects by participating in educational or job-related training programs may find that they have become more desirable mates to other women (e.g., Greitemeyer, 2007), and therefore may choose not to marry the mother of their child because of their increased comparison level for alternatives (Thibaut & Kelley, 1959). Intervention studies that incorporate more intensive assessments of participants, including qualitative interviews, would allow us to better understand their experience, including how the decision of whether to marry unfolds over time.

Of course, the many children growing up in poverty is a reflection of a larger societal problem in the United States. The proportion of families living in poverty at any given time has remained at approximately 14% for the past 30 years (DeNavas-Walt & Proctor, 2015), and more than 50% of the U.S. population experiences poverty at some time before the age of 65 (Rank & Hirschl, 1999). Comprehensive economic and social reforms that decrease income disparities, provide educational and work opportunities for disadvantaged populations, and provide a safety net for the most vulnerable families are needed to prevent children from growing up impoverished. However, until poverty in the United States is eradicated there will be impoverished families raising children and there will be a need for interventions to help these families enhance their economic circumstances and their family relationships.

The central implication of this work is that imposing new demands on vulnerable families can create long-term disadvantage by depleting an already-deficient set of resources, particularly when those demands reduce fathers’ financial contributions. In our analysis of unmarried new parents living in poverty, fewer than 20% went on to marry 36 months later. While we might

have expected education-based interventions to stabilize these families and increase marriage rates, neither job training nor education programs, for men or for women, achieved this goal. Instead, men participating in education-based training programs contributed less time and money to the upbringing of their child and, in turn, 10% of these men went on to marry the child's mother, as compared to 17% of comparable men not participating in these programs. These findings draw attention to the possibility that participation in well-intentioned and even potentially effective interventions can be onerous for couples living with few resources, and they argue that the immediate demands of living in poverty must be contained before any benefits of burdensome interventions can be realized.

Table 3.1. Coefficients from logistic regressions and t values from propensity score matches for 66 baseline covariates

	Mom Job Assistance		Dad Job Assistance		Mom Education		Dad Education	
	Coeff	t value	Coeff	t value	Coeff	t value	Coeff	t value
COUPLE								
Random Assignment	0.14	-1.12	0.12	-0.52	0.03	1.14	0.24	0.51
Program1	-0.39	-0.18	-0.43*	-0.89	-0.49*	-0.42	-0.18	-1.10
Program2	-0.03	0.44	-0.32	0.00	-0.33	0.00	0.26	1.11
Program3	0.08	-0.26	-0.53**	-0.21	-0.21	0.43	-0.01	-0.10
Program4	-0.27	0.61	-0.38	-0.26	0.07	0.57	0.26	-0.16
Program5	-0.20	-0.42	-0.29	0.75	-0.22	-0.13	0.14	0.00
Program6	-0.02	-0.28	-0.41	0.89	-0.33	-0.46	-0.16	0.50
Program7	0.44	-0.12	-0.63	1.20	-0.07	-0.72	0.40	0.61
FATHER								
Age	-0.01	-0.19	-0.03	0.37	-0.01	-0.36	-0.06**	-0.41
Latino	-0.29	0.09	0.54	0.87	-0.55	0.17	0.09	1.03
White	0.20	0.24	0.54	1.20	-0.01	0.09	-0.13	1.06
Black	0.07	-0.06	0.88	-1.67	0.23	0.30	0.55	-1.07
Other Race	-0.07	0.00	0.71	0.29	0.04	-1.08	0.48	0.74
English	0.21	-0.85	0.55	0.36	-0.48	-0.58	0.17	-0.43
HS Diploma	0.02	-0.18	0.02	-0.67	-0.13	0.36	-1.28***	-0.34
Mother pregnant	1.23	-0.71	-0.19	-1.06	-0.26	0.99	1.44	-1.09
Wanted to have baby with mother	-0.07	0.39	0.04	-0.45	0.05	-0.43	0.05	0.17
How long known before pregnancy	-0.03	-0.18	-0.16	0.00	-0.22	0.31	-0.18	0.18
Currently live with mother	0.06	-0.96	0.13	0.66	0.03	0.13	-0.05	0.77
Number children with mother	-0.05	-0.11	0.03	0.47	0.18	1.25	0.05	-0.65
Number children with other partners	0.05	1.54	0.03	1.03	-0.05	-1.06	0.04	-1.10
Employment status	-0.01	-0.43	-0.43	0.06	0.02	1.38	-0.10	0.61

Length of time unemployed	-0.01	0.43	-0.01	-0.06	0.01	-0.58	0.01	-0.22
Earnings	-0.02	0.00	-0.05	-0.62	0.03	0.97	-0.04	0.12
Cash welfare/TANF	-0.30	0.00	-0.50	0.19	0.71*	0.00	0.04	0.54
Food stamps	0.17	-0.21	-0.28	0.08	-0.33	-0.55	-0.43	0.12
Medicaid/SCHIP	-0.02	-0.53	0.08	-0.06	0.08	-0.90	0.04	0.09
SSI or SSDI	0.50	0.34	0.32	0.60	0.45	-0.82	0.55	-1.03
WIC	-0.23	-0.52	0.12	0.00	-0.10	-0.37	0.02	1.07
Unemployment compensation	0.32	-0.79	0.58	0.61	-0.54	0.71	-0.54	-0.58
Depression	-0.07	-0.34	0.14	0.01	0.01	-0.34	0.05	0.36
Someone to count on in emergency	0.21	0.88	0.09	-0.65	0.24	-0.86	-0.06	0.83
Someone to borrow \$100 from	-0.38*	-0.08	-0.21	0.50	0.05	-0.83	-0.22	-0.89
Attendance of religious services	-0.03	-0.25	0.07	0.66	0.13*	-0.69	0.17*	-0.32
Relationship Satisfaction	0.01	-0.34	-0.11	0.00	0.05	-0.60	0.08	0.15
Attitude about single parenting	0.04	-0.44	-0.12	0.25	-0.01	0.00	-0.07	0.36
Attitude about marriage	-0.05	-0.81	0.05	0.00	0.23**	0.05	0.01	-0.43
MOTHER								
Age	-0.04*	0.53	-0.01	0.56	-0.06**	0.06	-0.01	0.08
Latino	0.28	0.41	-0.06	0.59	0.06	0.17	0.09	0.77
White	-0.22	0.08	-0.21	0.73	0.04	0.17	-0.06	1.14
Black	0.52	-0.57	-0.17	-1.38	0.10	0.44	-0.02	-1.13
Other Race	0.72*	0.27	0.22	0.73	0.07	-0.57	-0.44	1.28
English	0.30	-0.25	0.52	0.37	-0.19	-0.91	0.03	0.00
HS Diploma	0.02	-0.54	0.13	-0.69	-1.50***	0.89	0.11	-0.96
Mother pregnant	-1.20	-0.71	0.21	-1.00	0.50	1.07	-1.45	-1.09
Wanted to have baby with father	0.05	-0.37	0.10	-0.48	0.05	-0.28	0.04	0.24
How long known before pregnancy	-0.13	-0.06	-0.13	0.06	-0.11	0.76	-0.07	0.36
Currently live with father	-0.06	-0.76	-0.14	0.62	-0.02	0.12	-0.10	0.35

Number children with father	-0.07	0.21	0.02	0.42	-0.13	1.06	-0.08	-0.26
Number children with other partners	0.06	0.65	0.02	0.81	-0.08	-1.15	0.08	-0.61
Employment status	-0.32**	-0.24	-0.03	0.12	-0.18	-0.16	0.24	-0.09
Length of time unemployed	-0.01	0.40	-0.01	-0.56	-0.01	-0.53	-0.01	0.82
Earnings	0.02	0.61	0.01	0.02	-0.13*	0.04	-0.08	0.67
Cash welfare/TANF	0.64***	0.34	0.15	0.00	0.26	0.00	0.36	-0.26
Food stamps	0.09	-0.06	0.13	-0.70	-0.09	-0.57	0.11	0.60
Medicaid/SCHIP	0.31*	0.00	-0.26	0.13	0.22	-0.33	-0.31	0.74
SSI or SSDI	-0.64**	1.44	-0.22	0.00	0.22	0.71	0.20	-0.48
WIC	0.29*	0.06	-0.19	-0.36	0.15	-0.08	0.19	0.98
Unemployment compensation	-0.01	-0.28	0.04	-0.14	-0.22	-0.59	-0.16	0.23
Depression	0.01	0.71	0.08	0.99	0.07	0.30	0.10	0.98
Someone to count on in emergency	-0.19	-0.69	-0.14	-0.11	0.11	0.00	0.03	-0.18
Someone to borrow \$100 from	-0.17	-0.16	-0.10	0.33	-0.21	-0.10	0.27	0.00
Attendance of religious services	-0.01	-0.35	-0.02	-0.30	0.04	-1.31	-0.15*	-0.67
Relationship Satisfaction	-0.25*	-1.03	-0.12	-0.95	-0.21	-1.02	-0.04	-0.99
Attitude about single parenting	0.02	0.70	0.02	-0.14	-0.07	-0.22	0.01	0.16
Attitude about marriage	0.24***	-0.45	-0.04	-0.27	-0.04	0.09	0.02	-0.56

Note. All t values are non-significant ($p > .19$)

Table 3.2. Descriptive information about propensity score matching process

	χ^2		Untreated Cases		Treated Cases	
	Before	After	Off	On	Off	On
	Matching	Matching	support	support	support	support
Mom Job Assistance	248.13***	23.50	0	2001	35	588
Dad Job Assistance	187.99***	19.02	0	1719	7	566
Mom Education	332.77***	23.21	0	2248	11	365
Dad Education	216.07***	27.56	0	2027	6	259

Note. χ^2 statistic is a difference test comparing the treatment and control groups on the 66 covariates before and after matching

*** $p < .001$

Table 3.3. Marriage rates of couples in which the father participated in the educational intervention, by subgroups

		No Intervention		Intervention		Chi Square	Difference in proportions
		Unmarried	Married	Unmarried	Married		
Age	Under 21	42.5% (116)	5.5% (15)	47.3% (129)	4.8% (13)	0.39	.011 [-.0618, .0887]
	Over 21	40.4% (99)	11.8% (29)	42.9% (105)	4.9% (12)			6.75**
Random Assignment	Program	38.1% (102)	8.2% (22)	48.1% (129)	5.6% (15)	3.01	.0172 [-.0598, .0893]
	Control	45.2% (113)	8.8% (22)	42.0% (105)	4.0% (10)			3.21
Attended Relationship Education	Yes	32.6% (60)	8.7% (16)	50.5% (93)	8.2% (15)	1.63	.0727 [-.0011, .1559]
	No	46.4% (155)	8.4% (28)	42.2% (141)	3.0% (10)			6.18*
Mother Also Received Education Intervention	Yes	40.7% (37)	3.3% (3)	50.5% (46)	5.5% (5)	0.15	.0011 [-.0732, .1179]
	No	42.1% (172)	10.0% (41)	43.3% (177)	4.6% (19)			7.45**
Employment Status at Baseline and 15-months	Unemployed to Unemployed	50.5% (49)	1.0% (1)	41.2% (40)	7.2% (7)	5.32*	.0185 [-.1283, .164]
	Unemployed to Employed	40.4% (36)	7.9% (7)	44.9% (40)	6.7% (6)			0.19

Note. Percentages represent proportion of couples within each row. Numbers in parentheses are raw numbers of couples. The chi square statistic is the overall contrast of the 4 cells in each row. The difference in proportions is a comparison of the proportion of couples in the intervention who went on to get married for the two conditions of each variable.

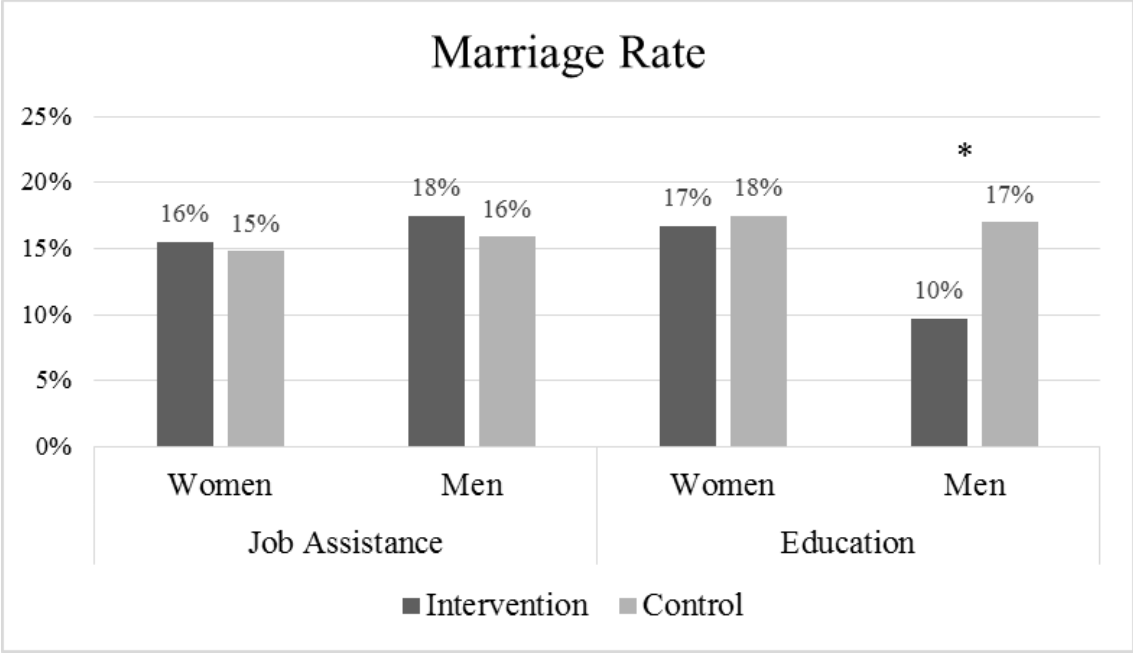


Figure 3.1. Three-year marriage rates for men and women who did and did not receive job assistance and education interventions.

* indicates that intervention and control groups are significantly different (difference in proportions = .073, 95% CI [.015, .132])

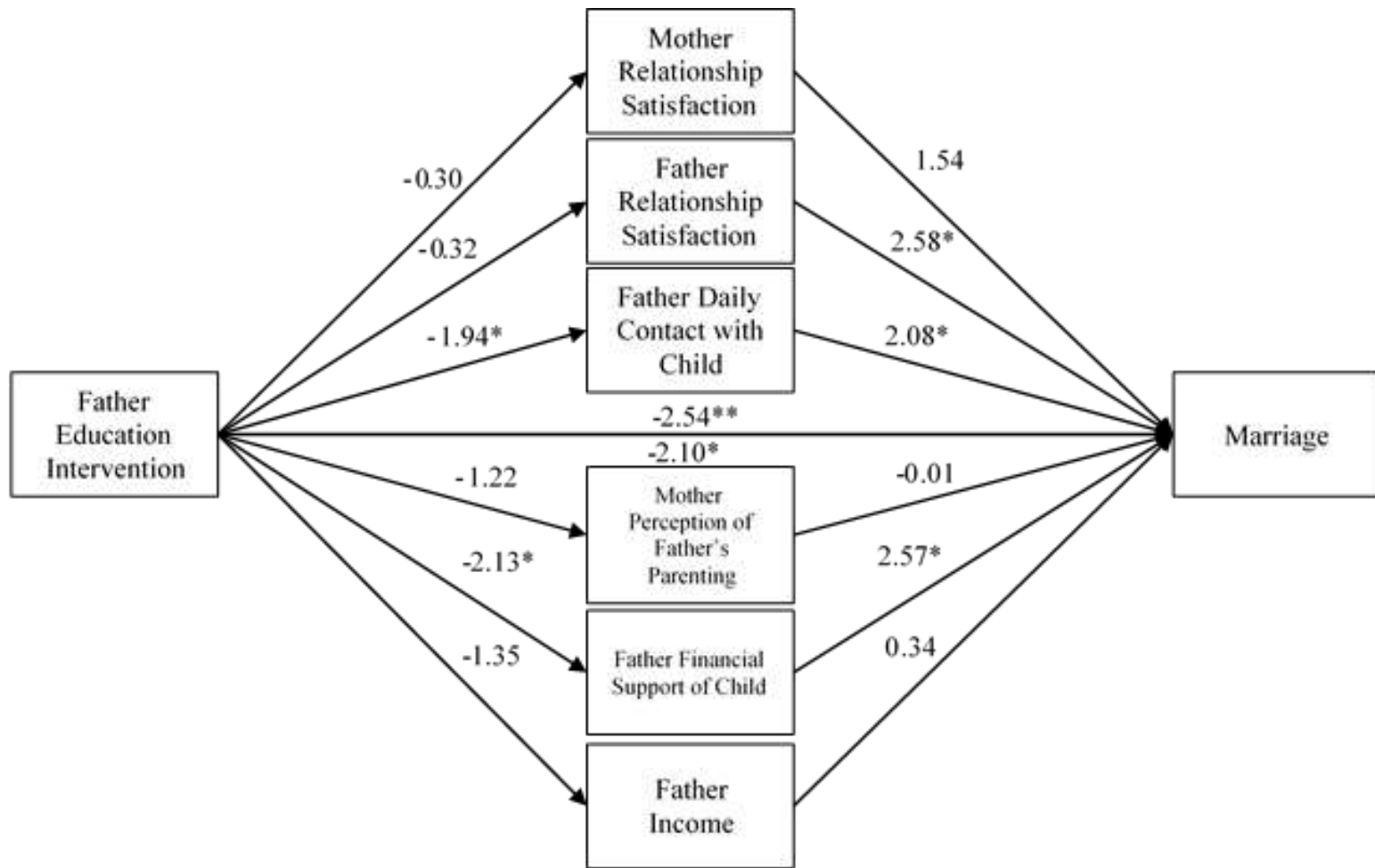


Figure 3.2. The negative association between educational interventions and 30-month marriage rates is mediated by reductions in fathers' daily contact with the child and fathers' financial support of the child after 15 months. Values shown are standardized regression coefficients.

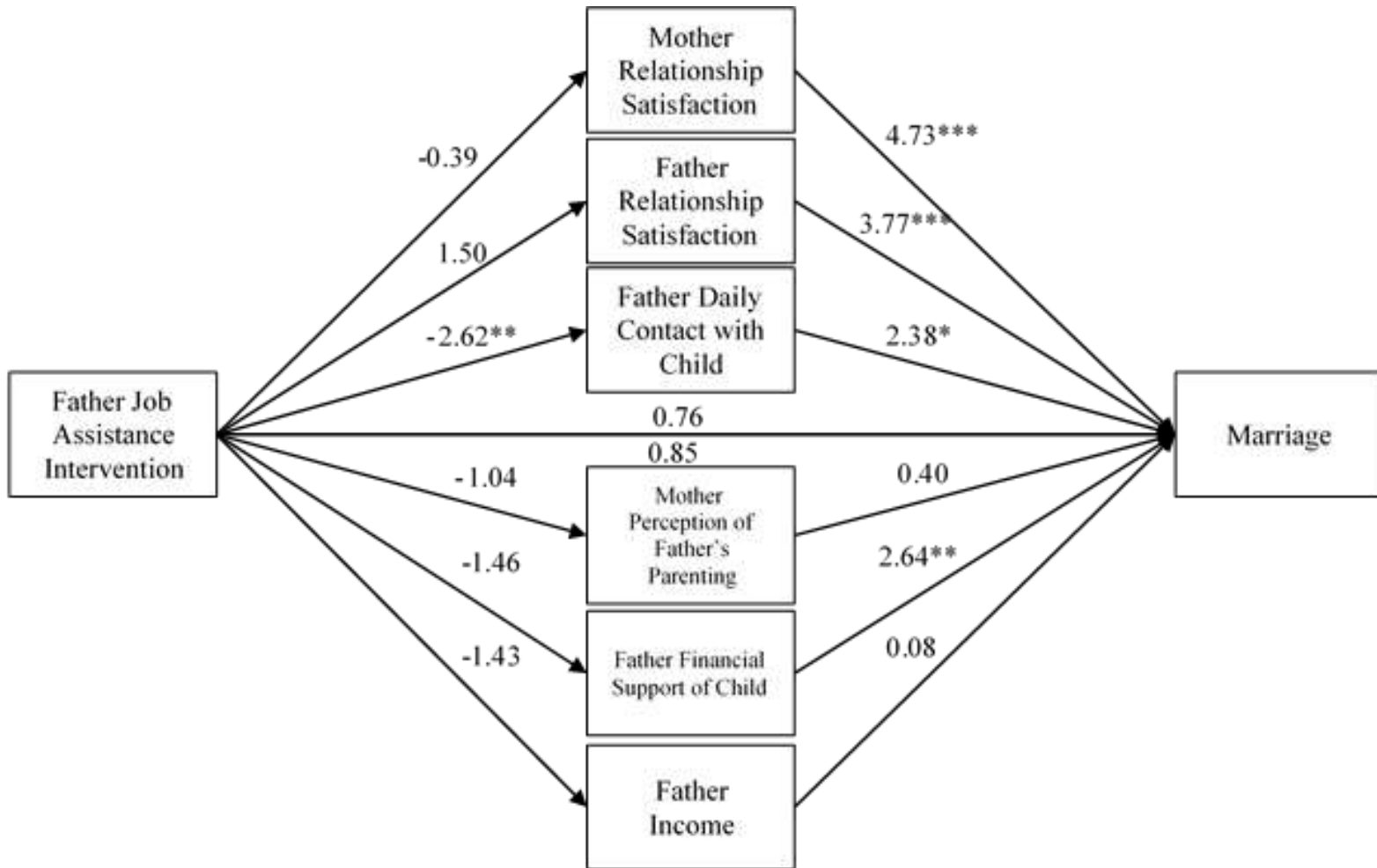


Figure 3.3. Job assistance decreased the likelihood of father’s daily contact with their children, but did not have an effect on any other potential mediator. Values shown are standardized regression coefficients.

Footnotes

¹ To test whether the negative effect of father's receipt of an educational intervention on marriage was specific to any subgroups, we tested whether age (one or both partners under 21 vs. both partners over 21), BSF random assignment status (program vs. control), participation in group relationship education (participated vs. did not participate), mother's participation in an education intervention (participated vs. did not participate), and change in employment status (unemployed to employed vs. continued unemployed) moderated the effects. For all five variables, the proportion of couples in which the father received the educational intervention who went on to marry was not significantly different between the two groups. See Supplemental Table 3 for the proportions of couples who married in each group and the chi square statistics.

CONCLUSION

Relationship distress and dissolution are especially common and costly among couples living with low incomes (Kennedy & Ruggles, 2014). Although economically vulnerable couples have not been the focus of much basic or applied work in psychology, this oversight is being corrected by a small but growing body of research on the unique challenges that these couples face and on the interventions that might ameliorate these challenges (e.g., see Johnson, 2012). The three studies in this dissertation added to this emerging literature by critically evaluating a range of intervention strategies intended to improve the interpersonal and economic foundation of couples contending with various forms of risk. While the studies diverge in the types of risk they emphasize and how that risk operates, they share a focus on intervention and the use of dyadic and longitudinal data drawn from randomized controlled trials. Below I outline the main findings from these studies before integrating those findings in a general summary of the work.

The first study indicated that, within a middle-class sample, demographic factors such as income and education did not moderate three-year treatment outcomes, across three different preventive programs. This finding would appear to be at odds with the general view within this dissertation that couples coming from various sociodemographic backgrounds would experience different outcomes following intervention, and this likely reflects a combination of low power and restricted representation of economic and racial diversity. However, relational risk factors assessed at baseline, including commitment and relationship satisfaction, did moderate outcomes, such that higher-risk couples experienced greater benefits from treatment than did lower-risk couples. Not all forms of pre-treatment risk foreshadowed greater benefits in this first study, however: couples reporting more severe types of pre-treatment risk, including physical aggression and alcohol use, fared worse in all three treatment programs compared. Lastly,

couples who were initially low-risk (e.g., started with higher levels of satisfaction and commitment) fared better in a low-intensity intervention, compared to more intensive skill-based interventions.

The second study examined the main effects of skill-based relationship education interventions on relationship satisfaction, the possible role of observed communication in mediating the effects of these interventions on satisfaction, and the possible moderating role of various risk factors on treatment-to-communication effects and communication-to-outcome effects. Using a large sample of couples living with low incomes, treatment couples experienced a small but statistically reliable increase in relationship satisfaction 30 months later. This main effect was moderated by an aggregate index of demographic risk (which included such variables as young age, lack of high school degree, unemployment, and receipt of public assistance), such that couples with a higher level of risk experienced a larger increase in satisfaction and greater improvement in observed communication, relative to couples with lower scores on the demographic risk index. Risk did not moderate associations between communication observed following treatment and satisfaction and, critically, changes in communication did not mediate the effects of intervention on relationship satisfaction.

Finally, Study 3 departed from the focus on relationship skills in Studies 1 and 2 by testing educational and job-related interventions intended to improve economic capacity. Examining the effects of these interventions was especially appropriate in Study 3 as these couples were all unmarried initially with very low household incomes and raising an infant or expecting a child. Couples in Study 3 were not randomly assigned to these interventions – the relationship skills interventions that formed the original basis of the Study 3 RCT proved unsuccessful – but propensity scores were used to identify participants who were highly similar

except for their exposure to educational and job-related interventions, thus affording control over selection effects into these experiences. When men participated in an educational intervention, they were *less* likely to marry over the next three years compared to similar men who did not participate in these interventions. This effect was mediated by decreases in fathers' support for the couples' child, operationalized by less money contributed to the child's upbringing and less time spent with the child on a daily basis. I interpret this finding as evidence that there may be short-term costs associated with participation in interventions intended to have relatively long-term benefits for new families, underscoring the need for intervention approaches that are sensitive to the unique constraints operating upon young couples living with low incomes.

Taken together, the results of these three studies suggest several directions for future research on interventions for low-income couples. First, Studies 1 and 2 indicate that moving from a primary prevention approach to a secondary, indicated intervention approach is probably necessary. The prevailing intervention model calls for provision of relationship education to all couples, regardless of their current level of risk, yet Study 1 shows that couples with low levels of initial risk may be damaged by participating in an intervention that is too intense for their current needs. Similarly, couples struggling with substance use and physical aggression fared poorly in the interventions, suggesting that they should be screened out and referred to treatment programs specific to those issues.

Additionally, Study 1, which used a sample of predominantly middle-class couples, found that socioeconomic status did not moderate treatment outcomes, whereas relational factors did help to isolate treatment effects. This suggests that once couples achieve a certain minimum level of financial stability, socioeconomic risk factors become less salient and their differentiating risk factors then shift over to relational concerns such as satisfaction,

commitment, and communication. This possibility is supported by the results of Study 2, which found that, within a low-income sample, a socioeconomic risk index did moderate treatment outcomes. Specifically, couples in the group more characterized by poverty-level incomes, as compared to couples in the low-income group (100% - 200% of the Federal Poverty Line), did experience better treatment outcomes. The results of Studies 1 and 2 therefore demonstrate that many couples may be able to reap benefits from relationship interventions, but low-income and impoverished couples may offer an exceptionally strong opportunity to effect change through various types of interventions.

Although the existing skill-based interventions have shown some statistically significant effects on relationship satisfaction for low-income couples, those effects have been quite small and do not translate to practically significant outcomes like decreases in divorce or increases in marriage. In fact, in Study 1, couples who benefitted more from the interventions still experienced a decrease in their relationship satisfaction, they just decreased at a slower rate than other couples. Similarly, in Study 2 the higher-risk couples who benefitted more from the intervention still had an effect size of only $d = |.13| - |.14|$ for communication and $d = .16$ for satisfaction. Intervention effects on communication did not mediate the effect of the intervention on changes in relationship satisfaction in Study 2, calling into question the theoretical basis of these skill-based interventions.

One clear applied implication of Study 2 is that there are inherent challenges in exporting intervention models developed with middle-class couples to couples living with low incomes. I found little evidence to support the view that communication would mediate treatment effects, raising the need for new intervention models that might be more responsive to the needs of vulnerable couples. The most plausible alternative target, I believe, is the economic

circumstance of the couple. Financial difficulties are a leading complaint and defining feature of low-income couples (Trail & Karney, 2012), and economic strain is a known correlate of observed negativity among newlywed couples living with low incomes (even after controlling for satisfaction; see Williamson, Karney, & Bradbury, 2013), thus it is reasonable to expect that improving economic circumstances and earning potential may do a great deal to reduce disparities in negative relationship outcomes experienced by low-income couples.

Less apparent is how best to achieve this goal. Study 3 highlights potential challenges by demonstrating that attempting to improve economic capacity without attending to the relationship dynamics and potential costs to the family can have detrimental effects. Relationship-focused interventions may be necessary but insufficient for generating lasting benefits for couples living with low incomes. The most effective interventions are likely to involve a multi-pronged approach that works to improve the context of the relationship (e.g., financial circumstances), while also focusing on improving the relationship itself and helping couples learn how to productively deal with external stressors. Future efforts should focus on developing and testing a multi-level intervention which combines relational and contextual change, as the combination of these two approaches may be greater than the sum of its' parts.

In conclusion, the three studies in this dissertation highlight the small effects that current intervention strategies yield for low-income couples, while underscoring the need for new approaches that acknowledge the potent role of risk and economic circumstances. Taken together, the results of these three studies suggest that future relationship interventions will need to account for contextual stressors (especially socioeconomic status) and relationship qualities to determine the appropriate intervention for any given couple. Development of more effective interventions will help to combat disparities in relationship outcomes that fall disproportionately

upon couples living with low incomes, thus enabling more children and families living in difficult life circumstances to reap greater rewards from their relationships.

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