Healthy Marriage and Relationship Education for Expectant and New Mothers: The One-Year Impacts of MotherWise

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Introduction

Many healthy marriage and relationship education (HMRE) programs funded by the federal government serve individual adults rather than couples. Such programs aim to help participants form and maintain healthy romantic relationships and avoid unhealthy relationships, regardless of their relationship status. These programs serve a mix of populations and often cover such topics as how to choose a partner wisely, how to improve communication skills, how relationship choices may affect many aspects of life, and how to recognize unhealthy relationships and leave those relationships safely.

Although the prevalence of HMRE programs serving individual adults has grown over recent years, there is little rigorous evidence of their effectiveness. To date, large-scale evaluations of HMRE programs have focused mostly on programs for adult couples. The few existing studies of HMRE programs for individual adults either use quasi-experimental methods, examine short-term effects, or examine programs that serve populations or operate in settings that are dissimilar to those of federally funded HMRE programs.

To help build the evidence base on the diverse set of HMRE programs serving individual adults, this study examines MotherWise, a relationship skills program for women with low incomes who are pregnant or have just had a baby. In 2015, the University of Denver received a five-year grant from the Office of Family Assistance within the Administration for Children and Families (ACF) at the U.S. Department of Health and Human Services to deliver the program, which aims to empower women to make informed decisions about relationships and other life choices. The program included a core group workshop made up of six weekly four-hour sessions, individual case management, and an optional couples' workshop.

Primary research question

This report addresses the following primary research question:

- What are the one-year impacts of MotherWise, an HMRE program for expectant and new mothers, on women's relationship skills, attitudes, and outcomes?

Purpose

This report is the second in a series on the implementation and impacts of MotherWise. It describes the program's impacts after one year. These impacts were estimated by comparing the outcomes of women who were randomly assigned to either a group that was offered MotherWise services or a control group that was not. The report also provides information on program implementation and costs and documents the study methods. An earlier report provided detailed information on the program's design and implementation during the first year of the impact study. A future report will examine longer-term impacts of the MotherWise program, based on a follow-up survey of women 30 months after they enrolled in the study. Mathematica and Public Strategies conducted this study as part of the Strengthening Relationship Education and Marriage Services (STREAMS) evaluation for ACF.

What we learned

- MotherWise positively affected women's relationship skills and attitudes after one year. Compared to women in the control group, those offered the MotherWise program reported better relationship skills and more healthy attitudes toward relationships one year after entering the program.

- Women in the MotherWise group were less likely to report having an unintended pregnancy in the year after entering the study. Only 7 percent reported an unintended pregnancy during this period, compared to 11 percent of women in the control group.
- Women in the MotherWise and control groups reported similar levels of experiences of intimate partner violence, co-parenting quality, and emotional well-being at the one-year follow-up.
- About three-quarters of women entered the MotherWise study in a steady romantic relationship with their baby's father. In both the program and control groups, about 9 in 10 of these women remained in that relationship a year later. Exploratory analyses suggest that, among women who remained in a relationship with their baby's father, MotherWise improved the quality of that relationship**.**

Methods

Between September 2016 through December 2018, 949 women enrolled in the study. To be eligible for the study, women had to be at least 18 years old and either be pregnant or have delivered a baby in the previous three months. The study team randomly assigned women to either (1) a group that was offered the MotherWise program or (2) a control group that was not offered the program but was free to seek other services available in the community. For the impact analysis presented in this report, we used data from a baseline survey that was administered at the time of enrollment and a one-year follow-up survey. A total of 799 women responded to the one-year follow-up survey, for a response rate of 84 percent. Response rates were similar between the program and control groups.

Considerations for HMRE programs and research

MotherWise took a unique approach to offering HMRE services to individual adults. It served exclusively expectant and new mothers with low incomes and aimed to empower them to make healthy decisions about their relationships that would keep them and their children safe. The positive impacts on women's relationship skills and attitudes provide some promising evidence of the potential of this approach.

The findings of this study offer an interim look at the effects of MotherWise one year after women entered the program. Some results are encouraging. The program reduced the number of unintended pregnancies during the one-year follow-up period, which suggests that MotherWise may have encouraged women to make more deliberate decisions about family planning. Although we found no impacts on intimate partner violence and co-parenting at the one-year follow-up, we found impacts on related outcomes such as perceived conflict management skills and attitudes concerning intimate partner violence. Because relationship outcomes can take time to unfold, impacts on co-parenting and experiences of intimate partner violence may still emerge at a later point. The 30-month impact study will provide evidence on the longer-term effects of MotherWise on relationship outcomes, as well as the overall well-being of participants and their children.

Why did MotherWise succeed in improving relationship skills and attitudes and reducing unintended pregnancies? One factor may have been the program's strong implementation. Participants regularly attended and engaged with program services; nearly two-thirds of participants completed the workshop. Moreover, the program leadership (which included developers of the Within my Reach curriculum) was closely involved with program implementation, helping to ensure that the program was implemented with fidelity. These findings underscore the importance of strong implementation for program success. Another factor may have been the well-defined population that the program served—women with low incomes who were expecting or had just had a baby. Having a well-defined service population allowed the program to tailor services more closely to their participants' specific needs, which may have

contributed to its effectiveness. Other HMRE programs serving individual adults may want to consider focusing their service populations on adults in particular family or relationship situations to allow them to tailor program services more closely to participant needs. Finally, the birth of a child may be a time when women are particularly open to taking stock of their romantic relationships, potentially making them more receptive to the program's healthy relationship content. Therefore, women with low incomes who are expecting a baby or have just had one may be particularly well suited for HMRE services and thus be a group future HMRE programs should consider serving. HMRE programs for individual adults could also consider serving other populations whose life circumstances might prime them to be more receptive to HMRE content. The 30-month findings will provide additional insights into the program's impacts.

The findings presented in this report indicate that programs similar to MotherWise can improve certain outcomes of new and expectant mothers with low incomes by offering them HMRE services and other supports. HMRE programs for individual adults can vary in the populations they serve and the services they offer, as well as the outcomes they try to influence. Future studies that examine other such programs can help develop a more complete picture of the potential effects of HMRE programs for individual adults on the full range of populations they serve.

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Introduction

Many healthy marriage and relationship education (HMRE) programs funded by the federal government serve individuals rather than couples. For example, in the 2015 HMRE grant funding cycle administered by the Office of Family Assistance (OFA) in the Administration for Children and Families (ACF) at the U.S. Department of Health and Human Services just over half of the grantees operated an HMRE program for individuals (OFA n.d.). Such programs aim to help participants form and maintain healthy romantic relationships and avoid unhealthy relationships, regardless of their relationship status (Stanley et al. 2020; Stanley and Rhoades 2009). These programs serve a mix of populations and often cover such topics as how to choose a partner wisely, how to improve communication skills, how relationship choices may affect many aspects of life, and how to recognize unhealthy relationships and leave those relationships safely (Rhoades and Stanley 2011; Visvanathan et al. 2014).

Although the prevalence of HMRE programs for individuals has grown over recent years, there is little rigorous evidence of their effectiveness (Visvanathan et al. 2014; Stanley et al. 2020). To date, evaluations of HMRE programs for families with low incomes have focused mostly on programs for adult couples (Moore et al. 2018; Wood et al. 2012; Lundquist et al. 2014). A handful of quasi-experimental studies of HMRE programs for individual adults have suggested that they might improve some short-term outcomes (Adler-Baeder et al. 2018; Bradford et al. 2016; Owen et al. 2017; Van Epp et al. 2008). However, few random assignment studies of such programs have been conducted. One recent small-scale study used a random assignment design to examine the short-term effects of a brief online HMRE program for individual adults (Nowlan et al. 2017). In addition, a few studies have examined the effects of for-credit courses about relationship issues on the college students who took them (Sharp and Ganong 2000; Braithwaite and Fincham 2009; Polanchek 2014). However, given their setting and target population, these studies provide limited guidance on the likely effectiveness of federally funded HMRE programs for individual adults.

To reflect the growing diversity of approaches used by federally funded HMRE programs, in 2015, ACF contracted with Mathematica and its partner Public Strategies to conduct a random assignment impact study of MotherWise, a relationship skills program for women with low incomes who are pregnant or have just had a baby. The University of Denver in Colorado received a five-year grant from OFA in 2015 to deliver the MotherWise program. The study was part of the broader Strengthening Relationship Education and Marriage Services (STREAMS) evaluation conducted by Mathematica and Public Strategies for ACF's Office of Planning, Research, and Evaluation with funding from OFA.

HMRE programs for individuals can serve a mix of populations in a range of relationship circumstances. MotherWise represents one approach. It exclusively serves women – specifically, women who are pregnant or have recently had a baby. It was designed by a developer of the *Within My Reach* curriculum, a commonly used HMRE curriculum for individuals, and was tailored to the needs of expectant and new mothers (that is, those who had delivered a child in the previous three months). MotherWise integrates *Within My Reach* into a comprehensive set of services that includes case management and other support services as well as an optional couples' workshop. The program's primary goal is to empower women with the knowledge and skills they need to make informed decisions about healthy relationships. Findings from this study will help build the evidence base for HMRE programs that focus on individual adults and will provide novel evidence on HMRE programs that serve only women. However, more research will be needed to create a full picture of the effects of such HMRE programs.

The study presented in this report addresses the question: "What are the one-year impacts of MotherWise, an HMRE program for expectant and new mothers, on relationship skills, attitudes, and outcomes?" To answer this question, we compare the outcomes of 949 women who were randomly assigned to either the MotherWise group or the control group that was not offered MotherWise services. This report was based on follow-up survey data collected one year after women enrolled in the study. The report describes the women who participated in the study, provides information on program costs and implementation, and documents the study methods. It is the second in a series on the implementation and impacts of MotherWise. An earlier report provided detailed information on the program's design and implementation during the first year of the impact study (Baumgartner and Paulsell 2019). A future report will examine longer-term impacts of the MotherWise program, based on a follow-up survey of women 30 months after they enrolled in the study.

About the STREAMS evaluation

Since the early 2000s, the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services has led a sustained effort to expand the available evidence on healthy marriage and relationship education (HMRE) programs. In 2015, ACF contracted with Mathematica and its partner, Public Strategies, to conduct the Strengthening Relationship Education and Marriage Services (STREAMS) evaluation to help identify strategies for improving the delivery and effectiveness of HMRE programs. The evaluation has a particular emphasis on understudied populations and program approaches not covered in ACF's prior federal evaluations. STREAMS includes in-depth process studies, random assignment impact studies, a rapid-cycle evaluation of text message reminders to improve attendance at HMRE group workshops, a formative evaluation of a facilitation training curriculum for HMRE programs for high school students, and predictive analytic modeling of attendance at HMRE group workshops. Learn more about the evaluation at https://www.acf.hhs.gov/opre/research/project/strengthening-relationship-education-and-marriage-services-streams.

The MotherWise program

Researchers at the University of Denver developed the MotherWise program. A prior report on the design and implementation of MotherWise (Baumgartner and Paulsell 2019) described its goals as follows:

> MotherWise aimed to empower women to make informed decisions about relationships and other life choices. It sought to teach women how to recognize the signs of unhealthy or dangerous dynamics in their relationships and how to safely remove themselves and their children from them. By bringing women together, it aimed to give women coping skills and help them develop their social networks. Finally, MotherWise taught women skills and techniques to communicate better; adjust to changes in their lives; connect with and care for their newborns; and develop strong, healthy relationships.

MotherWise aimed to improve relationship skills and attitudes. It emphasized the importance of making careful and deliberate decisions about relationships—including whom to have a child with—given the substantial consequences that relationship choices can have for participants and their children. The program also aimed to help participants protect themselves from intimate partner violence by teaching

women how to recognize signs of unhealthy relationships and by including messages of personal empowerment.[1]

MotherWise included three primary components: (1) a core group workshop made up of six weekly four-hour sessions, (2) individual case management, and (3) an optional couples' workshop. The core group workshop used the *Within My Reach* curriculum (15 hours of content), which was supplemented with information on infant care and parenting (three hours of content), for a total of 18 hours of content.

Within My Reach is an HMRE curriculum tailored for individual adults, distributed by PREP, Inc. While similar curricula for couples aim to help partners communicate and plan for their future together, *Within My Reach* emphasizes an individual's goals and needs and is designed to help adults make informed and healthy decisions about their personal and romantic relationships regardless of their relationship status (Pearson et al. 2015). The *Within My Reach* content, which forms the basis for the core MotherWise workshop, focuses directly on improving relationship skills and attitudes. It covers the characteristics of healthy relationships, communication and relationship skills, and common relationship challenges and how to resolve them. Table 1 provides an overview of the HMRE content covered in each of the six workshop sessions.

Table 1. Overview of the six MotherWise *Within My Reach* workshop sessions

Session	HMRE content covered
Session 1	• The state of relationships today • Healthy relationships: What they are and what they aren't • Sliding versus deciding
Session 2	• Sliding versus deciding (continued) • Smart love • Knowing yourself first
Session 3	• Knowing yourself first (continued) • Making your own decisions • Danger patterns in relationships
Session 4	• Where conflict begins • Smart communication • The speaker-listener technique
Session 5	• The speaker-listener technique (continued) • Infidelity, distrust, and forgiveness • Two types of commitment: Why it matters to adults and children
Session 6	• Two types of commitment: Why it matters to adults and children (continued) • Stepfamilies and the significance of fathers • Making the tough decisions • Reaching into your future

Source: MotherWise Program documents.

The MotherWise workshop also included content on parenting and infant care, with content developed by a pediatrician from Denver Health, a large public hospital that is the primary health care provider for families with Medicaid-funded births in the Denver area. The content covered issues related to parenting,

[1] Although the program aimed to help participants protect themselves from intimate partner violence by teaching women how to recognize signs of unhealthy relationships and by including messages of personal empowerment, the program developers also recognize that perpetrators, not their victims, are responsible for intimate partner violence.

infant care, and self-care during the early months of parenthood. This not only provided important and relevant information but also cover for women who were in an unsafe relationship and did not want their partners to know that they were in a program that included topics such as recognizing relationship danger signs and how to leave unhealthy relationships safely (Baumgartner and Paulsell 2019).

MotherWise used case management to reinforce the skills that the women learned in the workshop. Case managers began meeting with MotherWise participants shortly after enrollment and tried to meet with them weekly, in person or by phone, until they completed the core workshop sessions. Participants were expected to attend at least four meetings with a case manager during the course of the six-week program. Case management focused on helping the women apply the workshop concepts about healthy relationships to their own lives. In addition, case managers helped the women set personal goals and provided referrals to community resources—such as organizations that provided affordable baby items, domestic violence resources, mental health services, job readiness services, job placement, and financial literacy classes—as well as Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF) offices.

MotherWise included an optional couples' workshop that the mothers could attend with their romantic partners. The program developers designed this workshop to reinforce important HMRE concepts and communication skills. It was offered to women who were in committed relationships and who had completed at least the first three sessions of the *Within My Reach* workshop. The couples' workshop had two parts: (1) an all-day Saturday session and (2) a four-hour weeknight session. Couples could choose to attend either or both sessions.

All MotherWise workshops and supplementary services were provided in Spanish and English. Women receiving prenatal and postnatal services through Denver Health were targeted for the program. University of Denver supplemented this primary recruitment source with referrals from other medical and social service agencies that serve pregnant women and new mothers with low income in the Denver area.

Study design

To test the effectiveness of the MotherWise program, the study team used a random assignment design. We compared the outcomes of women who had been randomly assigned to one of two groups: (1) a group that was offered the MotherWise program and (2) a control group that was not offered the program but was free to seek other services available in the community. Because the study team assigned women to the two research groups at random, any difference in average outcomes between the two groups represents an unbiased estimate of the effect of the MotherWise program. The rest of this section describes the design of the impact study.

Sample intake

To enroll in the study, an individual had to meet the following eligibility criteria: (1) be female, (2) be at least 18 years old, and (3) either be pregnant or have delivered a baby in the previous three months. MotherWise staff primarily recruited study participants from the Denver Health clinic where they received perinatal care. Eligible women were identified through Denver Health's electronic medical record system and then approached in exam rooms before their doctor's appointments. There, MotherWise staff described the program and study and scheduled an intake appointment if the women were interested. To supplement this primary recruitment source, MotherWise staff also sought referrals from other medical and social service agencies that served pregnant women and new mothers with low

incomes in the Denver area. Study enrollment took place from September 2016 through December 2018. During this period, 949 women were enrolled in the study.

Random assignment

Women who were eligible for the study, who consented to the study, and who completed the baseline survey (described later in this section) underwent random assignment. After an eligible study participant completed the consent process and baseline survey, a MotherWise staff member would complete the enrollment process by using the study's computer system to randomly assign the participant to either the MotherWise group or the control group that was not eligible for MotherWise. As explained in the appendix to this report, the likelihood of being placed in the MotherWise group or the control group varied over time to ensure adequate enrollment in the program. Overall, 54 percent of study participants were assigned to the MotherWise group and 46 percent were assigned to the control group.

Data collection

The impact analysis presented in this report relies on data from the following two surveys administered to women in both research groups:

1. **Baseline survey.** Members of the STREAMS evaluation team administered a baseline survey to women by telephone during the program intake appointment. The survey collected information on the women's demographics, family backgrounds, relationship attitudes and skills, relationship experiences, children, employment, and well-being.
2. **One-year follow-up survey.** About 12 months after study enrollment, the study team attempted to contact the women in both research groups to complete a one-year follow-up survey, either online or by telephone. The survey collected information on the women's relationship attitudes, perceived skills, relationship experiences, and specifically their relationship with the father of the baby. The survey had an overall response rate of 84 percent. The response rate was similar for the two research groups: 83 percent for the MotherWise group and 85 percent for the control group. The appendix contains additional details on the survey administration procedures and response rates.

In addition to these surveys, the study team administered a longer-term follow-up survey 30 months after the baseline survey. The study team began administering the survey in May 2019 and plans to complete survey administration by the end of 2021. A future report will discuss the findings from the 30-month follow-up survey.

Because the program directly targeted the women's outcomes, the study team did not attempt to collect data from their romantic partners or co-parents. This should be kept in mind when interpreting findings for some outcomes. For example, the measures of co-parenting quality only reflect the woman's perceptions of the co-parenting relationship and do not capture her co-parent's perceptions of that relationship.

Analysis

For the purpose of this report, we conducted both a confirmatory analysis and an exploratory analysis (Schochet 2009). We used the confirmatory analysis as the basis of our main test of whether MotherWise achieved its intended effects on the outcomes of women who enrolled in the program. For this analysis, we specified both the outcomes and methods before examining the data to prevent the perception that we decided which findings to report after seeing the results. For the exploratory analysis, we examined the

additional research question of whether MotherWise had an impact on women's romantic relationships with their baby's father. We categorized this analysis as exploratory (that is, not part of the main test of program effectiveness) because these outcomes were not as central to the program's goals and were not relevant for all mothers served by MotherWise. MotherWise served individuals regardless of their relationship status; about three-quarters of study participants were in a romantic relationship with their baby's father when they entered the study or at follow-up. Because MotherWise taught relationship skills and how to recognize healthy and unhealthy relationships, the program may have affected the status and quality of these relationships. We conducted exploratory analyses to examine the extent to which the MotherWise program affected mothers' romantic relationship with their baby's father.

For the confirmatory analysis, we selected outcomes across six domains, informed by the program's implementation framework (Baumgartner and Paulsell 2018). The domains include: (1) relationship skills, (2) relationship attitudes, (3) exposure to intimate partner violence, (4) unintended pregnancy, (5) co-parenting, and (6) emotional well-being (Table 2). We selected these domains because they were central to the MotherWise goals. The first two domains were most directly targeted by MotherWise because the core group workshop focused on improving relationship skills and attitudes. In addition, a central goal of the program was helping participants recognize unhealthy relationships and protect themselves from intimate partner violence. MotherWise also emphasized the importance of making careful and deliberate decisions about relationships—including whom to have a child with and when to have a child—given the substantial consequences of relationship choices for the participants and their children. Like HMRE programming more broadly, MotherWise has the ultimate goal of improving child well-being. An important potential pathway by which the program may improve child well-being is through the relationship skills taught by the program, which could improve participants' co-parenting relationships. Finally, MotherWise could have effects on participants' emotional well-being due to its messages of personal empowerment and the opportunity it provides new mothers to avoid feelings of isolation. MotherWise may also indirectly improve well-being through its effects on other outcomes, such as participants' exposure to intimate partner violence and the quality of co-parenting.

Table 2. Confirmatory outcomes

Outcome	Measure
Relationship skills	
Perceived romantic relationship skills	Continuous scale variable: Average of mother's responses to six survey questions. Each question asked participants to report their level of agreement with a statement such as, "I believe I will be able to effectively deal with conflicts that arise in my relationship" or "I have the skills needed for a lasting, stable romantic relationship." Questions were a subset of items from the Relationship Deciding Scale (Vennum and Fincham 2011). Scale values ranged from 1 to 4, with higher values indicating greater perceived relationship skills.
Perceived conflict management skills	Continuous scale variable: Average of mother's responses to five survey questions. Each question asked women to report their perceived ability to perform certain conflict management skills, such as listening to another person's opinion during a disagreement or working through problems without arguing. Questions were adapted from the Conflict Management Subscale of the Interpersonal Competence Scale (Buhrmester et al. 1988). Scale values ranged from 1 to 4, with higher values indicating greater perceived skills.
Relationship attitudes	
Support for going slow in romantic relationships	Degree to which mother agreed with the following statement: People are more likely to succeed in their relationships if they take things slowly. Values ranged from 1 to 4, with higher values indicating greater agreement. This measure was recommended by the *Within My Reach* curriculum developers.

Outcome	Measure
Disapproval of couple violence	Continuous scale variable: Average of responses to 5 survey questions. Each question asked women to report their level of disagreement with a statement such as, "Violence between dating partners can improve the relationship" and "There are times when violence between dating partners is okay." Questions were a subscale of the Acceptance of Couple Violence Scale (Dahlberg et al. 2005). Scale values ranged from 1 to 4, with higher values indicating greater disapproval of couple violence.
Unintended pregnancy	
Had an unintended pregnancy since program enrollment	Whether mother reported having had an unintended pregnancy (she did not want to become pregnant or the pregnancy came sooner than intended) since random assignment. This measure was based on survey questions drawn from the National Survey of Family Growth 2015–2017 (National Center for Health Statistics n.d.).
Exposure to intimate partner violence	
Any psychological abuse	Whether mother reported that in the past year a romantic partner tried to keep her from seeing or talking with friends, made her feel stupid, kept money from her or took her money without asking, or made her feel afraid that the partner might hurt her. This measure was adapted from similar measures used in the Supporting Healthy Marriage evaluation (Hsueh et al. 2012).
Any physical abuse	Whether mother reported that in the past year a romantic partner pushed, shoved, slapped, punched, kicked, or beat her up. This measure was based on two items of the Physical Assault Scale of the Conflict Tactics Scale—Short Form (Straus and Douglas 2004).
Co-parenting	
Quality of co-parenting relationship with baby's father	Continuous scale variable: Average of responses to 10 survey questions. Each question asked women to report their level of agreement with positive statements about co-parenting with the father of the baby such as, "I feel good about [father]'s judgment about what is right for our children/child." Questions were a subset of items from the Parenting Alliance Inventory (Abidin and Brunner 1995). Scale values ranged from 1 to 4, with higher values indicating greater co-parenting quality.
Emotional well-being	
Depressive symptoms	Continuous scale variable: Sum of responses to eight survey questions. Each question asked women to report how frequently they experienced a depressive symptom in the past two weeks. Questions were from the Patient Health Questionnaire (Kroenke et al. 2009). Scale values ranged from 1 to 4, with higher values reflecting more frequent depressive symptoms.

For our exploratory analysis, we examined the impacts of MotherWise on the following aspects of women's romantic relationships with their baby's father (Table 3):

- **Relationship status with the baby's father.** We examined two relationship status measures: (1) whether the mother was in a romantic relationship with the baby's father at the one-year follow-up and (2) whether the mother was married to the baby's father at the one-year follow-up.
- **Quality of romantic relationship with the baby's father.** We examined program impacts on five aspects of the quality of the relationship the mother had with the baby's father: (1) support and affection, (2) relationship commitment, (3) relationship happiness, (4) use of constructive conflict behaviors, and (5) avoidance of destructive conflict behaviors. These outcomes were only defined for mothers who remained in a romantic relationship with their baby's father at the time of the follow-up survey.

Table 3. Exploratory outcomes

Outcome	Measure
Relationship status[a]	
Romantically involved with the baby's father at follow-up	Whether mother reports that she is married to or in a steady romantic relationship with the baby's father at the time of the one-year follow-up survey.
Married to the baby's father at follow-up	Whether mother reports that she is married to the baby's father at the time of the one-year follow-up survey.
Relationship quality[b]	
Support and affection	Continuous scale variable: Average of mothers' responses across 12 survey items about her relationship with the father of the baby. Designed to measure positive relationship traits such as support, intimacy, friendship, commitment, and trust. Values range from 1 to 4, with higher values indicating greater support and affection.
Relationship commitment	Continuous scale variable (ranges from 1 to 10), where 1 is not at all committed and 10 is completely committed to the romantic relationship with the baby's father, with higher values indicating that the mother is more committed to her relationship.
Relationship happiness	Continuous scale variable (ranges from 1 to 10), where 1 is not at all happy and 10 is completely happy, with higher values indicating that the mother has greater happiness in the romantic relationship with the baby's father.
Use of constructive conflict behaviors	Continuous scale variable: Average frequency with which the mother reports using constructive conflict behaviors with the baby's father, such as, "When [father] and I have a serious disagreement, we work on it together to find a solution." Values range from 1 to 4, with higher values indicating greater use of constructive conflict behaviors.
Avoidance of destructive conflict behaviors	Continuous scale variable: Average frequency with which the mother reports avoiding destructive conflict behaviors with the baby's father, such as, "When [father] and I argue, past hurts get brought up again." Values range from 1 to 4, with higher values indicating greater avoidance of destructive conflict behaviors.

Note: These measures were adapted from similar measures used in the Parents and Children Together evaluation (Moore et al. 2018).

[a] These outcomes were only defined for women who were in a steady relationship with baby's father at baseline.

[b] These outcomes were only defined for women who were in a steady relationship with baby's father at baseline and follow-up.

Characteristics of women in the study

MotherWise succeeded in reaching its intended population of economically disadvantaged expectant and new mothers (Table 4). Most women in the study were young, with an average age of 28. About two-thirds identified as Hispanic, while 11 percent identified as non-Hispanic Black and 16 percent as non-Hispanic White. About four in 10 were born outside the United States; a similar share of the women said they primarily spoke Spanish at home. About one-quarter of the women in the study had not completed high school; only 9 percent had a college degree. On the baseline survey, nearly three in four women reported that they had accessed government benefits such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) or SNAP or TANF in the past 30 days. Just under four in 10 women were working when they entered the study. The women reported earning about $517, on average, in the month prior to study enrollment. Although MotherWise served women regardless of their relationship status, most were in a romantic relationship when they entered the study. Most women were in a romantic relationship with their baby's father when they entered the study. Three-quarters (76 percent) reported being in a steady romantic relationship with the father; another 7 percent were in an on-again-off-again relationship with the baby's father. About 3 percent reported being in a romantic

Table 4. Women's characteristics at baseline (percentage unless otherwise specified)

Baseline characteristics	Mean or percentage
Demographics	
Average age (years)	28
Race and ethnicity	
Hispanic	67
Black, non-Hispanic	11
White, non-Hispanic	16
Other, non-Hispanic	6
Foreign-born	37
Language spoken at home	
English	58
Spanish	41
Other	1
Family and relationships	
Number of biological and adopted children (average)	1.6
Expecting a baby at study enrollment	83
New/expected baby is their first child	37
Relationship status	
In a steady romantic relationship with the baby's father	76
In an on-again, off-again relationship with the baby's father	7
In a steady romantic relationship with someone else	2
In an on-again, off-again relationship with someone else	1
Not in a romantic relationship	15
Intimate partner violence	
Any psychological abuse by a romantic partner in the past year	39
Any physical abuse by a romantic partner in the past year	16
Well-being	
At risk for moderate or severe depression	24
Socioeconomic status	
Highest educational level	
Less than high school	26
High school diploma or GED	37
Some college or vocational technical school	28
College degree	9
Worked for pay in past month	39
Earnings in past 30 days ($)	517
Receipt of SNAP, TANF, or WIC in past 30 days	73
Sample size	**949**

Source: STREAMS baseline survey conducted by Mathematica.

Note: Percentages may not sum to 100 due to rounding.

SNAP = Supplemental Nutrition Assistance Program; TANF = Temporary Assistance for Needy Families; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

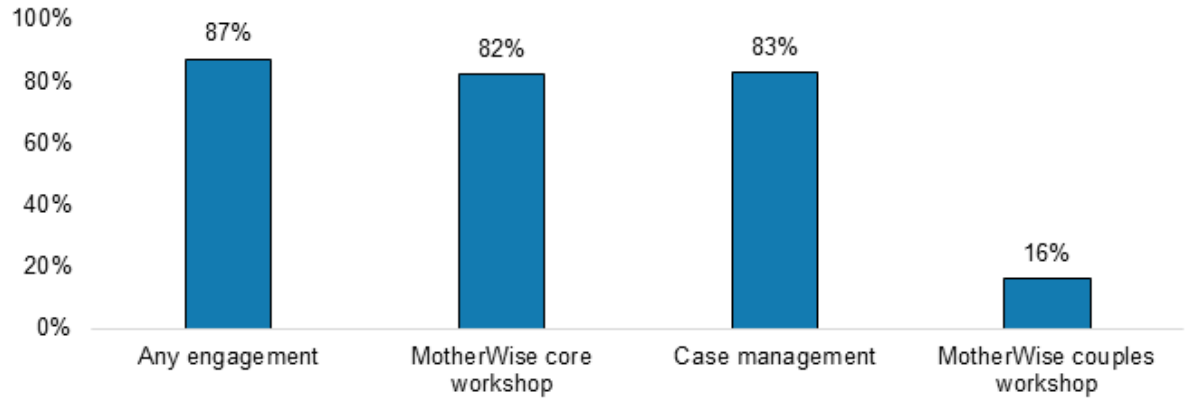
relationship (steady or on-and-off) with someone other than their baby's father at this point. Only 15 percent of women were not in a romantic relationship when they entered the study. Some women reported experiencing violence in their recent romantic relationships. In the past year, nearly 40 percent of the women had experienced psychological abuse and 16 percent had experienced physical abuse at the hands of a romantic partner (either the baby's father or a different romantic partner).

Program implementation and costs

Findings from an earlier process study showed that MotherWise was well implemented (Baumgartner and Paulsell 2019). The implementation study found that the *Within My Reach* curriculum was suitably adapted to be relevant and engaging for the target population. In addition, data entered by facilitators into the Information, Family Outcomes, Reporting, and Management (nFORM) system suggested that the staff achieved high fidelity to the curriculum.

Levels of engagement with the program were high, with 87 percent participating in at least one program activity (Figure 1). Most participants engaged in the core program components—including, the core workshop sessions (82 percent) and case management (83 percent). Participation in the optional couples' workshop was significantly lower: only 16 percent of women enrolled in MotherWise attended at least one couples' workshop with their partner. Across all participants, women participated in the core *Within My Reach* workshop for about 12 hours on average, out of a total 18 hours offered. Rates of program completion, which the program defined as completing at least five of six possible workshop sessions within four months of enrollment, were also high. Two-thirds of participants met this standard for program completion.

Figure 1. Engagement in program services



Source: Information, Family Outcomes, Reporting, and Management (nFORM) system.

The study team collected data on the resources required to deliver the MotherWise program. We estimated the cost of MotherWise as $4,350 per participant. This cost accounts for the women who participated in MotherWise and does not account for romantic partners who may have participated in the optional couples' workshop. It also excludes start-up costs. Personnel costs for program coordinators, facilitators, and other program and administrative staff accounted for the majority of the total annual program cost (60 percent). Overhead costs such as shared administrative personnel, IT support, phone services, and insurance were also a sizable component (21 percent) of the program cost. The per participant cost of the MotherWise program is similar to the estimated per participant costs of prior HMRE programs for couples. For example, the estimated average costs of the Supporting Healthy

Marriage (SHM) and Building Strong Families (BSF) programs were about $9,000 and $11,000 per couple, respectively, or $4,500 and $5,500 per participant (Gaubert et al. 2012; Wood et al. 2012).

Program impacts

MotherWise attempted to improve participants' ability to make healthy relationship choices for themselves and their families. In this section, we report our one-year findings on the program's success in achieving this goal. We begin by presenting the estimated impacts of MotherWise on relationship skills, relationship attitudes, unintended pregnancy, intimate partner violence, co-parenting, and emotional well-being. We then present findings from our exploratory analysis of program impacts on the romantic relationships of the women who were in a steady relationship with their baby's father when they entered the program (about three-quarters of the women in the study).

MotherWise positively affected women's relationship skills and attitudes after one year.

Compared to women in the control group, those who were offered the MotherWise program reported better relationship skills and more healthy attitudes toward relationships one year after entering the program (Table 5). On a general romantic relationship skills scale from 1 to 4, with higher values indicating greater perceived skills, women in the MotherWise group had an average value of 3.36 compared with an average of 3.25 for women in the control group. This measure represented the respondent's level of agreement with statements such as, "I am able to recognize early on the warning signs of a bad relationship." The impact of 0.11 on this scale is equivalent to having about 1 in 9 women move up one value on the four-point scale. For our measure of perceived conflict management skills, which used a similar 1 to 4 scale, women in the MotherWise group averaged 2.71 and women in the control group averaged 2.58, a statistically significant difference. The impact of 0.13 on this scale is equivalent to having about 1 in 8 women move up one value on the four-point scale. This measure represented the respondent's level of agreement with five statements such as, "I believe I will be able to effectively deal with conflicts that arise in my relationships." In addition, women in the MotherWise group reported greater support for going slow in romantic relationships and higher levels of disapproval of couple violence, relative to the control group.

MotherWise reduced the likelihood of an unintended pregnancy during the one-year follow-up period. It had no impact on intimate partner violence, co-parenting, or emotional well-being.

Women in the MotherWise group were less likely to report having an unintended pregnancy in the year after entering the study compared to women in the control group. In the control group, 11 percent of women reported that they had experienced a pregnancy that was either unwanted or mistimed, compared with only 7 percent of women in the MotherWise group. This difference was statistically significant at the 0.10 level. Women in the two research groups reported similar levels of intimate partner violence. About 10 percent of women in both groups experienced physical abuse at the hands of a romantic partner in the past year, while between 28 percent and 33 percent experienced psychological abuse during this period, a difference that was not statistically significant. Women in the MotherWise and control groups reported similar co-parenting quality and emotional well-being at the one-year follow-up. On a scale of co-parenting quality that ranged from 1 to 4, the average mother in both groups reported a score of about 3. This average value corresponded with mothers in both groups typically reporting that they agreed with several statements about positive co-parenting behaviors such as, "[Co-parent] and I communicate well about our children/child." Generally, women in the study reported few depressive symptoms one year after enrollment. On a 0 to 24 scale that measured the frequency with which they experienced depressive

symptoms in the previous two weeks, women in both the MotherWise and control groups reported an average score of about 4.

Table 5. Impacts of MotherWise on confirmatory outcomes

Outcome	MotherWise group	Control group	Impact	Effect size
Relationship skills				
Perceived romantic relationship skills (range = 1 to 4)	3.36	3.25	0.11**	0.23
Perceived conflict management skills (range = 1 to 4)	2.71	2.58	0.12**	0.21
Relationship attitudes				
Support for going slow in romantic relationships (range = 1 to 4)	3.40	3.31	0.09*	0.15
Disapproval of couple violence (range = 1 to 4)	3.65	3.53	0.12**	0.26
Unintended pregnancy				
Had an unintended pregnancy since study enrollment	7	11	-4+	-0.29
Intimate partner violence				
Any psychological abuse	28	33	-5	-0.13
Any physical abuse	9	11	-1	-0.10
Co-parenting				
Quality of co-parenting relationship (range = 1 to 4)	3.13	3.14	-0.01	-0.01
Emotional well-being				
Depressive symptoms (range = 0 to 24)	4.35	4.39	-0.04	-0.01
Sample size	**426**	**373**		

Source: Baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the MotherWise group and Control group columns are regression-adjusted predicted values of outcomes.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

Among women who remained in a steady relationship with the baby's father, the exploratory analyses suggest that MotherWise improved the quality of their relationship.

About three-quarters of women entered the MotherWise study in a steady romantic relationship with the baby's father. In the exploratory analyses, we found that MotherWise did not affect the status of these relationships during the one-year follow-up period (Table 6). Of the women who were in a romantic relationship with the baby's father when they enrolled in the study, roughly nine in 10 women in both research groups remained romantically involved with the father one year later, and about half of each group were married to the father at this point. However, compared to women in the control group, those who were offered the MotherWise program reported higher levels of relationship quality at the one-year follow-up survey. Among women who were still in a relationship with their baby's father, we found significant impacts on three of our five relationship quality measures. Based on scales ranging from 1 to 10, women in the MotherWise group reported higher levels of relationship commitment and happiness (9.53 and 8.39, respectively), compared to the control group (9.13 and 7.96, respectively). These impacts of about 0.40 are equivalent to having about 4 in 10 women move up one value on the ten-point scales. We also found an impact on women's use of constructive conflict behaviors. Based on a scale ranging from 1 to 4, women in the MotherWise group reported a higher frequency of using constructive conflict behaviors (3.37) compared to the control group (3.27). This impact of 0.10 is equivalent to having about 1

in 10 women move up one value on the four-point scale. We did not find significant impacts on our other two relationship quality measures—support and affection and avoidance of destructive conflict behaviors—at the one-year follow-up.

Table 6. Impacts of MotherWise on the relationship with baby's father (exploratory)

Outcome	MotherWise group	Control group	Impact	Effect size
Relationship status[a]				
Romantically involved (percentage)	91	90	1	0.04
Married (percentage)	47	52	-4	-0.10
Relationship quality[b]				
Support and affection (range = 1 to 4)	3.38	3.33	0.05	0.10
Relationship commitment (range = 1 to 10)	9.53	9.13	0.40**	0.25
Relationship happiness (range = 1 to 10)	8.39	7.96	0.42*	0.21
Use of constructive conflict behaviors (range = 1 to 4)	3.37	3.27	0.10*	0.17
Avoidance of destructive conflict behaviors (range = 1 to 4)	2.87	2.77	0.10	0.14
Sample size for relationship status outcomes	**345**	**269**		
Sample size for relationship quality outcomes	**315**	**243**		

Source: Baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the MotherWise group and Control group columns are regression-adjusted predicted values of outcomes.

[a] These outcomes were only defined for women who were in a steady relationship with baby's father at baseline.

[b] These outcomes were only defined for women who were in a steady relationship with baby's father at baseline and follow-up.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

Discussion and lessons learned

This study examined the impacts of MotherWise, an HMRE program for new and expectant mothers with low incomes living in the Denver metropolitan area. MotherWise offered a six-session relationship skills workshop based on *Within My Reach*, a commonly used HMRE curriculum tailored for individuals. The workshops were supplemented with one-on-one case management and optional couples' relationship education sessions for participants and their partners. MotherWise aimed to empower women to make informed decisions about their romantic relationships, with the ultimate goal of keeping them and their families safe and improving their overall well-being.

To conduct the MotherWise study, Mathematica partnered with staff at the University of Denver who developed and operated the program. An earlier report from the study documented that MotherWise was implemented as intended and that participation in the program was high (Baumgartner and Paulsell 2019). To measure program impacts, the study team randomly assigned 949 women to one of two research groups: (1) a group that was offered MotherWise services or (2) a control group that was not. We measured program impacts by comparing the outcomes of these two groups. We conducted follow-up surveys one year and 30 months after study enrollment. This report summarizes the one-year findings.

At the one-year follow-up, we found that MotherWise succeeded in improving the outcomes it most directly aimed to affect—that is, strengthening participants' perceived relationship skills and improving

their attitudes about healthy relationships. The program had impacts on all four measures of skills and attitudes we examined. These impacts suggest that the program succeeded in its most immediate goal of equipping women with the skills and attitudes to make informed and healthy decisions about their personal and romantic relationships.

We also found that MotherWise reduced the likelihood that women experienced an unintended pregnancy in the year after entering the program—cutting this rate by about one-third, from 11 percent in the control group to 7 percent in the MotherWise group. This difference was statistically significant at the 0.10 level. MotherWise emphasized the importance of making careful and deliberate decisions about relationships—including when to have a child and with whom. The impact on unintended pregnancy suggests that MotherWise may have encouraged women to make more deliberate decisions about family planning. In addition, subgroup analysis suggests that the impact on unintended pregnancy was particularly strong among women who entered the program in a romantic relationship with their baby's father (Table A.7). This pattern suggests that MotherWise may have helped these women navigate conversations about when and whether to have another child with their partners. Unintended pregnancy is associated with a host of negative outcomes for women and children, including underutilization of prenatal care, low birth weight, and maternal depression (Logan et al. 2007; Dibaba et al. 2013; Shah et al. 2011; Abajobir et al. 2015). In addition, unintended pregnancies come with substantial public costs (Monea and Thomas 2011; Sonfield et al. 2011). Therefore, even a modest reduction in unintended pregnancies could accrue considerable benefits for individual participants and society as a whole. The 30-month impact findings will provide more definitive information on MotherWise's longer-term effects on unintended pregnancy.

Although MotherWise succeeded in improving relationship skills and attitudes and reducing unintended pregnancy a year after program enrollment, it did not reduce experiences of intimate partner violence or depressive symptoms or improve the quality of the co-parenting relationship at the one-year point. Low levels of depressive symptoms among the control group may explain the lack of impacts on this outcome—there was limited room for improvement. In addition, MotherWise did not include romantic partners in the core workshop and participation in the optional couples' workshop was low, which may have limited the ability of the program to affect intimate partner violence and co-parenting. Although we found no impacts on intimate partner violence and co-parenting at the one-year follow-up, we did find impacts on related outcomes, such as disapproval of couple violence and conflict management skills. Because relationship outcomes can take time to unfold, impacts on co-parenting and intimate partner violence may still emerge at a later point. The findings of this study offer only a preliminary view of the program's effects on the relationship outcomes of the women who participated. The 30-month impact study will provide evidence on MotherWise's longer-term effects on relationship outcomes, as well as its effects on the overall well-being of participants and their children.

In our exploratory analyses, we examined impacts on the romantic relationships of the three-quarters of women who entered the study while they were in a romantic relationship with their baby's father. We considered these analyses exploratory because they did not examine all participants. We found no impact of MotherWise on the status of the relationship with the baby's father after one year. Among those who entered MotherWise in a romantic relationship with their baby's father, about 90 percent of women in both research groups remained in that relationship a year later. However, we did find sizable effects on the quality of these relationships. MotherWise had a positive impact on three of the five dimensions of relationship quality we examined—namely, relationship commitment, relationship happiness, and the use of constructive conflict behaviors. Although these exploratory analyses only consider a subset of women and only mothers' perspectives, the findings are encouraging and noteworthy due to the consistency of the

findings and size of impacts. To place these impacts on relationship quality into context, it is helpful to compare their magnitudes to those found in previous federally sponsored studies of HMRE programs that served couples (not women only as MotherWise did). The average effect size across the five relationship quality measures we examined was more than 70 percent larger than the average effect size across the relationship quality measures examined in the SHM evaluation (Hsueh et al. 2012) and more than twice as large as the average effect size across the relationship quality measures examined in the Parents and Children Together study (Moore et al. 2018). The BSF programs did not have significant impacts on relationship quality, on average (Wood et al. 2012). The sizable impacts of MotherWise on relationship quality provide support for the promise of the approach of providing HMRE services to new and expectant mothers with low incomes.

Why did MotherWise succeed in improving relationship skills and attitudes and reducing unintended pregnancies? One factor may have been the program's strong implementation. Participants regularly attended and engaged with program services; nearly two-thirds of participants completed the workshop. Moreover, the program leadership (which included developers of the Within my Reach curriculum) was closely involved with program implementation, helping to ensure that the program was implemented with fidelity. These findings underscore the importance of strong implementation for program success. Another factor may have been the well-defined population that the program served—women with low incomes who were expecting or had just had a baby. Having a well-defined service population allowed the program to tailor services more closely to their participants' specific needs, which may have contributed to its effectiveness. Other HMRE programs serving individual adults may want to consider focusing their service populations on adults in particular family or relationship situations to allow them to tailor program services more closely to participant needs. Finally, the birth of a child may be a time when women are particularly open to taking stock of their romantic relationships, potentially making them more receptive to the program's healthy relationship content. Therefore, women with low incomes who are expecting a baby or have just had one may be particularly well suited for HMRE services and thus be a group future HMRE programs should consider serving. HMRE programs for individual adults could also consider serving other populations whose life circumstances might prime them to be more receptive to HMRE content. The 30-month findings will provide additional insights into the program's impacts.

The findings presented in this report indicate that programs similar to MotherWise can improve certain outcomes of new and expectant mothers with low incomes by offering them HMRE and other supports. These findings help to expand the evidence base on the effectiveness of HMRE programs serving individual adults and those that only serve women. HMRE programs can vary in their target population, focus, and services, as well as the outcomes they try to influence. Additional research is needed to develop a more complete picture of the effects that HMRE programs for individuals can have on the full range of populations they serve.

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References

Abidin, R. R., and J. F. Brunner. "Development of a Parenting Alliance Inventory." *Journal of Clinical Child Psychology*, vol. 24, no. 1, 1995, pp. 31–40.

Abajobir, A.A., J.C. Maravilla, R. Alati, and J.M. Najman. "A Systematic Review and Meta-Analysis of the Association Between Unintended Pregnancy and Perinatal Depression." *Journal of Affective Disorders*. vol. 192, 2016, pp. 56–63.

Adler-Baeder, F., C. Garneau, B. Vaughn, J. McGill, K.T. Harcourt, S, Ketring, and T. Smith. "The Effects of Mother Participation in Relationship Education on Coparenting, Parenting, and Child Social Competence: Modeling Spillover Effects for Low-Income Minority Preschool Children." *Family Process*, vol. 57, no. 1, 2018, pp. 113–130.

Baumgartner, S., and D. Paulsell. "MotherWise: Implementation of a Healthy Marriage and Relationship Education Program for Pregnant and New Mothers." OPRE Report 2019-42. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2019.

Benjamini, Y., and Y. Hochberg. "Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing." *Journal of the Royal Statistical Society: Series B*, vol. 57, no. 1, 1995, pp. 289–300.

Bradford, K., J. W. Stewart, R. Pfister, and B. J. Higginbotham. "Avoid Falling for a Jerk(ette): Effectiveness of the Premarital Interpersonal Choices and Knowledge Program Among Emerging Adults." *Journal of Marital and Family Therapy*, vol. 42, 2016, pp. 630–644. doi:10.1111/jmft.12174.

Braithwaite, S. R., and F. D. Fincham. "A Randomized Clinical Trial of a Computer-Based Preventive Intervention: Replication and Extension of ePREP." *Journal of Family Psychology*, vol. 23, 2009, pp. 32–38.

Buhrmester, D., W. Furman, M. T. Wittenberg, and H. T. Reis. "Five Domains of Interpersonal Competence in Peer Relationships." *Journal of Personality and Social Psychology*, vol. 55, 1988, pp. 991–1008.

Cox, D. R. *Analysis of Binary Data*. London: Chapman and Hall/CRC, 1970.

Dibaba, Y., M. Fantahun, and M.J. Hindin. "The Effects Of Pregnancy Intention on the Use of Antenatal Care Services: Systematic Review and Meta-Analysis." *Reproductive Health*. 2013, 10:50.

Gaubert, Jennifer Miller, Daniel Gubits, Desiree Principe Alderson, and Virginia Knox. "The Supporting Healthy Marriage Evaluation: Final Implementation Findings." OPRE Report 2012-12. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2012.

Gottman, John Mordechai. *The Marriage Clinic: A Scientifically Based Marital Therapy*. New York, NY: W.W. Norton and Company, 1999.

Hedges, L. "Distribution Theory for Glass's Estimator of Effect Size and Related Estimators." *Journal of Educational Statistics,* vol. 6, no. 2, summer 1981, pp. 107–128.

Hsueh, JoAnn, Desiree Principe Alderson, Erika Lundquist, Charles Michalopoulos, Daniel Gubits, David Fein, and Virginia Knox. "The Supporting Healthy Marriage Evaluation: Early Impacts on Low-Income Families." OPRE Report 2012-11. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2012.

Kroenke, K., R. L. Spitzer, and J. B. Williams. "The PHQ-9: Validity of a Brief Depression Severity Measure." *Journal of General Internal Medicine*, vol. 16, no. 9, 2001, pp. 606–613.

Levin, H.M., and P.J. McEwan. *Cost-Effectiveness Analysis: Methods and Applications.* Second edition. Thousand Oaks, CA: Sage, 2001.

Logan, C., E. Holcombe, J. Manlove, and S. Ryan. "The Consequences of Unintended Childbearing." Washington, DC: Child Trends and National Campaign to Prevent Teen Pregnancy, 2007.

Lundquist, E., J. Hsueh, A. E. Lowenstein, K. Faucetta, D. Gubits, C. Michalopoulos, and V. Know. "A Family-Strengthening Program for Low-Income Families: Final Impacts from the Supporting Healthy Marriage Evaluation." OPRE Report No. 2014-09A. Washington, DC: U.S. Department of Health and Human Services, Office of Planning, Research, and Evaluation, Administration for Children and Families, 2014.

Monea, E., and A. Thomas. "Unintended Pregnancy and Taxpayer Spending." *Perspectives on Sexual and Reproductive Health*, vol. 43, no. 2, 2011, pp. 88–93..

Moore, Quinn, Sarah Avellar, Ankita Patnaik, Reginald Covington, and April Wu. "Parents and Children Together: Effects of Two Healthy Marriage Programs for Low-Income Couples." OPRE Report No. 2018-58. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2018.

National Center for Health Statistics. "NSFG 2015–2017, Female Pregnancy File Codebook, Pregnancy Variables; 3. Section E Raw Variables." n.d. Available at https://www.cdc.gov/nchs/nsfg/nsfg_2015_2017_puf.htm. Accessed March 5, 2020.

Nowlan, K. M., M. K. Roddy, and B. D. Doss. "The Online OurRelationship Program for Relationally Distressed Individuals: A Pilot Randomized Controlled Trial." *Couple and Family Psychology*, vol. 6, no. 3, 2017, pp. 189–204.

OFA. "Healthy Marriage and Responsible Fatherhood Grantee Locations." n.d.. Available at https://www.acf.hhs.gov/ofa/programs/healthy-marriage/map-of-hmrf-grantees. Accessed March 5, 2021.

Orr, Larry L. *Social Experiments: Evaluating Public Programs with Experimental Methods*. Thousand Oaks, CA: Sage, 1999.

Owen, J., B. Antle, and K. Quirk. "Individual Relationship Education Program as a Prevention Method for Intimate Partner Violence." *Journal of Family Social Work*, vol. 20, no. 5, 2017, pp. 457–469.

Pearson, M., S. M. Stanley, and G. K. Rhoades. *Within My Reach Leader Manual*. Denver, CO: PREP for Individuals, 2015.

Polanchek, Sara, "Effects of Individual-Oriented Relationship Education On University Students' Knowledge, Beliefs, And Attitudes." Graduate Student Theses, Dissertations, & Professional Papers, no. 10774, 2014. Available at https://scholarworks.umt.edu/etd/10774. Accessed March 8, 2021.

Puma, Michael J., Robert B. Olsen, Stephen H. Bell, and Cristofer Price. "What to Do When Data Are Missing in Group Randomized Controlled Trials." NCEE 2009-0049. Washington, DC: National Center for Education Evaluation and Regional Assistance, 2009.

Rhoades, Galena K., and Scott M. Stanley. "Using Individual-Oriented Relationship Education to Prevent Family Violence." *Journal of Couple and Relationship Therapy*, vol. 10, no. 2, 2011, pp. 185–200.

Schochet, Peter Z. "An Approach for Addressing the Multiple Testing Problem in Social Policy Impact Evaluations." *Evaluation Review*, vol. 33, no. 6, 2009, pp. 539–567.

Shah, P. S., T. Balkhair, A. Ohlsson, J. Beyene, F. Scott, and C. Frick. "Intention to Become Pregnant and Low Birth Weight and Preterm Birth: A Systematic Review." *Maternal And Child Health Journal*, vol. 15, no. 2, 2011, pp. 205–216.

Sharp, E. and L. Ganong. "Raising Awareness About Marital Expectations: Are Unrealistic Beliefs Changed by Integrative Teaching?" *Family Relations, vol.* 49, 2000, pp. 71–76.

Sonfield, A., K. Kost, R. B. Gold, and L. B. Finer. "The Public Costs of Births Resulting from Unintended Pregnancies: National and State-Level Estimates." *Perspectives on Sexual and Reproductive Health,* vol. 43, 2011, pp. 94–102. Available at https://doi.org/10.1363/4309411.

Stanley, S. M., R. G. Carlson, G. K. Rhoades, H. J. Markman, L. L. Ritchie, and A. J. Hawkins. "Best Practices in Relationship Education Focused on Intimate Relationships." *Family Relations*, vol. 69, 2020, pp. 497-519.

Stanley, S. M., and G. K. Rhoades. "Marriages at Risk: Relationship Formation and Opportunities for Relationship Education." In *What Works in Relationship Education: Lessons from Academics and Service Deliverers in the United States and Europe*, edited by H. Benson and S. Callan. Doha, Qatar: Doha International Institute for Family Studies and Development, 2009, pp. 21–44.

Straus, M., and E. Douglas. "A Short Form of the Revised Conflict Tactics Scales, and Typologies for Severity and Mutuality." *Violence and Victims*, vol. 19, no. 5, October 2004, pp. 507–520.

Van Epp, M. C., T. G. Futris, J. C. Van Epp, and K. Campbell. "The Impact of the PICK a Partner Relationship Education Program on Single Army Soldiers." Family and Consumer Sciences Research Journal, vol. 36, no. 4, 2008, pp. 328–349.

Vennum, Amber, and Frank D. Fincham. "Assessing Decision Making in Young Adult Romantic Relationships." *Psychological Assessment,* vol. 23, no. 3, 2011, p. 739.

Visvanathan, P. D., M. Richmond, C. Winder, and C. H. Koenck. "Individual-Oriented Relationship Education: An Evaluation Study in Community-Based Settings." *Family Process,* vol. 54, no. 4, 2014, pp. 686-702.

Wood, Robert G., Sarah Avellar, Reginald Covington, and Ankita Patnaik. "Literature Review for the Fatherhood, Relationships, and Marriage—Illuminating the Next Generation of Research (FRAMING Research) Project." Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2019.

Wood, Robert G., Brian Goesling, and Diane Paulsell. "Design for an Impact Study of Five Healthy Marriage and Relationship Education Programs and Strategies." OPRE Report No. 2018-32. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2018.

Wood, Robert G., Sheena McConnell, Quinn Moore, Andrew Clarkwest, and JoAnn Hsueh. "Strengthening Unmarried Parents' Relationships: The Early Impacts of Building Strong Families." Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2010.

Wood, Robert G., Quinn Moore, Andrew Clarkwest, Alexandra Killewald, and Shannon Monahan. "The Long-Term Effects of Building Strong Families: A Relationship Skills Education Program for Unmarried Parents." Princeton, NJ: Mathematica Policy Research, 2012.

Technical Appendix

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This technical appendix supplements the report on the one-year impacts of the MotherWise program. The first section details the study's sample intake and random assignment procedures. The second section describes the study's survey administration procedures and response rates. The third section explains the study team's methods for estimating program costs. The fourth and fifth sections discuss our confirmatory and exploratory impact analyses, respectively.

Sample intake and random assignment

During the 27 month recruitment period, MotherWise staff enrolled 949 women into the study. The evaluation team randomly assigned 512 women to the MotherWise group and 437 women to the control group. Below, we describe the processes that MotherWise staff and the evaluation team followed to conduct sample intake and random assignment.

MotherWise staff primarily recruited study participants where women received their perinatal care. To identify potential participants, the University of Denver partnered with Denver Health, a large public hospital that is the primary health care provider for families with Medicaid-funded births in the Denver, Colorado area. MotherWise recruited from three Denver Health locations: the main hospital campus and two community health centers that offered perinatal care. MotherWise staff identified eligible women through Denver Health's electronic medical record system. They then approached eligible women in exam rooms before their doctor's appointments, described the MotherWise program and study to them, and scheduled an intake appointment if the women were interested. To supplement this primary recruitment source, MotherWise staff also sought referrals from other medical and social service agencies that served pregnant women and new mothers with low income in the Denver area.

The study's intake appointment occurred at the program office. When a potential study participant arrived at her appointment, a MotherWise staff member would first verify her eligibility. If the woman was eligible, the staff member would then connect her by telephone to a trained Mathematica interviewer, who would complete the consent process and administer a baseline survey. Afterwards, the MotherWise staff member would finalize the enrollment and conduct random assignment using the study's computer system. Women were randomly assigned to either the MotherWise group or the control group that was not eligible for MotherWise.

The study used a stratified random assignment design. Throughout most of the sample enrollment period, random assignment occurred within language group (English or Spanish). This stratification process, which was introduced about one month after study enrollment began, ensured that the proportion of Spanish-speaking women (who may be more likely to attend the Spanish-language version of the workshop) was the same in the MotherWise and control groups.

Within each language group, the likelihood of being placed in the MotherWise group or the control group varied over time (Table A.1). When random assignment began in September 2016, applicants had an equal chance of being placed into the two research groups. The pace of recruitment into the MotherWise study was slower than anticipated in the early months of sample enrollment. In addition, placing half of the applicants into the control group made it difficult for the program to create cohorts of participants large enough to run the MotherWise workshops. For this reason, beginning in November 2016, the study team adjusted the random assignment ratio so that two-thirds of applicants were assigned to the MotherWise group and one-third were assigned to the control group. After several months, recruitment of English-speaking participants began meeting the study targets, while recruitment of Spanish-speaking participants remained slow. Therefore, in June 2017, the study team adjusted the random assignment ratio

for English speakers back to 50:50 but kept the ratio for Spanish speakers at two-thirds for the MotherWise group and one-third for the control group. Finally, in January 2018, once the recruitment of Spanish speakers met the study targets, the study team adjusted the random assignment ratio for Spanish speakers back to 50:50 for the final year of sample intake.

We adjusted for these features of the random assignment design in our impact analysis by using weights that accounted for the varying probabilities of assignment to the MotherWise and control groups. We calculated the base weight of a sample as the inverse of the probability with which sample members were randomly assigned to the MotherWise and control groups. Because randomization was conducted independently for each of four enrollment periods and based on language, we also calculated base weights within each enrollment period and language. We classified sample members into one of the 16 cells presented in the second and third columns of Table A.1 and calculated the base weight for sample members in each of those 16 cells to be the inverse of the probability of random assignment to that cell.

Table A.1. Random assignment probabilities, by language

Date	English speakers	Spanish speakers
09/01/2016–11/12/2016	• MotherWise: 50% • Control: 50%	• MotherWise: 50% • Control: 50%
11/13/2016–06/04/2017	• MotherWise: 67% • Control: 33%	• MotherWise: 67% • Control: 33%
06/05/2017–01/16/2018	• MotherWise: 50% • Control: 50%	• MotherWise: 67% • Control: 33%
01/17/2018–12/19/2018	• MotherWise: 50% • Control: 50%	• MotherWise: 50% • Control: 50%

As expected, data from the baseline survey showed that the random assignment process yielded groups of women that were generally similar at baseline (Table A.2). In Table A.2, the full sample represents the 949 women who enrolled in the study and underwent random assignment while the analytic sample represents the subset that responded to the one-year follow-up survey. The women in both study groups were similar on demographics, well-being, and socioeconomic status. We compared the two groups on seven characteristics related to family and relationships and found two statistically significant differences. First, women in the MotherWise group were more likely to be married or in a steady relationship with the baby's father. More generally, there were differences in the romantic relationship status reported by women at baseline—for example, a smaller share of women in the MotherWise group were single than women in the control group. As discussed in greater detail later in the appendix, we accounted for these differences by controlling for baseline relationship status and relationship with the baby's father in the regression models used to estimate program impacts.

Table A.2. Baseline characteristics for women in the full and analytic samples, by study group (percentage, unless otherwise specified)

Baseline characteristics	Full sample			Analytic sample		
	MotherWise group	Control group	Difference	MotherWise group	Control group	Difference
Demographics						
Average age (years)	28	28	1	28	28	1
Race and ethnicity						
Hispanic	67	67	1	69	64	5
Black, non-Hispanic	11	11	-1	11	13	-2
White, non-Hispanic	16	15	1	15	17	-2
Other, non-Hispanic	6	7	-1	5	7	-1
Foreign born	35	39	-4	35	37	-1
Language spoken at home						
English	59	57	3	58	58	-1
Spanish	40	42	-2	42	40	2
Other	1	2	-1	1	2	-1
Family and relationships						
Number of biological and adopted children (average)	1.6	1.5	0.1	1.6	1.5	0.0
Expecting a baby at study enrollment	84	83	2	85	82	2
New/expected baby is their first child	35	39	-4	36	38	-3
Married or in a steady relationship with the father of new/expected baby	79	72	6*	80	72	8**
Relationship status (with any romantic partner)			◊			◊◊
Married or engaged	54	51	3	56	49	7
In a steady relationship	26	23	3	25	24	1
In an on-again off-again relationship	8	8	-0	8	8	-0
Not in a relationship	12	18	-6	10	19	-8
Well-being						
At risk for moderate or severe depression	25	22	4	25	22	3
Socioeconomic status						
Highest educational level						
Less than high school	23	29	-6	22	29	-6
High school diploma or GED	40	34	6	40	34	6
Some college or vocational technical school	27	29	-2	27	29	-2
College degree	10	8	2	11	9	2

Baseline characteristics	Full sample			Analytic sample		
	MotherWise group	Control group	Difference	MotherWise group	Control group	Difference
Worked for pay in past month	40	39	2	41	38	3
Earnings in past 30 days ($)	545	489	56	556	494	62
Receipt of SNAP, TANF or WIC in past 30 days	72	74	-3	71	76	-5
Baseline measures of confirmatory outcomes						
Perceived romantic relationship skills (range: 1 to 4)	3.19	3.22	-0.02	3.19	3.21	-0.02
Perceived conflict management skills (range: 1 to 4)	2.47	2.50	-0.03	2.46	2.50	-0.03
Support for going slow in romantic relationships (range: 1 to 4)	3.29	3.30	-0.01	3.30	3.27	0.04
Disapproval of couple violence (range: 1 to 4)	3.63	3.61	0.02	3.64	3.61	0.03
Any psychological abuse by a romantic partner in the past year	39	38	1	39	38	0
Any physical abuse by a romantic partner in the past year	15	17	-1	14	17	-3
Depressive symptoms	6.34	5.96	0.38	6.32	5.94	0.38
Sample size	**512**	**437**		**426**	**373**	

Source: Baseline and one-year follow-up surveys conducted by Mathematica.

Note: Full sample refers to all women who were randomly assigned. The data were weighted to account for differences in random assignment probabilities. Analytic sample refers to all women who responded to the one-year follow-up survey. These data were weighted to account for differences in random assignment probabilities and probability of survey response. Percentages may not sum to 100 due to rounding.

[a] Baseline versions of co-parenting quality and unintended pregnancy were not available for all women.

**/*/+ Differences are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

◊◊◊/◊◊/◊ Difference is significantly different from zero at the .01/.05/.10 level using a chi-square test.

SNAP = Supplemental Nutrition Assistance Program; TANF = Temporary Assistance for Needy Families; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Survey administration and nonresponse

The study team administered three rounds of surveys: (1) a baseline survey at study enrollment, (2) a one-year follow-up survey about 12 months after enrollment, and (3) a longer-term follow-up survey about 30 months after enrollment. The analysis in the present report uses data only from the baseline and one-year follow-up surveys. A future report will present evidence on longer-term impacts using data from the 30-month survey.

The study team administered the baseline survey over the telephone during the program intake appointment. For the one-year follow-up survey, respondents could either complete a self-administered web survey on a smart phone or tablet or complete a computer-assisted telephone survey with a trained Mathematica interviewer. Of the 799 women who responded to the one-year follow-up survey, 27 percent completed the self-administered version, while 49 percent and 24 percent completed a computer-assisted telephone survey in a telephone interview or a field interview, respectively. All surveys were available in both English and Spanish. Study participants received a $30 gift card for enrolling in the study and completing the baseline survey and a $25 gift card for completing the one-year follow-up survey.

The survey administration procedures yielded a high response rate for the one-year follow-up survey. The survey had an overall response rate of 84 percent. The difference between the response rates for the MotherWise and control groups was small: 85 percent of the control group and 83 percent of the MotherWise group responded to the one-year follow-up survey.

To account for women who did not respond to the one-year follow-up survey, we constructed a survey nonresponse weight to use for the impact analysis. Specifically, we estimated a logistic regression model that predicted survey response—that is, whether the sample member was located for the follow-up survey, agreed to respond to the survey, and was able to respond. Accordingly, each survey respondent was assigned an adjustment factor corresponding to the probability that the follow-up sample member was located, agreed to respond to the survey, and was able to respond. Nonrespondents were assigned an adjustment factor equal to zero. The final weight for our main analysis model was the product of the base weight and the survey response adjustment factor.

We found that accounting for survey nonresponse and applying the nonresponse weights had little material effect on the similarity of women in the MotherWise and control groups (Table A.2). When examining baseline characteristics for only those women who completed a one-year follow-up survey, we found that women in the MotherWise group and the control group were similar on demographics, well-being, and socioeconomic status. In addition, we found the same differences in baseline characteristics for survey respondents as we had found for the sample of randomly assigned women in Table A.2. Compared with survey respondents in the control group, survey respondents in the MotherWise group were more likely to be married (and less likely to be single) and more likely to be in a relationship with the baby's father. We accounted for these differences by controlling for baseline relationship status and relationship with the baby's father in the regression models that were used to estimate program impacts.

Program cost estimates

We calculated the program cost estimates using the "ingredients" or resource cost method (Levin and McEwan 2001), a common standard in the field. The first step of this method requires identifying all the resources that grantees require to deliver their HMRE programs, including program staff, workshop facilitators, administrative staff, curriculum materials, office supplies and equipment, program incentives, and other shared administrative and indirect resources. The second step involves assigning a dollar value

to each resource identified, either by taking the amounts directly from accounting records or by estimating the value using market prices or publicly available sources. These dollar values form the basis for the summary estimates of program cost.

We collected data on the resources required to implement programming over a one-year period of typical operations. Our program cost estimates therefore reflect the resources required to deliver programming during a steady state of operations, rather than the start-up resources required to develop or launch a new program. In addition, our program cost estimates reflect the perspective of the organization responsible for implementing the program, rather than the perspective of program participants, taxpayers, or the federal government. From this perspective, the estimates reflect the resources that similar organizations would likely need to maintain the program in other locations.

To estimate program cost, we relied primarily on information on resource use and costs as reported by MotherWise program staff. We then made the following three adjustments to those data: (1) estimating the cost of rent-free office space using the market value of rental rates for commercial office space in the local area; (2) calculating the annual value of equipment- and facilities-related expenses by dividing the value of the original purchase price of the equipment (as estimated by MotherWise program staff) by the useful life, based on depreciation guidelines from the Internal Revenue Service; and (3) standardizing local costs to national levels by adjusting the total value of resources for personnel (staff salaries, payroll taxes, and benefits) and non-personnel (after all other adjustments) using an index created from average metropolitan area–level and national wages as reported in May 2018 by the Bureau of Labor Statistics.

We estimated the cost of providing services and examined the resources required to provide the services. We calculated (1) the total annual program cost and (2) the per participant cost, which was defined as the average cost to serve one participant. We first calculated the resources the University of Denver required to deliver MotherWise for a one-year period from October 2017 to September 2018. Next, we calculated the cost of serving one participant for one month by dividing total annual program cost by the total of number of months each mother participated in services during the one-year cost period. Finally, we calculated the average length of program participation (in months) for all mothers offered services throughout the entire study period, and multiplied this average length of program participation by the estimated cost of serving one participant for one month. In addition to calculating per participant costs, we broke down the estimates of total annual program cost to show the percentage of the total cost apportioned to each of five resource categories: (1) personnel; (2) contracted services; (3) supplies, equipment, and other direct costs; (4) facilities costs; and (5) overhead.

Details of the confirmatory analysis

Before conducting the impact analysis, we specified the outcomes and analytic methods we planned to use for answering the study's main research questions. Specifying this confirmatory analysis in advance prevents focusing the assessment of program impacts on outcomes that happen to emerge as statistically significant or the perception that this might have been the case (Schochet 2009). We publicly documented the outcomes selected for the confirmatory analysis as part of the study's registry on the website ClinicalTrials.gov (identifier: NCT02792309).

Confirmatory outcomes

We focused the confirmatory analysis on a targeted set of nine outcomes across six domains that were central to the program's goals and feasible to assess given the study's sample size and length of follow-up

period. Of these nine outcomes, five were scales constructed by combining the participants' responses to multiple survey questions. To maximize the sample size available for the analysis, we calculated a scale score for any woman who responded to at least two-thirds of the questions that made up the scale. For example, for a scale with six questions, we calculated a scale score for any woman who responded to at least four of the six questions. We coded women as missing on the scale if they responded to fewer than two-thirds of the questions, because we did not have enough information to calculate a score. For each scale, we checked the reliability of the scale for our study sample by calculating Cronbach's alpha (α) with data from the baseline survey.

Perceived romantic relationship skills

We measured perceived general relationship skills with a subset of items from the Relationship Deciding Scale (Vennum and Fincham 2011). For these items, the survey asked women to report their level of agreement with each of the following statements:

- I believe I will be able to effectively deal with conflicts that arise in my relationship.
- I feel good about my ability to make a romantic relationship last.
- I am very confident when I think of having a stable, long-term relationship.
- I have the skills needed for a lasting, stable romantic relationship.
- I am able to recognize early on the warning signs of a bad relationship.
- I know what to do when I recognize the warning signs of a bad relationship.

For each statement, the survey asked women to report their level of agreement on a 4-point scale, ranging from strongly agree to strongly disagree. For women who responded to at least four of the six questions, we calculated a scale score by taking the average value of the woman's responses across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating greater perceived relationship skills (six items, α = 0.88 for our study sample).

Perceived conflict management skills

We measured women's perceptions of their own conflict management skills with a subset of items adapted from the Conflict Management Subscale of the Interpersonal Competence Scale (Buhrmester et al. 1988). For these items, the survey asked women to report their level of perceived skill for each of the following five conflict management skills:

- Admitting that you might be wrong during a disagreement
- Avoiding saying things that could turn a disagreement into a big fight
- Accepting another person's point of view even if you don't agree with it
- Listening to another person's opinion during a disagreement
- Working through problems without arguing

For each item, the survey asked women to report their level of perceived skill based on the following four response options: (1) I am extremely good at this, (2) I am good at this, (3) I am ok at this, or (4) I am bad at this. For women who responded to at least four of the five items, we calculated a scale score by taking the average value of their responses across the different items. The resulting scale ranged from 1 to 4,

with higher values indicating greater perceived conflict management skills (five items, α = 0.79 for our study sample).

Support for going slow in romantic relationships

We measured support for going slow in romantic relationships through a single-item scale that reflected the woman's level of agreement—from strongly disagree (= 1) to strongly agree (= 4)—with the following statement: People are more likely to succeed in their relationships if they take things slowly. This single-item scale was recommended by the *Within My Reach* curriculum developers as an appropriate example of the kind of relationship attitude the curriculum aims to influence.

Disapproval of couple violence

We measured disapproval of couple violence with a subscale of the Acceptance of Couple Violence Scale (Dahlberg et al. 2005). For these items, the survey asked women to report their level of disagreement with each of the following five statements about dating violence:

- Violence between dating partners can improve the relationship.
- There are times when violence between dating partners is okay.
- Sometimes violence is the only way to express your feelings.
- Some couples must use violence to solve their problems.
- Violence between dating partners is a personal matter and people should not interfere.

For each item, the survey asked women to report their level of disagreement on a 4-point scale, ranging from strongly agree to strongly disagree. For women who responded to at least four of the five items, we calculated a scale score by taking the average value of the women's responses across the different items. The resulting scale ranged from 1 to 4, with higher values indicating greater disapproval of couple violence (five items, α = 0.83 for our study sample based on data from the baseline survey).

Any psychological abuse

We measured psychological abuse using a binary indicator adapted from the Supporting Healthy Marriage evaluation (Hsueh et al. 2012). The survey asked women if a romantic partner had done any of the following in the past year:

- Tried to keep them from seeing or talking with their friends
- Made them feel stupid
- Kept money from them or took their money without asking
- Made them feel afraid that they might hurt them

We created a binary indicator that took the value of 1 if the woman reported yes to any of the four items and a value of 0 if the woman reported no to all four items. The measure was coded as missing if data on at least one of the items was missing while the woman had not reported yes to any of the items.

Any physical abuse

We measured exposure to physical abuse by using two victimization measures of the Physical Assault Scale of the Conflict Tactics Scale—Short Form (Straus and Douglas 2004). For example, the survey

asked women if any romantic partner in the past year had punched, kicked, or beat them up. As recommended by the scale developers, we created a binary indicator that took the value of 1 if the woman reported yes to either of the two items and a value of 0 if the woman reported no to both items. The measure was coded as missing if data on at least one of the items was missing while the woman had not reported yes to any of the items.

Unintended pregnancy

We measured unintended pregnancy with questions drawn from the National Survey of Family Growth 2015–2017 (National Center for Health Statistics n.d.). The survey asked women if they had experienced a pregnancy since random assignment. If they had, the survey asked, "Right before the pregnancy, did you want to have a baby?" Women could respond on a 4-point scale: definitely yes, probably yes, probably no, definitely no. Unless the woman responded definitely no, the survey then asked her, "Would you say this pregnancy came sooner than you wanted, at about the right time, or later than you wanted?" We measured unintended pregnancy by constructing a binary variable equal to 1 if the mother reported that she did not want to become pregnant or the pregnancy came sooner than intended. Only pregnancies that began after random assignment were included.

Co-parenting quality

We measured the quality of the co-parenting relationship using a single summary measure of 10 items from the Parenting Alliance Inventory, a well-established, 20-item scale of the quality of the co-parenting relationship created by Abidin and Brunner (1995). These items indicated whether respondents thought that they and the baby's father communicated well in their co-parenting roles and were a good co-parenting team. For each statement, the survey asked women to report their level of agreement on a 4-point scale, ranging from strongly agree to strongly disagree. We assigned each response category a number ranging from 1 to 4, with higher values indicating stronger agreement. For women who responded to at least seven of the 10 questions, we calculated a scale score by taking the average value of our assigned number across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating better co-parenting quality (10 items, α = 0.97 for our study sample based on data from the baseline survey).

Emotional well-being

We measured women's emotional well-being with questions from the Patient Health Questionnaire Eight-Item Depression Scale, which has been shown to be a valid diagnostic and severity measure of depressive symptoms in research (Kroenke et al. 2009). For these items, the survey asked women to report the frequency—from not at all (= 0) to nearly every day (= 3)—with which she was experiencing some types of depressive symptoms, such as trouble falling or staying asleep or sleeping too much. For women who responded to at least six of the eight items, we calculated a scale score by taking the sum of the responses across the different items. The resulting scale ranged from 0 to 24, with higher values indicating greater frequency of depressive symptoms (eight items, α = 0.89 for our study sample based on data from the baseline survey).

Confirmatory analysis methods

For each outcome, we used multivariate weighted least squares regression models to estimate the impact of MotherWise. This approach accounted for the unique features of the random assignment design, such

as stratification and varying random assignment probabilities, and allowed for adjustments for the few differences in baseline characteristics between the MotherWise group and the control group. We used analysis weights to account for varying random assignment probabilities and survey nonresponse.

We included three types of covariates in the regression models. First, all models included a covariate to capture the respondent's primary language, because this was a stratification factor for random assignment. Second, to improve the statistical precision of our impact estimates, for each outcome, the models included baseline versions of all confirmatory outcomes that were available. To the extent that any of the covariates correlated with the outcome measure, including them in the regression model could improve the precision of the impact estimates by reducing the residual variation in the outcome measure (Orr 1999). Third, we included covariates to account for women's relationship status and relationship with the baby's father at baseline because we found statistically significant differences in these characteristics between the MotherWise and control group sample members.

We encountered a small amount of missing data on survey items and addressed them as follows. For any cases with missing baseline data for one or more covariates, we used dummy variable adjustment, which involves setting any missing baseline values to a single constant value and including flag variables for missing values as additional covariates in the regression model (Puma et al. 2009). For missing outcome data, we used nonresponse weights (described earlier) to account for survey nonresponse (women who did not complete the first follow-up survey) and case deletion to account for item nonresponse (meaning that the impact estimates for any particular outcome excluded women who did not respond to the survey questions for that particular outcome). For both the MotherWise and control groups, rates of item nonresponse were less than 8 percent for all confirmatory outcomes.

We deemed impact estimates as statistically significant if the associated *p*-value of the estimate fell below 10 percent based on a two-tailed hypothesis test. We further distinguished *p*-values that fell between 5 percent and 10 percent, between 1 percent and 5 percent, and below 1 percent. To help interpret the magnitude of the impact estimates, we calculated and reported an effect size for each outcome. For continuous outcomes, the effect size was calculated by dividing the impact estimate from the regression model divided by the unadjusted pooled standard deviation of the outcome for women across both the MotherWise and control groups (Hedges 1981). For dichotomous outcomes, the effect size was calculated by dividing the log odds ratio of the two study groups by 1.65 (Cox 1970).

Details of impacts on confirmatory outcomes

We presented the impacts on the nine confirmatory outcomes in Table 5. For five of the nine confirmatory outcomes, we found statistically significant differences in the average outcomes of women in the MotherWise and control groups (Table A.3 presents the same results as Table 5, but adds the corresponding p-values).

Table A.3. Impacts of MotherWise on confirmatory outcomes

Outcome	MotherWise group	Control group	Impact	Effect size	P-value
Relationship skills					
Perceived romantic relationship skills (range: 1 to 4)	3.36	3.25	0.11**	0.23	0.001
Perceived conflict management skills (range: 1 to 4)	2.71	2.58	0.12**	0.21	0.002
Relationship attitudes					
Support for going slow in romantic relationships (range: 1 to 4)	3.40	3.31	0.09*	0.15	0.033
Disapproval of couple violence (range: 1 to 4)	3.65	3.53	0.12**	0.26	0.000
Unintended pregnancy					
Had an unintended pregnancy since program enrollment	7	11	-4+	-0.29	0.071
Intimate partner violence					
Any psychological abuse	28	33	-5	-0.13	0.123
Any physical abuse	9	11	-1	-0.10	0.500
Co-parenting					
Quality of co-parenting relationship with baby's father (range: 1 to 4)	3.13	3.14	-0.01	-0.01	0.893
Emotional well-being					
Depressive symptoms (range: 0 to 24)	4.35	4.39	-0.04	-0.01	0.897
Sample size	**426**	**373**			

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the MotherWise group and Control group columns are regression-adjusted predicted values of outcomes. Data were weighted to account for differences in random assignment probabilities and survey nonresponse.

**/*/+ Impact is statistically significant from zero at the .01/.05/.10 levels, respectively, two-tailed test.

Robustness checks

Our confirmatory impact findings were robust to alternative specifications of the regression model that were used to estimate impacts (Table A.4). To verify that the findings from our confirmatory analysis were not overly sensitive to specific analytic decisions that we made, we repeated the confirmatory analysis with different analytic choices. Specifically, we compared our primary model to three different regression model specifications. First, we analyzed a model without weights that adjusted for survey nonresponse (the model still used weights to adjust for the varying probabilities of the stratified random assignment). Second, we analyzed a bivariate model that did not utilize any covariate adjustment. Third, we redid the analysis while accounting for multiple comparisons within an outcome domain. When a domain contained more than one confirmatory outcome, we conducted multiple hypothesis tests, which increased the risk of a finding a statistical result by chance. To correct for this risk, we used the Benjamini-Hochberg method (Benjamini and Hochberg 1995). None of these analytic decisions lead to results that differed based on statistical significance or substantive importance.

Table A.4. Impacts of MotherWise on confirmatory outcomes, using alternative methods

Outcome	Primary method	No weighting for non-response	No covariate adjustment	Multiple comparison adjustment
Relationship skills				
Perceived romantic relationship skills (range: 1 to 4)	0.11**	0.13**	0.10**	0.11**
Perceived conflict management skills (range: 1 to 4)	0.12**	0.13**	0.11*	0.12**
Relationship attitudes				
Support for going slow in romantic relationships (range: 1 to 4)	0.09*	0.10*	0.11*	0.09+
Disapproval of couple violence (range: 1 to 4)	0.12**	0.13**	0.13**	0.12**
Unintended pregnancy				
Had an unintended pregnancy since program enrollment	-4+	-4+	-4+	n.a.
Intimate partner violence				
Any psychological abuse	-5	-5	-4	-5
Any physical abuse	-1	-1	-1	-1
Co-parenting				
Quality of co-parenting relationship with baby's father (range: 1 to 4)	-0.01	-0.01	0.08	n.a.
Emotional well-being				
Depressive symptoms (range: 0 to 24)	-0.04	-0.07	0.16	n.a.
Sample size	**799**	**799**	**799**	**799**

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

n.a. = not applicable (because there was only one outcome in the domain).

Our impact findings were also robust to alternative measures of the confirmatory outcomes (Table A.5). For some but not all of the outcomes selected for the confirmatory analysis, the follow-up survey included more than one measure of the underlying construct or included items that enabled us to construct the outcome measure in more than one way. For example, for relationship attitudes, in addition to the confirmatory outcome that measured support for going slow in relationships, the follow-up survey also included a question about women's support for cooperation in relationships. Similarly, in addition to the confirmatory outcomes that measured exposure to psychological abuse and physical abuse, the survey included questions on exposure to sexual coercion and physical injury. To verify that the findings from our confirmatory analysis were not overly sensitive to specific measures that we chose, we conducted the confirmatory analyses with different measures that were similar to our confirmatory outcomes. The pattern of findings was similar for most outcomes, with one exception. While we found an impact on unintended pregnancy that was statistically significant at the .10 level, we found no impact on the related measure of unwanted pregnancy. Alternative measures were not available for the confirmatory outcomes that measured relationship skills or co-parenting.

Table A.5. Impacts of MotherWise on alternative measures of confirmatory outcomes

Outcome	MotherWise group	Control group	Impact	Effect size
Relationship attitudes				
Support for cooperation in relationships (range: 1 to 4)	3.76	3.65	0.11**	0.23
Unintended pregnancy				
Had an unwanted pregnancy since program enrollment	3	5	-2	-0.36
Intimate partner violence				
Any sexual coercion	3	4	-2	-0.30
Any physical injury	2	4	-2	-0.36
Emotional well-being				
Whether mother is at moderate or severe risk of depression	13	16	-3	-0.14
Sample size	**426**	**373**		

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the MotherWise group and Control group columns are regression-adjusted predicted values of outcomes. Data were weighted to account for differences in random assignment probabilities and survey nonresponse.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

Subgroup analyses

We explored whether the impacts of MotherWise were significantly larger or smaller for subgroups of women. We estimated impacts separately for subgroups of women based on each of the following three characteristics: (1) primary language (women who spoke Spanish as their primary language versus women who did not), and (2) relationship status with baby's father (women who were in a steady romantic relationship with the baby's father at the time of enrollment versus women who were not). We limited the subgroup analyses to only confirmatory outcomes.

We found a generally consistent pattern of results when estimating impacts separately for subgroups of women. We found no statistically significant difference for any confirmatory outcome in impacts between women who spoke Spanish as their primary language and women who did not (Table A.6), or between women who were in a steady romantic relationship with the baby's father at the time of enrollment and women who were not (Table A.7).

Table A.6. Impacts of MotherWise, by mother's primary language

Outcome	Is mother's primary language Spanish?				P-value for subgroup difference
	Yes		No		
	Control group	Impact	Control group	Impact	
Relationship skills					
Perceived romantic relationship skills (range = 1 to 4)	3.25	0.13*	3.25	0.11**	0.839
Perceived conflict management skills (range = 1 to 4)	2.51	0.19*	2.61	0.10*	0.327
Relationship attitudes					
Support for going slow in romantic relationships (range = 1 to 4)	3.38	0.03	3.28	0.11*	0.353
Disapproval of couple violence (range = 1 to 4)	3.47	0.12+	3.55	0.12**	0.997
Unintended pregnancy					
Had an unintended pregnancy since program enrollment	-1	-1	15	-5+	0.314
Intimate partner violence					
Any psychological abuse	35	-1	32	-6	0.423
Any physical abuse	8	-0	12	-2	0.693
Co-parenting					
Quality of co-parenting relationship with baby's father (range = 1 to 4)	3.20	0.02	3.11	-0.02	0.705
Emotional well-being					
Depressive symptoms (range = 0 to 24)	3.39	0.02	4.77	-0.06	0.899
Sample size		**226**		**573**	

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the two Control Group columns are regression-adjusted predicted values of outcomes for each subgroup. Data were weighted to account for differences in random assignment probabilities and survey nonresponse. We defined the two subgroups based on whether the STREAMS baseline survey was administered in Spanish or English.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

◊◊◊/◊◊/◊ Statistically significant differences among the subgroup impact estimates at the .01/.05/.10 levels, respectively.

Table A.7. Impacts of MotherWise, by whether the mother was in a steady romantic relationship with the baby's father at time of enrollment

Outcome	Was the mother in a steady romantic relationship with the baby's father at time of enrollment?				P-value for subgroup difference
	Yes		No		
	Control group	Impact	Control group	Impact	
Relationship skills					
Perceived romantic relationship skills (range = 1 to 4)	3.27	0.12**	3.17	0.10	0.805
Perceived conflict management skills (range = 1 to 4)	2.65	0.14**	2.38	0.05	0.350
Relationship attitudes					
Support for going slow in romantic relationships (range = 1 to 4)	3.34	0.09+	3.20	0.08	0.872
Disapproval of couple violence (range = 1 to 4)	3.55	0.13**	3.46	0.09	0.590
Unintended pregnancy					
Had an unintended pregnancy since program enrollment	5	-4+	29	-1	0.447
Intimate partner violence					
Any psychological abuse	35	-4	27	-6	0.753
Any physical abuse	8	1	19	-9	0.110
Co-parenting					
Quality of co-parenting relationship with baby's father (range = 1 to 4)	3.32	0.02	2.53	-0.11	0.424
Emotional well-being					
Depressive symptoms (range = 0 to 24)	5.03	-0.12	2.32	0.32	0.576
Sample size		**614**		**183**	

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the two Control Group columns are regression-adjusted predicted values of outcomes for each subgroup. Data were weighted to account for differences in random assignment probabilities and survey nonresponse.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

◊◊◊/◊◊/◊ Statistically significant differences among the subgroup impact estimates at the .01/.05/.10 levels, respectively.

Details of the exploratory analysis

In addition to the confirmatory analyses presented in the main body of the report, we also conducted exploratory analyses of the impacts of MotherWise on several measures of women's relationship status and quality with the baby's father. We considered these analyses exploratory partly because these outcomes were defined only for a subgroup of women. For relationship status, the analysis was limited to women who reported being in a relationship with the baby's father at baseline and who responded to the follow-up survey. For relationship quality, the analysis was limited to women who reported being in a relationship with the baby's father at both baseline and follow-up and who responded to the follow-up survey.

Exploratory outcomes

We describe the outcome measures for the exploratory analyses below. We followed the same rules for missing data for the exploratory outcome measures that we used for the confirmatory outcome measures. We coded women as missing if they did not meet the definitions of our analysis sample. In other words, women were coded as missing for the relationship status measures if they were not in a steady relationship with the baby's father at baseline and they were coded as missing for the relationship quality measures if they were not in a steady relationship with the baby's father at both baseline and follow-up.

Romantically involved

We measured relationship status with the baby's father using a binary indicator for whether the mother reported on the follow-up survey that she was married to or in a romantic relationship with the baby's father. This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline.

Married

We measured relationship status with the baby's father by using a binary indicator for whether the mother reported on the follow-up survey that she was married to the baby's father. This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline.

Support and affection

We measured support and affection by using a single summary measure of 12 items. The follow-up survey asked respondents the degree to which they agreed with 12 statements regarding their relationship with their romantic partner. The statements reflected positive relationship traits such as support, intimacy, friendship, commitment, and trust. For example, "[Partner] is honest and truthful with me" and "[I feel appreciated by [partner]." The source of these questions was the BSF study (Wood et al. 2012). For each statement, the survey asked women to report their level of agreement on a 4-point scale, ranging from strongly agree to strongly disagree. We assigned each response category a number ranging from 1 to 4, with higher values indicating stronger agreement. For women who responded to at least eight of the 12 questions, we calculated a scale score by taking the average value of our assigned number across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating more support and affection (α = 0.95 for our study sample based on data from the baseline survey). This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline and follow-up.

Relationship commitment

We measured relationship commitment by using a continuous variable that ranged from 0 to 10, with higher values indicating that the mother was more committed to her romantic relationship with the baby's father. This measure was based on the response to a question on the follow-up survey that asked, "On a scale from 0 to 10, where 0 is not at all committed and 10 is completely committed, how committed are you to your [marriage/relationship] with [partner]?" This measure was adapted from one used in the BSF study (Moore et al. 2012). This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline and follow-up.

Relationship happiness

We measured relationship happiness by using a continuous variable ranging from 0 to 10, with higher values indicating the mother's reports of greater happiness in her romantic relationship with the baby's father. This measure was based on the response to a question on the follow-up survey that asked, "On a scale from 0 to 10, where 0 is not at all happy and 10 is completely happy, taking all things together, how happy would you say your relationship with [partner] is?" The measure was adapted from one used in the BSF study (Moore et al. 2012). This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline and follow-up.

Use of constructive conflict behaviors

We measured the use of constructive conflict behaviors in the relationship with the baby's father by using a single summary measure of seven items. The follow-up survey asked respondents seven questions about the frequency with which they used constructive conflict behaviors with their partner. For example, respondents were asked about their level of agreement with the following statements:

- During arguments, we are good at taking breaks when we need them.
- Even when arguing we can keep a sense of humor.

The statements were drawn or adapted from the Gottman Sound Relationship House Questionnaires (Gottman 1999). For each statement, the survey asked women to report whether this never happens, hardly ever happens, sometimes happens, or often happens. We assigned each response category a number ranging from 1 to 4, with higher values indicating higher frequency. For women who responded to at least five of the seven questions, we calculated a scale score by taking the average value of our assigned number across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating more frequent use of constructive conflict behaviors (α = 0.86 for our study sample based on data from the baseline survey). This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline and follow-up.

Avoidance of destructive conflict behaviors

We measured avoidance of destructive conflict behaviors in the relationship with the baby's father by using a single summary measure of seven items. The follow-up survey asked respondents about the frequency with which they and their partners engaged in eight negative conflict behaviors. The statements were also drawn from the Gottman Sound Relationship House Questionnaires (Gottman 1999). They reflected criticism or contempt that the partners demonstrate toward each other, their tendency to escalate or withdraw from arguments or engage in personal attacks, and other harmful behaviors associated with conflict. For example, "When [partner] and I argue, past hurts get brought up again." For each statement,

the respondent was provided with four response options: (1) never, (2) hardly ever, (3) sometimes, or (4) often. We assigned each response category a number ranging from 1 to 4, with higher values indicating higher frequency. For women who responded to at least six of the eight questions, we calculated a scale score by taking the average value of our assigned number across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating more avoidance of destructive conflict behaviors (α = 0.86 for our study sample based on data from the baseline survey). This measure was only defined for women who were in a steady romantic relationship with the baby's father at baseline and follow-up.

Exploratory analytic samples

The analytic samples for the exploratory analyses were composed of subsamples of women, which were defined based on relationship status. For relationship status, the analysis was limited to a subgroup of women who reported being in a relationship with the baby's father at baseline and who responded to the follow-up survey. About 67 percent of women from the MotherWise group and 62 percent of women from the control group fell into this subgroup. For relationship quality, the analysis was limited to women (62 percent of the MotherWise group and 57 percent of the control group) who reported being in a relationship with the baby's father at both baseline and follow-up and who responded to the follow-up survey. Of the women who were in a relationship with their baby's father at baseline, more than 90 percent of women in both study groups remained in this steady relationship at follow-up. Using the What Works Clearinghouse standards, we assessed that there was a low risk of bias due to attrition (What Works Clearinghouse 2020).

We examined the baseline characteristics of women in the subsamples used for these exploratory analyses (Table A.8). Women in the MotherWise group and control group were similar on demographics, well-being, and socioeconomic status when we limited the sample to women who were in a relationship with the baby's father at baseline. We also confirmed that women in the MotherWise and the control groups had similar baseline characteristics when we limited the sample to women who were in a relationship with the baby's father at baseline and follow-up (Table A.8). We found no statistically significant differences between the two study groups within the subsample of women who were in a steady romantic relationship with the baby's father at both baseline and follow-up.

Table A.8. Baseline characteristics for women, by relationship status and study group (percentage unless otherwise specified)

Baseline characteristics	In a steady relationship with baby's father at baseline			In a steady relationship with baby's father at baseline and follow-up		
	MotherWise group	Control group	Difference	MotherWise group	Control group	Difference
Demographics						
Average age (years)	29	28	1	29	28	0
Race and ethnicity						
Hispanic	72	68	4	73	68	5
Black, non-Hispanic	8	7	1	7	7	-0
White, non-Hispanic	16	18	-3	16	18	-2
Other, non-Hispanic	4	7	-3	4	7	-3
Foreign born	40	43	-3	42	46	-4
Language spoken at home						
English	53	52	1	49	49	0
Spanish	46	46	0	49	48	1
Other	1	3	-2	1	3	-2
Family and relationships						
Number of biological and adopted children (average)	1.6	1.5	0.0	1.5	1.5	0.0
Expecting a baby at study enrollment	84	83	1	83	82	1
New/expected baby is their first child	35	39	-4	35	41	-6
Relationship status (with any romantic partner)						
Married or engaged	71	68	3	72	71	1
In a steady relationship	29	32	-3	28	29	-1
In an on-again off-again relationship	0	0	0	0	0	0
Not in a relationship	0	0	0	0	0	0
Intimate partner violence						
Any psychological abuse by a romantic partner in the past year	32	26	6	29	25	4
Any physical abuse by a romantic partner in the past year	9	8	1	9	7	2
Well-being						
At risk for moderate or severe depression	23	17	7*	23	17	6
Socioeconomic status						
Highest educational level						
Less than high school	21	29	-7	21	29	-7

Baseline characteristics	In a steady relationship with baby's father at baseline			In a steady relationship with baby's father at baseline and follow-up		
	MotherWise group	Control group	Difference	MotherWise group	Control group	Difference
High school diploma or GED	39	35	4	38	34	4
Some college or vocational technical school	27	25	2	26	26	1
College degree	13	11	2	14	12	2
Worked for pay in past month	40	36	4	40	34	6
Earnings in past 30 days ($)	592	518	74	594	520	74
Receipt of SNAP, TANF or WIC in past 30 days	66	71	-5	65	71	-7
Baseline relationship status with baby's father						
Romantically involved with baby's father	100	100	0	100	100	0
Married to baby's father	47	47	0	49	51	-2
Baseline relationship quality with baby's father						
Support and affection (range: 1 to 4)	3.32	3.38	-0.06	3.35	3.39	-0.04
Fidelity	15	17	-2	13	15	-2
Relationship happiness (range: 1 to 10)	8.32	8.34	-0.03	8.38	8.42	-0.04
Use of constructive conflict behaviors (range: 1 to 4)	3.29	3.34	-0.04	3.30	3.32	-0.01
Avoidance of destructive conflict behaviors (range: 1 to 4)	2.29	2.18	0.11+	2.27	2.18	0.09
Sample size	**345**	**269**		**315**	**243**	

Source: STREAMS baseline survey conducted by Mathematica.

Note: Percentages may not sum to 100 due to rounding.

**/*/+ Differences are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

◊◊◊/◊◊/◊ Difference is significantly different from zero at the .01/.05/.10 level using a chi-square test.

SNAP = Supplemental Nutrition Assistance Program; TANF = Temporary Assistance for Needy Families; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Details of impacts on exploratory outcomes

We presented the impacts on our exploratory outcomes in Table 6. We found no statistically significant differences for the two measures of relationship status but we did find statistically significant differences for three of the five measures of relationship quality (Table A.9 presents the same results as Table 6, but adds the corresponding p-values.).

Table A.9. Impacts of MotherWise on relationship with baby's father (exploratory)

Outcome	MotherWise group	Control group	Impact	Effect size	P-value
Relationship status[a]					
Romantically involved (percentage)	91	90	1	0.04	0.793
Married (percentage)	47	52	-4	-0.10	0.219
Relationship quality[b]					
Support and affection (range = 1 to 4)	3.38	3.33	0.05	0.10	0.225
Relationship commitment (range = 1 to 10)	9.53	9.13	0.40**	0.25	0.009
Relationship happiness (range = 1 to 10)	8.39	7.96	0.42*	0.21	0.013
Use of constructive conflict behaviors (range = 1 to 4)	3.37	3.27	0.10*	0.17	0.049
Avoidance of destructive conflict behaviors (range = 1 to 4)	2.87	2.77	0.10	0.14	0.104
Sample size for relationship status outcomes	**345**	**269**			
Sample size for relationship quality outcomes	**315**	**243**			

Source: STREAMS baseline and one-year follow-up surveys conducted by Mathematica.

Note: The numbers in the MotherWise Group and Control Group columns are regression-adjusted predicted values of outcomes.

**/*/+ Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] These outcomes were only defined for women who were in a steady relationship with their baby's father at baseline.

[b] These outcomes were only defined for women who were in a steady relationship with their baby's father at baseline and follow-up.

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