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2018

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### Publication Details

Kilburn, K., Hughes, J. P., Mac Phail, C., Wagner, R. G., Gomez-Olive, F. Xavier, Kahn, K. & Pettifor, A. (2019). Cash Transfers, Young Women's Economic Well-Being, and HIV Risk: Evidence from HPTN 068. *AIDS and Behavior*, 23 (5), 1178-1194.

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# Cash Transfers, Young Women's Economic Well-Being, and HIV Risk: Evidence from HPTN 068

## **Abstract**

Despite the large interest in economic interventions to reduce HIV risk, little research has been done to show whether there are economic gains of these interventions for younger women and what intermediary role economic resources play in changing participants' sexual behavior. This paper contributes to this gap by examining the impacts of a conditional cash transfer (CCT) for young women in South Africa on young women's economic resources and the extent to which they play a role in young women's health and behavior. We used data from HIV Prevention Trials Network 068 study, which provided transfers to young women (in addition to their parents) conditional on the young woman attending at least 80% of school days in the previous month. We found that the CCT increased young women's economic wellbeing in terms of having savings, spending money, being unindebted, and food secure. We also investigated heterogeneous effects of the program by household economic status at baseline because the program was not specifically poverty targeted and found that the results were driven by young women from the poorest families. From these results, we examined heterogeneity by baseline poverty for other outcomes related to HIV risk including sexual behavior and psychosocial well-being. We found psychosocial well-being benefits in young women from the poorest families and that economic wellbeing gains explained much these impacts.

## **Disciplines**

Education | Social and Behavioral Sciences

## **Publication Details**

Kilburn, K., Hughes, J. P., Mac Phail, C., Wagner, R. G., Gomez-Olive, F. Xavier., Kahn, K. & Pettifor, A. (2019). Cash Transfers, Young Women's Economic Well-Being, and HIV Risk: Evidence from HPTN 068. *AIDS and Behavior*, 23 (5), 1178-1194.

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# Cash transfers, young women's economic well-being, and HIV risk: Evidence from HPTN

068

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## **Compliance with Ethical Standards:**

Funding: Funding support for the HPTN was provided by the National Institute of Allergy and Infectious Diseases (NIAID), the National Institute of Mental Health (NIMH), and the National Institute on Drug Abuse (NIDA) of the National Institutes of Health (NIH; award numbers UM1AI068619 [HPTN Leadership and Operations Center], UM1AI068617 [HPTN Statistical and Data Management Center], and UM1AI068613 [HPTN Laboratory Center]. The study was also funded under R01MH110186, R01MH087118, and R24 HD050924 to the Carolina Population Center. Research reported in this publication was also supported by the NIAID of the NIH [Award Number T32AI007001]. Additional funding was provided by the Division of Intramural Research, NIAID, and NIH. The Agincourt Health and Socio-Demographic Surveillance System is supported by the University of the Witwatersrand, the Medical Research Council, South Africa and the Wellcome Trust, UK (grants 058893/Z/99/A; 069683/Z/02/Z; 085477/Z/08/Z; and 085477/B/08/Z).

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

1 **Introduction**  
2

3 Globally, young women and adolescent girls are disproportionately affected by poverty [1,2]. Girls that  
4 grow up in poor contexts encounter more discrimination and violence and have less access to education  
5 and health services than their male counterparts [3]. They also have limited opportunities for economic  
6 advancement since they typically lack access to and control of economic resources including assets and  
7 financial capital [1]. Social norms such as early marriage and exclusion from economic institutions like  
8 formal banking all work to further entrench these economic asymmetries between men and women [2].  
9 Poverty's disproportionate burden on young women has been recognized as an important risk factor in  
10 their increased vulnerability to HIV [4-6] and one reason for high sustained HIV rates among young  
11 women in sub-Saharan Africa (SSA) despite declining HIV rates across the general population [7-9].  
12

13 For young women and adolescent girls in high-poverty contexts, economic vulnerability influences and  
14 interacts with gendered power imbalances in sexual relationships to increase their risk of HIV [10,11].  
15 Across poor rural and urban areas in SSA, young women often seek out sexual partnerships to increase  
16 their economic and social capital [10, 12-14]. With these goals in mind, young women may choose to  
17 partner with older men who are better able to provide them money and gifts [15,16]. Partnerships with  
18 older men that are primarily transactional in nature enhance the gendered power imbalances within the  
19 relationship and it is men who tend to dominate sexual decision-making such as whether to use a condom  
20 [17-19]. Evidence shows that age and economic asymmetries play an important role in young women's  
21 HIV vulnerability as they are associated with riskier sexual behaviors [10,17]. Further, age-disparate sex  
22 and transactional sex are associated with an increased risk of HIV acquisition [19,20]. Young women  
23 have little power to challenge men's dominance in sexual decision-making because their economic  
24 vulnerability works to reinforce their low bargaining power [10]. Therefore, the pathway through which  
25 poverty is believed to increase young women's vulnerability to HIV is by furthering their dependence on  
26 men and constraining their relationship power such as their ability to refuse sex, negotiate safe sex, or  
27 leave risky relationships [5,21].

28 In response to this evidence, structural interventions to increase economic resources and opportunities for  
29 young women and girls have been prioritized as an HIV prevention strategy in SSA because they are  
30 hypothesized to empower women and influence risk attitudes and behaviors [5,22-25]. The economic  
31 theory underlying this reasoning is that individuals in poverty make decisions with survival or immediate  
32 gratification in mind rather than thinking and planning for their future. However, when subjected to the  
33 conditions of poverty such as chronic hunger, material deprivation, and social exclusion, these decisions,  
34 including sexual decisions that put individuals at greater risk of HIV, can be seen as logical based on the

1 reality of available economic opportunities [26,27]. Interventions that work to change the opportunities  
2 available to young women in poverty by increasing economic resources such as credit, savings; and  
3 financial capital, may empower young women to make decisions more amenable to the future rather than  
4 immediate needs. Programs that enhance economic security and future expectations of young women may  
5 also increase self-esteem, self-efficacy around communication and negotiation skills, and enhance  
6 decision-making [21,22]. Therefore, ‘economic empowerment’ interventions are hypothesized to reduce  
7 sexual risk behaviors by building ‘resistance’ to risky situations and ‘resilience’ to face economic shocks  
8 [28].

9 Despite the theory that empowering aspects of a woman’s economic resources can result in reduced risk  
10 of HIV acquisition, evidence to-date is mainly observational and does not show a clear pattern [29-31].  
11 One recent study found more positive associations between individual economic resources and protective  
12 sexual behaviors among sexually active young women in South Africa [31] while others have been more  
13 mixed [29,30]. In Cameroon, women (aged 15-49) with greater economic resources displayed more  
14 protective factors such as greater HIV knowledge and more condom use but were also more likely to test  
15 positive for HIV and to engage in riskier sexual behaviors such as having multiple partners in the past 12  
16 months [30]. Poor women that participated in a microfinance intervention in South Africa had greater  
17 asset ownership at the end of the study compared to the control group, but participants were older women  
18 (aged 34-49) and self-selected into the program [32]. Some evidence also exists from economic  
19 empowerment interventions for adolescents but focuses on the impacts of economic resources on sexual  
20 risk-taking intentions, also finding mixed results [33,34].

21 Although there is mounting experimental evidence from structural HIV prevention interventions on  
22 sexual behaviors and HIV for young women [11, 25, 35-39], these studies rarely examine economic  
23 empowerment directly or how it functions as the pathway underlying program effects. Specifically, we  
24 know little about the impacts of interventions on 1) individual economic outcomes and 2) the mediating  
25 role of economic well-being on sexual decision-making or attitudes that influence decision-making.

26 This paper fills this gap by using longitudinal data from a randomized conditional cash transfer program  
27 (CCT) for HIV prevention (HPTN 068) to assess its impact on individual economic well-being and the  
28 role economic empowerment had on program outcomes related to HIV risk. The CCT was targeted to  
29 young women attending high school in a poor, rural area of South Africa and provided monthly cash  
30 transfer to young women and her parents, conditional on continued school attendance. While there was no  
31 effect of the CCT intervention on HIV incidence, there were some improved sexual behaviors and a large  
32 reduction in the risk of intimate partner violence [39]. An analysis of baseline data also showed that

1 individual economic resources among the study sample were associated with a number of HIV preventive  
2 practices including periodic sexual abstinence, having fewer sexual partners, and consistent condom use  
3 [31]. Further, a qualitative analysis by MacPhail et al (2017), found young women in the treatment group  
4 experienced a number of benefits due to the cash itself, including enhanced status with peers and feelings  
5 of independence, which may have consequently affected their sexual risk-taking behavior and  
6 psychosocial well-being [40]. We therefore examine whether economic well-being went on to contribute  
7 to other program impacts on sexual behavior and subjective measures of well-being. While the HPTN 068  
8 cash transfer experiment took place in a poor, rural area of South Africa, the program was not poverty  
9 targeted. Therefore, in addition to the total effect on the economic empowerment of young women, we  
10 also examined the heterogeneity in program effects by assessing the role of household socio-economic  
11 status at baseline.

12

## 13 **Methods**

14

### 15 **Data**

#### 16 **Study site and design**

17 Participants for this study were recruited from villages within the Agincourt Health and Socio-  
18 Demographic Surveillance Systems (HDSS) catchment area in Mpumalanga province, South Africa near  
19 the Mozambique border. This rural area is characterized by high poverty and HIV prevalence [Kahn et al  
20 2012; Gomez-Olive et al, 2012]. Many households are food insecure and rely on government support in  
21 the form of non-contributory grants like the Child Support Grant and the Old Age Pension. Migration for  
22 work is also common for men and increasing for younger women leaving older women to care for  
23 children [41]. The most recent HIV prevalence survey in 2010 indicated a prevalence of 5.5% among girls  
24 aged 15–19 and 27% among young women aged 20–24, with peak prevalence at 46% among women  
25 aged 35-39 [42]. The HPTN 068 trial found incidence among young women during the trial of around 2%  
26 (per person-year) [39].

27

28 HPTN 068 (or Swa Koteka) was an individually randomized CCT intervention for females aged 13-20  
29 attending high school designed to test whether CCTs are an effective HIV prevention strategy. It was  
30 hypothesized that cash would reduce HIV acquisition by helping keep girls in school. Study participants  
31 in the treatment arm received financial support in the form of monthly cash transfers, conditional on  
32 regular school attendance (at least 80% of school days in the previous month) while the control arm  
33 received no transfers. Participants continued to receive transfers for up to three academic years (as long as  
34 they met the attendance criteria) or until they graduated high school. In addition to the direct transfer for  
35 the young woman, Swa Koteka also included a monthly transfer to the parents (or guardians) of

1 participants, which was also conditional on the young woman's school attendance. Cash transfers for both  
2 the young woman and the parent or guardian were deposited directly into their respective bank accounts.  
3 Monthly cash transfers amounted to 300 Rand (R), R100 for the young women and R200 (roughly US\$  
4 10 and US\$ 20 using 2012 conversion rates) for the parent or guardian. This total amount was chosen to  
5 be on par with the income from the Child Support Grant and represented a significant proportion of  
6 household consumption since monthly per capita household expenditure was R295 at baseline.

7  
8 Beginning in March 2011, study participants were recruited and by the end of 2012, 2,537 were found  
9 eligible and enrolled into the study. To be eligible for the study, young women had to be enrolled in a  
10 participating high school in the study location and be 13-20 years old. Other eligibility requirements  
11 included not being married or pregnant, living with at least one parent or guardian, being able to read,  
12 having or being able to open a bank or post office account, and be willing to take an HIV and herpes  
13 simplex virus (HSV)-2 test. After being recruited to the study, participants completed an Audio  
14 Computer-Assisted Self- Interview (ACASI) and HIV and HSV-2 tests, which included pre and post-test  
15 HIV counselling. Once baseline assessments were completed, young women (and their parent or  
16 guardian) were individually randomized (1:1) to either the treatment or control arm.

17  
18 Follow-up visits occurred annually at 12, 24, and 36 months or until the participant graduated from high  
19 school. A flow diagram of study participants over the trial has been previously published [39]. At each  
20 follow-up visit, young women completed an ACASI, HIV and HSV-2 testing (if negative at the previous  
21 visit), and pre and post-test HIV counselling. Parents or guardians also completed a household survey at  
22 baseline and each follow-up visit. Consent for study participation was obtained at the home visits with  
23 written informed consent from both young women and her parent or guardian. Written assent was  
24 obtained for female participants under 18 years old. Institutional Review Board approval for this study  
25 was obtained from the University of North Carolina at Chapel Hill and the University of the  
26 Witwatersrand Human Research Ethics Committee as well as the Provincial Department of Health's  
27 Research Ethics Committee.

## 28 29 **Measures**

30 Economic well-being was measured at both the household level and the individual level of the young  
31 woman. Dependent variables at the household level include total and food per capita household  
32 consumption. Economic well-being outcomes for the young woman include measures of economic and  
33 food security—food worry, borrowed any money (from anyone outside her household), and paid work—  
34 as well as access to economic resources—savings, bank account, and spending money. To assess the

1 overall impact of the CCT on young women’s economic well-being, we created an index measure that  
2 consists of four indicators coded to represent greater well-being: 1) food secure (no food worry past 12  
3 months), 2) always had spending money (past 12 months), 3) never borrowed money (past 12 months),  
4 and 4) had savings. We excluded access to bank accounts in our analysis since opening a bank or post  
5 office account was an eligibility requirement in order to safely transfer the cash to young women in the  
6 treatment arm. We also excluded paid work in our main index measure for economic well-being because  
7 it is uncertain whether engaging in paid work signifies greater well-being in our sample of school-  
8 attending young women. Participating in paid work could instead be a consequence of economic  
9 deprivation and demand time away from school.

10  
11 Additional outcome measures include young women’s sexual behaviors and psychosocial well-being to  
12 further examine whether baseline poverty status and individual economic well-being affected the CCT  
13 impacts on these measures. The importance of individual resources for young women’s psychosocial  
14 well-being is becoming increasingly clear in the literature [43-45] including among these young women,  
15 as evidenced from both qualitative and quantitative data [40].

16  
17 Psychosocial constructs include perceived power in sexual relationships, mental health, and hopefulness.  
18 Power in sexual relationships was measured using the 12-item sexual relationship power scale (SRPS),  
19 adapted for South Africa [46,47]. Mental health was measured using the 20-item Center for  
20 Epidemiological Studies Depression scale (CES-D) [48]<sup>1</sup> and hopefulness was measured using a 13-item  
21 Hope scale developed and validated for this population [49]. Each of the scales were scored on a four-  
22 point Likert scale, summed, and rebased to zero. Higher scores reflect greater power in relationships for  
23 the SRPS, greater depressive symptoms for the CES-D, and greater feelings of hope for the Hope scale.  
24 To compare effects of these varyingly scaled measures, we standardized outcomes so that each of the  
25 coefficients represent the effect change in standard deviations (z-scores). In addition, we tested for  
26 differential treatment effects for sexual behaviors that we hypothesized could be affected by individual  
27 economic resources including having any sexual partner, and for sexually active young women, having an  
28 older partner (5+ years difference) and having any transactional sex (exchange of sex for money and/or  
29 gifts).

30

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<sup>1</sup> The CES-D was not included in the baseline survey so we show baseline descriptive data for the 10-item Children’s Depression Index (cite) in Table 1.



1 **Estimation Strategy**

2 Since the Swa Koteka CCT program was not poverty targeted, we hypothesized that the money may have  
3 had a stronger economic benefit for young women from the poorest households. To understand this  
4 relationship, we first investigated the association between our outcomes of interest and relative baseline  
5 poverty, defined as being from the bottom 50% of the sample in terms of total per capita household  
6 consumption. We choose this cutoff as nearly half of the sample’s total consumption fell below the South  
7 African food poverty line at baseline and this created large enough subsamples to retain power to estimate  
8 differential effects [50]. For all economic outcomes at the level of the young women, we estimated the  
9 effect of baseline poverty on each outcome using generalized linear models with robust standard errors,  
10 and adjusted for young women’s age, grade level, household size, and whether they have ever had sex.  
11 Demographic controls were chosen based on existing literature on the confounders for our exposure–  
12 outcome relationships.

13

14 Next, we estimated the total effect of the CCT intervention on outcomes using an intent-to-treat (ITT)  
15 estimator. We used the linear model displayed in Equation (1) where  $CCT_i$  is the indicator for treatment,  
16  $Y_{it}$  is the outcome of interest and  $\varepsilon_{it}$  is the error.

17

18 (1)  $Y_{it} = \beta_0 \alpha + \beta_1 CCT_i + \varepsilon_{it}$

19

20 In addition to Equation (1), which gives us the total ITT effect, we also estimate Equation (2) to test for  
21 moderation of the treatment effect by baseline poverty status where  $P_i$  is an indicator for being in the  
22 bottom half of the sample at baseline, and  $CCT_i P_i$  is an interaction term between indicators for treatment  
23 and the baseline bottom half.

24

25 (2)  $Y_{it} = \beta_0 \alpha + \beta_1 CCT_i P_i + \beta_2 CCT_i + \beta_3 P_i + \varepsilon_{it}$

26

27 Using the p-value on the interaction term from Equation (2), we can also test for significant differential  
28 treatment effects by baseline poverty status.

29

30 In addition, we further investigated the role of economic well-being as a mediator to explain other  
31 program impacts on sexual behaviors and psychosocial well-being. For this we examined the extent to  
32 which heterogeneous treatment effects can be explained through the impacts of the CCT on economic  
33 indicators for young women from the bottom half. We estimated a simple model for mediation that builds  
34 off Equation (2) by including additional terms for economic index in the model.

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$$(3) Y_{it} = \beta_0 \alpha + \beta_1 CCT_i P_i + \beta_2 CCT_i + \beta_3 P_i + \beta_4 Econ_{it} + \varepsilon_{it}$$

*Econ<sub>it</sub>* is a vector that includes the economic index as both a contemporaneous and baseline covariate; baseline levels are controlled for to account for confounding between the mediator and dependent variable [51]. We then compared the treatment effect estimates from the mediated model to those from the unmediated model to evaluate how much the economic index attenuates the treatment effect. Attenuation of the treatment effect would suggest that other program impacts can be explained, at least in part, because of impacts to young women’s economic well-being.

To estimate Equations (1), (2), and (3), we used General Estimating Equation (GEE) models with exchangeable correlation structure and robust standard errors. GEE models were used to account for repeated observations on participants over the three follow-up study visits. Models with dependent variables at the level of the young woman additionally control for her age at baseline. Statistical analysis was performed using Stata 14.2.

**Results**

**Sample and baseline balance**

This analysis used data from the three follow-up visits during the main trial. The baseline sample included 2,533 young women of which 2,448 were HIV negative and included in the main analysis [39]. At the final planned visit, retention was 87% in the control group and 95% in the intervention group, however, differential retention was not significant and weighting for loss did not affect main study results [39]. Since we focus on economic outcomes in this analysis, we include all young women with at least one follow-up survey visit, N=2,438. Table 1 provides baseline descriptive statistics for demographic and outcome variables used in this analysis. We tested for balance by regressing baseline covariates on treatment indicators using OLS regression models. P-values in the right-hand column show that there are no significant differences across the two groups. Study participants were also balanced on the main study outcomes of HIV and HSV-2 infection status [39].

[Table 1 here]

All young women participating in the study were South African and of black race/ethnicity and had a median age of 15 years (IQR 14–17). More than 80 percent of households were receiving the South

1 African Child Support Grant for at least one of their children during the study period, which indicates that  
2 young women in the study generally lived in poor households. Table 1 provides additional detail about  
3 the low socio-economic status of young women in the study. At baseline, only 25% had any savings and  
4 16% had a bank or post office account. Additionally, a little over half of women had regular access to  
5 their own spending money (median amount per month: R50). For women that had any money, the main  
6 source of that money is from their families, followed by a job, and then outside grants (see Figure 1 for  
7 full classification of sources). Despite a job being women's top three sources of their money, only 15  
8 percent of young women report working at baseline. This low rate is likely due in part to eligibility  
9 requirements that young women enrolled in the study had to be in school and thus less able to hold a job  
10 at the same time. However, it also reflects the context of the study area, where employment opportunities  
11 are limited and youth unemployment is especially high [52].  
12

### 13 **Relative poverty of sample**

14 At the time of baseline data collection in 2011, the poverty line set by the Government of South Africa  
15 was R620 per capita/month [53]. The mean total per capita consumption of treatment and control  
16 households was R455 and R473/month respectively (Table 1), indicating a high rate of households in  
17 poverty. However, this is only a rough measure of poverty since our measure of aggregate consumption is  
18 not directly comparable to the government's measure used for determining poverty lines. On the other  
19 hand, the South African food poverty line (the amount which the government deems necessary for  
20 essential basic needs) provides a better basis of comparison as our survey included a comprehensive food  
21 consumption module. The food poverty line was R321 per capita/month in 2011 [53], which is around 70  
22 percent of total per capita consumption and almost R100 higher than the average per capita food  
23 consumption among our sample (Table 1). Food consumption among our sample also makes up around  
24 half of total consumption signifying that most consumption is for basic needs in these households. Further  
25 evidence of low food consumption is reflected in the fact that nearly one-third of young women in both  
26 groups reported being worried about having enough food in the past 12 months.  
27

28 Next, we estimated the baseline association between young women's economic outcomes and relative  
29 household poverty (Table 2). Relative household poverty was defined as being from the bottom half of  
30 the sample in terms of total per capita household consumption (a comparison of baseline characteristics  
31 for poverty subgroups can be found in Appendix Table A1). Table 2 shows that being relatively worse off  
32 is an important and significant predictor of young women's economic participation and control of  
33 economic resources. In particular, young women living in poorer households are 4 percentage points (pp)  
34 more likely to work while they are less likely to have savings (-11pp), a bank account (-7pp), or have

1 discretionary funds (-7pp). There is no significant relationship, however, between relative poverty and  
2 whether a young woman borrowed money from anyone outside the family.

3  
4 [Table 2 here]

5  
6 The relationships between relative poverty and young women’s economic resources at baseline suggests  
7 that household poverty may play a role in the extent to which the cash transfer effects these economic  
8 resources. However, these baseline relationships do not make clear what direction the relationship would  
9 take. The design of this CCT provided both the young woman and her household with conditional  
10 monthly cash payments, so depending on both perceptions of how the young woman’s money is to be  
11 used and the impact of the household transfer on household economic well-being, a young woman may  
12 feel obligated to use her own transfers to the contribute to the household [43]. In this case, we may find  
13 smaller treatment effects for young women from the poorest households if greater financial stress in these  
14 households translates into more pressure on the young woman to help out her family. Alternatively, recent  
15 qualitative and quantitative findings do not suggest that young women generally felt pressured to  
16 contribute to their households [40]. Consequently, we might observe larger treatment effects for young  
17 women from the poorest families since they start from a lower level of resources at baseline and thus have  
18 more to gain. In the following analysis, we further examine whether baseline poverty moderates the  
19 causal effect of the CCT on young women’s resources.

### 20 21 **Effects on economic well-being**

22 We first illustrate how young women’s financial independence changed in Figure 1, which shows the  
23 distribution of young women’s ‘main source of money’ by time and treatment arm. The baseline  
24 categories include family, friends, job, boyfriend/partner, sex work, other, or ‘didn’t have money’. At  
25 follow-up, the CCT became an additional source. We see that there is a balance between treatment and  
26 control groups across categories at baseline, but during follow-up, there is a clear shift in the distributions  
27 between treatment and control groups, primarily because of the introduction of the CCT. At baseline, the  
28 most commonly reported source of young women’s money was her family and then her job, these two  
29 accounting for over 50 percent of responses in both study arms. During follow-up study visits, jobs  
30 become less important and a woman’s family is a larger source of money for both groups compared to  
31 baseline, but the CCT becomes the second largest main source (27%) for young women in the treatment

1 group<sup>2</sup>. Additionally noteworthy is that reports of boyfriends as a ‘main source of money’ is low (less  
2 than 4%) across baseline and follow-up for both study arms<sup>3</sup>.

3  
4 [Figure 1 here]

5  
6 Next, Table 3 provides estimates for both the total and differential impacts of the CCT on household  
7 consumption and the index of young women’s economic well-being. Columns 1 to 4 show that the CCT  
8 significantly increased both total and food per capita household consumption between 4 to 5 percent, but  
9 there was no significant differential effect by baseline poverty status as indicated by the interaction term  
10 in columns (2) and (4). Additionally, the coefficients for the baseline bottom half indicate that the poorest  
11 households in control group have much lower total and food consumption across follow-ups, signifying  
12 that our baseline poverty designation was also a good measure for persistent poverty.

13  
14 Comparatively, for young women, the CCT led to a significant increase in the index for economic well-  
15 being of 0.15 points (Column 5,  $p < 0.01$ ), a modest 8.5% increase from baseline. There was also a  
16 significant differential treatment effect for the women from the bottom half at baseline (Column 6). The  
17 interaction term in Column (6) indicates the CCT led to a larger impact on the economic index (0.16  
18 points,  $p < 0.01$ ) for the bottom half over the top half. Consequently, the marginal effect of the CCT on the  
19 index for the bottom half is 0.23 points ( $p < 0.01$ ), representing a 14.4% increase from their mean at  
20 baseline. The marginal effect for the top half is much smaller at 0.07 points ( $p < 0.1$ ).

21  
22 [Table 3 here]

23  
24 This relationship is also apparent in CDF plots of the index by treatment status shown in the Appendix  
25 (Figure A1). Compared to baseline, when distributions are equal, there is a clear shift at follow-up and  
26 this is driven by the effects for those in the bottom half.

27  
28 [Figure 2 here]

29  

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<sup>2</sup> 3.4 percent of control group also reported the CCT as their main source of money. This data could be  
due to misreporting, but as there were reports of young women in the treatment group sharing their money  
with friends and siblings, this may reflect those allocations.

<sup>3</sup> Less than half of women report being sexual active during the trial, however, of the women that report  
having a partner, the majority report that they received money at some point from their partner.

1 We also examined marginal treatment effects on individual items of the resource index to understand  
2 which are most improved by the CCT (Figure A2). We find significant increases in *savings* and *always*  
3 *having spending money* among the full sample but no heterogeneity across poverty subgroups. For *food*  
4 *secure* and *never borrowed*, however, we find significant differential treatment effects which are  
5 explained by improvements for young women from the poorest households. Additionally, young women  
6 from the bottom half are significantly less likely to be doing *paid work* compared to young women from  
7 the top half.

8

### 9 **Effects on other outcomes**

10 The second part of our analysis then examined whether baseline poverty status further influenced the  
11 treatment effect on other study outcomes of interest including sexual behaviors: having any sex partner,  
12 transactional sex and older partner (among sexually active), and psychosocial well-being. Psychosocial  
13 outcomes include sexual relationship power (SRPS z-scores) for the sexually active only, depressive  
14 symptoms (CES-D z-scores), and feelings of hopefulness (Hope z-scores)). For each of our outcomes, we  
15 tested for differential treatment effects using Equation (2) but also show the total treatment effects using  
16 estimates from Equation (1) (many of which have been presented elsewhere; see [39]).

17

18

[Table 4 here]

19

20 Table 4 displays results for each outcome from separate regressions for the total effect (Model 1) and  
21 moderated effect (Model 2). For all sexual behavior outcomes (Columns 3-6), there are no differential  
22 effects by baseline poverty status and the only significant treatment effect (as reported in the results from  
23 the main trial [39]) is for any sexual partner in the past 12 months (RR 0.91,  $p < 0.05$ ). In contrast, for each  
24 psychosocial outcome in Table 4, we find no total treatment effect but large differential treatment effects.  
25 Results from the psychosocial outcomes indicate that the CCT had more beneficial effects on  
26 psychosocial well-being for young women from the poorest households at baseline. Coefficients, which  
27 are in standard deviations (SD), from the interaction terms show the poorest young women have higher  
28 sexual relationship power scores (0.28 SD,  $p < 0.01$ ), greater hope (0.14 SD,  $p < 0.05$ ), and lower depressive  
29 symptoms (-0.12 SD,  $p < 0.10$ ) than those from the top half at baseline. The positive impacts of the CCT  
30 for young women from poorest families at baseline are also in stark contrast to negative association  
31 between psychosocial wellbeing and being from the poorest families for the control group—coefficients  
32 for the ‘Baseline poverty’ indicator are all strongly significant and indicate lower psychosocial well-  
33 being.

34

1 Furthermore, we estimated marginal effects of treatment by poverty status using the model estimates  
2 presented in Table 4 (results not shown in Table 4). The marginal effects for young women from the  
3 bottom half calculated also indicate a beneficial effect of the CCT (SRPS 0.14 SD,  $p=0.05$ ; CESD -0.09  
4 SD,  $p=0.07$ ; and Hope 0.05 SD,  $p=0.30$ ). Comparatively, marginal effects for women from top half are all  
5 in the opposite direction (SRPS -0.14 SD,  $p=0.05$ ; CESD 0.05 SD,  $p=0.31$ ; and Hope -0.09 SD,  $p=0.08$ ).  
6 Figure 3 provides a visualization of these contrasting effects, making it clear that the positive impacts for  
7 the bottom half were washed out by the top half, leading to near zero treatment effects for full sample.  
8

### 9 **Mediation of Impacts**

10 Given the strong results for the poorest young women from Table 4, we further examined whether the  
11 differential treatment effects on psychosocial outcomes are attributable to the CCT impacts on their  
12 economic resources. We explored mediation of psychosocial wellbeing in Table 5 using the economic  
13 index used earlier (*always had funds, had savings, never borrows, and food secure*). In addition, we also  
14 used a second economic index that adds *no paid work* to the existing measure. We chose to add this  
15 indicator to the index because of the large differential impact on paid work as shown in Figure A2.  
16

17 To examine these relationships, we estimate the simple mediation model shown in Equation (3) that  
18 includes the economic index in the model at contemporaneous and baseline levels. Results in Table 5  
19 show that for CES-D and Hope, the addition of the economic index clearly attenuates the total treatment  
20 impact for the poorest half with the strongest attenuation in the last model, where the index also includes  
21 *no paid work*. The magnitude of the treatment effect is attenuated by 21% (from -0.14 SD to -0.11 SD) for  
22 the standardized CES-D score and 36% (from 0.14 SD to 0.09 SD) for the standardized Hope score in the  
23 third models (column 6 and 9, respectively). The coefficients on treatment effects are also no longer  
24 significant below the 10 percent level. On the other hand, the strong effect of the CCT on the sexual  
25 relationship power scale (SRPS) for poorer young women is less affected by the economic index. The  
26 total treatment effect is attenuated by 18% in the last model (column 3) but is still significant at the 5%  
27 level. Notably, the economic index is strongly associated with psychosocial well-being as coefficients for  
28 the economic indices are large and highly significant ( $p<0.01$ )  
29

30 [Table 5 here]  
31

1 Lastly, Figure 3 also shows the change in marginal effects for the bottom and top half after including the  
2 economic well-being index (without paid work) as a mediator<sup>4</sup>. The mediated effects for the bottom half  
3 are all clearly smaller (attenuated) and insignificant after accounting for young women's economic  
4 resources. The mediated effects for the top half, however, are either the same size or larger compared to  
5 the total treatment effect and significant for SRPS and Hope z-scores.

6  
7 To summarize, the pattern of results indicates that the CCT had the largest impacts on young women's  
8 economic resources for those study participants that were from the poorest households at baseline and that  
9 these impacts help explain the psychosocial well-being improvements for those same participants. In this  
10 way, the CCT appears to be most protective of the young women that would have otherwise been more at  
11 risk for depression and lower sexual empowerment. However, the improvement in economic well-being  
12 for the poorest young women did not explain as much of their increase in sexual relationship power scale  
13 (SRPS) as it did for the CES-D and Hope scales.

## 14 15 **Discussion**

16 Economic empowerment has shown promise in reducing HIV risk for young women, however, research is  
17 scant on the role economic resources play in empowering participants to gain control over their sexual  
18 lives [11, 25, 35-39]. Here, we focused on the effects of the CCT on the economic resources of  
19 participants to provide new experimental evidence on the scope of cash transfers as a structural HIV  
20 intervention to impact women's economic empowerment. We found a significant increase in economic  
21 well-being for young women who received transfers, and that the economic impact of the CCT is stronger  
22 for young women that come from the poorest families. In comparing the distribution of economic  
23 resources in each subgroup across treatment arms, it is clear that young women from the poorest  
24 households benefit most from the cash transfer because they would not have otherwise had those  
25 resources compared to young women from the better off households.

26  
27 When we further examined other program outcomes for heterogeneous effects by relative baseline  
28 poverty status, we find evidence that the CCT also improved psychosocial well-being for young women  
29 from the poorest families but not the better off families. Program impacts on scales for depression, sexual  
30 relationship power, and hope each displayed the same contrasting pattern. Results show a beneficial effect  
31 of the CCT for young women from poorest families compared to a negative effect for young women from  
32 the better off families. In this way, the heterogeneity in treatment effects for the top and bottom half were

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<sup>4</sup> Results look the same for the resource index with no paid work.



1 washed out in the full sample so that the total treatment effect is both null and approximately zero.  
2 Further investigation revealed that these heterogeneous impacts are partly explained by the increase in  
3 economic resources that were also driven by young women from the poorest families.  
4

5 In assessing economic resources mediating role in young women's behavior and health outcomes, this  
6 analysis provides a greater understanding of the underlying mechanisms through which such programs  
7 affect outcomes. This is important for assessing the theory behind economic empowerment for HIV  
8 prevention in this population and for distinguishing the effectiveness of specific interventions. An earlier  
9 structural HIV prevention intervention for adolescent girls in Zimbabwe found that not only was  
10 microfinance ill-suited for younger women due a combination of age, gender, and structural barriers, but  
11 having extra cash and traveling for business made some girls more vulnerable to theft and harassment  
12 [54]. Those findings highlighted the need to critically examine whether and how structural interventions  
13 improve economic empowerment or whether they lead to unintended consequences that can heighten  
14 young women's risk and vulnerability. This analysis contributes to our understanding of the process by  
15 which individual and household economic factors affect young women's ability to control and direct their  
16 lives. More rigorous research is needed on this relationship in other contexts and settings in order to  
17 design and target appropriate and effective economic interventions for girls and women across the region.  
18

19 This work builds on previous evidence from a similar cash transfer experiment in Malawi that also  
20 included direct transfers to girls. That program resulted in increased schooling and reduced HIV  
21 prevalence, in addition to lower rates of pregnancy and marriage in the unconditional arm [55].  
22 Additionally, the Malawi experiment varied the size and recipient of the transfer and a heterogeneity  
23 analysis showed some differences for the unconditional arm on schooling, marriage, and pregnancy by  
24 cash transfer amounts to parents. The results did not show that giving different amounts to the girl  
25 improved any outcomes, leading the authors to suggest that giving transfers directly to the girls would be  
26 not be more effective than parents [55]. While we do not have variation in the transfer size (or an  
27 unconditional treatment arm to separate the cash component from the schooling condition), we do have  
28 variation in the level of baseline poverty and can assess whether average treatment effects differ by  
29 baseline poverty status.  
30

31 The biggest impacts for young women from the poorest households at baseline were on improving food  
32 security and reducing their likelihood of borrowing money (Table and Figure A2). Additionally, young  
33 women from the bottom half were less likely to be doing paid work during the study period compared to  
34 those from the top half. This result is surprising since young women in the bottom half were more likely

1 to be doing paid work at baseline. What this means for economic empowerment is unclear, but since the  
2 CCT is conditional on school attendance and paid work can compete with a young woman's time spent on  
3 her schooling, this could suggest the transfer reduces the necessity of working for young women from  
4 poorer families who might otherwise need to help support her family. Anecdotally, however, some young  
5 women reported starting their own businesses with the money. Therefore, it is possible that the increase in  
6 paid work for the young women from the top half could reflect an increase in entrepreneurial activities.  
7 As these activities would require capital, young women that were better off to begin with economically  
8 would have an advantage over young women from the poorest households. Nevertheless, after including  
9 *no paid work* as part of the economic well-being index, we found that it increases the precision of the  
10 index as a pathway through which the CCT improved psychosocial well-being for young women from the  
11 bottom half.

12  
13 Given the exceptionally high rates of school attendance in both study arms (over 95%), we can reasonably  
14 attribute the effects of treatment on individual resources as effects of the cash transfer component. There  
15 is a strong literature showing that cash transfers that target the most vulnerable and poor families have  
16 large impacts on child schooling and household poverty [56]. The young women in this study come from  
17 a very poor area in South Africa, although the transfer amounts to young women were not large relative to  
18 other grant programs in South Africa (e.g., Child Support grant). The baseline relationships between  
19 relative poverty and young women's economic resources suggested that household poverty may play a  
20 role in the extent to which the cash transfer affects these economic resources as young women from the  
21 poorest households had significantly fewer economic resources and were more food insecure. In this case,  
22 we could have found smaller treatment effects for young women from the poorest households if greater  
23 financial stress in these households translated into more pressure on the young woman to help out her  
24 family. Recent quantitative and qualitative findings do not suggest that young women generally felt  
25 pressured to contribute to their households [40]. Noteworthy is that the CCT also included a monthly  
26 parental transfer (twice the size of the young women's). This likely contributed to the widespread account  
27 by the young women that they were both able to keep and make decisions on how to spend their  
28 individual transfer [40]. Consequently, we found larger treatment effects for young women from the  
29 poorest families since they start from a lower level of resources at baseline and thus have more to gain.  
30 These results highlight the need to take into account how household poverty can act as a moderator of  
31 program effects.

32  
33 Findings from this analysis have implications for HIV prevention and cash transfer programming. For  
34 one, age and gender-specific strategies might be further enhanced by poverty targeting to find the most

1 vulnerable young girls. By including community involvement or traditional proxy means tests as part of  
2 targeting procedures, interventions could better reach the most vulnerable families and girls. This includes  
3 other hard-to-teach young people such as out-of-school girls that our study did not include. Although  
4 enhanced targeting may maximize potential impacts by improving coverage of the most vulnerable  
5 adolescents, it can also be costly. The costs and benefits of increasing targeting versus having fewer  
6 exclusion criteria should be determined and considered by policy-makers in response to each context and  
7 available resources.

8  
9 Moreover, the design of this CCT—providing both the young woman and her household with monthly  
10 cash payments—appeared to play an important role. Young women, especially those from poorer  
11 families, may feel obligated to use their own resources to contribute to their households. By explicitly  
12 designating part of the transfer to the young woman and providing a separate transfer to the family, the  
13 intervention not only set expectations about who had ownership over the transfers, but also supported  
14 household economic well-being. This in turn reduced a potential financial obligation for the young  
15 women. The evidence from the study demonstrates how increasing economic resources for young women  
16 contributes to greater well-being. This complements other studies that have shown the importance of  
17 young women’s economic resources on sexual decision-making such as adopting sexual protective  
18 behaviors [14, 29-31]. Therefore, economic-strengthening initiatives for young women that allow for and  
19 encourage personal ownership over financial resources, could empower young women to avoid HIV,  
20 providing a missing link to support HIV prevention initiatives.

## 21 **Concluding remarks**

23 Young women and adolescent girls’ vulnerability to HIV makes them an important target group for  
24 policymakers. Structural interventions that target young women directly and increase their economic  
25 empowerment can provide a critical opportunity to reduce this vulnerability. Economic empowerment can  
26 drive change for young women in poverty by helping them to gain financial independence, opening  
27 opportunities for their future, strengthening their self-worth and confidence, and even improving sexual  
28 decision-making and health outcomes. Nonetheless, as this intervention was not specifically poverty  
29 targeted, we found that results varied across relative household poverty, suggesting that expansion of  
30 similar programs to all girls in SSA may not have the desired impacts.

31  
32 Because the relationships between economic status and HIV risk are complex and vary by context, more  
33 research is needed to understand the linkages among age, gender, and poverty in specific contexts, as no  
34 single approach is likely to work for all young women. Future studies should carefully consider the role  
35 of relative poverty in HIV prevention for young women and anticipate how heterogeneity in baseline

1 parameters may play out in hypothesized or desired outcomes. Policymakers planning to implement cash  
2 transfers and other economic interventions for HIV prevention, should reflect on whether more effective  
3 targeting of the most vulnerable girls and young women would lead to better use of limited resources.  
4 Greater coordination between health, gender, and economic development agendas could allow for  
5 improvements in this area and has implications for increased funding for programs that can enhance  
6 multiple outcomes for target groups.

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1 **Tables and Figures in Text**

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**Table 1. Baseline balance and summary statistics for outcomes and key demographics**

	Treatment <i>N=1,272</i>	Control <i>N=1,261</i>	Difference	p-value (T-C)
	Mean (SD)/Median(IQR), or %			
<b>Demographics</b>				
Age	15.5 (1.7)	15.5 (1.6)	0.0	0.89
Household size	6.2 (2.7)	6.1 (2.6)	0.1	0.42
Ever had sex	27.1	27.7	-0.6	0.72
Any sexual partner past 12 months	26.2	27.7	-1.5	0.42
Transactional sex <sup>1</sup>	15.5	17.1	-1.6	0.60
Older sexual partner (5+ years) <sup>1</sup>	19.9	20.6	-0.7	0.82
Any unprotected sex (past 3 months) <sup>1</sup>	32.9	27.5	5.4	0.12
<b>Psychosocial wellbeing</b>				
Sexual relationship power scale (0-24) <sup>1</sup>	15.5 (6.1)	15.6 (5.8)	-0.1	0.79
Hope score (range:0-39)	31.2 (7.2)	31.2 (7.2)	0.0	0.93
Child's Depression Index 10 item (0-18)	4.5 (3.1)	4.4 (3.0)	0.1	0.46
<b>Young women's economic resources</b>				
Always had spending money	9.7	11.0	-1.3	0.28
Typical amount of spending money per month (if any)	50 (IQR:20,100)	50 (IQR:20,115)	--	0.42
<i>Top three sources of young woman's funds:</i>				
Job	24.8	22.3	2.6	0.13
Family	31.8	32.3	-0.5	0.79
Grants to the household	10.6	11.1	-0.5	0.68
Engaged in paid work	15.0	17.1	-2.1	0.15
Savings	24.8	25.2	-0.4	0.80
Bank or post office account	15.8	16.5	-0.7	0.63
Ever borrowed money 'to get by'	23.4	21.5	1.9	0.25
Food worry (young woman, past 12 months)	32.9	35.7	-2.8	0.14
<b>Household SES</b>				
Household monthly per capita consumption (mean Rand)	455.0 (SD 675.3)	472.7 (SD 672.2)	-17.7	0.51
Household monthly per capita food consumption (mean Rand)	233.6 (SD 467.8)	239.8 (SD 413.5)	-6.1	0.73
Asset Index (mean, range 0-61)	14.3	14.2	0.1	0.61
Number of grants to the household	2.7 (SD 2.0)	2.7 (SD 1.9)	0.0	0.27
Poorest (bottom half of total per capita consumption)	50.7	49.2	1.5	0.45

4

Notes: P-values based on equality of means tests with robust standard errors. <sup>1</sup>Only for young women who had ever had sex (N=693).

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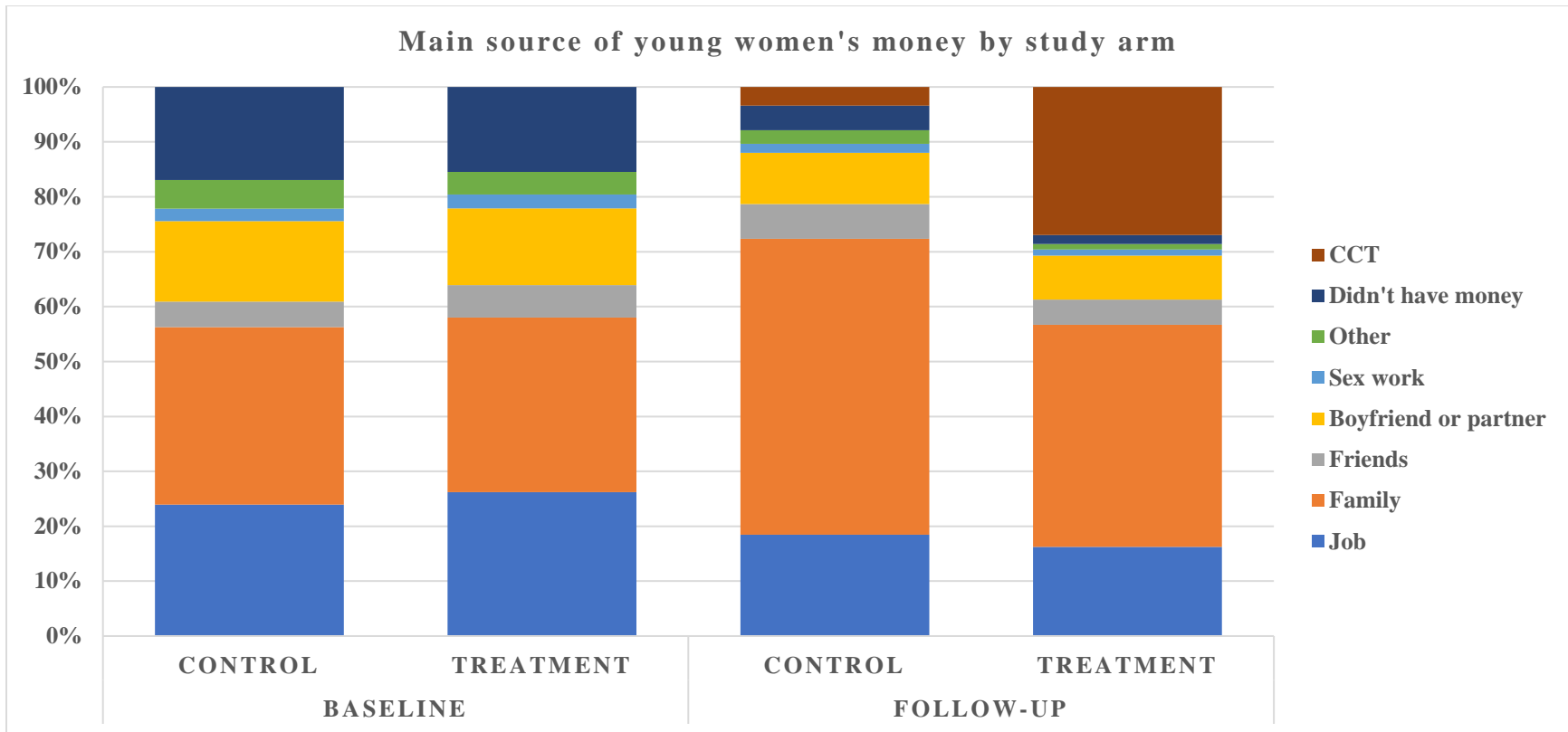
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1 **Table 2. Baseline relationships between relative poverty status and young women’s economic**  
 2 **resources**

Independent variable: Baseline poverty (poorest 50% in terms of household consumption)		
Dependent variable (yes/no):	Risk Difference (SE)	N
Engaged in paid work	0.04** (0.02)	2,501
Had any savings	-0.11*** (0.02)	2,517
Had a bank account	-0.07*** (0.02)	2,522
Always had spending money	-0.04*** (0.01)	2,508
Never borrowed outside household	-0.02 (0.02)	2,508
Food secure	-0.13*** (0.02)	2,507

3 Notes: \* $p < 0.1$ ; \*\*  $p < 0.05$  \*\*\* $p < 0.01$ . GLM linear estimates with robust standard errors. Models adjusted for age,  
 4 grade level, household size, and ever had sex.

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**Figure 1. Young women's main source of money (self-reported)**

Distribution of the source young women reported where they get most of their money by treatment status at baseline and follow-up (combined effect).

**Table 3. Intent-to-treat impacts of CCT on household consumption and index of economic resources, moderation by baseline poverty status**

Dependent variable:	Log per capita <i>total</i> expenditure <sup>1</sup>		Log per capita <i>food</i> expenditure <sup>1</sup>		Index of economic well-being	
	Coefficient (SE)					
	(1)	(2)	(3)	(4)	(5)	(6)
CCT	0.04*	0.05*	0.04**	0.05**	0.15***	0.07*
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)
CCT*Baseline poverty		-0.01		-0.02		0.16***
		(0.04)		(0.04)		(0.06)
Baseline poverty		-0.44***		-0.32***		-0.23***
		(0.03)		(0.03)		(0.04)
<i>Mean of control group (±SD)</i>	5.9 (±0.6)	5.9 (±0.6)	5.3 (±0.6)	5.3 (±0.6)	2.0 (±0.9)	2.0 (±0.9)
<i>Observations</i>	4,974	4,974	4,973	4,973	5,048	5,031

Notes: \* $p < 0.1$ ; \*\*  $p < 0.05$  \*\*\* $p < 0.01$ . GEE linear estimates with robust standard errors. Baseline poverty is defined as being in the bottom half of households for total per capita household consumption at baseline. Models using the index of economic resources as the dependent variable are adjusted for age. <sup>1</sup>Excluding outliers (top 1%)

**Table 4. Treatment impacts on standardized measures of subjective well-being and sexual behaviors, moderated by poverty status**

		SRPS <sup>1</sup> z-scores	CES-D z-scores	Hope z-scores	Any partner	Older <sup>1</sup> partner	Transactional <sup>1</sup> sex
		Coefficient (SE)			RR (95% CI)		
Model 1	CCT (total effect)	0.00 (0.05)	-0.02 (0.03)	-0.02 (0.04)	0.91** (0.84 - 0.99)	0.91 (0.74 - 1.12)	1.03 (0.87 - 1.21)
Model 2	CCT*Baseline poverty	0.28*** (0.10)	-0.14** (0.07)	0.14** (0.07)	1.03 (0.87 - 1.22)	0.81 (0.54 - 1.23)	0.93 (0.66 - 1.31)
	CCT	-0.14* (0.07)	0.05 (0.05)	-0.09* (0.05)	0.90* (0.79 - 1.02)	1.08 (0.80 - 1.44)	1.08 (0.84 - 1.41)
	Baseline poverty	-0.22*** (0.07)	0.13*** (0.05)	-0.16*** (0.05)	0.99 (0.87 - 1.12)	1.05 (0.79 - 1.41)	1.23* (0.97 - 1.57)
<i>Observations</i>		1,884	4,867	5,031	5,031	2,189	1,956

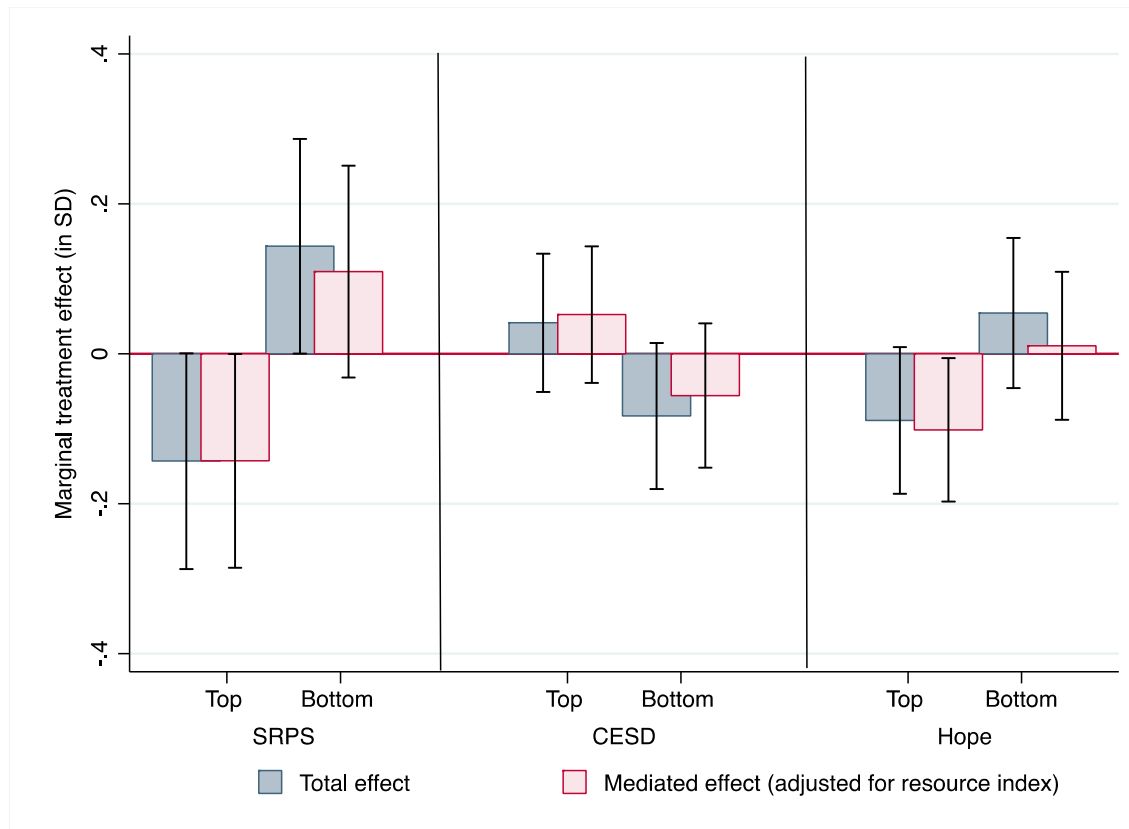
Notes: p<0.1; \*\* p<0.05 \*\*\*p<0.01. Coefficients estimated using GEE linear models with robust standard errors. Baseline poverty is defined as being in the bottom half of households for total per capita household consumption at baseline. Risk ratios estimates using GEE log-binomial models with robust standard errors. All models adjusted for age. <sup>1</sup>Only for young women who had ever had sex.

**Table 5. The role of economic resources as a mediator to explain the differential treatment effects on psychosocial wellbeing**

	SRPS z-scores <sup>1</sup>			CES-D z-scores			Hope z-scores		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coefficient (SE)									
CCT*Baseline poverty	0.28*** (0.10)	0.25** (0.10)	0.23** (0.10)	-0.14** (0.07)	-0.12* (0.07)	-0.11 (0.07)	0.14** (0.07)	0.11 (0.07)	0.09 (0.07)
Resource index	--	0.17*** (0.03)	--	--	-0.12*** (0.02)	--	--	0.18*** (0.02)	--
Resource index (with no paid work)	--	--	0.19*** (0.02)	--	--	-0.14*** (0.02)	--	--	0.21*** (0.02)
CCT	-0.14* (0.07)	-0.14* (0.07)	-0.13* (0.07)	0.05 (0.05)	0.06 (0.05)	0.05 (0.05)	-0.09* (0.05)	-0.10** (0.05)	-0.09* (0.05)
Baseline poverty	-0.22*** (0.07)	-0.18** (0.07)	-0.16** (0.07)	0.13*** (0.05)	0.10** (0.05)	0.08 (0.05)	-0.16*** (0.05)	-0.12** (0.05)	-0.09* (0.05)
<i>Observations</i>	1,884	1,884	1,884	4,867	4,867	4,867	5,031	5,031	5,031

Notes: p<0.1; \*\* p<0.05 \*\*\*p<0.01. Coefficient estimates are in standard deviations. Baseline poverty is defined as being in the bottom half of households for total per capita household consumption at baseline. GEE linear models with robust standard errors. The first model for each dependent variable are the total

effects from Table 4, the second and third models control for mediation through economic well-being (and also control for baseline levels of the mediator). All models adjusted for age. <sup>1</sup>Only for young women who had ever had sex.



**Figure 3. Marginal treatment effects of the CCT on psychosocial wellbeing by baseline poverty status (total and mediated effects)**

Estimated marginal treatment effects for each psychosocial outcome grouped by baseline poverty status (top half or bottom half). Each bar represents a separate model. Blue bars are the marginal effect from Table 4 models while the red bars are the marginal effects from Table 5 after accounting for the economic well-being index (excluding paid work).



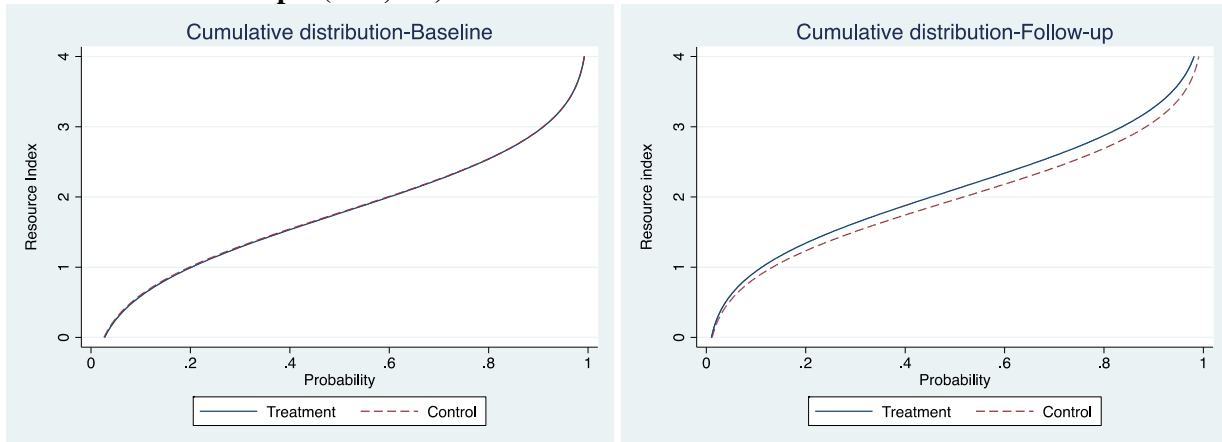
## Appendix

**Table A1. Baseline comparison between young women from the poorest (bottom half) of households to the top half at baseline**

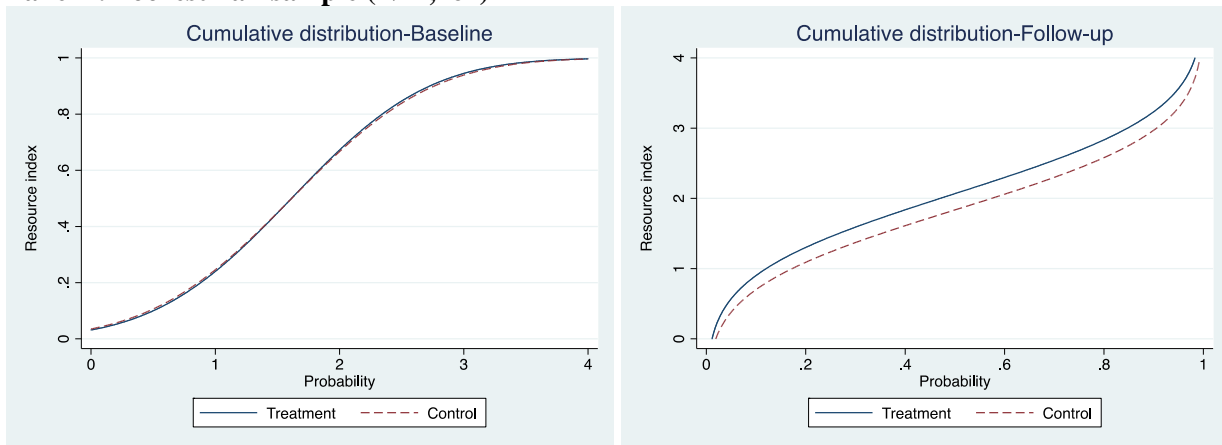
	Bottom half <i>N=1,265</i>	Top half <i>N=1,267</i>
	% (unless otherwise stated)	
<b>Demographics</b>		
Age	15.7	15.4
Household size	6.9	5.4
Ever had sex	28.8	26.0
Any sexual partner past 12 months	28.5	25.5
Transactional sex <sup>1</sup>		
Older sexual partner (5+ years) <sup>1</sup>	2.0	2.0
Any unprotected sex (past 3 months) <sup>1</sup>	33.2	26.6
Sexual relationship power scale (0-24) <sup>1</sup>	15.1 (SD 6.1)	16.1 (SD 5.8)
Hope score (0-39)	30.7 (SD 7.2)	31.7 (SD 6.9)
Child's Depression Index 10 item (0-18)	4.6 (SD 3.1)	4.4 (SD 3.0)
<b>Young women's economic resources</b>		
Always had spending money	8.2	12.5
<i>Top three sources of young woman's funds:</i>		
Job	25.4	21.7
Family	27.2	36.9
Grants to the household	11.7	9.9
Engaged in paid work	17.9	14.2
Savings	19.5	30.4
Bank or post office account	12.4	19.9
Ever borrowed money 'to get by'	23.6	21.2
Food worry (young woman, past 12 months)		
<b>Household SES</b>		
Household monthly per capita consumption (mean Rand)	182.5	740.5
Household monthly per capita food consumption (mean Rand)	120.6	350.4
Asset Index (mean, range 0-61)	12.6	15.9
Number of grants to the household	3.1	2.3

Notes: P-values based on equality of means tests with robust standard errors. <sup>1</sup>Only for young women who had ever had sex (N=693).

**Panel A2. Pooled sample (N=2,533)**



**Panel 2. Poorest half sample (N=1,267)**



**Panel 3. Top half sample (N=1,265)**

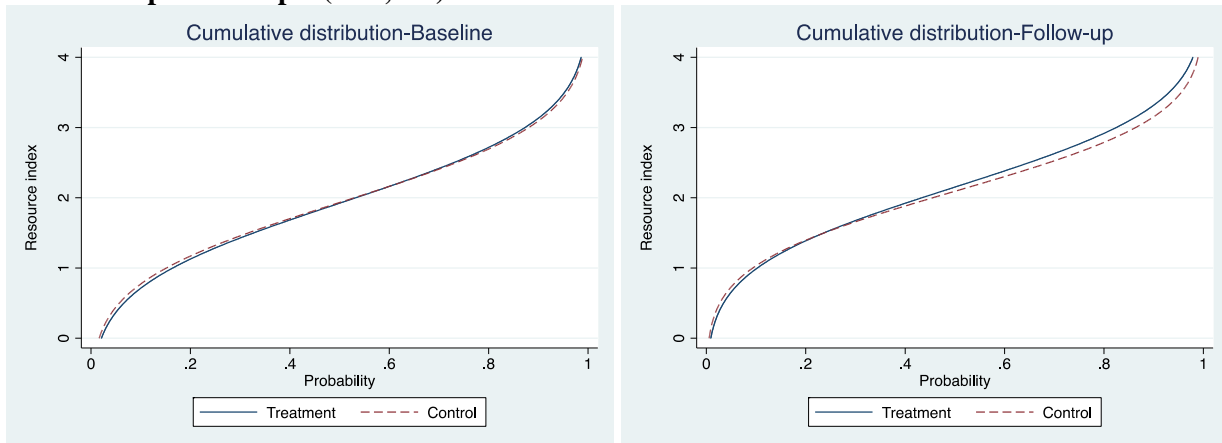
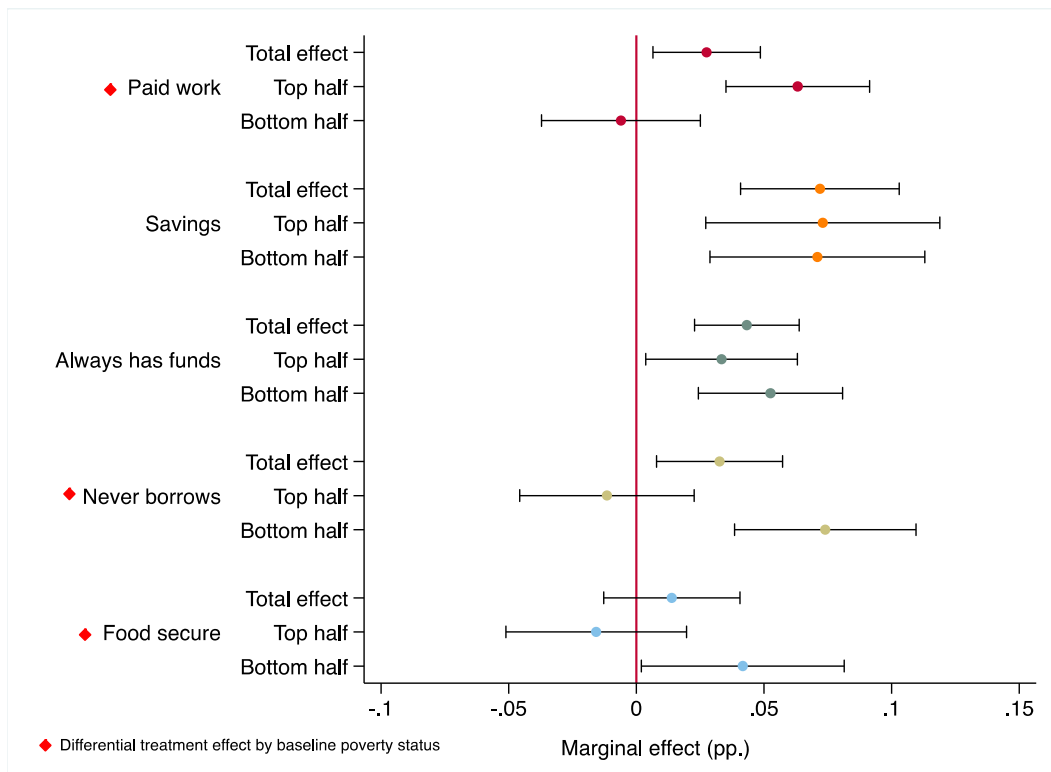


Figure A1. Cumulative distribution functions (CDFs) for the economic index  
CDFs show the cumulative distribution of the economic index separately for treatment and control arms across baseline and follow-up visits. Panel 1 shows the distributions for full sample, while Panel 2 and 3 divide the sample by baseline poverty status (Panel 2, Bottom half; Panel 3, Top half).

**Table A2. Impacts of CCT on Young women's economic resources and moderation by baseline poverty**

	Paid work		Savings		Discretionary funds		Never borrow	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coefficient (SE)							
CCT	0.03*** (0.01)	0.06*** (0.01)	0.07*** (0.02)	0.07*** (0.02)	0.04*** (0.01)	0.04** (0.02)	0.03** (0.01)	-0.01 (0.02)
CCT*baseline poverty		-0.07*** (0.01)		0.00 (0.03)		-0.01 (0.01)		0.08*** (0.03)
Baseline poverty		0.07*** (0.01)		-0.06** (0.02)		0.02 (0.02)		-0.06*** (0.02)
<i>Observations</i>	4,997	4,980	5,017	5,000	4,996	4,979	5,001	4,984

Notes: \* $p < 0.1$ ; \*\*  $p < 0.05$  \*\*\* $p < 0.01$ . GEE linear estimates with robust standard errors, adjusted for age. Baseline poverty is defined as being in the bottom half of households for total per capita household consumption at baseline.



**Figure A2. Marginal effects for the impact of the CCT on young women’s economic participation and resources.**

Notes: Marginal effects for the total treatment effect and by baseline poverty status (top or bottom half). Estimates provided with 95% confidence interval bars (insignificant results cross the vertical line at 0).