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Are You (Not) Expecting? The Unforeseen Benefits of Job Training on Teenage Pregnancy

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Inter-American Development Bank
Labor Markets and Social Security Unit

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Are You (Not) Expecting? The Unforeseen Benefits of Job Training on Teenage Pregnancy*

Rafael Novella Laura Ripani†

Abstract

Teenage pregnancy in the Dominican Republic represents a persistent development challenge. This paper uses data from a randomized impact evaluation of the youth training program Juventud y Empleo, which includes soft-skills training, to examine its impact on teenage pregnancy. We find that the program reduces the probability of teenage pregnancy by 8 percentage points (about 20 percent), particularly among teenagers who are not already mothers. The program seems to affect teenage pregnancy through improvements in soft skills and expectations, among others channels. In addition, we find that the program plays a protective role for teenagers from more deprived backgrounds.

JEL Codes: J24, J13, O15

Keywords: teenage pregnancy, youth training programs, soft skills, Dominican Republic.

1 Introduction

Teenage pregnancy is among the most pervasive problems affecting the social and economic empowerment of young women around the world. The Latin America and the Caribbean (LAC) region has the second-highest adolescent fertility rate, after Sub-Saharan Africa. The Dominican Republic, after Nicaragua, is the most affected country within LAC,[1] with 100 births per 1,000 women ages 15–19.[2] This paper

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[1] Abortions and miscarriages, among other factors, make adolescent fertility rate lower than the teenage pregnancy rate. However, to the best of our knowledge, there are no comparable statistics of the prevalence of teenage pregnancy across countries and, thus, adolescent fertility rate is widely used as proxy.

[2] According to the World Bank (2014), in 2012, the adolescent fertility rate (i.e., births per 1,000 women ages 15–19) was 69 in LAC, 108 in Sub-Saharan Africa, 100 in the Dominican Republic, and

studies the effects of one of the country's youth training programs, Juventud y Empleo (JE), on teenage pregnancy and shows that improving youths' soft skills and personal expectations reduces the incidence of pregnancy at a young age.

The determinants of teenage pregnancy and motherhood are still widely discussed. The literature about this topic sheds some light on causes by analyzing the impact of teenagers' family backgrounds (Wolfe et al. 2001) and welfare and family planning policies (Acs 1996; An et al. 1993; Kearney and Levine 2012; Lundberg and Plotnick 1990, 1995 1995).[3] However, there is still a lot to learn about the factors behind the decision to have a child at young age. Parental expectations about school choices seem to be important for teenagers deciding whether to have children soon (Rascon-Ramirez 2014), which may reflect that perceived opportunity costs are an important decision-making factor. At the same time, adolescent attitudes seem to play a role in teen birth rates, as described in a recent study about the impact of MTV's 16 and Pregnant (Kearney and Levine 2014).

There is also a debate about the impacts of teenage pregnancy and motherhood on labor market outcomes. Despite their differences on magnitude of the impacts, the majority of studies point to a negative impact of teenage pregnancy and motherhood on human capital investments, the probability of getting married, and other consequences, such as performing worse in the labor market (Ashcraft and Lang 2006; Ermisch and Pevalin 2005).[4] A recent study (Cygan-Rehm and Riphahn 2014) finds that teenage pregnancies rise in times of high (youth) unemployment. This could suggest that opportunity costs matter to young women who think they do not have a chance of finding a good job. Such women cannot gain social recognition from working, so they may decide to get it by having a child at a young age.

Recent evidence for LAC also shows that, in general, there is a negative impact of teenage pregnancy on socioeconomic outcomes. For instance, looking at short-term effects in Mexico, teenage pregnancy seems to reduce teenagers' years of schooling, school attendance, and hours of work while increasing marriage rates (Azevedo, Lopez-Calva and Perova 2012). In the long run, being a mother at a young age reduces years of education and per capita household income and contributes to a higher probability of being married or divorced (Arceo-Gomez and Campos-Vazquez 2014). In Chile, Berthelon and Kruger (2014) find that teenage motherhood significantly reduces the probability of the teenager's high school completion. A recent regional study for LAC (Näslund-Hadley and Binstock 2010) argues that the main determinant of teenage pregnancy is not the lack of information about skills for planning for the future, but the lack of willingness to use them. And in the Dominican Republic, according to Carrasco (2012), teenage pregnancy is related to a lack of life goals, low incentives

101 in Nicaragua.

[3] In terms of family background and attitudes, the literature shows that teenagers with more educated mothers are less likely to be pregnant at a young age, and there is also an impact of household characteristics such as family structure, family stress factors, parental attitude, expectations, monitoring and control of children, and contraceptive practices. In terms of welfare and family planning policies, the literature shows that the existence of generous welfare programs (such as Medicaid) have increased teenage pregnancy rates and generated intergenerational welfare dependency, and on the other side, higher investments in public family planning policies had the opposite effect, decreasing adolescent pregnancy rates.

[4] According to a classification made by Rascon-Ramirez (2014), the most relevant empirical evidence about the consequences of teenage motherhood may be grouped by consequences on: human capital investment and labor market outcomes (Rosenzweig and Wolpin 1995; Hotz et al. 1997; Klepinger et al. 1999; Chevalier and Viitanen 2003; Levine and Painter 2003; Ashcraft and Lang 2006; and Fletcher and Wolfe 2009) and partnerships (Plotnick 1992; Goodman and Walker 2004; and Ermisch and Pevalin 2005).

to go to school, and a perceived lack of opportunities, especially among the poorest population tier; all these aspects are addressed in this paper. Similarly, a regional report of the World Bank (Azevedo, Favara and Haddock 2012) finds that poverty and lack of opportunities are key determinants of childbearing.

In this sense, interventions targeted at increasing the opportunity cost of being a teenage mother (for instance, through improvements in self-esteem, personal plans for the future, or perceptions about the future) are expected to reduce pregnancy rates. Empirical studies from the United States and the United Kingdom show that teenagers' attitudes and expectations about their future negatively affect the probability of pregnancy (Plotnick 1992, 1993, and 2007). Life-skills training programs, such as JE in the Dominican Republic, are examples of interventions aimed at changing expectations and soft skills that might affect teenage pregnancy.[5]

Young men and women in LAC are facing disproportionate difficulties in the labor market: unemployment or bad-quality jobs.[6] There is also a high percentage of youth who are neither working nor studying, and many are not even looking for a job. Since the early 1990s, some LAC countries have addressed this by implementing job-training programs specially tailored for youth. These programs regularly target vulnerable youth and include training in soft[7] and technical skills plus apprenticeships or internships in the private sector.[8] JE was the first such program in LAC to have an experimental evaluation design from its inception. While previous evaluations of these programs have focused almost exclusively on labor market impacts (employment rate, labor earnings, and quality of employment), Ibarrarán et al. (2014) also report on the mechanisms by which training is supposed to improve participants' labor market performance, particularly JE's emphasis on the skills—especially soft skills—with which youth join the labor force. The paper also preliminarily examines other important outcomes that can be attributed to training, such as changes in teenage pregnancy rates and consumption of alcohol, cigarettes, drugs and lottery.

This paper is different mainly in that: (i) our definition of teenage pregnancy considers a how many times a woman has been pregnant, not just if a woman is pregnant at the moment of the follow-up survey; (ii) we attempt to estimate the simultaneous effect of JE on soft skills and teenage pregnancy; (iii) we estimate whether JE heterogeneously affects teenage pregnancy by civil status, number of children, and pre-intervention individual (self-esteem) and household characteristics (wealth index); and (iv) we also explore the association of JE and teenage fatherhood.

The vast majority of the previous studies about teenage pregnancy and labor market outcomes are based on associations. These papers find it difficult to solve

[5] In the literature, soft skills are also called socio-emotional, non-cognitive, or life skills. They are skills related to attitudes and behaviors and differ from cognitive skills, which are related to the ability to learn and the intellectual coefficient.

[6] As many as 73 million young people aged 15 to 24 are unemployed, and a large proportion of those employed have poor quality jobs; increasing numbers are working part-time and in temporary and informal forms of employment (International Labour Organization 2015).

[7] The academic literature agrees that there is a positive relationship between possessing soft skills and the probabilities of finding a good job and maintaining it for a longer time (Heckman et al. 2006). Focusing on soft skills has become increasingly important for training programs in LAC (Ibarrarán and Rosas 2009; Gonzalez Velosa et al. 2012), where different programs have included or expanded the provision of soft skills.

[8] See Gonzalez-Velosa et al. (2012) for an in-depth analysis of six job-training programs for youth in LAC, using as inputs the results from impact evaluations, qualitative fieldwork, and a statistical analysis of surveys of firms and program beneficiaries. Other important references are Heckman et al. (1999) for a general overview of training programs and Betcherman et al. (2004) for a summary that includes some evaluations of developing countries' training programs.

the potential endogeneity problem of unobserved factors affecting both adolescent pregnancy and labor market outcomes. We use the randomized experimental data of the JE program, which allow us to identify the causal effect of the program on teenage pregnancy. This paper contributes to a better understanding of how youth training programs that include training in soft skills affect teenage pregnancy. At the same time, it enriches the discussion about which elements are important in the agenda of reducing teenage pregnancy in developing countries.

Our analysis is based on a sample of applicants for the cohort of trainees who participated in the 2008 version of the JE program.[9] We find that the program reduces the probability of pregnancy for all women but has a particularly strong effect for teenagers (reduction of about 8 percentage points in the probability of being pregnant or, in other words, women in the treatment group are 20 percent less likely to be pregnant than those in the control group), especially those who are not already mothers. This is mainly achieved through training on soft skills and stressing expectations of students. Moreover, JE has larger effects on teenagers whose initial self-esteem did not fall within the highest or lowest quartile and among teenagers from poorer households.

The rest of the paper is organized as follows: Section 2 describes the JE program, its previous evaluations, and our data. Section 3 presents the empirical strategy, section 4 presents the results, and section 5 concludes.

2 The Youth and Employment Program (Juventud y Empleo)

Begun in 2001, JE is aimed at increasing the probability that youth aged 16 to 29 years who did not complete high school are able to get a good job. As JE is constantly evolving, we examine a version with different training content, labor intermediation, and evaluation design than the 2001 version of the program.[10] In particular, the program we evaluate offers a component of 75 hours of soft-skills training plus a component of 150 hours of vocational training for a wide variety of jobs (such as providing administrative assistance, working in a bakery, or styling hair). The soft-skills training includes: (i) planning skills: development of the participant's personal life project; (ii) basic cognitive skills: management of basic math and communication skills; (iii) social skills: improved management of social risk situations as well as conflict prevention and negotiation skills; (iv) skills for productive work: promotion of decision-making skills,

[9] The first evaluation of the first version of JE corresponds to Card et al. (2011).

[10] Changes mainly consist in structuring and standardizing the modules of soft-skills training and putting more emphasis in the relationship between the classroom training and the private sector internships. For instance, in a qualitative analysis of JE, Fazio (2011) finds additional evidence that private firms value more the 75 hours of soft-skills training than the 150 hours of technical training. More specifically, the changes were as follows: (i) COS worked closer to the private sector companies in order to have an internship experience much more tailored to the needs of the firm; (ii) the life-skills training was modified, better structured and homogeneously provided by the COS, given that the firms expressed that these skills were highly valued, even more than JE's technical training Moreover, changes in the evaluation design included the following: (i) the sample for the random assignment was larger for each course (20 individuals in the treatment and 15 individuals in the control groups); and (ii) in general, several aspects of the evaluation were improved, such as the sample size (1,349 individuals in the first evaluation and 3,761 in the new evaluation design), the survey instruments, and the organization of the fieldwork (supervisors of the interviewers and quality controls in the field at the time of the interviews).

team collaboration, and the ability to work with efficiency and quality; and (v) sensitivity to gender equality and respect of the physical environment.[11] The vocational training teaches technical knowledge tailored to the needs of employers.

The two training components are provided by private training institutions (Centros Operadores del Sistema; COS) that are registered and approved by the national training institution (Instituto Nacional de Formación Técnico Profesional). Participants' COS training is followed by a three-month internship in the private sector; the internship opportunities are selected by the COS with the objective of matching the participant's technical training with a firm's human resources needs—soft-skills training has the same content regardless of the technical training course pursued. Each COS conducts an open call for applicants then matches them with their preferred career, based on availability of the matching training course.

Previous literature on the program analyzes two types of cohort samples. The first is the impact evaluation by Card et al. (2011) that analyzes the original design of the program, which considers a sample of applicants who applied to receive training in early 2004, with the follow-up survey was in mid-2005 (10 to 14 months after most trainees had finished their training). This evaluation shows JE having little impact on employment rates, but a 10 percent increase in both hourly wages and earnings. The evaluation also shows modest impacts on formality (i.e., probability of holding of a job that offers health insurance) for men.[12] The second impact evaluation of the program (Ibarrarán et al., 2014) used data from 2008 to 2010 and found a positive impact on quality of employment (a 17 percent increase on formality for men and a 7 percent increase on monthly earnings among employed women and men) but no impact on employment rates.

Ibarrarán et al. (2014) also find unexpected results, foremost among them is a 5-percentage-point reduction in teenage pregnancy in the treatment group. These findings are consistent with incremental changes in participants' expectations and soft skills. The 2008 cohort was also surveyed for a second time at the end of 2014 (six years after treatment), and the results show that the program additional long-lasting impacts. The most important results show increases of 25 percent on formality for men in the treatment group (rather than the 17 percent finding in the two-year follow-up), 31 percent on formality for young people living in urban areas, 25 percent on formality for older students, and 25 percent on earnings for women who live in urban areas (Ibarrarán et al. 2015).

The participants identified as eligible by the COS had to meet the following criteria: (i) be 16 to 29 years of age; (ii) reside in a poor neighborhood; (iii) not be attending school; (iv) have an incomplete high school education or less; (v) be unemployed, underemployed, or occupationally inactive; and (vi) hold a Dominican identity card.[13] Each randomization process consisted of the COS sending JE information on 35 eligible individuals with interest in JE training. Next, JE verified that the applicants had never previously registered for the program and sent the COS a list of individuals randomly assigned to the treatment or the control group. The treatment

[11] It is important to highlight that the JE training did not explicitly include sex education in the curriculum.

[12] During the first evaluation of the program, people who were originally assigned to receive training but failed to show up or those who attended only briefly were not included in the follow-up survey. This potentially compromised the randomized design of the Card et al. (2011) JE evaluation.

[13] The eligibility requirement of living in a poor household was related to applicants' location across the country and targeting priorities established by the national government. Data from the program shows that 72 percent of the postulants met the location criteria, but only 40 percent were poor.

group of 20 individuals was formed first, and the control group was formed of the remaining 15. If individuals were offered the program but either did not respond or dropped out before the tenth day of classes, the COS could replace up to five individuals with people from the control group. In theory, the replacements are randomly selected given that they had initially been one of 35 randomly selected participants. But in practice, the COS had a degree of discretion in selecting the five replacements from the 15 people in the control group.

3 Empirical Strategy

Our study considers what happened at the random assignment to estimate the intention-to-treat effects of offering the JE program.[14] The estimates yield the causal effect of offering the program (Duflo et al. 2007), and its estimation includes the group of eligible people who participated in the random assignment.

The data used in this paper corresponds to a baseline collected at registration at the COS for 10,309 eligible applicants (63% women), from which 5,000 individuals (3,130 women, including 810 adolescent women) were randomly selected to participate in a survey 18 to 24 months (between November 2010 and February 2011) after courses had completed. Attrition rates between waves for the whole sample (19 percent), the sample of all women (19 percent), and the sample of adolescent women (21 percent) are statistically similar between the treatment and control groups.[15] The final sample corresponds to 2,227 women aged 16–29 at the baseline (564 are adolescents, aged 16–19, with complete information in all the variables used in the analysis).[16]

The dependent variable in equation (1) corresponds to a dummy variable taking the value of 1 when a woman is either pregnant at the time of the follow-up survey or has a baby after the treatment, and the value of 0 otherwise. One-third of the women in our sample are pregnant or were recently pregnant at the time of the follow-up survey. To compute whether a woman has been recently pregnant, we construct the history of births of each female in our sample. In particular, we calculate the number of children born alive between the follow up and the baseline.[17] T_i corresponds to random assignment to the control or treatment group; t is a dummy variable that takes the value of 0 when the follow-up information was collected in the last two months of 2010 and 1 when it was collected in the first two months of 2011; x_i corresponds to individual characteristics, such as age; and, ϵ_{ic} is an individual error term. Because

[14] Tables A1 and A2, in annex I, show the balance for the samples of all women and only adolescent women.

[15] Even though attrition is associated to having lower education, being less poor, and living in urban areas, attrition rates between individuals in the treatment and control groups seem to be random, as columns (5) in tables A1 and A2 in annex I show.

[16] Similarly, columns (8) in tables A1 and A2 in annex I show that having completed information in the variables used in the analysis is (weakly) different between the treatment and control groups in just a few observable characteristics.

[17] If the age of a child, plus the 9 months of gestation, is smaller than the time lapse between the two waves, the child is considered a newborn and her mother is a recent pregnant woman. Given data restrictions, we are not able to include history of pregnancies or number of miscarriages and abortions of women in the sample. We observe changes only between the baseline and follow-up in the number of live births. Taking this into consideration, we find that JE does not affect motherhood (probability of being mother nor the number of newborns). These results are available on request. In addition, even though we are also able to reconstruct the history of births for males in the sample, severe selection problems makes us very cautious about interpreting the results that JE affects neither the probability of being father nor the number of newborns (table A.6a and A.6b in annex I).

of the random assignment the correlation between this error term and T_i is expected to be 0 and therefore the estimation of β unbiased.[18]

$$pregnancy_{ic} = \alpha + \beta T_i + \gamma t_i + \delta x_i + \epsilon_{ic} \quad (1)$$

In addition, to explore the channels through which JE affects teenage pregnancy, this analysis uses a set of rich information contained in the follow-up survey. In particular, we use information about the youths' expectations and soft-skills indexes.[19] These j variables are the dependent variables estimated separately using equation (2).

$$y^j_{ic} = \alpha + \beta T_i + \gamma t_i + \delta x_i + \epsilon_{ic} \quad (2)$$

From the expectations module, we compute an index (using principal–component factoring analysis) combining the responses to a set of questions regarding expectations about the youths' personal lives.[20] For measures of soft skills, we use the Social and Personal Competencies Scale (CPS, for its name in Spanish), the Rosenberg self-esteem scale, and the Grit scale, which were standardized within the samples of men and women in the follow-up survey and transformed so higher values indicate higher levels of the dimension measured. Brea (2010) presents a detailed discussion of the construction, reliability and interpretation of the three scales for the sample of JE. The CPS was designed exclusively to measure the impact of the soft-skills modules in JE, and its scale measures different dimensions of social and personal competencies related to attitudes and values, including: leadership, communication and social acceptance, ability to establish social relationships, empathy and communication, self-esteem, order, organization, and conflict resolution skills. The Rosenberg scale measures self-esteem through questions about participants' feelings;[21] and the Grit scale (Duckworth et al., 2007) measures perseverance or passion for long-term goals and consistency of interest.

To deal with the simultaneous effect that JE might have on pregnancy, expectations, and soft skills, we also estimate a seemingly unrelated regressions (SUR) model using system of equations (3). For the five equations of a given individual, the model is as follows:

[18] Ideally, we would control for course fixed effects. However, reducing the sample to teenagers results in 30 percent of the courses with only one observation. To marginally account for common unobservables at the course level, the standard errors allow for heteroscedasticity at course level.

[19] Another possible channel is an incapacitation effect of the JE, through which adolescent women are less likely to engage in risky behaviors when they are in training. However, data limitations do not allows us to analyze this potential channel of JE effects.

[20] Annex II describes the construction of the expectation index in detail.

[21] The JE evaluation questionnaire collected the 10 items of the RSE scale. Specifically, individuals were asked to report how much they agree (on a four-point scale: 1-strongly agree; 2-agree; 3-disagree; and 4-strongly disagree) with each of the following statements: (1) on the whole, I am satisfied with myself; (2) at times, I think I am no good at all; (3) I feel that I have a number of good qualities; (4) I am able to do things as well as most other people; (5) I feel I do not have much to be proud of; (6) I certainly feel useless at times; (7) I feel that I am a person of worth, at least on an equal plane with others; (8) I wish I could have more respect for myself; (9) all in all, I am inclined to feel that I am a failure; and (10) I take a positive attitude toward myself.

$$\begin{pmatrix} pregnancy \\ cps \\ rosenberg \\ grit \\ expectations \end{pmatrix} = \begin{pmatrix} X_1 & 0 & \dots & \dots & 0 \\ 0 & X_2 & \dots & \dots & 0 \\ \dots & \dots & X_3 & \dots & \dots \\ \dots & \dots & \dots & X_4 & 0 \\ 0 & \dots & \dots & 0 & X_5 \end{pmatrix} \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{pmatrix} + \begin{pmatrix} \epsilon_1 \\ \epsilon_2 \\ \epsilon_3 \\ \epsilon_4 \\ \epsilon_5 \end{pmatrix} \quad (3)$$

Although this model assumes that the error terms have zero mean and are independent across individuals, it takes into account the potential correlation between the error terms across equations for a given individual. To allow the error to be heteroscedastic, we report bootstrapped standard errors.

Finally, using the following specification, we explore whether JE affects teenage pregnancy heterogeneously by the level of some characteristics at the baseline. In particular, we include a dummy for whether a woman was married or cohabitating, her number of children, her self-esteem according to the Rosenberg scale; and a wealth indicator of her household. These variables, included in h_i, are separately included in the estimation of equation (4).

$$pregnancy_{ic} = \alpha + \gamma t_i + \delta x_i + \beta(T_i * h_i) + \epsilon_{ic} \quad (4)$$

4 Results

The linear probability model estimates of the effects of JE on pregnancy (equation 1) are shown in table 1.[22] Similar to the findings of Ibarrarán et al. (2014), we find that the program reduces the likelihood of pregnancy by about 3 percentage points for all women, which is not statistically significant and is likely due to differences in how pregnancy is defined. However, as models (2) and (3) show, we find a significant effect of JE in the youngest group of women, aged 16–19 years at the baseline. The program reduces their probability of pregnancy by 8 percentage points (20 percent), but it has no effect on women aged 20–29 years.

Table 1: Overall JE Effects (ITT) on Pregnancy

Pregnancy	(1) All women	(2) Age 16–19	(3) Age 20–29
Treatment	-0.027	-0.078*	-0.009
	(0.020)	(0.041)	(0.024)
Mean dep. var. for control group	0.350	0.389	0.337
Observations	2,227	564	1,663

Notes: Robust standard errors clustered at the course level in parentheses. All models include a dummy variable for whether the follow-up interview was in 2011 and a variable for individual's age. *Significant at 10%.

The next three tables focus on the sample of adolescent women. Table 2 shows the effect of JE on the potential channels through which the program might affect teenage pregnancy: soft skills and expectations. The table corresponds to the estimation of

[22]Table A.3 in annex I shows that the marginal effects of the Probit model are similar to the ones of the Linear Probability model.

equation (2), for the different dependent variables h_i (CPS score, the Rosenberg self-esteem scale, the Grit scale, and the expectations index). In terms of soft skills, JE substantially increases the CPS and Grit scores. Similarly, it increases teenagers' expectations about their future. On the other hand, we find that JE does not affect the Rosenberg self-esteem scale for adolescent women.

Table 2: JE Effects (ITT) on Soft Skills and Expectations

	(1) Total CPS score	(2) Rosenberg scale	(3) Total Grit scale	(4) Expectations index
Treatment	0.172*	-0.010	0.212*	0.305**
	(0.079)	(0.073)	(0.092)	(0.089)
Mean dep. var. for control group	-0.024	0.128	-0.124	-0.175
Observations	564	564	564	564

Note: Robust standard errors clustered at the course level in parentheses. All models include a dummy variable for whether the follow-up interview was in 2011 and a variable for individual's age. *Significant at 5%, **Significant at 1%.

The estimates shown in tables 1 and 2 suggest that the increase in soft skills and expectations about the future might serve as channels through which the JE reduces teenage pregnancy.[23] To account for the potential correlation of the error terms of the equations of teenage pregnancy, soft skills measures, and expectations for a given teenager, we estimate a SUR model.[24]

Table 3 explores whether the effect of JE on teenage pregnancy is heterogeneous across different levels of some individual and household characteristics collected at the baseline. The estimates correspond to equation (4) where h_i refers to a dummy variable for whether the woman is married or cohabiting (model 1), how many children she has (model 2), Rosenberg's self-esteem scale (model 3), and a household wealth indicator (model 4). In models (3) and (4), we centered the variables to different points of their distribution because the value zero falls below the minimum value of these variables.

As expected, being married or cohabiting increases the probability of pregnancy among teenagers.[25] Even though the JE does not affect married/cohabiting and "single" women differently (coefficient on the interaction term in model 1), table 4 shows that JE reduces the probability of teenage pregnancy for "single" women (in about 8 percent). On the other hand, model 2 shows that JE reduces, by about 11 percent (coefficient on Treatment), the probability of pregnancy for teenagers who are not already mothers. This is an important result because of the importance of being

[23] While the effect of JE on the CPS scores of female and male teenagers is positive and similar in magnitude, the program affects males' self-esteem and does not affect their Grit or expectations index. Results are available upon request.

[24] Table A.4 in annex I shows the estimates of the impact of JE on the system of equations (3). The Breusch-Pagan test at the bottom of table A.4 confirms that the error terms of these equations are not independent. In addition, table A.4 shows that even considering the impact of JE on the soft skills measures and the expectation index, JE reduces teenage pregnancy, which suggests that JE also affects pregnancy through other channels. Table A.5 shows the correlation matrix of the residuals of the equations included in table A.4.

[25] The linear combination of the coefficient on "Women married or cohabiting" and "Women married or cohabiting*Treatment" is 0.178, significant at the 99% level.

Table 3: Heterogeneous Effects of JE on Pregnancy

Pregnancy	(1)	(2)	(3)	(4)
Treatment when $x_i = 0$	-0.077	-0.105*	—	—
	(0.047)	(0.048)	—	—
Treatment at percentile 5 of x_i	—	—	-0.119	-0.250**
	—	—	(0.089)	(0.079)
Treatment at percentile 10 of x_i	—	—	-0.108	-0.211**
	—	—	(0.071)	(0.066)
Treatment at percentile 25 of x_i	—	—	-0.088*	-0.133**
	—	—	(0.047)	(0.046)
Treatment at percentile 50 of x_i	—	—	-0.073*	-0.066
	—	—	(0.041)	(0.042)
Treatment at percentile 75 of x_i	—	—	-0.056	-0.006
	—	—	(0.054)	(0.051)
Treatment at percentile 90 of x_i	—	—	-0.056	0.064
	—	—	(0.054)	(0.070)
Treatment at percentile 95 of x_i	—	—	-0.050	0.111
	—	—	(0.061)	(0.086)
x_i	0.128	0.017	-0.011	-0.013**
	(0.080)	(0.056)	(0.008)	(0.005)
Treatment*x_i	0.050	0.092	0.006	0.014*
	(0.108)	(0.075)	(0.010)	(0.006)
Observations	564	564	564	564

Note: Each line in Table 3 corresponds to a separate regression. x_i corresponds to baseline characteristics: a dummy variable for whether women were married or cohabiting (model 1); the number of children (model 2); the Rosenberg' self-esteem scale (model 3); and the Life-Quality Index (model 4). All models include a dummy variable for whether the follow-up interview was in 2011 and a variable for individual's age. Robust standard errors clustered at the course level in parentheses. *Significant at 5%, **Significant at 1%.

a mother for the first time and the implications this has on women's careers. The fact that the program has an impact on those who did not have children yet is likely to change the career path for female teenagers.

Finally, table 3 explores how the JE program affects pregnancy at different points in the distribution of self-esteem and a household wealth index. Table 3 shows that the difference in the effect of pre-intervention self-esteem on pregnancy between treatment and control groups is not statistically significant at traditional levels. However, the protective role of self-esteem for the treatment group, relative to the control group, seems to activate when the Rosenberg's score is not too high or too low (i.e., differences between controls and treatments are statistically significant at percentiles 25 and 50). Teenagers with moderate levels of pre-intervention self-esteem taking the JE training are about 8 to 9 percentage points less likely to be pregnant than those in the control group. On the other hand, JE even further reduces the probability of pregnancy for those teenagers coming from poorer households. The correlation between poverty and pregnancy is also observed in the coefficient on "Life-Quality Index".

In summary, we find that the JE effects are larger among teenage women (16–19 years old), especially those who are single and not already mothers. Moreover, JE plays a protective role for teenagers with pre-intervention moderate levels of self-esteem and for those coming from poorer households.

5 Conclusions and Discussion

This paper examines the impact of the Dominican Republic's JE training program on teenage pregnancy. In contrast with previous evaluations, we include a broader definition of teenage pregnancy, which exploits a woman's whole history of pregnancies; estimate the simultaneous effect of JE on soft skills and teenage pregnancy; estimate whether JE heterogeneously affects teenage pregnancy; and also explore the association of JE and teenage fatherhood.

Our results show that the JE program reduces the probability of pregnancy by about 3 percentage points for all women, but this impact is not statistically significant. However, the impacts are much larger and are statistically significant for women aged 16-–19 (8 percentage points or 20 percent). We also find that the program improves the soft skills of young women (measured through different scores) and their expectations about the future. Finally, we find that the effect of JE through these channels is not homogeneous. In particular, we find that JE has a statistically significant impact for single women who are not yet mothers, and it has a protective role for those teenagers with moderate pre-intervention levels of self-esteem (measured on the Rosenberg scale) and those coming from poorer households.

Even though our analysis shows important effects of JE on teenage pregnancy, it has some limitations that are important to discuss. First, we are not able to disentangle which of the components of the program, or what combination of them, is affecting teenage pregnancy. A second concern is the reduced sample size of adolescent women. Also, even though is not the main focus of the paper, the results about teenage fatherhood should be read with caution because of potential sample selection issues.

In terms of the policy implications of this paper, the main message is that adolescent women with stronger self-esteem and better soft skills and who are more hopeful about the future seem to postpone having children. Youth training programs that include soft-skills training can change not only the skills that are necessary to perform better in the labor market, but they also increase self-confidence and expectations about the future. Therefore, youth training programs that usually have a main expected result of improving labor market outcomes might also have unexpected impacts. In this sense, the programs can effectively increase the opportunity cost of having a child at an early stage in life and make young women decide not to have a child at a young age. In contexts of high pregnancy rates, focusing on providing soft skills and vocational training for young girls can have positive outcomes on teenage pregnancy rates, and therefore on labor market outcomes.

In this sense, the findings of this paper reinforce the idea that there is a need for public interventions in the challenge of decreasing teenage pregnancy rates. It is necessary to implement a comprehensive set of public policies that go beyond just giving information about methods to plan for the future. The policies should also have an impact on improving expectations and augmenting self-esteem and other soft skills, especially for the poorest people within the population.[26] Eventually, such policies would lead to better opportunities for women in the labor market, improved access to better quality jobs, and better earnings.

[26] In the Dominican Republic, the Inter-Agency Technical Committee for the Prevention of Teen Pregnancy presented the "Strategic Plan to Prevent Teen Pregnancy: Toward a National Policy." This plan is being implemented but has not yet been evaluated.

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Annex I

Table A.1: Balance of the Sample of Women

	Original randomization			Attrited				Complete information			
	(1) Control	(2) Treatment	t	(3) Yes	(4) No	t	(5) DD	(6) No	(7) Yes	t	(8) DD
Age	22.24	22.40	-1.21	22.19	22.38	-1.22	0.19	22.48	22.36	0.55	-0.47
Rosenberg's self-esteem score	23.72	23.91	-1.28	23.95	23.82	0.75	0.16	23.70	23.83	-0.37	0.30
Married	0.34	0.33	0.14	0.33	0.34	-0.26	0.06	0.33	0.34	-0.09	-0.01
Number of children	0.99	1.00	-0.28	0.94	1.01	-1.39	-0.03	1.01	1.01	0.00	-0.25*
Attends school	0.23	0.23	0.04	0.20	0.24	-2.01**	-0.03	0.27	0.24	1.46	-0.03
Incomplete primary educ.	0.20	0.20	-0.17	0.23	0.20	1.68*	0.01	0.18	0.20	-0.60	0.03
Complete primary educ.	0.06	0.05	0.70	0.05	0.05	-0.22	0.00	0.07	0.05	1.71*	-0.01
Incomplete secondary educ.	0.55	0.56	-0.60	0.51	0.56	-2.43**	-0.02	0.55	0.57	-0.58	-0.01
Complete secondary educ.	0.03	0.04	-0.40	0.04	0.03	0.81	-0.01	0.02	0.04	-1.85*	0.03
More than secondary educ.	0.00	0.00	-1.30	0.00	0.00	-0.22	0.01	0.01	0.00	1.76*	-0.01*
Missing education	0.04	0.04	0.28	0.06	0.04	2.58**	0.01	0.06	0.03	2.56**	-0.01
No data on education	0.12	0.11	0.95	0.11	0.11	-0.25	0.00	0.11	0.11	-0.37	-0.01
Number of jobs	0.19	0.19	-0.20	0.21	0.19	1.16	0.06	0.17	0.19	-0.91	-0.08
Employed	0.03	0.03	0.49	0.03	0.03	1.00	0.00	0.01	0.03	-1.22	-0.03
Salaried worker	0.02	0.01	1.52	0.01	0.01	-0.52	0.02	0.01	0.01	-0.75	-0.02
Unemployed	0.45	0.45	0.26	0.46	0.45	0.60	0.05	0.41	0.45	-1.27	0.07
Life-Quality Index (0–100)	62.17	62.12	0.12	63.19	61.89	2.74***	0.33	63.64	61.67	3.01***	2.59*
Receives remittances	0.09	0.08	0.31	0.08	0.08	-0.30	0.01	0.12	0.08	2.12**	0.04
Urban	0.91	0.90	0.71	0.93	0.90	2.70***	-0.04	0.92	0.89	1.55	-0.05
Lives in Santo Domingo	0.35	0.35	0.41	0.36	0.34	0.79	-0.04	0.46	0.33	4.60***	0.02
Observations	1,080	2,050		600	2,530			303	2,227		

Note: This shows baseline means for the control group (1); the treatment group (2); attritors in the follow-up group (3); non-attritors (4); non-attritors with incomplete information in key variables (6); and non-attritors with complete information (7). T-tests and significance levels for mean difference between columns 1 and 2, 3 and 4, and 6 and 7 are shown. To test for whether attrition or complete information on key variables differs across treatment and control groups, columns 5 and 8 respectively, show the difference-in-difference (DD) estimate: [T_(x= 1) − T_(x=0)] − [C_(x=1)− C_(x=0)], where T and C stand for treated and control individuals, and x for attrition or complete information. *Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.2: Balance of the Sample of Young Women

	Original randomization			Attrited				Complete Information			
	Control	Treatment	t	Yes	No	t	DD	No	Yes	t	DD
Age	18.38	18.44	-1.03	18.35	18.44	-1.26	0.01	18.55	18.42	1.49	-0.17
Rosenberg's self-esteem score	23.59	23.82	-0.81	24.13	23.64	1.43	0.60	23.4	23.66	-0.42	-0.73
Married	0.28	0.18	3.10***	0.22	0.22	0.15	-0.02	0.23	0.22	0.18	0.12
Number of children	0.38	0.29	2.09**	0.31	0.33	-0.30	0.06	0.33	0.33	-0.05	0.09
Attend school	0.41	0.39	0.55	0.39	0.40	-0.32	-0.14	0.49	0.39	1.73*	-0.13
Incomplete primary educ.	0.15	0.16	-0.18	0.20	0.14	1.78*	0.02	0.10	0.15	-1.17	0.06
Complete primary educ.	0.05	0.03	1.16	0.04	0.04	0.10	0.03	0.04	0.04	-0.14	0.07
Incomplete secondary educ.	0.55	0.63	-2.20**	0.52	0.62	-2.36**	-0.08	0.69	0.62	1.25	-0.24**
Complete secondary educ.	0.04	0.04	0.42	0.04	0.04	0.10	-0.06	0.01	0.04	-1.35	-0.05
More than secondary educ.	0.00	0.00	0.75	0.00	0.00	-0.51	0.00	0.00	0.00	-0.38	0.00
Missing education	0.05	0.03	1.09	0.07	0.03	2.11**	0.02	0.03	0.03	-0.33	0.04
No data on education	0.15	0.10	1.98**	0.13	0.12	0.24	0.06	0.14	0.12	0.53	0.11
Number of jobs	0.14	0.17	-0.93	0.19	0.16	1.01	0.13*	0.19	0.15	0.72	-0.19*
Employed	0.02	0.02	0.12	0.02	0.01	0.57	-0.04	0.00	0.02	-1.06	-0.01
Salaried worker	0.01	0.01	0.25	0.00	0.01	-1.13	0.00	0.00	0.01	-0.84	0.00
Unemployed	0.44	0.45	-0.15	0.46	0.44	0.27	0.11	0.39	0.45	-0.92	-0.01
Life Quality Index (0-100)	63.87	64.08	-0.31	64.72	63.83	1.08	1.21	64.43	63.75	0.61	2.24
Receives remittances	0.07	0.11	-1.92*	0.08	0.10	-0.53	0.02	0.13	0.09	0.87	-0.06
Urban	0.93	0.91	0.82	0.94	0.91	1.18	0.03	0.98	0.90	2.14**	-0.06
Lives in Santo Domingo	0.38	0.39	-0.42	0.40	0.39	0.29	-0.05	0.53	0.37	2.76***	-0.10
Observations	291	519		166	644			80	564		

Notes: This table shows baseline means for those in the control group (column 1); in the treatment group (column 2); attritors in the follow-up (column 3); non-attritors (column 4); non-attritors but with incomplete information in key variables (column 6); and, non-attritors with complete information (column 7). T-tests and significance levels for the mean difference between columns 1 and 2, 3 and 4, and 6 and 7 are also shown. To test for whether either attrition or having complete information on key variables differs across treatment and control groups, columns 5 and 8 respectively shows the difference-in-difference (DD) estimate: $[T_{(x=1)}-T_{(x=0)}]-[C_{(x=1)}-C_{(x=0)}]$, where T and C stand for treated and control individuals, and x either for attrition or having complete information.*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.3: Overall JE Effects on Pregnancy (probit, marginal effects)

Pregnancy	(1) All women	(2) Age 16-19	(3) Age 20-29
Treatment	-0.026	-0.078*	-0.009
	(0.021)	(0.041)	(0.024)
Mean dep. var. for control group	0.35	0.389	0.337
Observations	2,227	564	1,663

Notes: Robust standard errors clustered at the course level in parentheses. All models include a dummy variable for whether the follow-up interview was in 2011 and a variable for individual's age. *Significant at 10%.

Table A.4: SUR Estimation of the JE Effects

	(1) Pregnancy	(2) Total CPS score	(3) Rosenberg scale	(4) Total Grit scale	(5) Expectations index
Treatment	-0.078*	0.172**	-0.010	0.212**	0.305***
	(0.043)	(0.082)	(0.075)	(0.087)	(0.085)
Observations	564	564	564	564	564
R-squared	0.011	0.008	0.005	0.013	0.044
Breusch-Pagan test of independence: chi2(10) = 381.240, Pr = 0.0000					

Note: Bootstrapped standard errors in parentheses (1,000 replications). All models include a dummy variable for whether the follow-up interview was in 2011 and a variable for the individual's age. *Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.5: Correlation Matrix of Residuals

	Pregnancy	Total CPS score	Rosenberg scale	Total Grit scale	Expectations index
Pregnancy	1	—	—	—	—
Total CPS score	-0.079	1	—	—	—
Rosenberg scale	-0.091	0.289	1	—	—
Total Grit scale	-0.066	0.563	0.370	1	—
Expectations index	-0.048	0.238	0.127	0.211	1

Table A.6a: Overall JE Effects on Fatherhood: Newborns

Is newborn's father the JE beneficiary?	(1) All men	(2) Age 16-19	(3) Age 20-29
Treatment	-0.005	0.006	-0.009
	(0.019)	(0.027)	(0.025)
Mean dep. var. for control group	0.110	0.0679	0.132
Observations	1,329	440	889

Note: Robust standard errors clustered at the course level in parentheses.

Table A.6b: Overall JE Effects on Fatherhood: Number of Newborns

Number of new children of male JE beneficiary	(1) All men	(2) Age 16-19	(3) Age 20-29
Treatment	0.008	0.028	-0.001
	(0.024)	(0.037)	(0.031)
Mean dep. var. for control group	0.123	0.0741	0.149
Observations	1,329	440	889

Note: Robust standard errors clustered at the course level in parentheses.

Annex II

About the Construction of the Expectations Index

The follow-up survey included a module of 13 questions that asked about individual, subjective expectations in five years' time from the survey. The questions are "how likely do you think is that when you are [current age + 5] you. . . : (1) had finished an education level higher than the one you currently have; (2) live in a better neighborhood and have the house and car that you want; (3) live in the Dominican Republic; (4) have your own business; (5) have the job that you want; (6) have achieved your professional aspirations or goals; (7) have achieved your aspirations or goals for personal or family life; (8) keep your current group of friends; (9) have a problem with a relative (parents, siblings, partners, ex-partners, children); (10) had committed a delinquent act or been in jail; (11) get infected with HIV/AIDS; (12) have someone closer to you who get infected with HIV/AIDS; and, (13) have someone closer to you (family or friend) dead in a violent act. From this list we selected the items (1), (2), (4), (5), (6), and (7), which are related to expectations about individual labor outcomes or wellbeing, to construct our expectations index.

For this, we use principal-component factoring analysis. Applying the Kaiser criterion (i.e., retain those factors with eigenvalues equal or higher than 1), we keep only factor 1, which explains the 49 percent of the total variance. Our expectation index corresponds to the predicted values of a regression scoring based on varimax rotated factors. Figure A.1 shows its distribution for the whole sample, for the whole sample of women, and for adolescent females.

Figure A.1: Kernel Density Estimation of Expectation Index