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THE IMPACT OF RELATIONSHIP STATUS AND RELATIONSHIP ASYMMETRY ON THE USE OF CONDOMS, NON-BARRIER CONTRACEPTION, AND DUAL METHODS IN BRAZILIAN WOMEN

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ABSTRACT

Relationship context, gender dynamics, and fertility desires all greatly influence decisions around condom use and contraception. This study focuses on dual methods for dual protection, against STIs (including HIV) and unintended pregnancy, and estimates the effects socio-demographics, fertility desires, and relationship context on the use of dual methods, condoms, and non-barrier contraception. Weighted descriptive statistics and logistic regression models are estimated using the 2006 PNDS, a nationally representative household survey of women of reproductive age in Brazil. We find that relationship status is associated with whether or not condoms are used and that relationship context is associated with which of dual protection is used (condoms vs. dual methods). Lastly, we find that women who use dual methods use condoms less consistently than women who use a single method (condoms) for dual protection. This study finds preliminary evidence that casual partners use condoms consistently and use dual methods (with inconsistent condoms) and non-barrier contraception as they transition to being long-term romantic partners.

INTRODUCTION

The global syndemic of HIV and unintended pregnancy has prompted research on dual protection, the simultaneous protection against STIs (including HIV) and unintended pregnancy (Berer 2006). As defined in public health, dual protection can be achieved through the use of a *single method* (e.g. male or female condom) or *dual methods* (condoms + another non-barrier contraceptive). Therefore, since the dawn of HIV, male condoms have been promoted as the shining star of dual protection. This narrow focus on a single method for dual protection has come at a cost for prevention, with both HIV and unintended pregnancy spiking to epidemic levels in women around the world, and especially in Brazil. It is clear that romantic partners, gender dynamics, and fertility desires all greatly influence decisions around condom use and contraception. This study focuses on dual methods for dual protection and estimates the effects socio-demographics, fertility desires, and relationship context on the use of dual methods, condoms, and non-barrier contraception.

The relationship context frames the environment in which partners communicate, assess their risk of HIV, STIs, and pregnancy and decide whether or not to use condoms. The decision to use condoms and/or contraception rides on factors like the degree of relationship closeness, trust, and power dynamics. The closer partners are in a relationship, the greater their levels of communication are thought to be. According to theory and past research, consistent condom use in casual sexual

relationships is common, but dissipates over time once partners become more familiar with each other, build trust, and transition into a long-term sexual relationship (Ku, Sonenstein et al. 1994). Condoms are associated with mistrust, interfere with intimacy and sensation, and couples often grow tired of using them (Rosenthal, Gifford et al. 1998; Flood 2003; Westhaver 2005; Chimbiri 2007); making them undesired in committed relationships. Studies find that, as partners transition into more committed romantic relationships, women generally uptake non-barrier methods for contraception and transition from dual protection (with consistent condom use) to only protecting against unintended pregnancy (non-barrier contraception only) (Ku, Sonenstein et al. 1994; Chimbiri 2007). Additionally, partners that desire to have children will eventually forgo non-barrier contraception for an extended period of time to become pregnant.

One unanticipated consequence of condom promotion for HIV prevention has been a decline in non-barrier contraceptive use associated with a subsequent increase in unintended pregnancy and abortion (Bajos, Warszawski et al. 2001). Although condoms can be a very effective contraceptive with perfect clinical use, condom use is often hindered by a slew of user-based errors (e.g. not having a condom, beginning sex before condom is applied, condom slippage, male partner doesn't want to use a condom etc.) that deem condoms a less effective contraceptive in typical use (Crosby, Salazar et al. 2007). According to typical use, condoms are not as effective for pregnancy prevention as other non-barrier contraceptives. For example, the typical failure rate of

condoms (15%) is anywhere from two to 150 times greater than the typical failure rate of female controlled methods like the birth control pill (8%), hormonal injection (3%), and IUD (0.1-0.8%) (Trussell 2004). Furthermore, condoms are male-controlled and women may find it challenging and/or unappealing to negotiate their consistent use in order to attain dual protection, placing them at risk for HIV.

The promotion of dual methods – one barrier and one non-barrier – is posited as the most prudent method for dual protection (Cates and Steiner 2002; Trussell and Wynn 2008). Dual methods are especially important for women who cannot consistently negotiate condom use with their partners. Also, the use of dual methods provides people at risk for HIV and other STIs with a safe way to space and limit their pregnancies (Ngure, Heffron et al. 2009). However, the few studies that examine dual method use report that women who use dual methods will use one or both methods more inconsistently than women who use only one method (MacPhail, Pettifor et al. 2007).

This study investigates relationship effects on dual protection. We aim to describe levels of dual protection and type of dual protection (dual method use vs. condom use only); to characterize the socio-demographic profiles of women based on their contraceptive choice; to understand how relationship context is associated with dual method use (vs. condom only or non-barrier contraception only); and to test the dual method hypothesis in a representative sample of women of reproductive age in

Brazil. We also test a hypothesis that dual method use serves as a bridge between consistent condoms (in single women) and non-barrier contraceptive use (in women in committed relationships) for romantic partners as they transition relationship statuses.

METHODS

Study Context

Brazil is an ideal country to research dual protection and relationship context for many reasons, yet to our knowledge there has been no national study of dual protection. Over a third of all the people living with HIV in Latin America and the Caribbean live in Brazil and women are a growing demographic in Brazil's HIV epidemic; the male to female ratio of new HIV infections fell dramatically from 26.5:1 in 1985 to 1.5:1 in 2006 (MOS 2008). Heterosexual transmission in stable relationships plays an important role in the spread of the HIV epidemic (Parker 2000; MOS 2008). Moreover, the HIV and unintended pregnancy syndemic in Brazil disproportionately affect women in the lower socioeconomic segments of society. The comprehensive condom use promotion in Brazil coupled with a lack of comprehensive family planning for decades makes it a compelling context to study how condom use and contraception overlap. Furthermore, there is an overall lack of studies in Latin America and Brazil that consider relationship context and dual protection via condom or dual method use.

Data

This study reports findings from a secondary data analysis of the 2006 Pesquisa Nacional Demografica e da Saúde da Criança e da Mulher (PNDS), a cross-sectional household survey of women of reproductive age that is conducted in Brazil every ten years and modeled on the Demographic Health Surveys (DHS) (Brasil 2009). The PNDS utilized a complex two-stage stratified sampling design (using census sectors and households) to achieve a sample representative of all women of reproductive age in Brazil who live in private households (in both formal and informal neighborhoods, including favelas). The full analytic sample for this study includes fecund women of reproductive age (15-49 years old) who report using condoms, a non-barrier contraceptive method only, or dual methods, and who have complete information on all covariates.

The main outcome of interest is dual method use, which is defined as the use of a condom in conjunction with the use of another modern, non-barrier contraceptive method (e.g. birth control pill, hormonal injection, diaphragm, IUD). This study compares dual method use to condom use only and to non-barrier contraceptive use only. We also compare condom use only to non-barrier contraceptive use only.

Statistical Analysis

Analyses begin with a description of the sample, reporting weighted percentages, in terms of socio-demographic, early sexual risk, fertility, and relationship characteristics. The chi-square statistic (for categorical variables) and the ANOVA F-statistic (for

continuous variables) were used to identify significant differences between independent variables and dual protection. Weighted logistic regression models estimated the odds ratios that associate independent variables to dual protection net of other variables in the model. All analyses were conducted in STATA 12 (StataCorp 2012). The weighting scheme was defined using the – svyset – command and all analyses were run using the – svy, subpop – command in STATA 12.

Using this data, we apply a syndemic approach and the theory of gender and power to elucidate how socio-demographics and relationship factors influence contraception and condom use in sexually-active, fecund women of reproductive age. We then estimate several logistic regression models to test the hypothesis that women who use dual methods are transitioning from using condoms consistently in their casual relationship to using a non-barrier contraceptive method only in long-term relationships. We hypothesize that women who use consistent condoms only will be younger and more single than women who use dual methods. We also hypothesize that women who use a non-barrier contraceptive method only will be older and in more committed relationships (e.g. married or in union) than women who use condoms or dual methods. In line with the dual methods hypothesis, we test whether women who use dual methods use condoms less consistently than women who use condoms only.

RESULTS

Table 1 describes the full sample of fecund, sexually active women who report using a non-/barrier method of contraception with survey weights applied. Our sample averaged 28 years, almost 9 years of education, and half were of Black race. The majority of the sample was of Catholic religion (63%), almost half resided in the Southeastern region of Brazil (47%), and most lived in an urban area (86%). In terms of early sexual risk, almost half of the sample reported using a condom at sexual debut (48%). In terms of fertility, women had on average 1.1 children and almost 50% wanted to have (more) children. In terms of relationship context, most women were either married or in a civil union (68%) and 24% were single. Among the women either married or in civil union (n=4,046), the majority were in an age asymmetric relationship (n=2,809) with women averaging 16 years younger in age than their male partner. In contrast, most women were in an educationally symmetric relationship (n=3,022) with 59% in a relationship where both partners had more education than the national average at the time of study.

Table 2 describes the sample and their non-/barrier contraceptive use by socio-demographic factors, early sexual risk, fertility, and relationship context factors. On average, dual method users were the youngest (26 years) and most educated (9.2 years) than women who use a contraceptive only or condom only. Women of other race and of Afro-religion or 'Other' religion report a greater frequency of dual method use than women of White or Black race and women of other religions. Although a greater

proportion of women in the South and Southeast regions of Brazil report dual method use, condom use only was the most frequent method reported by women of all regions except for women in the South who reported more frequent use of a contraceptive method only. Dual method use was not the most common method by women in non-urban and urban areas. Women in non-urban areas most commonly used a non-barrier contraceptive method only (42%) and women in urban areas commonly used condoms only (41%). Women who used dual methods averaged a significantly higher household wealth score than other women. Early sexual risk, measured with risk at sexual debut, is significantly associated with dual method use. A greater proportion of women who use dual methods also report having used a condom at sexual debut than women who used a contraceptive method only or no method at sexual debut. However, women who use a condom at sexual debut most commonly use a condom only (41%) and women who use a contraceptive method only at sexual debut most commonly use a contraceptive method only (41%). This finding goes in line with the life course perspective that condom use at sexual debut conditions condom use behavior later in life; this may occur through various mechanisms, one which might include conditioning women to negotiate and communicate condom use as a normal aspect of sexual relations. Despite this finding, 40% of women who report no method use at sexual debut report using a condom only, which gives promise that condom use promotion after sexual debut can still be effective.

Both fertility measures (e.g. number of children and future fertility desires) are significantly associated with non-/barrier contraceptive use in this sample. Women who report using a contraceptive method only report significantly more children than women in the other categories, averaging 1.4 children (compared to 1.0 children). Additionally, significantly more women who desire children in the future report using a condom only or dual methods than women who do not want future children (who report more use of a contraceptive method only).

All relationship context measures are significantly associated with non-/barrier contraceptive use in this sample (measured by relationship status, age asymmetry, and educational asymmetry). Women who are not in a relationship (e.g. single and separated) report most frequently using only condoms compared to women who are in a relationship (e.g. in civil union or married) who report most frequently using a non-barrier contraceptive method only. Among women in a relationship (n=4,046), relationship context variables were significantly associated with contraceptive choice. Women who use dual methods were closer in age to their partner, on average (14.1 years younger), than women who use condoms only (17.4 years younger) or a non-barrier contraceptive method only (16.7 years younger). Women who use dual methods were more educated in relation to their partner compared to women who use condoms only or non-barrier contraception only.

Table 3 reports the weighted odds ratios of bivariate models and full models (that control for all socio-demographic, early sexual risk, and fertility variables discussed earlier) that estimate relationship context variables on dual method use, condom use only, and non-barrier contraceptive use only. Relationship status was significantly associated with dual method use (versus contraceptive only) and condom use versus contraceptive only, but not dual method use (versus condom only). It appears that relationship status is significantly associated with the decision to use condoms, and to use condoms in addition to a non-barrier contraceptive method. Women who were not in a relationship (e.g. single or separated), had significantly greater odds (both unadjusted and adjusted) of using dual methods (vs. contraceptive only) and condoms only (versus contraceptive only) compared to married women. This finding goes in line with the hypothesis that partners begin their sexual relationships with condom use and eventually transition to use non-barrier contraception, except this study finds that dual methods may be the segue for this transition (condoms only → dual methods → contraception only).

Among women in relationships, age asymmetry is significantly associated with dual method use, but not condom use (vs. contraceptive method only). Women within 2 years of their partner in age had significantly greater odds of using dual methods than women who were three or more years younger than their partner. This finding goes in line with the thought that partners who are closer in social indicators (like age) can

more easily coordinate dual method use. Although educational asymmetry was also significantly associated to dual method use in the bivariate model, the significant association did not hold up in the adjusted models.

Table 4 reports the weighted logistic regression that tests the dual method hypothesis that women who use dual methods are less likely to use one or both of those methods more inconsistently than women who use condoms only. Table 4 shows that women who use dual methods have much lower odds of using condoms consistently than women who use condoms only. This finding supports the dual methods hypothesis, but also supports that dual methods may be used while couples transition from consistent condom use to non-barrier contraception only.

DISCUSSION

1. Discuss levels of dual protection – condom use, dual methods, contraception only
2. Discuss relationship status → condom use
3. Discuss how relationship context affects type of dual protection (dual methods vs. condom only)
4. Discuss dual methods hypothesis
5. Study limitations

This study should be viewed in light of several limitations. First, data are cross-sectional therefore limiting my ability to assert causal inference. However, the cross-

sectional design does not necessarily invalidate the claim that relationship status is a proxy for relationship context, which conditions the environment where partners communicate and make decisions whether or not to use dual protection. The cross-sectional nature of the data, however, do limit the ability to assess selection bias into certain relationship statuses; a common limitation with relationship research. However, to overcome this bias I did make a thorough effort to describe how women in different relationship statuses differed by individual and relationship context characteristics. Furthermore, random sampling approaches would ensure that this variable is equally distributed across the sample.

Second, the data is based on self-reports and require the respondent to recall sexual activity, partnership characteristics, and condom use. This caveat may have introduced measurement error from recall bias or social desirability effects of concern about confidentiality from interviewer, family members, or spouse. In addition, questions regarding sexual activity and condom use in large surveys often involve limited depth and no contextualization of behavior. One example is that we are uncertain about the depth and mutual partner participation involved in reporting 'communication'. Another example occurs with condom use measures. Researchers assume that women in stable relationships report on condom use with their stable partner but, unless we ask, we cannot be certain that women are not reporting on condom use with their casual partner or with concurrent partners; inconsistent condom

use may reflect consistent condom use with casual partners and no condom use with stable partners. In instances of discrepant responses, however, the PNDS survey employed standardized methods that required interviewers to clear up any inaccuracies found throughout the survey. Although measures of contraception and condom use are both validated measures it is also important acknowledge that missing data for each question may bias findings in research.

Third, the PNDS in 2006 collected limited information from male partners and even that information is limited to women who report being in civil union or married. Limited socio-demographic information was collected about sexual partners to the exclusion of key relationship context variables like length of sexual relationship and frequency of sexual relations. As noted in this study of condom use, male partner characteristics like education may take precedence over female partner characteristics when determining whether or not condoms (a male-controlled method) will be used and if so how consistently. Furthermore, as noted in the theoretical section of this study, gender norms in Brazil are greatly influential in setting the stage for partner dynamics in a relationship.

6. Summary paragraph

TABLE 1. Weighted Distributions of Factors in Fecund, Sexually Active Women (15-49 years) Using a Method, Brazil 2006 (N=6,017)

Characteristic	*N*	Wgt. %
Socio-demographics		
Age (mean, SD)	6,017	28.3 (0.26)
Education (years) [mean (std)]	6,017	8.8 (0.09)
Race		
White	2,565	43.4
Black	3,137	50.9
Other	315	5.8
Religion		
None	530	8.9
Catholic	4,008	63.3
Evangelical	1,172	21.9
Afro-religion or Other	307	6.0
Region		
North	897	6.5
Northeast	1,031	22.0
Southeast	1,327	46.8
South	1,608	17.9
Mid-West	1,154	6.8
Urban	1,575	85.8
Household wealth score	6,017	0.1 (0.03)
Early Sexual Risk		
Risk sexual debut		
No method	2,071	31.3
Contraceptive method only	1,216	21.0
Condom	2,730	47.6
Fertility		
Number of children [mean (std)]	6,017	1.1 (0.03)
Wants more children		
Yes	2,899	49.3
No	2,947	48.0
Don't know	171	2.7
*Relationship Context**		
Relationship status		
Single	1,370	24
Separated	601	9
Civil union	1,969	31
Married	2,077	37
Age asymmetry [avg diff. (std; range)]	neg. 16.29 (0.30; -63 to 6)	
Woman is within 2 years	1,237	30
Woman is 3+ years younger	2,429	61
Woman is 3+ years older	380	9
Educational asymmetry [ave. cat. diff (std; range)]	2.19 (0.04; 0 to 3)	
Both low	818	16
Woman low/man high	307	7
Woman high/man low	717	18
Both high	2,204	59

Note: Ns are unweighted; means and percentages are weighted; std=standard deviation

*Relationship context variables (except relationship status) include women in rel. (n=4,046)

TABLE 2. Weighted Percentage Distribution of Contraception, Condom, and Dual Method Use By Factors in Fecund, Sexually Active Women (15-49 years), Brazil 2006

	Contraceptive Only	Condom Only	Dual Methods
100%	33% (N=2,056)	40% (N=2,321)	27% (N=1,640)
Socio-demographics			
Age (mean, SD) ***	29.6 (0.29)	28.7 (0.52)	26.0 (0.29)
Education (mean, SD) ***	8.3 (0.14)	8.8 (0.15)	9.2 (0.12)
Race *			
White	34	37	29
Black	32	42	25
Other	22	43	35
Religion **			
None	29	40	31
Catholic	35	37	28
Evangelical	32	46	22
Afro-religion or Other	20	45	34
Region ***			
North	23	57	20
Northeast	34	44	22
Southeast	29	41	30
South	42	27	31
Mid-West	36	38	27
Urban ***	31	41	28
No	42	33	25
Yes	31	41	28
Household wealth score**	0.0 (0.04)	0.1 (0.04)	0.2 (0.04)
Early Sexual Risk			
Risk sexual debut***			
No method	39	40	21
Contraceptive method only	41	36	23
Condom	25	41	34
Fertility			
Number of children***	1.4 (0.04)	1.0 (0.04)	1.0 (0.05)
Wants more children***			
Yes	27	41	31
No	38	38	24
Don't know	36	43	21
Relationship Context			
Relationship status (n=6,017)***			
Single	11	52	37
Separated	18	52	31
Civil union	42	32	26
Married	42	36	22
Age asymmetry [avg diff. (std)]***	neg 16.7 (0.38)	neg 17.4 (0.67)	neg 14.1 (0.43)
Woman is within 2 years*	41	31	28
Woman is 3+ years younger	42	35	23
Woman is 3+ years older	46	37	16
Educational assymetry [avg. cat. diff (std)]***	2.1 (0.05)	2.2 (0.08)	2.3 (0.05)
Both low*	50	34	16
Woman low/man high	44	34	22
Woman high/man low	47	28	26
Both high	38	36	26

*Relationship context variables (except relationship status) include women in civil union or married (n=4,046)

TABLE 3. Weighted Logistic Regression of Dual Method Use vs. Condom vs. Contraception in Fecund, Sexually Active Women (15-49 years), Brazil, 2006

	DM vs. Condom Only (N=3,961)		DM vs. Contra Only (N=3,696)		Condom vs. Contra Only (N=4,377)	
Odds Ratio [95% CI]	Model 1: Bivariate	Model 2: Full Model	Model 1: Bivariate	Model 2: Full Model	Model 1: Bivariate	Model 2: Full Model
Relationship Context †						
Relationship status						
Single…..……	1.147	0.774	6.343***	3.888***	5.528***	5.163***
	[0.80,1.64]	[0.53,1.12]	[4.26,9.45]	[2.56,5.92]	[3.59,8.51]	[3.35,7.96]
Separated……	0.962	0.994	3.339***	3.470***	3.469***	3.309***
	[0.66,1.40]	[0.67,1.47]	[2.09,5.34]	[2.16,5.58]	[2.25,5.34]	[2.14,5.13]
Civil union……	1.331	1.183	1.186	1.113	0.891	0.906
	[0.99,1.79]	[0.88,1.59]	[0.93,1.51]	[0.86,1.44]	[0.680,1.17]	[0.69,1.19]
Married……	ref.	ref.	ref.	ref.	ref.	ref.
Age asymmetry						
Woman is within 2 years…….	ref.	ref.	ref.	ref.	ref.	ref.
Woman is 3+ years younger..	0.700*	0.562***	0.764	0.716*	1.091	1.209
	[0.51,0.96]	[0.41,0.78]	[0.58,1.00]	[0.54,0.94]	[0.83,1.44]	[0.92,1.59]
Woman is 3+ years older……	0.477**	0.722	0.509**	0.655	1.068	0.854
	[0.29,0.79]	[0.43,1.21]	[0.56,0.87]	[0.41,1.05]	[0.70,1.63]	[0.55,1.32]
Educational asymmetry						
Both low……	ref.	ref.	ref.	ref.	ref.	ref.
Woman high/man low……	1.355	1.217	1.548	1.344	1.143	1.112
	[0.70,2.64]	[0.62,2.41]	[0.85,2.81]	[0.73,2.48]	[0.62,2.11]	[0.60,2.06]
Woman low/man high……	2.007*	1.429	1.725*	1.394	0.86	0.906
	[1.11,3.64]	[0.71,2.89]	[1.13,2.64]	[0.78,2.49]	[0.52,1.42]	[0.51,1.62]
Both high……	1.521	0.916	2.059***	1.502	1.354	1.406
	[0.90,2.56]	[0.46,1.82]	[1.44,2.95]	[0.85,2.66]	[0.87,2.12]	[0.75,2.64]

† Relationship context variables (except relationship status) include women in civil union or married (n=2,232 DM vs. Condom; N=2,771 DM vs. Contra; n=3,089)

TABLE 4. Weighted Logistic Regression of Dual Method (vs. Condom) Consistentcy in Fecund, Sexually Active Women (15-49 years), Brazil 2006

Odds Ratio [95% CI]	Model 1: Bivariate, Full Sample (N=3,961)	Model 2: Full Model, Full Sample (N=3,961)	Model 3: Bivariate, In Relationship (N=2,232)	Model 2: Full Model, In Relationship (N=2,232)
Condom use consistency				
No……	ref.	ref.	ref.	ref.
Yes……..……	0.238***	0.192***	0.124***	0.112***
	[0.18,0.31]	[0.15,0.25]	[0.09,0.17]	[0.08,0.16]

† Model 2 is controlled for with all variables and relationship status & Model 4 is controlled for with all variables and age and educational difference

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