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Race and ethnicity may not be associated with risk of unintended pregnancy

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Abstract

Objectives—To use improved measures and methodology to investigate whether race and ethnicity are associated with unintended pregnancy.

Study Design—Cross-sectional study of English- or Spanish-speaking women, aged 16–44, with pregnancies <24 weeks' gestation recruited from pregnancy testing and abortion care sites in New Haven, CT, between June 2014 and June 2015. Participants completed self-assessments of race, ethnicity, and multi-dimensional measures of pregnancy “context,” including timing, intention, wantedness, desirability, happiness, and planning (measured with the London Measure of Unplanned Pregnancy). Multivariable analysis was performed, adjusting for maternal demographics, language, recruitment site, substance use, and medical conditions including history of depression.

Results—Among 161 participants (mean age=27.2±6.6 years), mean gestational age: 9±4.6 weeks. Overall, 14% self-identified as White non-Hispanic, 37% Black non-Hispanic, 42% Hispanic, and 7% multiracial. Most (85%) were unmarried, and 75% had at least one child. After adjustment, happiness about new pregnancies was more likely among Black non-Hispanic than White non-Hispanic women OR=5.66 (95%CI: 1.51-21.20). Neither race nor ethnicity was significantly associated with pregnancy intention, wantedness, planning, timing, or desirability.

Conclusion—In a diverse cohort with multiple, antenatal measures of pregnancy context, neither race nor ethnicity is significantly associated with unintended pregnancy, as previous studies reported. Black non-Hispanic women were more likely to report happiness about new pregnancies than White non-Hispanic women. This study improves upon previous analyses that used retrospective and limited assessments of pregnancy intention, excluded women with miscarriages or abortions, and lacked adjustment for confounding.

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Keywords

Ethnicity; London Measure of Unplanned Pregnancy; pregnancy intention; race; unplanned pregnancy

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1. INTRODUCTION

Unintended pregnancy is a common occurrence (45% of pregnancies in the United States) [1], and has been associated with adverse maternal and neonatal outcomes including maternal depression and anxiety, delayed initiation of prenatal care, insufficient prenatal folic acid consumption, substance use during pregnancy, premature or low birthweight infants, and failure to breastfeed [2-9]. Data from the National Survey of Family Growth (NSFG) and Pregnancy Risk Assessment Monitoring Program System (PRAMS) have consistently shown that rates of unintended pregnancy (including unplanned, mistimed, or unwanted pregnancies) are highest among women aged 18-24, women who are cohabitating but not married, women below the poverty line, women with less than a high school diploma, and Black and Hispanic women [1, 10, 11]. Pregnancies reported as unintended demonstrate variation by race and ethnicity; unintended pregnancy rates of 64% among Black non-Hispanic women, 50% among Hispanic women, and 38% among White non-Hispanic women have been previously reported [1, 12]. Race-stratified analyses suggest that the association between race and unintended pregnancy may be mediated by relationship status at time of pregnancy [11], and reproductive coercion [13-15].

Recent research has called for improved measures of pregnancy intention and reevaluation of previously reported associations of unintended pregnancy [16-21]. Two of the largest and most commonly used data sources for research on unintended pregnancy (NSFG and PRAMS) have been criticized for introducing recall and social desirability bias by assessing pregnancy intention retrospectively, sometimes years after a given pregnancy [22,23], and may not capture women's reassessment of life circumstances (e.g. partner relationships and financial stability) once pregnancy occurs [24].

Such limitations regarding measures of unintended pregnancy may be especially relevant for Black and Hispanic women. More recent reports of the association between unintended pregnancy and adverse maternal and neonatal outcomes among Black and Hispanic women have found weak or inconsistent effects of pregnancy intention on key outcomes such as premature delivery and low birthweight [3-5, 25], or no associations after adjustment for confounders [14, 26-28]. Such research suggests that pregnancy intention may not be entirely representative of the multidimensional and intersecting social, emotional, cognitive, and contextual aspects of pregnancy that Black and Hispanic women face [20, 29], and that traditional measures of pregnancy intention may offer an incomplete representation of Black and Hispanic women in particular.

Given the criticisms of measurements regarding unintended pregnancy and recent calls for re-evaluation of the association between race and ethnicity and unintended pregnancy, [20, 21], we conducted a cross-sectional analysis to investigate whether race and ethnicity are associated with prospective, multi-dimensional measures of pregnancy context (intention,

wantedness, planning, timing, desirability, and happiness) in a diverse cohort of women in early pregnancy. Evaluation of measurement constructs that more accurately capture the experiences of women are needed especially for Black and Hispanic women to help improve understanding of family planning interventions.

2. MATERIALS AND METHODS

2.1 Study setting and design

We conducted a cross-sectional study among women presenting for pregnancy testing or abortion services from June 2014 to June 2015 at clinical sites in New Haven, CT. All recruitment sites offered comprehensive reproductive health care, including pregnancy testing and direct provision or referrals for abortion and prenatal care. Eligibility criteria for the study included age between 15 and 44 years, English or Spanish fluency, <24 completed weeks gestational age, and completed study enrollment within 1 week of their pregnancy test or pre-operative abortion clinic visit. Three hundred and sixty-one women were screened, of which 269 were determined to be eligible. One hundred and ninety-six women were interested in participating, 164 enrolled. Three women were excluded from analysis: one woman provided consent but did not complete the enrollment questionnaire, and two women who initially tested positive for pregnancy were subsequently found not to be pregnant. Thus, 161 participants comprised our analytic sample.

We collected data in person at the site of enrollment through self-administered paper questionnaires, primarily at clinical sites of enrollment. A research assistant was present to answer questions during questionnaire completion. A small fraction of questionnaires (<5%) were completed in public, community settings (e.g. restaurant or coffee shop) for the participants' convenience [24].

2.2 Race and ethnicity

Participants self-reported information on race and ethnicity. Study participants were asked to select from the following racial and ethnic categories: Black, White, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, Other, and Hispanic. Participants were instructed to select all categories that apply, so multiple responses could be indicated. Similarly, some participants only chose an ethnic category (e.g. Hispanic) and did not choose a racial category. For analysis, race and ethnicity were defined as: Black non-Hispanic; White non-Hispanic; Hispanic; and multiracial or other.

2.3 Measures of Pregnancy Context

At enrollment, we asked contextual questions regarding specific circumstances and conditions related to the pregnancy, referencing the time period just prior to pregnancy or around conception. These context measures included pre-pregnancy perspectives (intention, wantedness, and planning) and post-conception perspectives (timing, desirability, and happiness) (Appendix A) [24]. Each pregnancy context measure was assessed independently and women were asked to provide responses to all of the pregnancy context measures. The London Measure of Unplanned Pregnancy (planning) is a composite measure of 6 items [29]. We ascertained all measures of pregnancy context as 3-level categorical variables (e.g.,

intended, intentions changing, or unintended for pregnancy intention), reflecting favorable, ambivalent/neutral, or unfavorable perceptions. For analysis, measures of pregnancy context were evaluated as dichotomous outcomes, defined as ambivalent or unfavorable context (e.g. changing intention or unintended) compared to favorable context (e.g. intended) (Appendix A).

2.4 Potential confounding variables

We collected information on demographic factors that could confound the relationship between race and pregnancy context including maternal age, gestational age, language that the study was conducted in (English or Spanish), level of educational attainment, employment status, relationship status, maternal health condition (e.g. depression, substance use), reproductive history (parity, previous miscarriage, and previous abortion), plans for the current pregnancy (abortion, adoption, parenthood) and study site (pregnancy testing or abortion clinic). We calculated gestational age using date of latest menstrual period or clinician's estimate of gestational age at time of enrollment. Previous research has demonstrated maternal age, gestational age, education, income (similar to our study's measurement of employment), relationship status, parity, plans for current pregnancy, and proportions of pregnant women choosing abortion or parenthood are all correlates of both race and pregnancy context [1, 11, 25, 30-33]. Additionally, education, parity, relationship status, and country of origin (similar to language that the study was conducted in) are correlates of race [12, 28, 30-33], and age, education, income, relationship status, parity, depression, and substance use are all correlates of pregnancy intention [1, 3, 4, 6, 8, 32-34], hence are included as potential confounders.

2.5 Statistical analysis

We performed bivariate analysis using chi-square and Fisher's exact tests as appropriate. Logistic regression modeling was used to evaluate the association between race and ethnicity with pregnancy context measures as the outcome, producing unadjusted and adjusted odds ratio (OR) estimates and 95% confidence intervals (CI). Multivariable logistic regression was performed to adjust for potential confounding variables using backwards selection at $\alpha=0.10$. All statistical analysis was performed using SAS 9.4 (SAS Institute, Cary, NC).

The study protocol was reviewed and approved by the Yale University Human Research Protection Program. Written consent was obtained from study participants prior to enrollment.

3. RESULTS

3.1 Sample characteristics

The most represented ethnicity in the study was Hispanic, with 42% of participants identifying as Hispanic only. Black non-Hispanic was the most represented race (37%), followed by White non-Hispanic (14%), and multiracial/other (7%) (Table 1). Very few women (1%) identified as White, Black and Hispanic, or White and Hispanic. Even fewer women (0.6%) identified as Black and Hispanic, Black Hispanic and Native American/Alaskan Native, Hispanic Native American/Alaskan Native, or Native Hawaiian/Pacific

Islander. Most participants chose to complete the study in English (74%). Participants ranged in age from 16-44 years, and the mean age was 27 (± 7 years), and mean estimated gestational age at enrollment was 9 (± 5) weeks. Approximately one-fifth of women reported previous diagnoses of depression (22%) or anxiety (21%). Most participants reported a previous birth (75%), 44% reported a previous abortion, and 36% experienced a previous miscarriage. More than three quarters of participants were recruited from a pregnancy testing site (76%). Approximately one third reported that their pregnancy was intended (28%), wanted (32%), planned (25%), or occurred at the right time (34%). About half the sample reported their new pregnancy as desired (49%), and most reported feeling very or somewhat happy about their pregnancy (63%).

3.2 Association of race and ethnicity with pregnancy context

Overall, a higher proportion of Hispanic women reported favorable pregnancy contexts compared to all other races and ethnicities. In bivariate analysis, race and ethnicity were associated with all pregnancy context measures (all p-values < 0.03) (Table 2). While the majority of Hispanic (72%) and Black non-Hispanic (65%) women reported feeling very or somewhat happy about their pregnancy, this was true of only about one third (36%) of White women.

In unadjusted analyses, Hispanic women had significantly higher odds of reporting their pregnancy as intended (OR=3.34, 95% CI 1.05-11.25), well-timed (OR=3.50, 95% CI 1.16-10.59), and desired (OR=5.04, 95% CI 1.78-14.23) compared to White women (Table 3). Both Hispanic (OR= 4.42, 95% CI 1.60-12.23) and Black (OR= 3.24, 95% CI 1.16-9.02) women had higher odds of reporting happiness about their pregnancy than White women. There was no significant difference by race and ethnicity in unadjusted measures of pregnancy wantedness or planning.

After multivariate adjustment for potential confounders (relationship status, language that the study was conducted in, study site (pregnancy testing or abortion care) parity, and history of depression), Black non-Hispanic women demonstrated a significantly increased likelihood of reporting happiness about pregnancy news (OR=5.66, 95% CI 1.51-21.20) compared to White women (Table 3). Race and ethnicity were not significantly associated with pregnancy intention, wantedness, planning, timing, or desirability after adjustment.

4. DISCUSSION

In this cross-sectional study of a diverse cohort of pregnant women, we found that neither race nor ethnicity were significantly associated with pregnancy intention, wantedness, planning, timing, or desirability in adjusted analyses. However, Black non-Hispanic women were significantly more likely to report feeling happy about pregnancy after adjustment for confounding when compared to White women.

These findings contradict previous research reporting unintended pregnancy to be more common among Black and Hispanic women [1, 3, 12, 28]. Notably, these earlier studies have multiple methodological limitations. Studies using NSFG data [1, 3, 12, 30] are limited by retrospective assessments of pregnancy intention (questions about pregnancy are asked

after a woman has given birth), periods of recall between 2 and 5 years since pregnancy [3, 30], and exclusion of women who experience miscarriage or abortion [3, 12]. Women participating in the NSFG were never directly asked whether the pregnancy was unintended, unwanted, or mistimed. Instead, NSFG uses a complex algorithm to characterize pregnancies as unintended, and subcategorize those as unwanted or mistimed based on flawed assumptions, such as contraception non-use as a reflection of intended pregnancy [12, 30]. Prior analyses also lacked robust adjustment for important covariates such as mental health diagnoses, previous miscarriage, and previous abortion [1, 3, 12]. Several of these measures (parity, language, relationship status, history of depression, substance use, and recruitment site) were retained in final multivariable models for our study. Finally, previous analyses showing an association between race and/or ethnicity and unintended pregnancy did not investigate other discrete measures of pregnancy context, such as pregnancy desirability and happiness [1, 3, 12, 28], which are important components of how women perceive pregnancy.

Our study improves on previous findings by directly asking a racially and ethnically diverse cohort [32-34] about discrete, multi-dimensional pregnancy contexts, assessed antenatally (9 weeks mean gestational age). Further, our study sample includes women with all potential pregnancy outcomes (abortion, birth, miscarriage) [24], which improves upon earlier research restricted to only women who continue pregnancy and deliver and exclude women who experience miscarriage or abortion [3, 12]. In our study, race and ethnicity were both self-identified, which improves upon previous studies that did not analyze Hispanic as a discrete category [19, 31].

Our finding that Black non-Hispanic women have higher odds of reporting happiness about a new pregnancy than White women is consistent with previous research [31-34], suggesting pregnancy happiness and intention are separate aspects of pregnancy context that should be measured individually, and may vary by race and ethnicity. This finding also suggests that there may be more complicated truths about pregnancy perspectives than current measurements have allowed, including differences in social acceptability and expectations among different racial and ethnic groups [1, 3, 18, 31]. For example, assuming that unintended pregnancies are also unwanted, unplanned, ill-timed, undesired, and unhappy may apply these terms to Black and Hispanic women in incorrect ways.

However, our findings differ from the literature that finds Hispanic women are more likely to report happiness about both hypothetical and actual unintended pregnancy compared to Black and White women [33-34]. While a similar proportion (72%) of Hispanic women in our study reported happiness about pregnancy news compared to previous studies (61-75%) [33], we found no association between Hispanic ethnicity and happiness after multivariable adjustment.

Differences between our results and previous studies on race, ethnicity, and pregnancy happiness may be attributable to differences in study population, methodology, adjustment for confounders, and defined outcomes. In contrast to studies that surveyed non-pregnant [31-33] or postpartum [32, 34] women, we enrolled women early in gestation, prospective to pregnancy resolution (abortion, miscarriage, birth) to address recall bias [19], and measured

multiple dimensions of pregnancy context. As previously discussed, we also adjusted for confounders retained in final multivariable models that were not included in other studies [31-34]. Many previous studies have only included one or two racial/ethnic categories [19, 31-34], and therefore has limited generalizability for the population of reproductive aged women. Finally, other studies evaluating happiness about pregnancy focused on whether women were happy about unintended pregnancy [31-34], whereas our study looked at happiness about pregnancy in general, among women with intended, ambivalent, and unintended pregnancies.

Our study may be limited by potential misclassification of race and ethnicity. Although participants self-identified race and ethnicity from among several choices, some women chose only an ethnicity (Hispanic) and did not choose a race. All participants who identified as American/Indian, Alaskan Native, Native Hawaiian/Pacific Islander, and other, and all participants who chose more than one racial/ethnic identifier were categorized as “multiracial/other” (total n=11) due to the small number of participants within these racial groups. Heterogeneity of the “other” category could have led to results that are not representative of each of its sub-components. However, a recent analysis found that New Haven, CT, where this study was conducted, is the metropolitan area most similar in demographic characteristics to the U.S. overall [35]. Our study may also be limited by the cross-sectional nature of our study which does not permit investigation as to whether pregnancy contexts differ by race and/or ethnicity over the course of pregnancy; however, our data provides new and important information about pregnancy context in the period following pregnancy diagnosis and before pregnancy resolution, which has not been well studied. Additionally, pregnancy intention was evaluated dichotomously due to sample size restrictions, and further studies are warranted to investigate pregnancy ambivalence as a distinct category. Further studies evaluating the possible association between multiple measures of pregnancy context and reproductive coercion would be important, since reproductive coercion was not measured in our study. While our study shows significant results with a small sample, additional research with larger sample sizes and repeated measures of pregnancy context from prior to conception, after pregnancy diagnosis, and during the course of pregnancy, are needed to confirm the observed associations and investigate any differences in reported pregnancy context over time by race and ethnicity.

Our study demonstrates that pregnancy intention does not differ significantly by race and ethnicity when measured as its own discrete pregnancy context, and Black non-Hispanic women are significantly more likely to report happiness about a newly-diagnosed pregnancy than White women. To obtain an accurate understanding of where racial and ethnic disparities in unintended pregnancy exist, it is necessary to develop and utilize appropriate measurements of pregnancy context capable of capturing women’s unique perspectives. Focusing on whether a pregnancy was intended or not implies a normative belief that unintended pregnancies are uniformly experienced as negative life events that will result in adverse outcomes [20]. Future studies incorporating measures of discrete dimensions of pregnancy context among diverse racial and ethnic groups would be informative to confirm our findings. Further evaluation of these contexts is also needed to determine if such measures effectively describe the relationship between pregnancy intention and adverse birth outcomes, or if new questions and models should be developed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Implications

Evaluation of multi-dimensional pregnancy contexts assessed antenatally are important and may capture the experiences of women more accurately, especially Black and Hispanic women.

Table 1 Participant demographics and pregnancy context at enrollment (N=161)^a

Characteristic	N (%)
Total	161 (100)
<i>Sociodemographics</i>	
Race and ethnicity	
White non-Hispanic	22 (13.9)
Black non-Hispanic	58 (36.7)
Hispanic	67 (42.2)
Multiracial, Other	11 (7.0)
Language Study Conducted In	
English	119 (73.9)
Spanish	42 (26.1)
Age	
25	74 (46.3)
> 25	86 (53.8)
Gestational age at enrollment	
Up to 12 completed weeks	132 (83.0)
>12 completed weeks	27 (17.0)
Education (in years)	
< 12	29 (18.1)
12 or GED	68 (42.5)
Some college/college degree	63 (39.4)
Employment	
Full-time	39 (24.2)
Part-time	38 (23.8)
Unemployed	51 (31.9)
Homemaker	32 (20.0)
Relationship Status	
Single	69 (43.1)
Married	24 (15.0)
Living with Partner, not married	48 (30.0)
Separated, divorced, widowed, other	19 (11.9)
Ever diagnosed with depression	34 (21.1)
Ever diagnosed with anxiety	33 (20.5)
Parity	
0	40 (25.2)
1	56 (35.2)
2+	63 (39.6)
Previous miscarriage	54 (36.0)
Previous abortion	67 (43.8)
Recruitment Site	

Characteristic	N (%)
Pregnancy Testing	123 (76.4)
Abortion	38 (23.6)
Plans for Current Pregnancy	
Parenting	97 (60.6)
Planning Adoption	2 (1.3)
Planning Abortion	41 (25.6)
Don't Know	20 (12.5)
<i>Measures of Pregnancy Contexts</i>	
Pregnancy Intention	
Intended	44 (27.33)
Intentions Changing, Not Intended	117 (72.7)
Pregnancy Wantedness	
Wanted	51 (31.7)
Mixed Feelings, Unwanted	110 (68.3)
Pregnancy Planning	
Planned	40 (24.8)
Ambivalent, Unplanned	121 (75.2)
Pregnancy Timing	
Right Time	55 (34.2)
Okay But Not Quite Right, Wrong Time	106 (65.8)
Pregnancy Desirability	
Desired	79 (49.4)
Not Sure, Not Desired	81 (50.6)
Pregnancy Happiness	
Very Happy, Somewhat Happy	101 (63.1)
Neither Happy Nor Unhappy, Somewhat Unhappy, Very Unhappy, Don't Know	59 (36.9)

^aTotal Ns may not add to 161 due to missing information

Table 2

Bivariate association of race and ethnicity and measures of pregnancy context at enrollment (N=161)^a

	Intention – n (%)		Wantedness – n (%)		Planning – n (%)		Timing – n (%)		Desirability		Happiness						
	Intended	Intentions changing, Not Intended	p-value ^b	Wanted	Mixed feelings, Unwanted	p-value ^b	Planned	Ambivalent, Unplanned	p-value ^b	Right time	Ok not quite right, Wrong time	Desired	Not sure, Not desired	p-value ^b	Very or Some-what happy	Unsure unhappy ^c	p-value ^b
N (%)	43 (27.2)	115 (72.8)	0.001	49 (31.1)	109 (69.0)	0.004	39 (24.7)	119 (75.3)	0.012	54 (34.2)	104 (65.8)	80 (49.7)	81 (50.3)	99 (63.1)	58 (36.9)		0.026
Race/Ethnicity																	
White non-Hispanic	4 (18.2)	18 (81.8)		5 (22.7)	17 (77.3)		5 (22.7)	17 (77.3)		5 (22.7)	17 (77.3)	7 (31.8)	15 (68.2)	8 (36.4)	14 (63.6)		
Black non-Hispanic	7 (12.1)	51 (87.9)		10 (17.2)	48 (82.8)		7 (12.1)	51 (87.9)		12 (20.7)	46 (79.3)	20 (35.1)	37 (64.9)	37 (64.9)	20 (35.1)		
Hispanic	29 (43.3)	38 (56.7)		31 (46.3)	36 (53.7)		25 (37.3)	42 (62.7)		34 (50.8)	33 (49.3)	47 (70.2)	20 (29.9)	48 (71.6)	19 (28.4)		
Multiracial, Other	3 (27.3)	8 (72.7)		3 (27.3)	8 (72.7)		2 (18.2)	9 (81.8)		3 (27.3)	8 (72.7)	4 (36.4)	7 (63.6)	6 (54.6)	5 (45.5)		

^aTotal Ns may not add to 161 due to missing information;
^bp-value based on chi-square or Fisher exact for associations when appropriate
^cNeither happy nor unhappy. Somewhat or very unhappy. Don't know.
Bold text indicates statistical significance.

Table 3

Unadjusted and adjusted associations between race and ethnicity with measures of pregnancy context

Race and Ethnicity	Intended OR (95% CI)		Wanted OR (95% CI)		Planned OR (95% CI)		Right Time OR (95% CI)		Desired OR (95% CI)		Happy OR (95% CI)	
	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^b	Unadjusted	Adjusted ^c	Unadjusted	Adjusted ^d	Unadjusted	Adjusted ^e	Unadjusted	Adjusted ^f
White non-Hispanic	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Black non-Hispanic	0.62 (0.16-2.36)	0.77 (0.20-3.04)	0.71 (0.21-2.37)	0.56 (0.15-2.01)	0.47 (0.13-1.67)	0.47 (0.13-1.67)	0.89 (0.27-2.89)	0.47 (0.12-1.80)	1.16 (0.41-3.31)	0.91 (0.25-3.31)	3.24 (1.16-9.02)	5.66 (1.51-21.20)
Hispanic	3.43 (1.05-11.25)	1.29 (0.29-5.75)	2.93 (0.97-8.86)	1.60 (0.48-5.42)	2.02 (0.67-6.16)	0.85 (0.21-3.44)	3.50 (1.16-10.59)	2.38 (0.66-8.57)	5.04 (1.78-14.23)	3.35 (0.95-11.82)	4.42 (1.60-12.23)	2.24 (0.55-9.14)
Multiracial, Other	1.69 (0.30-9.36)	2.53 (0.42-15.20)	1.28 (0.24-6.70)	1.11 (0.19-6.34)	0.76 (0.12-4.70)	0.76 (0.12-4.70)	1.28 (0.24-6.70)	1.12 (0.17-7.46)	1.22 (0.27-5.61)	0.78 (0.12-5.11)	2.10 (0.48-9.14)	3.23 (0.53-19.61)

^aAdjusted for study language (English or Spanish) and parity;

^bAdjusted for study site (pregnancy testing or abortion care) and substance use;

^cAdjusted for study language (English or Spanish);

^dAdjusted for study site (pregnancy testing or abortion care) and history of depression;

^eAdjusted for relationship status, study site (pregnancy testing or abortion care), and history of depression;

^fAdjusted for relationship status, study language (English or Spanish), study site (pregnancy testing or abortion care), parity, and history of depression