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FEMALE INCOME, WOMEN'S STATUS, AND SPOUSAL VIOLENCE: EFFECTS OF THE MEXICAN OPORTUNIDADES PROGRAM

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Abstract: Although a growing literature examines the relationship between women's economic status and spousal violence, compelling empirical evidence remains scarce. This paper uses a regression discontinuity approach to identify and estimate the effect of the *Oportunidades* program – a conditional cash transfer scheme partly intended to improve women's status within the household – on spousal violence. In contrast to existing studies, the research design allows us to identify the causal effect of women's socio-economic status on spousal violence. In addition, we use multiple measures of spousal violence—physical, sexual, emotional, economic—and examine both prevalence and intensity. The evidence suggests that women in beneficiary households are less likely to be victims of spousal violence, especially of emotional and economic violence, in contrast with naïve correlations which suggest increases in emotional abuse.

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I. Introduction

The extent to which women's socio-economic status affects spousal abuse has been extensively discussed in both social science and public policy circles. In the economics literature in particular, existing models of domestic violence predict a negative relationship between female economic resources and violence against women (Tauchen et al 1991; Farmer and Thiefenthaler 1997). However, although a growing empirical literature examines the relationship between women's economic status and spousal violence, compelling empirical evidence remains scarce. Existing non-experimental studies exploring these impacts are difficult to interpret due to possible selection and endogeneity biases, such as assortative mating of partners by tolerance and tendencies to commit violence and women's likelihood of exiting abusive relationships.

The aim of this paper is to identify the causal effect of women's economic status on the prevalence of spousal violence in Mexico. This study uses a regression discontinuity design approach to identify and estimate the effect of the *Oportunidades* program – a conditional cash transfer scheme partly intended to improve women's status within the household – on spousal violence. The rules of the *Oportunidades* program regarding community eligibility result in increases in the probability of women's (household) eligibility for the conditional cash transfers. In order to improve program targeting, communities were assigned a marginality index, and those communities under a *specific marginality cutoff point* were targeted to receive the program. Therefore, we can compare spousal abuse rates for unions in villages who barely became eligible for the transfer scheme with those of unions living in villages that were barely ineligible. This essentially constitutes a quasi-experiment that allows us to identify the effect of the program on both the prevalence and severity of spousal violence. In addition, we use in the empirical analysis a newly-available nationally-representative survey on the dynamics of household relationships in Mexico that includes detailed information on the prevalence and intensity of spousal abuse against women. We broadly define violence from the survey measures as including physical, sexual, emotional, and economic abuse, measures of spousal violence that allow us to better characterize the impacts of women's economic status on spousal abuse among these Mexican households.

The evidence suggests that women in beneficiary households are less likely to be victims of spousal violence than non-beneficiary women. However, the distinction between the different types of violence is meaningful: although women in beneficiary households are as likely to be victims of physical, and sexual violence, they are substantially less likely to be victims of emotional and economic abuse. Our main estimates imply a reduction of approximately 100 percent on the incidence of both emotional and economic abuse. These effects are substantial, given the high intensity of emotional violence in the population: 30 percent of women reported suffering some type of emotional abuse in the year preceding the survey, and 22 reported suffering some form of economic abuse. These results stand in contrast with naïve partial correlations of spousal violence and beneficiary status, which actually suggest that

beneficiary women are more likely to suffer emotional violence. In conclusion, the results make a strong case for an expansion of the theoretical framework to take into account the different forms of spousal violence, and current work by the authors is addressing this critique to the economics literature on intra-household violence.

The identifying assumption for this research design is that female income, spousal violence, and other women, partner, and household characteristics, would change smoothly, rather than discontinuously, in the absence of a discrete change in *Oportunidades* eligibility at the community (locality or *localidad*) level. The change in locality eligibility rules allows us to compare households in localities that are barely eligible to receive the program with those living in barely non-eligible communities. The implication is that, for households close to the discontinuity, it is as if *Oportunidades* eligibility were randomly assigned. It is important to verify that other household and individual characteristics do not change discontinuously along with program eligibility (Hahn et al. 2003; Porter 2003).

This paper differs from existing studies in two important ways. First, the research design allows us to identify the causal effect of women's socio-economic status on spousal violence. Existing non-experimental studies have looked at the relationship between female income, or relative income shares, and domestic violence. However, they do not address issues of selection and endogeneity of labor income. Previous studies have also been limited to the prevalence of physical violence against women. In contrast, we use multiple measures of spousal violence—physical, sexual, emotional, economic—and examine both prevalence and severity. However, there are certain limitations of our study due to the structure of the data. For example, the use of a single cross-section allow us to limitedly address questions of potential selection into and exit from abusive relationships, although Bobonis (2004) shows evidence that, over a two-year period, divorce rates as a result of the conditional cash transfer scheme increased only marginally.

The paper is structured as follows. In Section II we briefly discuss the theoretical and empirical literature on women's socio-economic status and spousal abuse in both developed and developing countries. Section III provides a concise description of the Oportunidades program, its implementation, as well as the data used in the analysis. In Section IV, we then describe our identification strategy and discuss how it avoids the identification pitfalls. The main estimates are reported in Section V, and Section VI concludes.

II. Women's Income and Spousal Abuse

A subset of the economics literature on household decision-making has modeled domestic violence. Existing models of spousal violence include non-cooperative bargaining models in which female income, and more generally, financial resources outside the marriage change the woman's threat point and, all else

equal, reduce the level of violence in equilibrium (Tauchen et al, 2001; Farmer and Thiefenthaler (1997). More recently, Bloch and Rao (2002) model spousal violence in India as a bargaining instrument used to extract larger dowry payments from the bride's family. The bargaining and reallocation of resources takes place between the families of the bride and groom, rather than within the couple itself.

Existing theoretical work also addresses certain stylized facts of domestic violence, including the fact that battered women are not unlikely to return to an abusive relationship even after seeking help. In a model by Farmer and Thiefenthaler (1996), battered women use shelters and other support services to signal to the abuser their ability to leave the relationship, which changes their threat-point. Finally, a paper by Robert Pollak (2003) addresses the prevalence of domestic violence –as opposed to its causes— by modeling the inter-generational transmission of domestic violence. In the model, individuals raised in violent homes are more likely to marry partners who were also raised in violent homes. Thus, assortative mating increases the equilibrium level of violence.

Existing (non-experimental) empirical evidence on the relationship between female and income and violence is mixed.[4] In the U.S., Tauchen et al. (1991) examine this relationship using a sample of 125 women referred from shelters and other advocates for battered women, and find the expected negative correlation between violence and female income for a subset of low and middle income couples in their sample. However, these results are based on a small non-random sample (of battered women), and therefore are not comparable to studies based on representative samples of women. In the context of less developed countries, Panda and Agarwal (2005) find that women who own property are less likely to be victims of spousal violence in India, but Gonzalez-Brenes (2005) does not find a relationship between female income shares and the probability of violence for women in several East African countries.

There is a rich theoretical and empirical literature on the causes of domestic violence in other social sciences, particularly sociology and psychology. At risk of oversimplifying, sociological models link violence to gender inequality. The causes of gender violence lie in the way society is organized: for instance, unequal economic opportunities available to women and men, the availability of institutional resources for women who are victims of spousal violence, and degree of protection offered by the legal system all affect the prevalence of violence against women.[5] Psychological models also incorporate individual characteristics as determinants of violence. The literature characterizes violence as an expression of the batterer's desire for control over the victim, and links violence to batterer's low self-esteem, pathological jealousy, and severe stress. There is also qualitative evidence that abuse is often accompanied by a curtailment of the victim's economic and social independence.[6]

III. Oportunidades Program, Data, and Social Context

[5] For details on the sociological literature, see the review in Castro (2004).
[6] See, e.g., Walker (1984)

A Overview of the Oportunidades Program

In 1997, the Mexican government initiated a large-scale Education, Health, and Nutrition Program ("PROGRESA") aimed at improving the human development among children in marginalized rural areas in Mexico. "PROGRESA" was renamed "Oportunidades" in 2001 under the Fox Administration. The program targets the poor in marginal rural communities, where 40 percent of the children from poor households left school after the primary level. The program provides cash transfers to the mothers of over 2.6 million children conditional on school attendance, health checks and health clinics participation, at an annual cost of approximately one billion dollars, or 0.2 percent of Mexico's GDP. The education component of Oportunidades consists of subsidies provided to mothers, contingent on their children's regular attendance to school. These cash transfers are available for each child attending school in grades three to nine of primary and lower secondary school, and range from $70 to $255 pesos per month, depending on the gender and grade level the child is attending (with a maximum of $625 per month per family in 1998). The health and nutrition component of the program focuses on cash transfers based on participation by mothers in monthly health talks with the local health care provider, vaccinations and health checks of all children under 5 years old, and biannual health checks of all household members. Overall, the program transfers are important, representing 10 percent of the average expenditures of beneficiary families (Bobonis 2005). This eligibility information will be important in our construction of the eligible women sample (see Section III.B).

We next briefly discuss the targeting and phase-in of the program.[7] Targeting of the program was done at two levels. First, eligible localities were identified on the basis of clear eligibility rules. Program officials used locality-level characteristics from the 1995 Population Mini-Census to construct a marginality index for each locality, an index that reflected the degree of marginalization of communities and was correlated with the incidence of poverty in the locality. The variables used to construct this marginality index were: (i) the locality's population, (ii) the number of dwellings in the village, (iii) the proportion of the adult population illiterate, (iv) the proportion of adults working in the agricultural sector (in 1990), the proportion of households (v) without potable water, (vi) without drainage, (vii) without electricity, (viii) with a dirt floor (in 1990), and (ix) the average number of persons per room in each household (in 1990).

Second, program enumerators conducted household surveys within eligible localities to identify households that would be classified as poor (based on income-expenditure surveys). Within these selected communities, a poverty indicator was constructed using the household income data collected from the baseline surveys. A discriminant analysis was then separately applied in each region in order to identify the household characteristics that maximized the correct classification of as poor and non-poor

[7] Discussion of the targeting and phase-in of the program largely follows the discussion in Green (2005).

(minimizing Type I and Type II targeting errors). Eligible households were identified on the basis of this welfare index (see Skoufias et al. 2001 for a more detailed description of the targeting process). Therefore, within each eligible community, only households below a welfare threshold became program beneficiaries. The list of potential beneficiaries was then discussed in a community meeting and suggested revisions sent to the central Oportunidades office. In practice, however, very few changes were made (Skoufias et al. 1999).

Initially, a locality was eligible for Oportunidades if it (i) was poor (marginality grade 4) or very poor (marginality grade 5) out of a scale from 1 to 5 based on the locality-level marginality index, (ii) had access to a primary school, (iii) had access to a secondary school, (iv) had access to a health center, and (v) was rural (defined as inhabited by fewer than 2,500 people), but had at least 50 inhabitants (Skoufias et al. 1999). Criterion (v) was relaxed early on to incorporate some semi-urban localities (localities with between 2,500 and 14,999 inhabitants). The health center criterion was relaxed in 1998 when mobile health clinics were introduced. The inclusion of less marginal localities into the program was gradually extended throughout the 1997-2003 period. By the year 2003, localities within the marginality grade 3 (average marginality) had been incorporated into the program.

The Oportunidades program was phased-in through a different targeting design in urban areas starting in 2001. Since this targeting mechanism is very complex, we thus focus our identification strategy and analysis strictly using the variation in phase-in of the program in rural areas.

B. Data and Summary Statistics

The analysis is based on the Mexican National Survey on Relationships within the Household (ENDIREH Survey), a nationally representative household survey measuring the prevalence and intensity of domestic violence, among other intra-household dynamics. The survey is designed to be representative for urban and rural areas, and individually for a subset of states in Mexico. The survey instrument was administered during the months of October and November, 2003, to 54,230 households. The domestic violence module was administered to women 15 years or older living with a husband or partner, and only one eligible woman per household was interviewed.[8]

The ENDIREH survey contains data on household demographics, socio-economic characteristics, marital history, household decision-making, marital conflict, and a module designed to measure the prevalence and severity of spousal violence in the year preceding the survey. The domestic violence module included questions on physical, sexual, emotional and economic abuse in the previous twelve

[8] Although roughly 34,000 women were surveyed, many observations have missing data for at least one variable included in the analysis. The sample of women with complete data is reduced to 26,183 observations.

months. Following is a detailed description of the construction of the different measures of violence used in the analysis.[9] The exact survey questions are included in the data appendix to this paper.

Dichotomous measures of violence consist of indicator variables equal to one if the woman suffered physical, sexual, emotional, or economic abuse from her spouse or partner within the past year, and zero otherwise. In the case of both physical and sexual violence, a single incident reported within the past year is classified as violence. That is, the physical violence indicator is equal to one if the woman answers affirmatively to at least one question about physical abuse, and the same is true for the sexual violence indicator. For each type of violence, questions range from least to most severe. For example, the first question on physical violence is as follows, "Has your partner pushed you or pulled your hair?", and the last, "Has your partner shot you with a gun?". For each question, women were asked first whether it had occurred in the past twelve months, and for those who answered affirmatively, how often it had occurred ("one time", "a few times", many times"). Physical violence includes pushing, kicking, throwing objects, hitting with hands or objects, choking, attacking with a knife or blade, and shooting. Sexual violence includes demanding sex, forced sexual acts and forced sexual relations.

In contrast, a single incident of emotional or economic abuse is not necessarily classified as violence. For both emotional and economic abuse, survey questions are categorized as "low" or "high" severity. "Low" severity emotional abuse includes: a partner who stops speaking to a woman, leaves all the housework and childcare to her even when he has time, humiliates her ("Did he make you feel ashamed, belittled you, said you were ugly or compared you to other women?"), destroys or hides things that belong to her or the household, gets very upset if she does not finish domestic work/the food is not to his liking/he believes she has not fulfilled her duties, accuses her of cheating, ignores her/doesn't take her into account/doesn't give her affection, has made her feel fear, has turned her relatives against her. There are only two remaining questions, which are categorized as "high" severity emotional violence: a partner who has threatened a woman with a knife/blade/gun/rifle, or a partner who has threatened to kill himself/kill her/ kill the children. The emotional violence indicator is equal to one if (i) a women answers "yes" to at least two of the "low" severity emotional abuse questions, or (ii) a woman answers "yes" to only one "low" severity emotional abuse question, but states it happened more than once ("a few times" or "many times") in the past year, or (iii) a woman answers "yes" to one of the "high" severity emotional violence questions. In terms of economic violence, "low" severity economic abuse includes: a partner who complains about how a woman spends money, has been stingy with household expenses even if he has money, has threatened not to or refused to give her money for household expenses, has spent all the money needed for household expenses. "High" severity economic violence includes actions such as taking over/appropriating/taking away money or goods (things, land parcels, animals, etc.), or forbidding

[9] This follows closely the description provided in the documentation and results of the survey in Castro et al (2004).

her from working or studying. As was the case with emotional violence, the economic violence indicator is equal to one if (i) a women answers "yes" to at least two of the "low" severity economic abuse questions, or (ii) a woman answers "yes" to only one "low" severity economic abuse question, but states it happened more than once ("a few times" or "many times") in the past year, or (iii) a woman answers "yes" to one of the "high" severity economic violence questions.

The analysis also includes measures of the severity of violence. These indices were constructed based on the responses to the questions described above (and presented in detail in the data appendix). The severity index is constructed as follows: the simple index sums the total number of affirmative answers to questions in each category. The maximum for physical violence, for example, is eight (the total number of questions for that type of violence). The composite index takes into account the frequency reported by women ("one time", "a few times", "many times"), but assigns equal weight to all questions within a category. Clearly, some behaviors are more severe than others. In order to be able to take into account both frequency and severity, the weighted indices assign a weight to each behavior within a category, and multiply this weight by the frequency with which the behavior occurred. The weights are derived from a survey of 240 Mexican women, half of them residing in Mexico and the other half in California. The analysis uses these final weighted indices, which take into account both severity and frequency.

Data on program participation comes from the ENDIREH survey, and is self-reported by women. The measure we use is whether the woman receives benefits from any government support program. Although *Oportunidades* is the largest and most generous cash transfer program, there are other small government programs that provide non-cash benefits. In the future, we hope to get administrative data on the whether the households are eligible or actually receive transfers from *Oportunidades*.

Since we are interested in identifying the effects of women's income changes on spousal violence outcomes against women, using the complete sample of households may confound the income effect and the conditionality effects of the program (i.e., the fact that households only received cash if children were in school and satisfy the conditions from the health and nutrition components). Schultz (2004) presents evidence that school enrollment rates were close to 100 percent for primary school children among both program and comparison village children in a randomized evaluation of the program, and therefore the program had no impacts on primary school enrollment. Since conditionality constraints are not likely to be binding for households with primary school children (based on this evidence) and in order to minimize the confounding with the program conditionality effects, we restrict the sample to two groups: (i) intact households with children ages 11 years and younger at baseline, who are not old enough to attend secondary school, and (ii) intact households with children reported to have completed less than six years of schooling (primary school) or with children under 5-years old. This sample allows us to better identify

households who are likely to be eligible to receive program benefits based on their demographic composition.

We also restrict the sample to women ages 25 and older, based on the fact that these women, if at some point during their lifetimes lived in program villages/localities, would have been too old to be eligible for program benefits as children, potentially improving their socio-economic status before marriage (women in the sample were 19 years old and older during 1997, at the start of the initial phase-in of the program). These restrictions result in a sample of approximately 2,400 households.

Figure 1 graphically represents the distribution of beneficiary households based on the village-level marginality index. Although there is a lot of noise in the data aggregated at the village level (Panel A), because only 10 households are randomly selected from each village to participate in the survey, from which we construct the selected sample discussed above, the data aggregated by percentiles of the marginality index distribution suggest a substantial increase in the proportion of beneficiary households in villages around an index value of -1. This variation suggests the use of a 'fuzzy' regression discontinuity design to identify program impacts in this context (Angrist and Lavy 1999; Hahn et al. 2001). However, we will defer discuss of the formal determination of the discontinuity point in Section IV.

Women in this sample come from relatively poor socio-economic status households, since Oportunidades is targeted to poor households in marginalized rural communities (Table 1). We report summary statistics for both samples discussed above, and for restricted samples around the discontinuity (see discussion in Section IV below). Approximately 12 percent of these women have no schooling, although two thirds of them have completed some primary school (Table 1, Panel A). A non-negligible share (20 percent) of the women in the sample come from an indigenous background (80 percent do not speak an indigenous language). The women's average age is approximately 35 years, as expected since the sample selects women with children 11 years old and younger or in primary school. The reported proportion of women exposed to spousal abuse between her parents during her childhood is quite large, at approximately 8 percent.

Most partners of these women belong to the same age group (average partner age is approximately 36 years), and have similar schooling attainment (Panel B). Interestingly, approximately fs20 percent of partners live in an unmarried cohabiting union, a common observation in rural Mexico. The reported proportion of partners exposed to spousal abuse between her parents during their childhood is substantial at approximately 15 percent. These, as will be shown below, are important predictors of spousal abuse among current partners. Finally, households are relatively large, with 5.6 members on average, a statistic usually correlated with low socio-economic status in the Mexican context.

The distinction between types of violence is important, as the overall incidence of different forms of violence varies substantially (Panel C). Roughly 40 percent of women in the sample experienced some form of spousal violence within the last year, be it physical, sexual, emotional or economic. The single

most common form of abuse is emotional, with a third (29 percent) of women in the sample experiencing some form of emotional violence in the past year. About a quarter of women in the sample experienced economic violence in the same period, which involves some sort of restriction on their economic agency. The prevalence of physical and sexual violence is similar, with roughly 8 percent (7.5 and 7.8 percent in the restricted samples, to be precise) experiencing physical violence, and 8 percent (exactly 7.5 and 8.4) reporting sexual violence in the previous year. Although the average on the indices that measure the intensity of violence tend to be low, the standard deviations are large. For example, the intensity of economic violence is approximately 0.06 (on a scale of zero to one), with a standard deviation of 0.13.

IV. Methodology

This study uses a regression discontinuity approach to identify and estimate the effect of the *Oportunidades* program on spousal violence. The rules of the program regarding community eligibility resulted in differences in the probability that a household would become eligible for a conditional cash transfer depending on the community in which the household resided. In order to improve program targeting, communities were assigned a marginality index which was created for each community based on certain locality-level characteristics, and the localities were subsequently assigned to five different categories based on these marginality indices. Those communities under a specific marginality cutoff point were targeted to receive the program. Therefore, ideally, we could compare spousal abuse rates for unions in villages who barely became eligible for the transfer scheme with those of unions living in villages that were barely ineligible. This would essentially constitute a quasi-experiment that would allow us to identify the effect of the program on both the prevalence and severity of spousal violence among women in villages close the selectivity cutoff (the local average treatment effect). If there is a causal effect of the program on spousal abuse, the discontinuous increase in the individual probability of receiving a cash transfer should be accompanied by a discontinuous reduction or increase in violence against women.

Formally, we are interested in estimating the following relationships:

$$B_{ic} = \alpha_1 + \delta_1 T_c + f_1(M_c) + X_{ic}\beta_1 + L_c\gamma_1 + \varepsilon_{1ic} \quad (1)$$

$$V_{ic} = \alpha_2 + \delta_2 T_c + f_2(M_c) + X_{ic}\beta_2 + L_c\gamma_2 + \varepsilon_{2ic} \quad (2),$$

where B_{ic} is an indicator for whether the woman is an *Oportunidades* program recipient; V_{ic} is either an indicator for whether a woman in household i and locality c has been a victim of spousal violence or a measure of the severity of violence; T_c is an indicator variable determining whether the community has a marginality index below the cutoff point for high program eligibility; $f_j(M_c)$, $j = \{1,2\}$ is a n^{th}-order polynomial function of the community-level marginality index; X_{ic} are individual and household characteristics, and L_c are locality characteristics. Conditioning on a smooth polynomial function of the marginality index across communities, and under certain continuity assumptions (Cook and Campbell

1979; Hahn et al. 2001; Porter 2003), these specifications allow us to estimate discontinuities in the (i) proportion of eligible women within a community as a result of the targeting rules of the program (parameter δ_1), and (ii) potential changes in spousal abuse in the communities as a result of the program (parameter δ_2), for the communities at the margin of being classified as highly targeted or not.

Finally, it would be possible to get an estimate of the effect of being eligible for *Oportunidades* on the extent of spousal abuse, by estimating the equation using an IV methodology:

$$V_{ic} = \alpha + \theta B_{ic} + f(M_c) + X_{ic}\beta + L_c\gamma + \upsilon_{ic} \qquad (3),$$

where all the variables are defined as above.

These estimates rely on the assumption that we can determine exactly where the discontinuity in household eligibility (based on the marginality index) lies. Since the program was being expanded during the period 1997-2003, and our household survey data is for the year 2003, we would need to know exactly at which marginality level the program has been phased in during these years. However, this information is not available to us at the time.[10] Therefore, we use a regression-discontinuity estimation method with unknown cut-off, proposed by Porter (2003). Using this method, we can first estimate the point in the community distribution where the discontinuity was most likely to have taken place during the year 2003 and, secondly, estimate the magnitude of the discontinuity in the proportion of beneficiaries and differences in spousal abuse among households close to the discontinuity. Next, we discuss the two step estimation in more detail.

V. Results

A. Estimating the Unknown Cut-Off

When estimating the unknown cut-off point, we are essentially choosing the marginality index level in the distribution of communities where the discontinuity best 'fits-the-data'. It is a problem analogous to estimating structural breaks in time-series data. Porter (2003) proposes the use of these analogous methods for estimation of the unknown cut-off in a regression discontinuity design.

We estimate a series of regressions equivalent to equation (1), where we allow the discontinuity in the proportion of beneficiary households to vary. Specifically, each regression allows a different candidate discontinuity; the potential discontinuities are assumed to be each percentile of the distribution of households by the community-level marginality index. We can then test which one (or more) of these regressions provides the best fit to the data, by constructing F-test statistics of the discontinuity and polynomial function coefficients, and choosing the specification with the largest F-statistic. We plot this series of F-statistics as a function of each potential community-level marginality index cut-off in Figure 1. Each panel in the figure reports statistics from models that allow varying order of polynomials in the

[10] We have requested this information from the Oportunidades Evaluation Office in Mexico City.

marginality index in the estimation equation. As can be seen, the F-tests report the strongest fit of the data at the 78th percentile of the household distribution; this is the case irrespectively of which polynomial order is used to fit the data (except in the case 6th order polynomial specification). More importantly, this is actually the same point that we observe in the descriptive data as the one where the jump in the proportion of beneficiary households is largest: a discontinuity at the marginality index level -1.00.

Additionally, we present estimates of the potential discontinuity in the proportion of beneficiaries at threshold level $\{z = -1.00\}$ in Table 2, using the restricted sample of households around the estimated discontinuity index (marginality index $\in$ [-1.25,-0.75]), and include varying sets of control variables: (i) women, partner, and household-level characteristics, (ii) the determinants of the marginality index (see Section III.A), and (iii) state fixed effects. Although the estimated discontinuity varies substantially between specifications, these are in the range between 15.9 percentage points (significant at 95 percent confidence, Panel A, column 1) and 61.6 percentage points (significant at 99 percent confidence, column 5) for the sample of women with children ages 11 and younger, and between 17.4 percentage points (significant at 95 percent confidence, Panel B, column 1) and 62.8 percentage points (significant at 99 percent confidence, column 5) for the sample of women with children in primary school or under ages 5 and younger. Most estimates are quite precisely estimated, with t-statistics of 2.77 and 2.46 for the two different samples, on average. This provides evidence that our IV estimates do not suffer from substantial weak instruments problems.

In order to use the estimated cut-off point as a valid threshold for comparison of households in this quasi-experimental design, we need to make the assumption that households at both sides of the eligibility cut-off are similar in terms of predetermined observable and unobservable characteristics. Potential threats to the validity of the design include: (i) partners in beneficiary HHs may be more likely to divorce (lower tolerance of spousal abuse by women who receive cash transfers), and therefore they do not appear in the sample. (ii) New family formation may have increased/decreased as a result of the program, and there are changes in the characteristics and intra-household dynamics of these newly-formed households. (ii) Sorting of HHs into communities where they are more likely to qualify for *Oportunidades* benefits, and this sorting is associated with the intra-family dynamics (e.g., spousal abuse, cooperation in decision-making among household members), or in other potential determinants of spousal abuse (e.g., women's schooling level, labor force participation and occupational status).

Although this assumption is not perfectly verifiable, we can perform tests of whether observable characteristics of women, their partners, and the households, are similar (vary smoothly) along the discontinuity. Finding no evidence of significant jumps in these observable characteristics along the discontinuity provides evidence *consistent with* the validity of the design. Therefore, we present estimates of potential discontinuities for a number of predetermined observable characteristics of households (Table 3). We find very little evidence of discontinuities in these characteristics; therefore, this provides some

confidence that our estimates of the discontinuity in beneficiary status and that estimates of program impacts on spousal abuse are not spurious. Moreover, we estimate partial correlations of these observable characteristics around the discontinuity and test for joint significance of the coefficients, and find that, once we control for state fixed effects, very little evidence of selection on observables (Table A1).

B. Naïve OLS Estimates

Table 4 presents "naïve" OLS estimates of the effect of receiving a cash transfer ("beneficiary") on different measures of violence, which are comparable to previous non-experimental estimates of female income on spousal violence. We first estimate this relationship using the complete rural sample, that is, all eligible women in rural areas, without placing restrictions on the length of the union or range of the marginality index. The estimated coefficient on the beneficiary indicator is not significantly different from zero for any dichotomous measure of violence—physical, sexual, emotional, economic (Table 4, Panel A, rows 1-5). Moreover, the sign and magnitude vary a great deal depending on the definition of woman's eligibility used (by primary school status or age of children), with the exception of physical violence. OLS estimates of the relationship between receiving a cash transfer and physical violence are consistently negative, but not significantly different from zero.

In terms of the severity of violence, results suggest women who receive a transfer suffer more severe emotional and economic violence, and the results are precisely estimated for the sample of women with children in primary school or ages 5 and younger (Panel A, row 7). In terms of magnitudes, the point estimates are 0.019 (significant at 95 percent confidence) excluding state fixed effects and 0.027 (significant at 95 percent confidence) when including these; these estimates would suggest a 0.2-0.3 standard deviation increase in the intensity of emotional violence as a result of becoming a program beneficiary. The results are unchanged when the sample is restricted to women in unions (cohabiting or married) for at least five years (not reported in the tables). In fact, the positive relationship between receipt of a cash transfer and severity of emotional violence is positive and highly significant for both samples in this case (based on either definition of eligibility).

We also report naïve OLS estimates for the sample of households for which the values of the marginality index are restricted to a range around the discontinuity (Table 4, Panel B), in order to compare these to the reduced form and IV estimates. Using the sample of rural eligible women in communities with a marginality index between -1.25 and -0.75, we find that beneficiaries are significantly more likely to report suffering from some economic violence (economic violence indicator; Panel B, row 5). The coefficient estimates on the beneficiary indicator varies substantially for other dichotomous measures of violence, and are not significantly different from zero for outcomes other than economic violence. Estimates of the relationship of receiving a transfer with the severity of violence are mixed, but overall, not significant. The estimated relationship with severity of physical violence is negative, while

both emotional and economic severity measures are positively related to receipt of a transfer (Panel B, rows 6-8).

C. Regression Discontinuity Estimates using the Estimated Cut-Off Point

In this section, we report estimates of the discontinuity in the prevalence of spousal violence based on the estimated cut-off point. Very broadly, for the sample of all unions in communities with a marginality index between -1.25 and -0.75, the reduced form effects of the discontinuity in the probability of receiving a cash transfer are consistently negative for most binary measures of violence, but in many cases, not statistically different from zero (Table 5). Controlling for the determinants of the marginality index, the point estimate on the discontinuity indicator is consistently negative and large in magnitude for all dichotomous measures of violence. Women in communities with a marginality index above the discontinuity are less likely to be victims of any form of violence. However, in the most reliable specification, that excludes state fixed effects (in which the discontinuity in the proportion of beneficiaries is precisely estimated), we find reductions in any type of spousal violence of -0.028 (not significant) for the sample of women with primary school children and -0.088 (significant at 95 percent confidence) for the more reliable sample of women with children ages 11 and younger (Table 5, columns 1 and 4).

The reduced form effects on the severity of violence are small and we cannot reject zero differences in intensity of violence, for any outcomes (Table 5, rows 6-8). The results suggest that the discontinuous change in probability of receipt does not affect the severity of physical, economic violence, or emotional abuse. Controlling for the determinants of the marginality index, the coefficient on the discontinuity indicator is estimated to be zero or close to zero for both physical and economic violence, although large standard errors mean we cannot rule out relatively large effects in either direction, particularly for economic violence. Coefficient estimates are similar for a more restricted sample of couples who have been in unions for at least five years (those women who would not have been affected by the program as children) (not reported in the tables).

Instrumental variable estimates of the effect of receiving a cash transfer suggest that, controlling for the determinants of the marginality index, receipt of a cash transfer reduces the probability of any form of abuse (defined broadly), and in particular emotional and economic violence—the most common forms of abuse (Table 6). Although this result is not robust to the inclusion of state fixed effects, note that the first stage F-statistics are very low in this case (1.61 and 2.63 for the two samples), and therefore we have a substantial weak instruments problem in this case. The IV estimates of the effect of receiving a cash transfer are negative and large in magnitude for all dichotomous measures of violence. However, the estimated effect of receipt on physical violence is not statistically different from zero. For most samples,

in particular samples that restrict the range of the marginality index, the effect of receiving a transfer on emotional violence is estimated to be negative and extremely large in magnitude.

Since we are estimating models for dichotomous dependent variables and a dichotomous endogenous regressor (beneficiary status), the IV/GMM estimates cannot be interpreted as the local average effects on the probability of spousal abuse. Therefore, we also estimate IV probit models and report probit coefficients (we have not estimated mean marginal effects based on these estimates yet). The coefficient estimates are in line with the IV/GMM estimates (Table 6, columns 3 and 6). In summary, the IV estimates suggest substantial reductions in spousal violence, and these are concentrated in emotional and economic violence measures.

VI. Conclusion

The aim of this paper is to identify the causal effect of women's economic status on the prevalence of spousal violence in Mexico. This study uses a regression discontinuity design approach to identify and estimate the effect of the *Oportunidades* program – a conditional cash transfer scheme partly intended to improve women's status within the household – on spousal violence.

The evidence suggests that women in beneficiary households are less likely to be victims of spousal violence than non-beneficiary women. However, the distinction between the different types of violence is meaningful: although women in beneficiary households are as likely to be victims of physical, and sexual violence, they are substantially less likely to be victims of emotional and economic abuse. Our main estimates imply a reduction of approximately 100 percent on the incidence of both emotional and economic abuse. These effects are substantial, given the high intensity of emotional violence in the population: 30 percent of women reported suffering some type of emotional abuse in the year preceding the survey, and 22 reported suffering some form of economic abuse. In conclusion, the results make a strong case for an expansion of the theoretical framework to take into account the different forms of spousal violence, and current work by the authors is addressing this critique to the economics literature on intra-household violence.

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Figure 1: Proportion of Beneficiary Women, by Village Marginality Index

Panel A: Prop. of Beneficiaries, by Village

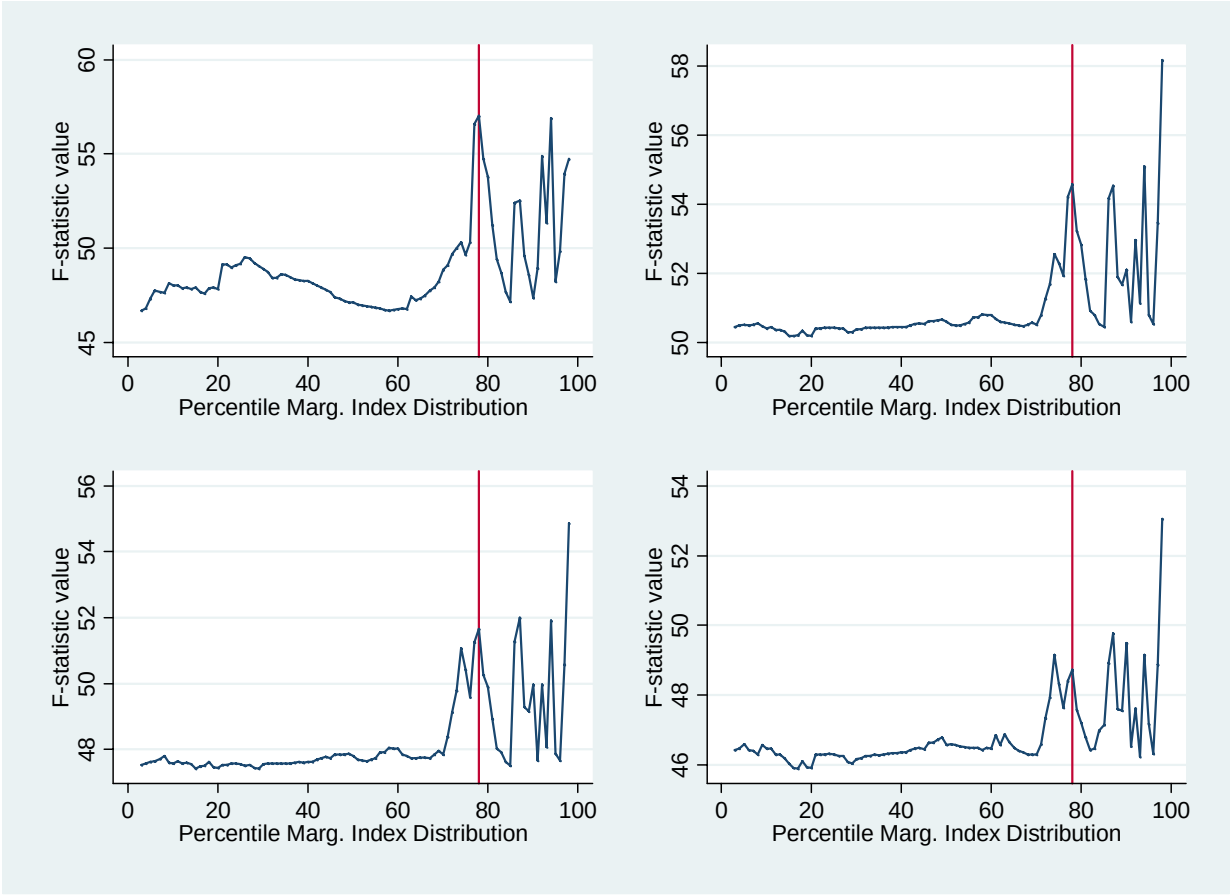
Panel B: Prop. of Beneficiaries, by Percentile of Marg. Index Distribution

Notes to Figure 1: The sample encompass all women ages 25 and older in rural villages classified as potentially program eligible – with children ages 11 and younger. In Panel A, each dot in the graph represents the proportion of beneficiaries in a village. In Panel B, each dot in the graph represents the proportion of beneficiaries in the percentile of the village marginality index distribution.

Figure 2: Tests for Discontinuity with Unknown Cutoff: F-statistic Sequence as a Function of Community-Level Marginality Index

Panel A: 3rd order polynomial

Panel B: 4th order polynomial

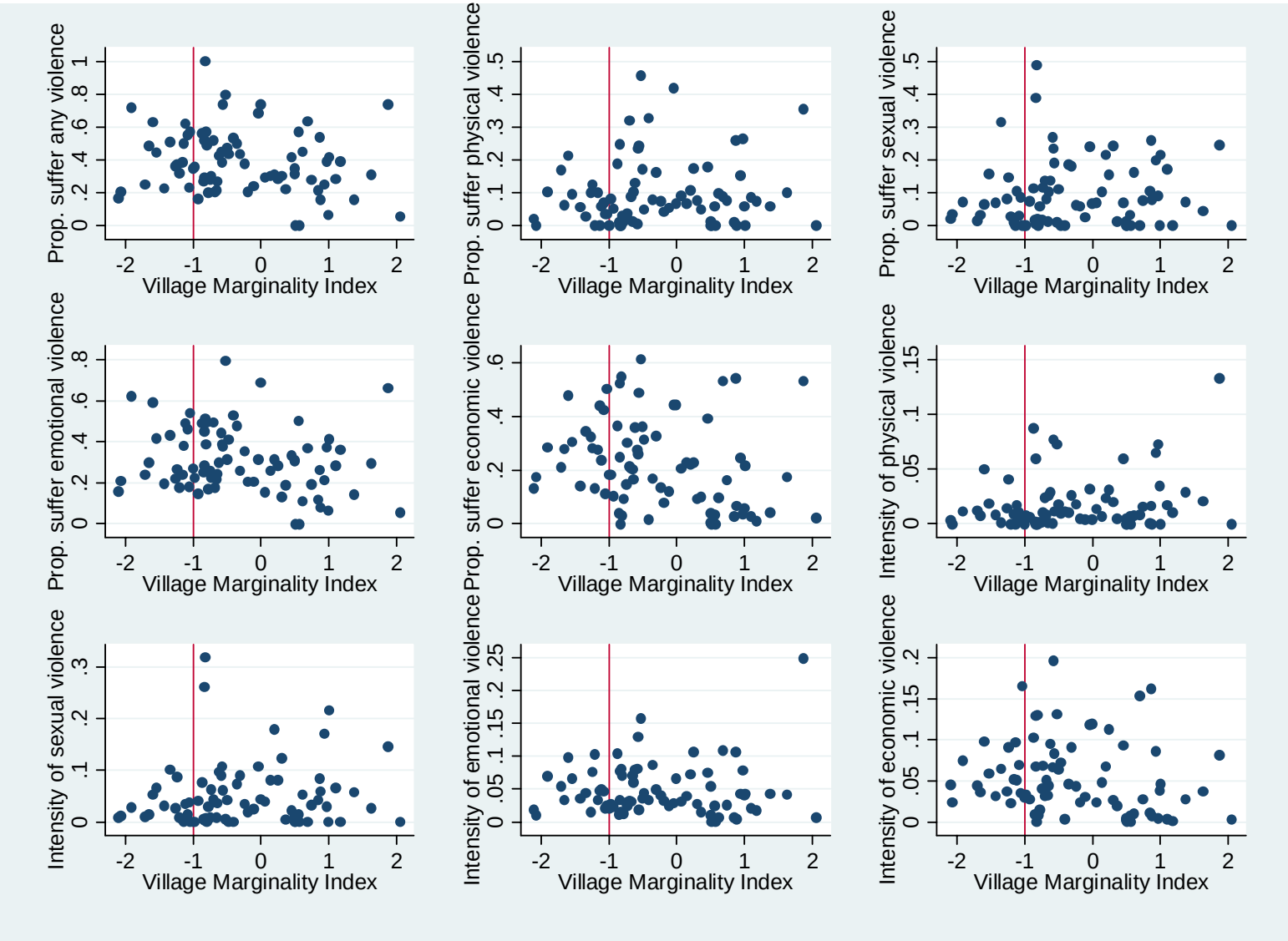


Panel C: 5th order polynomial

Panel D: 6th order polynomial

Notes to Figure 1: Each point in the graph is a test from a different regression; the dependent variable is one indicating whether the household is an Oportunidades beneficiary household (or not), and explanatory variables are an indicator of discontinuity at percentile (iteration) x, a polynomial function of the community-level marginality index, and a set of predetermined household controls. Reported (plotted) are F-test statistics of the joint significance of the discontinuity, polynomial, and HH controls coefficient estimates from OLS regressions weighted by survey sampling weights; standard errors in each regression are allowed to be correlated within community but not across communities. The household sample size is 26,937 in 1,328 communities.

Figure 3: Incidence Rates of Spousal Violence and Mean Intensity of Violence, by Percentiles of Village Marginality Index



Notes to Figure 3: The sample encompass all women ages 25 and older in rural villages classified as potentially program eligible – with children ages 11 and younger. Each dot in the graph represents the proportion of beneficiaries in the percentile of the village marginality index distribution.

Table 1: Summary Statistics

	Women with children under age 11 years		Women with children in primary school or under age 5 years	
	Rural Sample	Restricted Sample	Rural Sample	Restricted Sample
	(1)	(2)	(3)	(4)
Panel A: Woman Characteristics				
Beneficiary HH	0.502	0.402	0.509	0.414
	(0.500)	(0.491)	(0.500)	(0.493)
Woman's Age	35.1	35.1	35.3	34.9
	(7.4)	(7.4)	(7.6)	(7.4)
Indigenous Woman	0.198	0.100	0.200	0.092
	(0.398)	(0.300)	(0.400)	(0.290)
No Schooling	0.121	0.055	0.126	0.057
	(0.326)	(0.228)	(0.332)	(0.233)
Some Primary School	0.623	0.602	0.627	0.609
	(0.485)	(0.490)	(0.484)	(0.489)
Middle School	0.182	0.245	0.174	0.238
	(0.386)	(0.431)	(0.379)	(0.426)
Secondary School	0.041	0.051	0.040	0.047
	(0.198)	(0.220)	(0.195)	(0.212)
Incidence of spousal violence during childhood	0.080	0.081	0.080	0.090
	(0.271)	(0.273)	(0.271)	(0.287)
Intensity of spousal violence during childhood	0.154	0.157	0.154	0.178
	(0.603)	(0.621)	(0.600)	(0.662)
Panel B: Partner & HH Characteristics				
Indigenous Partner	0.208	0.109	0.211	0.107
	(0.406)	(0.312)	(0.408)	(0.309)
Partner's Age	35.8	35.7	35.9	35.5
	(8.3)	(8.1)	(8.4)	(8.0)
Partner's Schooling	3.2	3.5	3.2	3.4
	(1.4)	(1.3)	(1.4)	(1.3)
Incidence of spousal violence during childhood	0.144	0.149	0.145	0.156
	(0.351)	(0.356)	(0.353)	(0.363)
Intensity of spousal violence during childhood	0.201	0.198	0.203	0.209
	(0.526)	(0.511)	(0.528)	(0.526)
Family Size	5.6	5.5	5.7	5.6
	(1.9)	(1.9)	(1.9)	(1.9)
Cohabiting Union	0.196	0.145	0.201	0.148
	(0.397)	(0.353)	(0.400)	(0.355)
Years in Union	15.3	15.1	15.5	15.0
	(8.0)	(8.0)	(8.3)	(7.9)
Observations	2427	530	2319	488

Notes for Table 1: Standard deviations are reported in parentheses. Rural sample are all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics. The restricted sample is those women who satisfy the conditions above who live in villages with marginality index around cutoff [-1.25,0.75].

Table 1: Summary Statistics (cont.)

	Women with children under age 11 years		Women with children in primary school or under age 5 years	
	Rural Sample	Restricted Sample	Rural Sample	Restricted Sample
	(1)	(2)	(3)	(4)
Panel C: Spousal Violence				
Incidence of any spousal violence	0.372	0.391	0.376	0.393
	(0.484)	(0.488)	(0.484)	(0.489)
Incidence of physical violence	0.096	0.075	0.097	0.078
	(0.294)	(0.264)	(0.297)	(0.268)
Incidence of sexual violence	0.087	0.075	0.088	0.084
	(0.281)	(0.264)	(0.283)	(0.278)
Incidence of emotional violence	0.296	0.291	0.298	0.293
	(0.457)	(0.454)	(0.458)	(0.456)
Incidence of economic violence	0.220	0.251	0.223	0.250
	(0.415)	(0.434)	(0.417)	(0.433)
Intensity of physical violence	0.017	0.013	0.018	0.014
	(0.072)	(0.062)	(0.076)	(0.064)
Intensity of sexual violence	0.043	0.033	0.045	0.038
	(0.159)	(0.128)	(0.165)	(0.142)
Intensity of emotional violence	0.045	0.040	0.047	0.043
	(0.113)	(0.101)	(0.117)	(0.108)
Intensity of economic violence	0.052	0.056	0.054	0.057
	(0.129)	(0.130)	(0.129)	(0.130)
	2427	530	2319	488

Notes for Table 1: Standard deviations are reported in parentheses. Rural sample are all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics. The restricted sample is those women who satisfy the conditions above who live in villages with marginality index around cutoff [-1.25,0.75].

Table 2: Estimates of Discontinuity in the Proportion of Beneficiaries, Restricted Sample

	Dependent variable: Beneficiary indicator					
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS
Panel A: Women with children ages 11 and younger						
Marginality index > -1	0.159**	0.540***	0.276***	0.281***	0.616***	0.284
	(0.081)	(0.202)	(0.073)	(0.074)	(0.221)	(0.175)
Woman, Partner, and HH Controls	Yes	No	No	Yes	Yes	Yes
Marginality Index Determinants	No	Yes	No	No	Yes	Yes
State Fixed Effects	No	No	Yes	Yes	No	Yes
Marginality Index Range	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]
Observations	510	530	530	530	510	510
Panel B: Women with children in prim. school or under age 5 yrs.						
Marginality index > -1	0.174**	0.551**	0.236***	0.232***	0.628***	0.237
	(0.078)	(0.213)	(0.076)	(0.085)	(0.222)	(0.187)
Control	Yes	No	No	Yes	Yes	Yes
Marginality Index Determinants	No	Yes	No	No	Yes	Yes
State Fixed Effects	No	No	Yes	Yes	No	Yes
Marginality Index Range	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]	[-1.25, -0.75]
Observations	470	488	488	488	470	470

Notes for Table 2: Each coefficient is from a separate regression. Robust standard errors in parentheses; disturbance terms are allowed to be clustered within villages but not across villages; significant at (*) 90 percent, (**) 95 percent, and (***) 99 percent confidence levels. Coefficient estimates from OLS regressions weighted by survey sampling weights. Controls include indicator variables for woman and partner's age, indigenous status, household size, women's schooling-level indicators, cohabiting couple indicator, variables measuring reported histories of spousal abuse in parental household during childhood. Marginality index determinants are discussed in the text. The restricted sample encompass all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics, who live in villages with marg. index around cutoff [-1.25,0.75].

Table 3: Estimates of Discontinuity in Predetermined Observable Characteristics

	Coefficient Estimate on Treatment [Marginality Index > -1] (s.e.)							
Sample:	Women with children 11 years old and younger				Women with children in primary school or 5 years old and younger			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Woman's Age	-0.051	-2.939	-0.606	-1.590	0.576	-3.757	-0.230	-1.885
	(1.752)	(2.043)	(2.648)	(1.957)	(1.656)	(2.398)	(2.983)	(1.857)
Cohabiting Couple	0.012	0.001	-0.020	0.121	0.002	0.003	-0.045	0.079
	(0.149)	(0.026)	(0.091)	(0.108)	(0.141)	(0.021)	(0.074)	(0.097)
Indigenous Woman	0.042	0.033	-0.153	-0.218*	0.038	0.047	-0.189	-0.202
	(0.042)	(0.038)	(0.114)	(0.103)	(0.038)	(0.035)	(0.109)	(0.109)
No Schooling	-0.040	-0.065	-0.132*	-0.067	0.013	0.034	-0.118*	-0.052
	(0.035)	(0.039)	(0.061)	(0.065)	(0.032)	(0.025)	(0.046)	(0.049)
Primary School	0.151	0.187**	-0.067	0.076	0.116	0.002	-0.046	0.005
	(0.096)	(0.064)	(0.200)	(0.107)	(0.093)	(0.113)	(0.219)	(0.108)
Middle School	-0.076	-0.108*	0.117	-0.039	-0.086	-0.082	0.087	-0.029
	(0.070)	(0.043)	(0.125)	(0.097)	(0.070)	(0.080)	(0.128)	(0.116)
Secondary School	-0.062	0.001	-0.093	0.069	-0.068	0.070	-0.142	0.105
	(0.071)	(0.027)	(0.094)	(0.049)	(0.073)	(0.048)	(0.087)	(0.060)
Indigenous Partner	-0.059	0.036	-0.242*	-0.139	-0.063	0.044	-0.267*	-0.173
	(0.071)	(0.037)	(0.111)	(0.082)	(0.072)	(0.033)	(0.120)	(0.092)
Partner's Age	-2.329	-2.163	1.564	-1.643	-1.956	-3.044	1.544	-2.449
	(1.973)	(2.318)	(2.991)	(2.586)	(1.974)	(2.607)	(3.097)	(2.531)
Partner's Schooling Level	0.229	-0.087	0.835	-0.011	0.081	0.092	0.759	0.141
	(0.300)	(0.168)	(0.458)	(0.297)	(0.271)	(0.368)	(0.394)	(0.300)
Family Size	-0.505	0.625	-0.283	0.623	-0.274	0.757*	-0.427	0.857
	(0.482)	(0.350)	(0.582)	(1.034)	(0.559)	(0.345)	(0.674)	(0.976)
Years In Union	-0.361	-3.294	-0.786	-0.929	1.778	-1.709	0.579	-1.880
	(2.065)	(2.423)	(2.907)	(2.317)	(1.675)	(1.712)	(3.047)	(2.314)
Violence during Woman's	-0.119	0.036	-0.108	0.125	-0.117	0.036	-0.129	0.071
Childhood	(0.104)	(0.035)	(0.127)	(0.092)	(0.109)	(0.035)	(0.145)	(0.106)
Violence during Partner's	-0.015	0.023	-0.158	0.035	0.010	0.012	-0.070	0.071
Childhood	(0.063)	(0.064)	(0.094)	(0.102)	(0.066)	(0.064)	(0.110)	(0.125)
Intensity of Violence during	-0.275	0.058	-0.184	0.471*	-0.281	0.063	-0.236	0.388
Woman's Childhood	(0.225)	(0.076)	(0.269)	(0.216)	(0.234)	(0.075)	(0.304)	(0.230)
Intensity of Violence during	0.082	-0.048	0.128	-0.235	-0.025	0.023	-0.158	0.153
Partner's Childhood	(0.043)	(0.096)	(0.148)	(0.136)	(0.100)	(0.075)	(0.148)	(0.178)
Marg. Index Determinants	No	No	Yes	Yes	No	No	Yes	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Marg. Index Range	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]
Observations	530	530	510	510	488	488	470	470

Notes to Table 3: Each reported coefficient is from a different regression. Robust standard errors in parentheses; disturbance terms are allowed to be correlated within villages but not across villages; significant at (*) 95 percent, (**) 99 percent confidence levels. Marginality index determinant controls are total population in village, number of dwellings in village, proportion of illiterate adults, proportion of adults working in agricultural sector, proportion of dwellings without potable water, without drainage, without electricity, with a dirt floor, number of individuals per room.

Table 4: Naïve OLS Estimates

	Coefficient on Beneficiary Indicator (s.e.)					
Eligibility Criteria/Sample:	Children in primary or under five			Children 11 years or less		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:	WLS	WLS	Probit	WLS	WLS	Probit
Panel A: All unions in rural areas						
Any violence indicator	-0.004	0.019	0.015	-0.008	0.008	0.007
	(0.046)	(0.046)	(0.050)	(0.041)	(0.043)	(0.047)
Physical violence indicator	-0.034	-0.038	-0.008	-0.036	-0.044	-0.007
	(0.035)	(0.034)	(0.015)	(0.031)	(0.030)	(0.012)
Sexual violence indicator	0.009	0.003	0.002	-0.018	-0.034	-0.020
	(0.025)	(0.028)	(0.017)	(0.026)	(0.029)	(0.017)
Emotional violence indicator	0.009	0.025	0.021	-0.009	-0.003	-0.004
	(0.039)	(0.040)	(0.042)	(0.037)	(0.036)	(0.037)
Economic violence indicator	0.001	0.035	0.037	-0.011	0.011	0.018
	(0.036)	(0.039)	(0.040)	(0.032)	(0.038)	(0.038)
Severity of physical violence	0.002	0.004		0.000	-0.001	
	(0.007)	(0.007)		(0.005)	(0.005)	
Severity of emotional violence	0.019**	0.027**		0.015	0.020	
	(0.009)	(0.011)		(0.010)	(0.012)	
Severity of economic violence	0.013	0.023*		0.005	0.010	
	(0.011)	(0.013)		(0.009)	(0.012)	
State fixed effects	No	Yes	Yes	No	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
Marginality Index determinants	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1832	1832	1831	1944	1944	1943
Panel B: Villages with Marg. Index [-1.25,-0.75]						
Any violence indicator	0.022	0.081	0.063	-0.028	0.030	0.013
	(0.080)	(0.087)	(0.100)	(0.046)	(0.057)	(0.067)
Physical violence indicator	0.020	0.024	0.025	0.006	0.004	0.018
	(0.037)	(0.045)	(0.026)	(0.031)	(0.038)	(0.024)
Sexual violence indicator	-0.027	-0.037	-0.061	-0.050	-0.068	-0.077
	(0.053)	(0.058)	(0.045)	(0.061)	(0.067)	(0.050)
Emotional violence indicator	0.020	0.117	0.094	-0.045	0.017	0.000
	(0.084)	(0.094)	(0.098)	(0.061)	(0.072)	(0.077)
Economic violence indicator	0.069	0.110*	0.145*	-0.003	0.023	0.064
	(0.056)	(0.056)	(0.075)	(0.044)	(0.055)	(0.071)
Severity of physical violence	0.002	0.003		0.002	0.000	
	(0.010)	(0.013)		(0.009)	(0.011)	
Severity of emotional violence	0.009	0.027**		-0.012	0.004	
	(0.014)	(0.012)		(0.013)	(0.011)	
Severity of economic violence	0.013	0.029		-0.009	-0.004	
	(0.017)	(0.019)		(0.012)	(0.016)	
State fixed effects	No	Yes	Yes	No	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
Marginality Index determinants	Yes	Yes	Yes	Yes	Yes	Yes
Observations	455	455	443	497	497	486

Notes to Table 4: Each reported coefficient and marginal effect is from a different regression. OLS coefficients and marginal effects from probit regressions evaluated at mean covariates, both weighted by survey sampling weights. Robust standard errors in parentheses; disturbance terms are allowed to be correlated within villages but not across villages; significant at (*) 95 percent, (**) 99 percent confidence levels. Controls include indicator variables for woman and partner's age, indigenous status, household size, women's schooling-level indicators, cohabiting couple indicator, variables measuring reported histories of spousal abuse in parental household during childhood. Marginality index determinant controls are discussed in the text. The restricted sample encompass all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics, who live in villages with marginality index around cutoff [-1.25,0.75].

Table 5: Reduced-Form Estimates of Discontinuity on Violence, by Violence Measure

	Coefficient Est./Marginal Effect on Beneficiary Indicator (s.e.)					
Eligibility Criteria/Sample:	Children in primary or under five			Children 11 years or less		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:	WLS	WLS	Probit	WLS	WLS	Probit
Any violence indicator	-0.028	-0.317*	-0.383*	-0.088*	-0.251*	-0.299*
	(0.047)	(0.179)	(0.202)	(0.049)	(0.134)	(0.175)
Physical violence indicator	0.008	-0.129*	-0.129	0.005	-0.072	-0.040
	(0.020)	(0.075)	(0.096)	(0.024)	(0.073)	(0.059)
Sexual violence indicator	0.043	-0.104	-0.416	0.043	-0.111	-0.190
	(0.047)	(0.090)	(0.295)	0.021	(0.113)	(0.179)
Emotional violence indicator	-0.003	-0.041	-0.042	-0.025	-0.124	-0.145
	(0.039)	(0.126)	(0.183)	(0.043)	(0.121)	(0.163)
Economic violence indicator	0.012	-0.279	-0.270	-0.017	-0.104	-0.083
	(0.061)	(0.187)	(0.229)	(0.058)	(0.144)	(0.180)
Severity of physical violence	0.008	-0.001		0.007	-0.001	
	(0.006)	(0.017)		(0.008)	(0.017)	
Severity of emotional violence	0.014	0.018		-0.047	0.029	
	(0.035)	(0.019)		(0.036)	(0.037)	
Severity of economic violence	0.009	-0.054		0.001	-0.021	
	(0.015)	(0.052)		(0.016)	(0.050)	
State fixed effects	No	Yes	Yes	No	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
Marginality Index determinants	Yes	Yes	Yes	Yes	Yes	Yes
Observations	472	455	443	516	497	486

Notes to Table 5: Each reported coefficient and marginal effect is from a different regression. OLS coefficients and marginal effects from probit regressions evaluated at mean covariates, both weighted by survey sampling weights. Robust standard errors in parentheses; disturbance terms are allowed to be correlated within villages but not across villages; significant at (*) 95 percent, (**) 99 percent confidence levels. Controls include indicator variables for woman and partner's age, indigenous status, household size, women's schooling-level indicators, cohabiting couple indicator, variables measuring reported histories of spousal abuse in parental household during childhood. Marginality index determinant controls are total population in village, number of dwellings in village, proportion of illiterate adults, proportion of adults working in agricultural sector, proportion of dwellings without potable water, without drainage, without electricity, with a dirt floor, number of individuals per room. The restricted sample encompass all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics, who live in villages with marginality index around cutoff [-1.25,0.75].

Table 6: IV Estimates of Beneficiary Status on Spousal Violence, by Violence Measure

	Coefficient Estimate on Beneficiary Indicator (s.e.)					
Eligibility Criteria/Sample:	Children in primary or under five			Children 11 years or less		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:	IV/GMM	IV/GMM	IVProbit	IV/GMM	IV/GMM	IVProbit
Any violence indicator	-0.522***	-0.965	-0.091	-0.540***	-0.700	-1.568***
	(0.171)	(0.603)	(0.915)	(0.191)	(0.451)	(0.600)
Physical violence indicator	-0.049	-0.394	0.710	-0.074	-0.201	0.422
	(0.083)	(0.289)	(1.020)	(0.096)	(0.209)	(1.695)
Sexual violence indicator	-0.072	-0.318	1.560***	-0.143	-0.314	-1.189
	(0.117)	(0.268)	(0.494)	(0.124)	(0.237)	(0.977)
Emotional violence indicator	-0.447***	-0.124	0.400	-0.605***	-0.347	-0.141
	(0.160)	(0.354)	(0.973)	(0.216)	(0.329)	(2.041)
Economic violence indicator	-0.377**	-0.850	0.975	-0.339*	-0.289	
	(0.164)	(0.660)	(0.947)	(0.185)	(0.418)	
Severity of physical violence	0.010	-0.004		0.006	-0.002	
	(0.029)	(0.048)		(0.031)	(0.044)	
Severity of emotional violence	0.037	0.043		0.007	0.081	
	(0.052)	(0.106)		(0.048)	(0.109)	
Severity of economic violence	-0.086*	-0.166		-0.081	-0.059	
	(0.047)	(0.174)		(0.051)	(0.135)	
State fixed effects	No	Yes	No	No	Yes	Yes
HH Controls	Yes	Yes	No	Yes	Yes	Yes
Marginality Index determinants	Yes	Yes	No	Yes	Yes	Yes
First-stage F-statistic	8.00	1.61	-	7.77	2.63	-
Observations	472	455	443	516	497	486

Notes to Table 6: Each reported coefficient is from a different regression. Coefficients estimates from IV/GMM and IV probit regressions weighted by survey sampling weights. Robust standard errors in parentheses; disturbance terms are allowed to be correlated within villages but not across villages; significant at (*) 95 percent, (**) 99 percent confidence levels. Controls include indicator variables for woman and partner's age, indigenous status, household size, women's schooling-level indicators, cohabiting couple indicator, variables measuring reported histories of spousal abuse in parental household during childhood. Marginality index determinant controls are total population in village, number of dwellings in village, proportion of illiterate adults, proportion of adults working in agricultural sector, proportion of dwellings without potable water, without drainage, without electricity, with a dirt floor, number of individuals per room. The restricted sample encompass all women ages 25 and older in rural villages classified as program eligible based on demographic and socio-economic characteristics, who live in villages with marginality index around cutoff [-1.25,0.75].

Appendix

Table A1: Partial Correlations of Predetermined Observable Characteristics around Discontinuity Cut-Off (Marg.. Index = -1)

	Dependent variable: Village-level Marginality Index > -1							
Sample:	Women with children 11 years old and younger				Women with children in primary school or 5 years old and younger			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Woman's Age	0.017	0.002	-0.006	0.001	0.002	-0.014	-0.006	0.002
	(0.011)	(0.006)	(0.004)	(0.002)	(0.014)	(0.011)	(0.004)	(0.002)
Cohabiting Couple	0.141	0.007	0.016	0.004	0.135	0.022	0.011	0.002
	(0.115)	(0.027)	(0.020)	(0.011)	(0.076)	(0.034)	(0.015)	(0.010)
Indigenous Woman	0.293*	0.037	-0.019	-0.062*	0.348*	0.096	-0.061	-0.062
	(0.134)	(0.078)	(0.057)	(0.031)	(0.154)	(0.088)	(0.052)	(0.034)
No Schooling	0.054	-0.042	-0.077	-0.039	0.197	0.298	-0.163	-0.069
	(0.280)	(0.245)	(0.115)	(0.035)	(0.271)	(0.248)	(0.134)	(0.052)
Primary School	0.185	0.087	-0.049	-0.018	0.101	0.170	-0.112	-0.036
	(0.206)	(0.145)	(0.075)	(0.025)	(0.197)	(0.148)	(0.096)	(0.035)
Middle School	-0.057	-0.052	-0.035	-0.013	-0.113	0.063	-0.092	-0.026
	(0.188)	(0.100)	(0.049)	(0.019)	(0.183)	(0.127)	(0.063)	(0.026)
Secondary School	-0.192	-0.006	-0.110	0.056*	-0.150	0.167	-0.181*	0.060*
	(0.193)	(0.110)	(0.059)	(0.027)	(0.190)	(0.135)	(0.076)	(0.029)
Indigenous Partner	-0.133	0.041	-0.139**	-0.035	-0.207	0.012	-0.107**	-0.056*
	(0.126)	(0.089)	(0.048)	(0.022)	(0.126)	(0.091)	(0.037)	(0.026)
Partner's Age	-0.011	-0.002	0.006	-0.001	-0.011	0.000	0.005	-0.002
	(0.009)	(0.005)	(0.004)	(0.001)	(0.008)	(0.005)	(0.003)	(0.001)
Partner's Schooling Level	0.068	-0.003	0.017	-0.008	0.060	0.033	0.005	-0.011
	(0.051)	(0.037)	(0.016)	(0.007)	(0.050)	(0.043)	(0.018)	(0.010)
Family Size	0.006	0.029*	0.000	0.004	0.011	0.030*	0.000	0.007
	(0.017)	(0.013)	(0.005)	(0.005)	(0.016)	(0.014)	(0.005)	(0.005)
Years In Union	-0.008	-0.008	0.000	0.000	0.007	0.005	0.002	-0.001
	(0.007)	(0.004)	(0.002)	(0.001)	(0.010)	(0.008)	(0.002)	(0.001)
Violence during Woman's Childhood	0.079	-0.039	-0.009	-0.011	0.088	-0.068	0.003	-0.015
	(0.142)	(0.090)	(0.052)	(0.030)	(0.146)	(0.079)	(0.048)	(0.030)
Violence during Partner's Childhood	0.076	-0.036	-0.020	-0.024	0.266	0.001	0.029	-0.026
	(0.256)	(0.165)	(0.061)	(0.026)	(0.231)	(0.168)	(0.062)	(0.028)
Intensity of Violence during Woman's Childhood	-0.141*	0.043	-0.003	0.019	-0.144*	0.062	-0.007	0.019
	(0.070)	(0.048)	(0.024)	(0.014)	(0.068)	(0.045)	(0.023)	(0.015)
Intensity of Violence during Partner's Childhood	-0.086	0.012	-0.006	0.016	-0.191	-0.006	-0.024	0.019
	(0.168)	(0.105)	(0.041)	(0.020)	(0.150)	(0.103)	(0.041)	(0.023)
Marg. Index Determinants	No	No	Yes	Yes	No	No	Yes	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Marginality Index Range	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]	[-1.25,-0.75]
F-test joint significance obs= 0	3.94	1.75	2.49	0.91	5.38	1.02	2.33	1.07
P-value	[0.00]	[0.05]	[0.00]	[0.56]	[0.00]	[0.44]	[0.00]	[0.40]
Observations	530	530	510	510	488	488	470	470
R-squared	0.14	0.57	0.90	0.96	0.14	0.56	0.91	0.96

Notes to Table A1: Robust standard errors in parentheses; disturbance terms are allowed to be correlated within villages but not across villages; significant at (*) 95 percent, (**) 99 percent confidence levels. Marginality index determinant controls are total population in village, number of dwellings in village, proportion of illiterate adults, proportion of adults working in agricultural sector, proportion of dwellings without potable water, without drainage, without electricity, with a dirt floor, number of individuals per room.

Data Appendix

I. Questions in the Domestic Violence Module

For each question, women were first asked whether the behavior had occurred within the past twelve months. If the answer was "yes", there was a follow-up question that asked how often it had occurred. The responses available were "One time", "A few times", "Many times".

Next to each question is the weight derived from a survey of 120 women residing in Mexico, and 120 women residing in California. The weights denote the severity (on a scale from zero to one) attached to each behavior by all women interviewed for this purpose[11].

A. Physical Violence

In the past twelve months, has your spouse/partner…

1. Pushed you or pulled your hair? 0.66
2. Tied you up? 0.83
3. Kicked you? 0.89
4. Thrown any object at you? 0.63
5. Hit you with his hands or with an object? 0.87
6. Tried to choke or strangle you? 0.93
7. Attacked you with a knife or blade? 0.94
8. Shot you with a firearm? 0.97

B. Sexual Violence

In the past twelve months, has your spouse/partner…

1. Demanded that you have sex with him? 0.84
2. Forced you to do [sexual] things? 0.87
3. Used force to have sexual relations? 0.91

C. Emotional Violence

In the past twelve months, has your spouse/partner…

1. Stopped speaking to you? 0.32
2. Made you feel ashamed, belittled you, said you were ugly or compared you to other women? 0.60
3. Destroyed, thrown away, or hidden things that belong to you or to your household? 0.59
4. Threatened to leave you, hurt you, take your children away or kick you out? 0.75
5. Become very angry because the domestic chores are not done, because the food is not done the way he likes it, or he thinks you did not fulfill your duties? 0.50

[11] For methodology details, see Castro (2004).

6. Locked you in, forbidden you from going out or being visited? 0.64
7. Left you with all the domestic work and childcare even when he had time to help? 0.31
8. Accused you of cheating on him? 0.36
9. Made you feel fear? 0.72
10. Turned your relatives against you? 0.65
11. Ignores you, does not take you into account, does not give you affection? 0.33
12. Threatened you with a deadly weapon (knife, switchblade, gun or rifle)? 0.90
13. Threatened to kill you, kill himself, or kill the children? 0.88

D. Economic Violence

In the past twelve months, has your spouse/partner…

1. Complained about how you spend money? 0.51
2. Been stingy with household expenses even when he had money? 0.54
3. Threatened not to give you money for household expenses or not given you money [for household expenses]? 0.55
4. Spent all the money needed for the home? 0.57
5. Taken away or taken over money or goods (things, land parcels, animals, etc.)? 0.59
6. Forbidden you from working or studying? 0.60