

From sugar daddies to baby daddies: Pregnancy prevention among adolescents whose boyfriends are their primary spending money source.

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Abstract

Reproductive coercion may cause unplanned pregnancies. This paper evaluates three potential sources of coercion — economic factors, emotional abuse, and physical abuse — in adolescent women's contraception and pregnancies. Data is from an HIV prevention intervention with African-American adolescent women in urban Atlanta surveyed at baseline (n=715), 6 months (n=607), and 12 months (n=605). Analysis used Poisson regression with outcomes of pregnancy and unprotected sex to obtain incidence rate ratios. Physically abused women were 45% more likely not to use contraception and women whose boyfriends were their primary sources of spending money, had jobs, or emotionally abused them were more than 20% more likely not to use contraception. Women whose boyfriends were their primary source of spending money and who had jobs were more likely to be pregnant at the following wave, but physical abuse was less predictive. Subsequent research will use matched sampling methods to minimize confounding.

Introduction

Partner coercion may account for a substantial but unknown proportion of unplanned pregnancies. The mechanism for this relationship may be that women with less relationship bargaining power have lower ability to insist on safe sex (1).

Past research has documented that women in relationships with intimate partner violence (IPV) are likely to be subject to reproductive coercion including birth control sabotage and unplanned pregnancy (2, 3). Few studies have examined causes of reproductive coercion other than IPV. Although non-IPV sources of reproductive coercion are more subtle and difficult to study, they are likely to be more common and could be responsible for a large number of unplanned pregnancies.

This study applies theories from the sociology of family that find that romantic partners' relative power within their relationships is influenced by the resources they contribute (4) to adolescents' relationships.

Few studies in US populations have investigated long-standing adolescent romantic relationships where the economic dimension is implicit rather than explicit (5). The study's hypotheses derive from research in adolescent populations in southern Africa. Evidence from southern Africa suggests that many romantic relationships include an implicit economic component, even in higher socioeconomic status populations such as university students (6).

Our earlier study using this data found that teen women who derive economic benefits from their boyfriends — whose primary source of spending money is their boyfriend and whose boyfriends own cars — were more likely to report condom non-use in the past 14 and 60 days, after balancing on 80 personal, relationship, and boyfriend factors. This condom non-use could be explained to avoid losing their spending money (6), to deepen their relationships, either intangibly through trust implicit in condom non-use (7), or tangibly through pregnancy if they consciously or unconsciously interpret spending money or car ownership as signaling ability to support children (8).

This study extends the previous research to examine a broader set of outcomes and a broader set of indicators of inequality. The earlier research looked at receiving money from a boyfriend and having a boyfriend with a car. This research will look at these as well as having a

whether women who receive economic benefits from their boyfriends are more likely to get pregnant

or less likely to prevent pregnancy: oral contraception, a biomarker for unprotected sex in the past 14 days, and

Methods

Theoretical models

This study is motivated two theories. Lee Rainwater's and Michael Walzer's independently derived theories of money and commodities hypothesize that deploying money for consumer goods beyond the level of subsistence is necessary for full membership in modern industrialized societies (9, 10). Sociological theories of power within the family hypothesize that relationship partners receive decision-making precedence proportional to the resources that they bring to their relationships (4). Together, these theories predict that boyfriends who own cars or give spending money to their girlfriends will have greater power within relationships, and some boyfriends will use that power to promote condom non-use.

The conceptual model for the relationship between boyfriend coercion, unprotected sex, and pregnancy is in Figure 1. Biological factors such as frequency of sex and contraception use influence whether a pregnancy takes place. Boyfriend coercion may influence women both in the biological factors that influence pregnancy and at the stage of the decision whether to keep the pregnancy. Boyfriend coercion and women's pregnancy intentions influence the biological factors as well as the decision whether to keep a pregnancy. In this study, all women stated that they wished to avoid pregnancy. This self-reported pregnancy intention may not be the actual pregnancy intention.

Data

We evaluated these hypotheses using data from a longitudinal intervention study of 715 low SES African-American adolescent women ages 15–21 surveyed at baseline, 6 months, and 12 months (11). The Horizons intervention was a randomized trial of an HIV prevention program in Atlanta that enrolled African-American females at a publicly funded STI clinic, a teen clinic based in a large public hospital, and a family planning clinic in Atlanta from March 2002 through August 2004. Unmarried African-American females were eligible to participate if they were sexually active in the past 60 days and neither pregnant nor attempting pregnancy: 847 participants were eligible, of whom 84% agreed to

participate. Emory University's Institutional Review Board approved the study protocol prior to implementation. A 40 minute interview was administered via audio computer-assisted subject interviewing (ACASI). Follow-up interviews were administered at 6 and 12 months using similar methods. Participants were tested for chlamydia, gonorrhea, and trichomoniasis at each visit using nucleic acid based metrics. Participants were paid \$50 upon completion of each survey.

Measures

The pregnancy risk variables with their definitions are listed in Table 5.

The survey included several measures of contraception use, including a biomarker for unprotected sex in the past 2 weeks; and self-reported having used a condom in the past 60 days, past 14 days, and at last sex; which method of contraception used at last sex; and birth control pill use without having skipped any pills in the past 60 days. Hormonal contraception was an option in the list of contraception used at last sex, but few respondents used other methods of hormonal contraception other than oral contraception.

Data Analysis

Data analysis will be performed in R and Stata SE version 11.

The initial analysis determined which factors are the strongest predictors of pregnancy in waves 2 and 3. Several measures of contraception use were attempted as predictors of pregnancy at the subsequent wave to identify which measures predicted pregnancy significantly. The difference between levels of significance is generally not statistically significant (?), and it would be an error to conclude that contraception measures with smaller p-values are stronger predictors (?). To differentiate between the measures, we used the raw effect size — the difference in pregnancy rates between the two groups — to compare the strength of predictors.

Results

All attempted measures of contraception use predicted pregnancy significantly for one or both waves. The strongest predictor of pregnancy in the subsequent wave was the variable for having tested positive on the biomarker for unprotected sex in the past 14 days, and weren't current perfect users of oral contra-

ception, and not using any condoms in the past 14 days, and not currently using oral contraception, by the measure of raw effect size. This variable captures the possibility of a negative on the biomarker for unprotected sex despite lack of condom use (not a false negative since semen Y-chromosome may no longer be present), as well as the possibility of condom use over-report. Cohen's effect size is also the largest for this predictor of pregnancy: $d=0.17$ for wave 2 pregnancy and $d=0.10$ for wave 3 pregnancy. The subsequent analyses will use this variable as one of the two outcomes of the study. The other outcome is self-reported pregnancy.

In bivariate analysis, nearly all measures of boyfriend coercion predicted unprotected sex. The raw effect size was greatest for physical abuse, which predicted an average of 23.5 percentage point difference in unprotected sex. Women whose boyfriends are their primary source of spending money had an average 14.8 percentage point difference in unprotected sex. Women whose boyfriends emotionally abuse them, have jobs, cars, and make more money are also more likely to have unprotected sex.

In bivariate analyses, not all measures of boyfriend coercion predicted pregnancy in the following wave. The largest average raw differences were in financial variables and physical abuse: women whose boyfriends have jobs or give them money were on average about 5 percentage points more likely to get pregnant in the following wave, and women whose boyfriends make more money or physically abuse them were a little over 4 percentage points more likely to get pregnant in the following wave.

In multivariate analysis, boyfriend physical abuse predicted unprotected sex strongly: women who were physically abused by their boyfriends were 45% more likely to use no form of pregnancy prevention. Women whose boyfriends were their primary source of spending money, whose boyfriends had a job, and whose boyfriends emotionally abused them were about 20% more likely to use no form of pregnancy prevention. Boyfriends with cars and boyfriends who make more money were negligibly more likely not to use any form of pregnancy prevention.

In multivariate analysis, financial variables predicted pregnancy more strongly than physical abuse, as in the bivariate analysis.

Discussion

As in past studies, this study found a connection between intimate partner violence and unprotected sex and pregnancy. Unlike past studies, this study measured multiple dimensions of potential partner coercion, including economic disparities between partners. The use of economic factors finds that while physical abuse most strongly predicted unprotected sex, having a boyfriend as primary spending money source was almost as strong of a predictor.

In this study, all respondents stated a desire to avoid pregnancy, so the use of no form of contraception at all, especially after the intervention, represents a strong deviation from this stated intention to avoid pregnancy.

For pregnancy, this study had slightly different results: we found that economic factors such as a boyfriend's financial status, employment, and giving spending money to the respondent were more strong predictors of pregnancy than physical abuse. It may be that abused women are more likely to get pregnant, but they may have abortions before taking the second or third wave surveys, which asked only about current pregnancies. The survey did not measure pregnancy between waves or abortions, so this study cannot differentiate between those possibilities.

Limitations and further research

These differences between women in potentially coercive relationships and not may It may be that women who are ambivalent about their pregnancy intentions are also more likely to enter abusive or potentially coercive relationships, so the unprotected sex could be explained by the women's ambivalence rather than the coercion itself. Future analyses will use sensitivity analyses and causal inference methods to reduce the potential confounding by unmeasured factors such as these.

Figure 1: Conceptual model for relationship between boyfriend coercion, unprotected sex, and pregnancy. Biological factors such as frequency of sex and contraception use influence whether a pregnancy takes place. Boyfriend coercion may influence women both in the initial steps of getting pregnant and at the stage of deciding whether to keep the pregnancy.

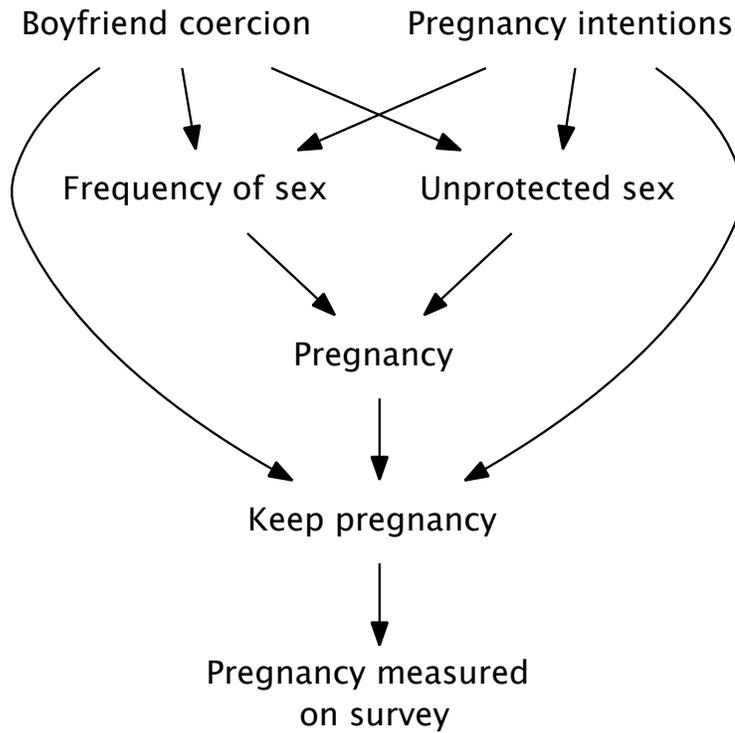


Table 1: Bivariate results for contraception non-use for each of the predictors of interest. The average raw difference summarizes the difference for each factor, and is defined as the average difference in the unprotected sex percentages across the three waves between those with and without the factor. The results are sorted in order of the average raw difference.

Predictor	Outcome: Positive biomarker or no pregnancy prevention									Average Raw Difference
	Wave 1 (n=715)			Wave 2 (n=607)			Wave 3 (n=605)			
	No	Yes	p	No	Yes	p	No	Yes	p	
Boyfriend who physically abuses	47.9	66.0	*	38.7	73.3	***	35.1	52.1	**	23.2
BF is main spending money source	40.4	58.4	****	34.8	49.6	**	31.6	43.3	*	14.8
Boyfriend who emotionally abuses	45.9	64.8	**	39.4	53.7	*	35.9	43.3		13.5
Boyfriend with job	36.7	51.0	****	31.6	43.5	**	27.7	39.6	**	12.7
Boyfriend with car	41.1	49.8	*	34.0	44.8	**	31.0	38.8	*	9.1
Boyfriend who makes more money	39.0	51.2	***	35.0	42.4	+	30.7	38.5	*	9.1

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

Emotional and physical abuse are limited to respondents over 18 due to mandatory reporting requirements: n=385, 366, 419, at waves 1, 2, and 3. p is from t-test.

Table 2: Bivariate results for pregnancy for each of the predictors of interest.

Predictor	Outcome: Pregnant						Average Raw Difference
	Wave 2 (n=607)			Wave 3 (n=560)			
	No	Yes	p	No	Yes	p	
Boyfriend with job	5.7	11.3	*	6.7	11.0	+	5.0
Money from boyfriend	7.4	13.7	*	8.3	11.7		4.9
Boyfriend who makes more money	6.2	11.9	*	7.8	10.9		4.4
Boyfriend who physically abuses	10.7	13.6		10.6	16.0		4.2
Boyfriend with car	8.0	10.2		8.2	10.6		2.3
Boyfriend who emotionally abuses	10.4	13.3		11.0	10.6		1.3

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

Emotional and physical abuse are limited to respondents over 18 due to mandatory reporting requirements: n=315, 337 at waves 2 and 3.

Table 3: Poisson regression results with outcome for no pregnancy prevention, measured by testing positive on the biomarker for unprotected sex or self-reporting no pregnancy prevention in the last 14 days (oral contraception or condom use).

Predictor	Outcome: Positive biomarker and no pregnancy prevention							Mean IRR
	Wave 1 (n=715)		Wave 2 (n=607)		Wave 3 (n=605)			
	IRR (95% CI)	p	IRR (95% CI)	p	IRR (95% CI)	p		
Boyfriend who physically abuses	1.25 (0.99, 1.57)	+	1.51 (1.17, 1.94)	**	1.63 (1.17, 2.27)	**	1.45	
Money from boyfriend	1.23 (1.04, 1.45)	*	1.26 (1.03, 1.55)	*	1.27 (1.00, 1.63)	+	1.25	
Boyfriend with job	1.24 (1.05, 1.48)	*	1.16 (0.93, 1.45)		1.29 (0.98, 1.68)	+	1.23	
Boyfriend who emotionally abuses	1.27 (1.04, 1.56)	*	1.26 (0.97, 1.63)	+	1.14 (0.83, 1.56)		1.22	
Boyfriend with car	1.12 (0.96, 1.31)		1.11 (0.91, 1.36)		1.10 (0.87, 1.40)		1.11	
Boyfriend who makes more money	1.23 (1.05, 1.44)	*	1.02 (0.83, 1.25)		1.08 (0.86, 1.37)		1.11	

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

The mean incidence risk ratio is the geometric mean of the incidence risk ratios. The table is sorted in order of average IRR. Regressions for emotional and physical abuse are limited to respondents over 18 due to mandatory reporting requirements: n=385, 366, 419 at waves 1, 2, and 3. Control variables are number of months with boyfriend (linear and quadratic), respondent and boyfriend partner concurrency, randomization to intervention, which of the 3 clinics respondents were recruited from (Planned Parenthood, Fulton County Hospital, or Grady). For waves 2 and 3, the outcome from the previous wave was also used as a control variable, so wave 2 no pregnancy prevention used wave 1 no pregnancy prevention as a control variable.

Table 4: Poisson regression results with outcome pregnancy. Predictor is measured in the wave prior to the pregnancy.

Predictor	Outcome: Pregnant				Mean IRR
	Wave 2 (n=607)		Wave 3 (n=560)		
	IRR (95% CI)	p	IRR (95% CI)	p	
Boyfriend with job	1.93 (1.08, 3.45)	*	1.56 (0.86, 2.82)		1.74
Boyfriend who makes more money	1.93 (1.14, 3.29)	*	1.33 (0.76, 2.32)		1.60
Money from boyfriend	1.73 (1.00, 3.00)	*	1.34 (0.74, 2.42)		1.52
Boyfriend who physically abuses	1.25 (0.54, 2.90)		1.54 (0.59, 4.04)		1.39
Boyfriend with car	1.25 (0.75, 2.09)		1.20 (0.69, 2.08)		1.22
Boyfriend who emotionally abuses	1.27 (0.60, 2.67)		1.02 (0.41, 2.50)		1.14

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

The mean incidence risk ratio is the geometric mean of the incidence risk ratios. The table is sorted in order of average IRR. Regressions for emotional and physical abuse are limited to respondents over 18 due to mandatory reporting requirements: n=315 and 337 at waves 2 and 3. Control variables are number of months with boyfriend (linear), randomization to intervention, and which of the 3 clinics respondents were recruited from (Planned Parenthood, Fulton County Hospital, or Grady).

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Table 5: Pregnancy risk variables: This table lists the outcome variables, the time periods they refer to, their definitions, the proportion of respondents with the factor at each wave, and the proportion of wave 2 pregnant respondents who had and did not have the factor at wave 1. The hypotheses were tested in all safe sex measures. Percent pregnant is the percent of wave 2 respondents who report being pregnant.

Measure with definition	Prevalence, %			Pregnant w2, %			Pregnant w3, %			
	Time Period	w1	w2	w3	No	Yes	p	No	Yes	p
No condom use	60 days	21	20	23	7.5	14.2	*	8.5	11.6	
Reported having used condoms in 0 episodes of vaginal sex.										
No condom or oral contraception use	60 days	20	19	21	7.4	15.0	**	8.5	12.0	
No condom use and not currently taking oral contraception.										
Biomarker + no pregnancy prevention	14 days	45	38	34	4.5	14.2	****	7.0	12.8	*
No condom use, not currently taking oral contraception, or tested positive for Yc-PCR biomarker for unprotected sex.										
Biomarker positive and no oral contraception	14 days	31	18	16	16.2	5.7	****	13.0	8.3	
Tested positive on Yc-PCR biomarker and no current oral contraceptive use										
Biomarker unprotected sex	14 days	32	19	17	5.8	15.5	****	8.4	12.1	
Tested positive on Yc-PCR biomarker for unprotected sex in past 14 days.										
No condom or oral contraception use	14 days	25	26	25	7.6	12.7	*	7.9	12.9	+
No condom use and not currently taking oral contraception.										
No condom use	14 days	27	27	27	7.7	11.9		8.0	12.3	+
Reported having used condoms in 0 episodes of vaginal sex.										
No pregnancy protection	Last sex	48	47	47	7.6	10.3		6.2	12.8	**
Reported using no method of pregnancy prevention at last sex, and not currently taking oral contraception.										

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

The Y-chromosome PCR (Yc-PCR) biomarker for unprotected sex is sensitive to the presence of semen Y-chromosome for up to 14 days even during menses (12–14).