

Effects of Relationship Education on Couple Communication and Satisfaction: A Randomized Controlled Trial With Low-Income Couples

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Objective: Although preventive educational interventions for couples have been examined in more than 100 experimental studies, the value of this work is limited by reliance on economically advantaged populations and by an absence of data on proposed mediators and moderators. Data from the Supporting Healthy Marriage Project—a randomized, controlled trial of relationship education for couples living with low incomes—were therefore analyzed to test whether intervention effects on relationship satisfaction would be mediated by observational assessments of relationship communication and whether any such effects would be moderated by couples' pretreatment risk. **Method:** Within the larger sample of Supporting Healthy Marriage Project couples randomized to a relationship education or no-treatment control condition, the present analyses focus on the 1,034 couples who provided (a) data on sociodemographic risk at baseline, (b) observational data on couple communication 12 months after randomization, and (c) reports of relationship satisfaction 30 months after randomization. **Results:** Intervention couples reported higher satisfaction at 30 months than control couples, regardless of their level of pretreatment risk. Among higher risk couples, the intervention improved observed communication as well. Contrary to prediction, treatment effects on satisfaction were not mediated by improvements in communication, and improvements in communication did not translate into greater satisfaction. **Conclusions:** Relationship education programs produce small improvements in relationship satisfaction and communication, particularly for couples at elevated sociodemographic risk. The absence of behavioral effects on satisfaction indicates, however, that the mechanisms by which couples may benefit from relationship education are not yet well understood.

What is the public health significance of this article?

For married couples with children, relationship education programs generate small improvements in relationship satisfaction.

For couples who are younger, with less education and lower incomes, these programs produce small improvements in the quality of communication as well.

Although improvements in communication do not necessarily lead to improvements in satisfaction, both types of change might enable couples to have stronger, healthier families.

Keywords: communication, couples, low-income, marriage, relationship education

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

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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 hr 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 quasiexperimental studies with postassessment and follow-up data on communication skills demonstrated intervention effects at postassessment, 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, Baucom, Burnett, Allen, & Ragland, 2003), that decreases in negative communication do not benefit relationships (Stanley, Rhoades, Olmos-Gallo, & Markman, 2007), and even that increases in negative communication can be beneficial for relationships (Bodenmann, Bradbury, & Pihet, 2008). 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 pretreatment 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 pretreatment 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 pretreatment 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 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 White, 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 2 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 married.¹ Some sites also had more stringent criteria (e.g., enrolling only expectant parents; see Miller Gaubert, Gubits, Alderson, & Knox, 2010, for details). Couples

¹ Although 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).

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 hr 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 nine to 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 1-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 hr ($SD = 9$) or 72.7%

($SD = 30.4%$) of group curricula on average. This is more than the typical participant in relationship education, who receives 12 hr on average according to a recent meta-analysis (Hawkins, Stanley, Blanchard, & Albright, 2012).² 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-min videotaped discussions with the couple, for a total behavioral sample of 21 min. 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 90° 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 min 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, Conger, & Scaramella, 1998). Coders—11 of whom were native Spanish speakers—coded only in their native language. Most of the discussions

² Although 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.

(68%) took place in English, 30% took place in Spanish, and 2% were in a combination of English and Spanish. Coders participated in 10 hr 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 2 hr 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 Observer XT 8.0 coding software (Noldus Information Technology, Wageningen, The Netherlands), 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 two 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 1 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, Bradbury, Trail, & Karney, 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 (reverse coded) codes. 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. Interrater 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: (a) either partner was under the age of 23, (b) husband had less than a high school education, (c) wife had less than a high school education, (d) husband was unemployed, (e) wife was unemployed, (f) couple's income was below the poverty line, (g) husband was receiving public assistance, (h) wife was receiving public assistance, (i) husband reported no one to help in an emergency, and (j) 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 = .101 to .151, median $r = .107$). Similarly small effects suggested that subsample couples were less likely to be below the FPL ($d = .08$) 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 FPL ($d = .29$), 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 equation 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.

Table 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%	$\chi^2(1) = .49$	.02
Household income below 200% federal poverty line	80.6%	80.6%	$\chi^2(1) = .01$	-.01
White	21.3%	20.8%	$\chi^2(1) = .08$	.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%	$\chi^2(1) = .45$	-.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)	$t(1) = .71$	.01
Husband relationship satisfaction	27.0 (5.1)	26.7 (5.3)	$t(1) = -.94$	.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 coefficient for χ^2 analyses.

* $p < .05$.

Results

Equivalence of Treatment and Control Conditions

As shown in Table 1, couples in the treatment and control conditions were equivalent on 10 of 11 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, the lower risk and higher risk groups differed on all 10 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 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 $r = 1.161$ to $r = 1.481$, with all $p < .001$. Among wives, correlations between communication variables ranged from

Table 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 coefficient for χ^2 analyses.
*** $p < .001$.

$r = 1.171$ to $r = 1.521$, with all $p < .001$. Baseline and 30-month satisfaction scores covaried reliably with communication codes in all instances ($r = 1.091$ to $r = 1.261$, 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; $\chi^2(44) = 51.35$, $p = .21$, standardized root-mean-square residual (SRMR) = .022, root-mean-square error of approximation (RMSEA) = .018, comparative fit index (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 1 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 1, 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 relation-

Table 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	.8
(2) Negativity	-.48***	.58 ***	-.17***	-.10**	-.16***	1.4	.6
(3) Positivity	.38***	-.16***	.82 ***	.26***	.19***	2.0	.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	.8	.4	.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.
** $p < .01$. *** $p < .001$.

ship 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 1 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 1, 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 ($\beta = .16, p = .003$).^{3,4}

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 policymakers, 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-satisfaction paths in this mediated model were themselves moderated by pretreatment 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)—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.⁵ 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 pro-social behav-

³ As 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 reran 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 ($p < .06$).

⁴ As 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 reran 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 pairwise comparisons across models (all $ps > .5$). 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.

⁵ Support 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 12.37 to 6.69 and p ranging from $<.018$ to $<.001$).

ior, humor, and affection may hold greater potential for improving couples' positive behavioral repertoires.⁶

Second, although interventions did yield improvements in relationship satisfaction across levels of pretreatment 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 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 (see Table 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 Cobb, Lawrence, Johnson, & Bradbury (2013) indicates that a one-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, Atkins, Baucom, & Yi, 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; 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 connect personal and

⁶ Observed positivity and negativity were correlated at $r = -.16$ for husbands and $r = -.17$ for wives (see Table 3), suggesting some independence in these aspects of couples' behavioral interactions.

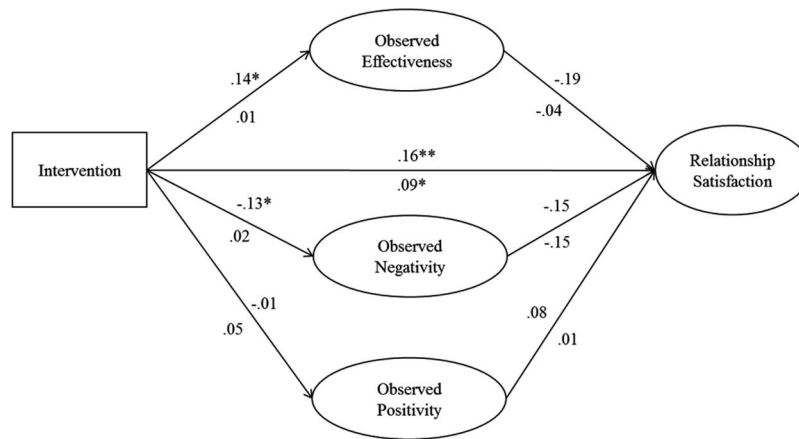


Figure 1. Structural equation model testing communication behavior as a mediator of intervention effects on relationship satisfaction in lower risk and higher risk groups. Standardized factor loadings are presented. Results for the higher risk group are presented *above* the paths; results for the lower risk group are presented *below* the paths. Baseline relationship satisfaction and indicator variables of latent factors are not shown. $N = 1,034$ couples, $\chi^2(44) = 51.35$, $p = .21$, comparative fit index = .99, standardized root-mean-square residual = .02, root-mean-square error of approximation = .02. * $p < .05$. ** $p < .01$.

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.

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