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How Does Mass Media Exposure Affect Knowledge of Different Contraceptive Techniques Among Women in Brazil?

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Introduction

Various economic studies have examined the relationship between mass media exposure and contraceptive knowledge and use, but these studies have not examined the depth of contraceptive knowledge. Knowledge about contraception in general is an important point of study, but I am interested in how much women know about various contraceptive techniques. Do women know the range of options available to them and how does mass media affect this knowledge? In this paper I will examine this question in the context of Brazil.

Literature Review

Evidence from a number of studies suggests that increased mass media exposure leads to higher rates of contraceptive use (Gupta et al. 2003; McNay et al. 2003; Olaleye and Bankole 1994). McNay et al. (2003) study uneducated women in India and find that mass media exposure operates as a form of social learning whereby individuals acquire knowledge from an impersonal mass media source. Mass media thus acts as a channel of diffusion contributing to the increased use of contraception. The authors propose two mechanisms through which increased mass media exposure may lead to increased use of contraception. First, mass media may feature explicit family planning messages, influencing both knowledge of and preferences regarding contraception. Secondly, mass media may operate by exposing viewers to different lifestyles that value smaller family sizes.

Similar studies exist that examine the relationship between mass media exposure and fertility. One study in India considers how cable television affects women's preferences regarding fertility (Jensen and Oster 2007). The study suggests that cable viewers may change their fertility preferences when exposed through television to different lifestyles and increased information about the outside world. The study finds that with the introduction of cable

television, the yearly increase in the number of children or pregnancies decreases by 0.09. The study finds no significant relationship between cable television introduction and desired fertility. The study's findings may indicate an increase in birth spacing but not on the overall fertility rate.

Ferrara, Chong, and Duryea (2008) consider a type of mass media specific to Brazil: *novelas*, or Brazilian soap operas. The authors find that soap operas have contributed to the rapid decline in the fertility rate in Brazil over the past four decades. The dramatic drop in the fertility rate in Brazil is notable for being the only of its kind in the developing world. Though China has also experienced rapid decline in fertility in recent decades, this decline has been due to government policy aimed at population control. Brazil has had no such government policies. Rather, Brazil's ubiquitous *novelas* have spread throughout Brazil the image of the ideal family as white, urban, middle to upper middle class, and small. The authors find evidence suggesting that this has influenced fertility preferences among women in Brazil, contributing to stopping behavior rather than to delayed first births, a finding which makes sense given Brazil's steadily high adolescent fertility rate.

A number of studies examining the link between mass media exposure and contraceptive use do so in the context of national family planning policies (Gupta et al. 2003; Olaleye and Bankole 1994). One such study examines the effect of multimedia behavior change communication (BCC) campaigns in Uganda on rates of current contraceptive use and intention to begin contraceptive use within the next 12 months (Gupta et al. 2003). This study finds a statistically significant relationship between exposure to BCC messages and increased use of contraception as well as with intention to use contraception in the near future. Another study examines the adoption and current use of contraception in Ghana after the establishment of the Ghana National Family Planning Programme (Olaleye and Bankole 1994). Using data from the

1988 Ghana Demographic and Health Survey, the study examines two media-related explanatory variables of interest: (1) exposure to family planning messages in the media, and (2) women's views on the acceptability of family planning messages in the media. The study finds a positive relationship between both of these explanatory variables and current contraceptive use as well as with timing of adoption of contraception.

Cheng (2011) examines the effect of mass media in increasing contraceptive knowledge among women for a period during Taiwan's family planning program. The program used mass media such as radio, television, newspapers and movie-theater advertisements to educate people about contraceptive techniques. The study finds that women who were exposed to mass media regularly have greater contraceptive knowledge than women with less mass media exposure.

My paper will fill a hole in the literature by examining the effect of mass media exposure on knowledge of different methods of contraception. Though Cheng (2011) examines the effect of mass media on contraceptive knowledge, the study does so in the context of Taiwan's family planning program. Thus mass media content included explicit family planning messages promoted by the government. My paper will explore the role of mass media as a diffuser of popular culture, not as a vehicle for explicit family planning messages. My paper also considers the diversity of contraceptive options and the extent to which women in Brazil know about the range of options available.

Theory

Though little research has been done on factors affecting knowledge of multiple contraceptive techniques, some of the same factors that affect contraceptive use can be expected to affect contraceptive knowledge, a necessary precursor to use. I will use a supply and demand

framework to structure my theory. There are certain factors which theory tells us will affect either the supply or demand of contraceptive knowledge, or both.

I expect that geography plays a role in the supply of knowledge, with contraceptive knowledge being more readily available in urban areas than in rural areas with less globalized and more conservative cultures. Wide regional disparities exist in Brazil, with the Northeast region known for being among the least developed and having an adolescent fertility rate well above the national rate (Gupta 2000). Regional cultural and political differences may also cause contraceptive knowledge across regions to vary. I expect the Northeast to have the lowest average contraceptive knowledge and the more developed Southeast region to have the highest average contraceptive knowledge.

Networks play a role in determining the supply of knowledge. The first type of network I consider is a health network. I expect that women with greater access to health care will have greater contraceptive knowledge. With increased access to doctors, hospitals, and health coverage the supply of contraceptive knowledge available to women should increase. Social networks and personal relationships play an important role in increasing the supply of contraceptive knowledge available to women, as recognized by Cheng (2011). I expect that women who live in households with other women may know more about contraceptive techniques, as they are likely to share information amongst each other.

Behind the myth of Brazil as a "racial democracy" lies a Brazil plagued by structural racism. Brazilian society is still organized in a way so as to disadvantage people from certain racial or ethnic backgrounds, and I believe this may affect the supply of contraceptive knowledge for people of these racial or ethnic groups. My model will include a variable for race to take into

account structural advantages and disadvantages based on race not accounted for by the other variables in my model.

A different set of variables affect the demand for contraceptive knowledge, including relationship status and number of children. Ferrara, Chong, and Duryea (2008) include a dummy variable equal to one if a woman is married in their regression for fertility, and I suspect that a similar relationship may hold with respect to contraceptive knowledge. As the number of children a woman has increases, I expect that her demand for contraceptive knowledge will increase as she approaches a stopping age and no longer wishes to have more children. Even for women with some contraceptive knowledge already, these women may seek out new, more permanent contraceptive techniques such as sterilization or intra-uterine devices (IUDs). Stopping behavior is especially relevant in Brazil, where the rapid decline in fertility in recent decades can be attributed to stopping behavior and not to decreased adolescent fertility rates (Gupta 2000; Ferrara, Chong, and Duryea 2008).

Sexual orientation and choice of sexual partners may also affect the demand for contraceptive knowledge. Women who are not engaging in sex with men may have a lower demand for contraceptive techniques since they do not need to protect themselves from pregnancy. They do still have to protect themselves from sexually transmitted infections (STIs) and this may lead them to possess knowledge of a different set of sexual protection methods than heterosexual women.

A number of factors affect both the supply of and demand for contraceptive knowledge. Education affects the supply of contraceptive knowledge. Regardless of whether education includes a sexual education component, as women (and men) become more educated they should become increasingly equipped to seek out knowledge of various contraceptive techniques and

evaluate which ones will work best for them. Equipped with these new skills, women may also increase their demand for contraceptive knowledge.

Age and the number of years a woman has been sexually active may also affect both the supply of and demand for contraceptive knowledge. As age increases, the amount of information that a woman has been exposed to in her daily life increases, potentially increasing her supply of contraceptive knowledge. As women age, their demand for contraceptive knowledge may also increase as they reach a stopping age and seek out techniques for avoiding pregnancy. As the number of years that a woman has been sexually active increases, I expect that the supply of contraceptive knowledge she has come into contact with will increase. I also expect that her demand for contraceptive knowledge will increase as she may seek out alternative methods that are more conducive to her lifestyle or more effective.

Religion may also affect contraceptive knowledge, especially in a highly Catholic country such as Brazil. Ferrara, Chong, and Duryea (2008) include a dummy variable equal to one if a woman is Catholic in their analysis of fertility in Brazil. I expect that Catholicism will decrease the supply of contraceptive knowledge. Because of the Catholic Church's teachings, I believe Catholicism may also decrease the demand for contraceptive knowledge.

Income affects the supply and demand sides of the contraceptive knowledge equation. Women with higher incomes have access to more resources for learning about different contraceptive techniques, increasing supply. These women may also have a higher demand for contraceptive knowledge since they have the disposable income to choose more expensive techniques. Inability to pay for expensive contraceptive techniques may discourage women with lower incomes from seeking out alternative techniques.

To this existing theory, I add my hypothesis that mass media has an effect on the level of contraceptive knowledge by affecting both the supply of and demand for such knowledge. Mass media affects the supply of contraceptive knowledge by acting as a provider of knowledge in society and as a vehicle for advertising messages by producers of contraceptives. Thus, my equation for the supply of contraceptive knowledge is:

$$P^s = \alpha_0 + \alpha_1 Urban + \alpha_2 Region + \alpha_3 HealthPlan + \alpha_4 WomenInHousehold + \alpha_5 Race + \alpha_6 Education + \alpha_7 Age + \alpha_8 YearsSexuallyActive + \alpha_9 Religion + \alpha_{10} Income + \alpha_{11} MassMedia + \alpha_{12} Q^s$$

Mass media exposure also affects the demand for contraceptive knowledge by individual women. Mass media exposes women to different lifestyles, values, and portrayals of the ideal family size than the Brazilian reality. The small family sizes portrayed on television may lead to increased demand among women for contraceptive knowledge as they seek to conform to this smaller, idealized family size. My equation for the demand of contraceptive knowledge is:

$$P^d = \beta_0 + \beta_1 Children + \beta_2 Relationship + \beta_3 SexualOrientation + \beta_4 Education + \beta_5 Age + \beta_6 YearsSexuallyActive + \beta_7 Religion + \beta_8 Income + \beta_9 MassMedia + \beta_{10} Q^d$$

These equations for the supply and demand of contraceptive knowledge are the structural equations that form the basis of my theoretical framework. What we actually observe in reality is the equilibrium point between these two equations for each woman, which represents her individual level of contraceptive knowledge. At this equilibrium point, $P^s = P^d = P$ and $Q^s = Q^d = Q$. Setting the two above equations equal to one another, I solve for Q to derive my guiding equation:

$$Q = \gamma_0 + \gamma_1 Urban + \gamma_2 Region + \gamma_3 Health + \gamma_4 WomenInHousehold + \gamma_5 Race + \gamma_6 Education + \gamma_7 Age + \gamma_8 YearsSexuallyActive + \gamma_9 Religion + \gamma_{10} Income + \gamma_{11} Children + \gamma_{12} \text{Re} lationship + \gamma_{13} SexualOrientation + \gamma_{14} MassMedia$$

The coefficients in this equation represent the observable reduced form parameters, gammas (γ), which are determined by the deep parameters, alphas (α) and betas (β), from the supply and demand equations. In the context of this paper, we are concerned with the coefficient on the mass media variable, where:

$$\gamma_{14} = \frac{\beta_9 - \alpha_{11}}{\alpha_{12} - \beta_{10}}$$

Summary Statistics

I will use cross-sectional data from the 2006 *Pesquisa Nacional de Demografia e Saúde da Criança e da Mulher* (National Demographic Study on Children's and Women's Health). Conducted nationally in Brazil in 1986, 1996 and 2006, the study is financed by the Ministry of Health and coordinated by the Population and Society team of the Brazilian Center of Analysis and Planning. The study, representative of the country as a whole, was carried out in five macro-regions including both urban and rural areas. The team interviewed a total of 15,575 women. My analysis is based on the 12,355 observations for which answers to all questions relating to my variables were recorded.

Recall from the theory section that the guiding equation for my analysis is:

$$Contraceptive\ Knowledge_i = \alpha_0 + \gamma_1\ Mass\ Media\ Exposure_i + \gamma_2\ Education_i + \gamma_3\ Income_i$$

$$+ \gamma_4 Age_i + \gamma_5 Religion_i + \gamma_6 Healthcare_i + \gamma_7 Urban_i + \gamma_8 Region_i + \gamma_9 Years\ Sexually\ Active_i + \gamma_{10} Relationship_i + \gamma_{11} Sexual\ Orientation_i + \gamma_{12} Other\ Women\ in\ Household_i + \gamma_{13} Children_i + \gamma_{14} Race_i + \varepsilon_i$$

The study team conducted interviews with women between the ages of 15 and 49. The interview includes sections on characteristics of the woman, reproduction, contraception, access to medication, pregnancy and childbirth, vaccination and health, marriage and sexual activity, fertility planning, characteristics of spouse and woman's work, and anthropometric measures. The contraception section of the survey asks women if they know of, have heard of, have used, or are using fourteen different contraceptive methods: female sterilization, vasectomy, the pill, intrauterine devices (IUDs), injections, Norplant (implant), male condoms, female condoms, diaphragms, vaginal cream, abstinence while ovulating, pulling out, the morning after pill (Plan B), and other methods. In my research, I am interested in whether the women know of these different techniques. I thus construct my response variable, Number of Methods Known, by summing the total number of methods each individual woman knows. Table 1 displays the breakdown of contraceptive knowledge among the women included in my analysis. Male Sterilization is the most-known method, followed by female sterilization, pulling out, and the female condom. Figure 1 displays a graph of the roughly normal distribution of Number of Methods Known. Most women in my sample know between 6 and 8 contraceptive methods.

My independent variable of interest, mass media exposure, consists of three types of exposure: reading the newspaper or magazine, listening to the radio, and watching television. The survey asks women whether they do each of these every day, almost every day, at least once a week, less than once a month, or not at all. Table 2 displays the summary statistics for the

mass media variables. The levels of the mass media variables are mutually exclusive, so I will include all levels of the variables in my analysis without repeating women.

Table 3 displays summary statistics for the remaining, control variables. Income comes from a question on the survey asking the household's gross income in the last month and is recorded in reais (R$). Women in the study range between 15 and 49 years old, with a mean age of 33 in my data. Health Plan is a dummy variable for which a value of one represents that the woman has a health plan or health insurance. For education I will use the number of years of education a woman has had. Using the woman's age and the age at which she first engaged in sex, I construct a variable for the number of years each woman has been sexually active.

The survey asks women whether they are formally married, in a relationship with a man or woman, or not in a relationship. I include this as a categorical variable with three levels in my analysis: single, in a relationship, and married. Because of the way the data are coded, it is not possible to tell whether women who are in relationships are in relationships with men or women. The survey does not ask women for their sexual orientation, so I am not able to include this variable in my model. Sexual orientation is the only variable from my guiding equation for which I do not have data. The survey records the number of eligible women, meaning between the ages of 15 and 49, in the household. I subtract one from this number to create a variable for the number of other women in the household. I include a variable for the number of children each woman has given birth to who are still alive.

Urban is a dummy for which a value of one represents that the woman currently lives in an urban area. The study also divides the country into five commonly used macro-regions: North, Northeast, South, Southeast, and Center. I include region as a multi-level categorical variable.

The survey asks respondents to self-identify their skin color given the following choices: amarela (yellow), branca (white), indígena (indigenous), parda (mixed), preta (black), and don't know. I maintain the Portuguese terminology as well as a literal English translation in parentheses because the Brazilian classification of skin color is unique and the same classification system would not be used in English. I include race as a multi-level categorical variable.

I include religion as a dummy variable with four main levels: Afro-Brazilian religion, Catholic, Spiritual, and Evangelical. Women also had the option to answer "no religion" or "other religion".

Analysis

Estimation Issues

Because I have cross-sectional data, I am worried about multicollinearity and heteroskedasticity in my data. Age and Years Sexually Active exhibit strong multicollinearity, with a correlation coefficient of above 0.9. The VIF for both of these variables is also above 5, indicating multicollinearity. This is due to the limited variation in starting age among women. Over fifty percent of the women in my sample first had sex between the ages of 15 and 18. To resolve this estimation issue, I drop Years Sexually Active as a variable from my model. I believe that age is a more important determinant of contraceptive knowledge than years sexually active because women can learn about contraception before they become sexually active.

I test for heteroskedasticity using the Breusch-Pagan / Cook-Weisberg test. This test returns a P-value (prob > chi2) of 0.0037, below 0.05, thus I reject the null hypothesis of homoscedasticity and conclude that I do have heteroskedasticity in my data. To remedy this, I use the robust option when running my regressions.

Main Results

Table 4 displays the main results of my analysis. For my mass media variables, the omitted reference level is not reading the newspaper / not listening to the radio / not watching television. As expected, all the mass media coefficients are positive. All four levels of reading the newspaper/magazine are statistically significant at the one percent level. Three levels of watching television (at least once a week, almost every day, and every day) are statistically significant at the one percent level. None of the levels of listening to the radio are statistically significant beyond the ten percent level. These results suggest that exposure to the newspaper, magazines, and television increases contraceptive knowledge among women in Brazil.

To check whether the mass media variables as a whole have an impact on contraceptive knowledge, I use a series of F-Tests that test the significance of a set of dummy variables. I run four F-Tests in all: (1) for all levels of reading the newspaper/magazine, (2) for all levels of listening to the radio, (3) for all levels of watching TV, and (4) for all levels of all my mass media variables. For all except the second F-Test, the p-value is below 0.05 and I reject the null hypothesis. I conclude that reading the newspaper/magazine, watching TV, and mass media exposure in general (as measured by all three media forms) impact contraceptive knowledge, while listening to the radio does not have an overall impact.

A number of the control variables in the model are statistically significant. Age is positive and statistically significant at the one percent level. This could suggest that a woman's contraceptive knowledge tends to increase as she gets older. Since this is cross-sectional data, this coefficient could also represent generational differences in contraceptive knowledge that have to do with different cultural contexts over time. For example, the positive coefficient on age could represent that older women grew up in a more liberal society in which discussions of

contraception were more widespread. Given that Brazilian society is becoming less conservative over time, I favor the first interpretation of the age coefficient.

Some geographic variables also prove to have significant effects on contraceptive knowledge. The coefficient on the urban dummy is positive and significant, implying that women living in urban areas have greater contraceptive knowledge than those in rural areas. I include all five levels of region in my regression and use the average as the reference level. Both the Northeastern and the Southern regions are statistically significantly lower than the average. Contraceptive knowledge in the Central and Northern regions is statistically significantly higher than the national average.

The coefficient on Years of Education is also positive and statistically significant, confirming my theory's assertion that increases in education are associated with increased levels of contraceptive knowledge. Women in relationships, but not married, have statistically significantly higher contraceptive knowledge than single women, who were used as the reference level for In a Relationship and Married.

Number of Other Women in the Household and Number of Children are statistically significant but the signs are negative, not positive as I had expected. I am worried about potential endogeneity with Number of Children. The negative coefficient in my main results could indicate that women with more contraceptive knowledge have fewer children as they are more informed on preventing pregnancy. I will address this further in my robustness section.

None of the levels of the religion variable are statistically significantly different from the omitted reference level of no religion. The omitted reference level for skin color / race is *Branca* (White). Contraceptive knowledge for *Amarela* (Yellow) is statistically significantly higher than for *Branca* (White). The coefficient on *Preta* (Black) is negative, but only significant at the ten

percent level. The coefficient for women who declined to identify their skin color is negative and significant at the one percent level. I suspect this may be due to women who have experienced discrimination based on their skin color not wishing to identify this characteristic to interviewers. If so, this could suggest that structural racism does affect the supply of contraceptive knowledge, but we cannot tell given the available data. This could be a potentially fruitful avenue for future research.

Robustness

Table 5 displays the regression results from my first round of robustness analysis. Regression (i) displays the main results again. In the next three regressions, I included only one type of mass media exposure to see what the effect on the coefficients of that mass media variable is. When I include only reading the newspaper or magazines (ii), the coefficients on all four of the levels increase slightly but there is no change in statistical significance. When I include only listening to the radio (iii), the coefficient estimates increase slightly and listening to the radio every day becomes statistically significant at the one percent level. When I include only watching television, the coefficient estimates increase slightly but there is no change in statistical significance.

Next, I see if omitting skin color (v) or religion (vi) from my regression has any effect on the coefficients of my mass media variables. I find no significant changes in either case. Finally, I repeat my regression for two different age groups. The first group is a subset of women between the ages of 15 and 30 containing 6,250 observations. For these women, reading the newspaper/magazine almost every day and every day are not statistically significant. Listening to the radio every day becomes statistically significant for this group. The second group is a subset of women between the ages of 31 and 49 containing 6,105 observations. For

these women, all four levels of reading the newspaper/magazines remain statistically significant, as do the three levels of watching television that were statistically significant in the main results. In general, reading the newspaper/magazine has a greater impact on contraceptive knowledge for women over 30 while watching TV has roughly the same impact across age groups.

Table 6 displays a series of robustness checks by geographic location. I run the regression individually for each of the regions to see if certain types of mass media have greater effects on contraceptive knowledge in certain regions. I find that reading the newspaper/magazine has the greatest effect in the Northern region of Brazil, while watching TV appears to have the greatest effect in the Southeastern and Southern regions. Watching TV is the only significant mass media variable in the Northeastern and Southeastern regions. None of the regions show a statistically significant impact of listening to the radio. Differences also emerge when examining urban and rural areas separately. In urban areas, reading the newspaper/magazines has a greater effect on contraceptive knowledge than in the rural areas. Watching TV has a statistically significant and roughly equivalent effect in both urban and rural areas. For the rural subset, the coefficients on the radio variables are greater and listening to the radio every day becomes statistically significant at the five percent level.

Finally, I do one last robustness check excluding Number of Children from my regression. Because I am worried about potential endogeneity with Number of Children, I am worried that my coefficients may be biased. Thus, I compare the regression with Number of Children in the regression, the same as my main results, and then without Number of Children in the regression. Table 7 displays the results of these two regressions, with the differences bolded in the second regression. Overall, when I drop Number of Children from the model, the magnitude of the significant mass media variables increases slightly. The only change in

significance among the mass media variables is that listening to the radio every day becomes significant at the five percent level. The only variable that changes signs when I take out Number of Children is Health Plan, which changes from positive to negative but is not statistically significant in either the main results or the new regression. Throughout all of my robustness analysis, the statistically significant coefficients are all positive, indicating that mass media exposure has a positive effect on contraceptive knowledge.

Conclusion

I find evidence suggesting that mass media exposure contributes to increased contraceptive knowledge among women in Brazil. My results are robust to a large number of conditions, including media type, geographic features, and age group. My paper begins to fill a hole in the literature regarding the effect of mass media exposure on the volume of contraceptive knowledge. Further research could examine contraceptive methods individually to see if different kinds of media affect knowledge of different contraceptive techniques differently. For example, how do the three types of media used in this study affect knowledge of female sterilization? A valuable continuation of the work begun in this paper would be to examine whether knowledge of a wider range of contraceptive techniques leads to higher contraceptive use.

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Tables and Figures

Table 1. Contraceptive Knowledge

Contraceptive Technique	Number of Women	Percentage of Women
Vasectomy (Male Sterilization)	9852	79.7%
Female Sterilization	9348	75.7%
Pulling Out	9214	74.6%
Female Condom	8919	72.2%
Plan B	8661	70.1%
Periodic Abstinence	8243	66.7%
Injections	7744	62.7%
Diaphragm	5840	47.3%
Intra-Uterine Device (IUD)	5176	41.9%
Implant	3472	28.1%
Vaginal Cream	3255	26.3%
Male Condom	1502	12.2%
The Pill	841	6.8%
Other Methods	12	0.1%

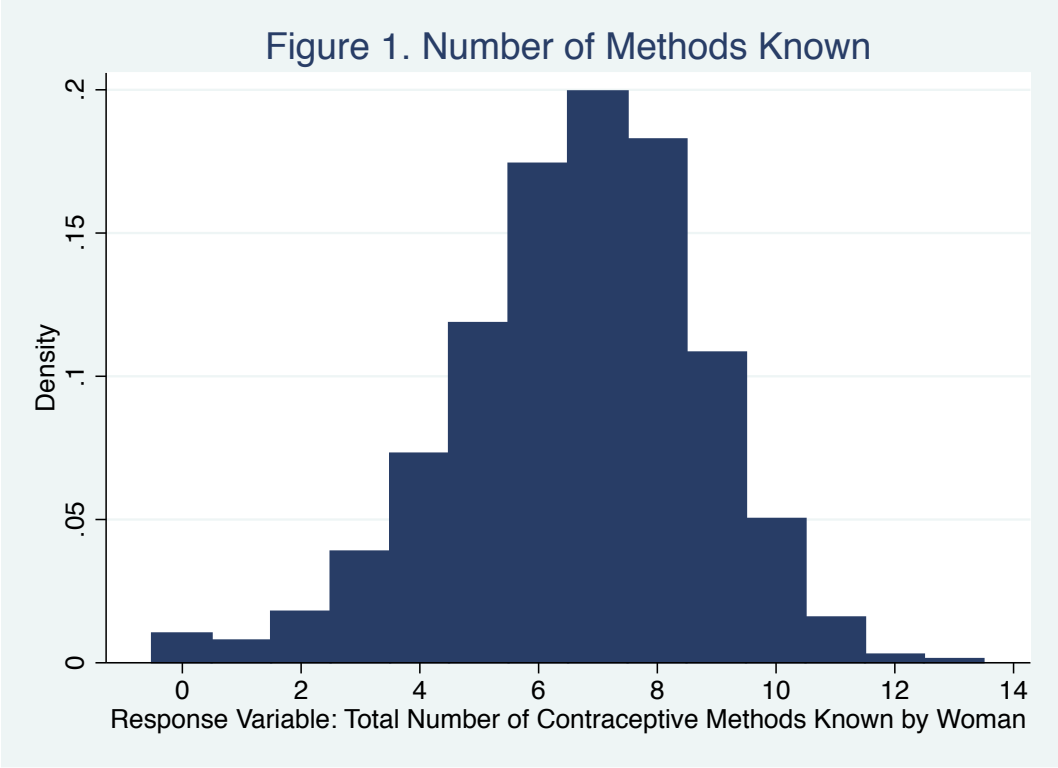

Table 2. Summary Statistics for Mass Media Variables

Independent Variable	Mean	Standard Deviation
Don't Read Newspaper of Magazine	0.323	0.468
Read Less Than Once a Month	0.200	0.400
Read At Least Once a Week	0.239	0.427
Read Almost Every Day	0.138	0.344
Read Every Day	0.100	0.301
Don't Listen to the Radio	0.157	0.364
Listen Less Than Once a Month	0.047	0.212
Listen At Least Once a Week	0.130	0.337
Listen Almost Every Day	0.155	0.362
Listen Every Day	0.510	0.500
Don't Watch TV	0.046	0.210
Watch Less Than Once a Month	0.009	0.094
Watch At Least Once a Week	0.044	0.205
Watch Almost Every Day	0.092	0.289
Watch Every Day	0.809	0.393

Observations: 12355

Table 3. Summary Statistics for Control Variables

Independent Variable	Mean	Std. Dev.	Min	Max
Household Income (R$)	1190	1848	0	50000
Age	30.9	9.7	15	49
Health Plan	0.229	0.420	0	1
Years of Education	8.83	4.25	1	18
Years Sexually Active	13.04	9.31	0	37
Single	0.343	0.475	0	1
In a Relationship	0.289	0.453	0	1
Married	0.368	0.482	0	1
Number of Other Women in Household	0.49	0.76	0	5
Number of Children	1.74	1.72	0	14
Urban	0.719	0.449	0	1
Central Region	0.204	0.403	0	1
Northeastern Region	0.200	0.400	0	1
Northern Region	0.187	0.390	0	1
Southeastern Region	0.207	0.405	0	1
Southern Region	0.203	0.402	0	1
Skin: Amarela (Yellow)	0.028	0.166	0	1
Skin: Branca (White)	0.380	0.485	0	1
Skin: Indígena (Indigenous)	0.022	0.146	0	1
Skin: Don't Know	0.006	0.077	0	1
Skin: Parda (Mixed)	0.467	0.499	0	1
Skin: Preta (Black)	0.096	0.294	0	1
Afro-Brazilian Religion	0.003	0.058	0	1
Catholic	0.654	0.476	0	1
Spiritual	0.029	0.167	0	1
Evangelical	0.223	0.416	0	1
No Religion	0.074	0.261	0	1
Other Religion	0.017	0.129	0	1

Observations: 12355

Table 4. Main Results

Independent Variable		Independent Variable		Independent Variable	
Read Newspaper/Magazine Less Than Once a Month	0.223***	Health Plan	-0.00394	Skin: Don't Know	-0.473*
	(0.052)		(0.051)		(0.246)
Read At Least Once a Week	0.272***	Urban	0.247***	Skin: Parda (Mixed)	-0.0558
	(0.052)		(0.045)		(0.044)
Read Almost Every Day	0.178***	Central Region	0.0970**	Skin: Preta (Black)	-0.114*
	(0.063)		(0.038)		(0.067)
Read Every Day	0.153**	Northeastern Region	-0.109***	Skin: Denied to Answer	-0.887***
	(0.077)		(0.036)		(0.293)
Listen to Radio Less Than Once a Month	0.0613	Northern Region	0.142***	Skin: No Answer	-0.911
	(0.099)		(0.039)		(0.795)
Listen At Least Once a Week	0.0408	Southeastern Region	0.0169	Religion: Afro-Brazilian	0.0536
	(0.068)		(0.038)		(0.287)
Listen Almost Every Day	0.0255	Southern Region	-0.139***	Religion: Catholic	-0.0178
	(0.066)		(0.040)		(0.070)
Listen Every Day	0.101*	Years of Education	0.0852***	Religion: Spiritual	-0.18
	(0.054)		(0.006)		(0.126)
Watch TV Less Than Once a Month	0.332	In a Relationship	0.169***	Religion: Evangelical	0.0241
	(0.259)		(0.052)		(0.078)
Watch At Least Once a Week	0.648***	Married	0.0654	Religion: Don't Know	-0.284
	(0.126)		(0.051)		(0.529)
Watch Almost Every Day	0.592***	Number of Other Women in Household	-0.0678**	Religion: Other	0.0563
	(0.108)		(0.026)		(0.157)
Watch Every Day	0.677***	Number of Children	-0.0984***	Religion: No Answer	-0.157
	(0.092)		(0.015)		(0.797)
Household Income (R$)	-1.52E-05	Skin: Amarela (Yellow)	0.285**	Constant	4.136***
	(0.000)		(0.116)		(0.144)
Age	0.0301***	Skin: Indígena (Indigenous)	-0.144		
	(0.003)		(0.135)		
Observations	12,355	Robust Standard Errors in Parentheses			
R-squared	0.0773	*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level			

Table 5. Robustness Analysis

	Regression Coefficients							
Independent Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Read Newspaper/Magazine Less Than Once a Month	0.223***	0.243***	.	.	0.222***	0.223***	0.165**	0.270***
	(0.052)	(0.052)	.	.	(0.053)	(0.052)	(0.074)	(0.074)
Read At Least Once a Week	0.272***	0.298***	.	.	0.272***	0.272***	0.163**	0.410***
	(0.052)	(0.052)	.	.	(0.052)	(0.052)	(0.071)	(0.076)
Read Almost Every Day	0.178***	0.205***	.	.	0.175***	0.178***	0.135	0.246***
	(0.063)	(0.063)	.	.	(0.063)	(0.063)	(0.086)	(0.094)
Read Every Day	0.153**	0.185**	.	.	0.154**	0.153**	0.0155	0.313***
	(0.077)	(0.077)	.	.	(0.077)	(0.077)	(0.112)	(0.106)
Listen to Radio Less Than Once a Month	0.0613	.	0.115	.	0.0555	0.0599	0.0332	0.0529
	(0.099)	.	(0.099)	.	(0.099)	(0.099)	(0.141)	(0.137)
Listen At Least Once a Week	0.0408	.	0.106	.	0.0392	0.0406	-0.0577	0.0837
	(0.068)	.	(0.068)	.	(0.068)	(0.068)	(0.100)	(0.092)
Listen Almost Every Day	0.0255	.	0.0882	.	0.0201	0.0239	0.104	-0.0692
	(0.066)	.	(0.066)	.	(0.066)	(0.066)	(0.095)	(0.092)
Listen Every Day	0.101*	.	0.172***	.	0.0975*	0.0975*	0.196**	-0.00109
	(0.054)	.	(0.054)	.	(0.054)	(0.054)	(0.078)	(0.076)
Watch TV Less Than Once a Month	0.332	.	.	0.338	0.352	0.32	0.141	0.569
	(0.259)	.	.	(0.261)	(0.259)	(0.259)	(0.364)	(0.364)
Watch At Least Once a Week	0.648***	.	.	0.660***	0.651***	0.643***	0.660***	0.576***
	(0.126)	.	.	(0.126)	(0.126)	(0.126)	(0.174)	(0.181)
Watch Almost Every Day	0.592***	.	.	0.604***	0.592***	0.586***	0.497***	0.628***
	(0.108)	.	.	(0.108)	(0.108)	(0.108)	(0.153)	(0.152)
Watch Every Day	0.677***	.	.	0.707***	0.681***	0.668***	0.593***	0.695***
	(0.092)	.	.	(0.092)	(0.092)	(0.091)	(0.127)	(0.132)
Observations	12,355	12,355	12,355	12,355	12,355	12,355	6,250	6,105
R-squared	0.0773	0.0724	0.0703	0.0744	0.0759	0.0771	0.0916	0.0760

Robust standard errors in parentheses
*** Significant at the 1% level, ** significant at the 5% level,
* significant at the 10% level
Note: (i) main results, (ii) only media newspaper/magazine, (iii) only media radio, (iv) only media TV, (v) without skin color, (vi) without religion, (vii) younger age subset, (viii) older age subset

Table 6. Robustness By Geography

	Regression Coefficients							
Independent Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Read Newspaper/Magazine Less Than Once a Month	0.223***	0.266**	0.173*	0.405***	0.0206	0.246*	0.226***	0.198**
	(0.052)	(0.117)	(0.103)	(0.115)	(0.126)	(0.128)	(0.064)	(0.091)
Read At Least Once a Week	0.272***	0.334***	0.202*	0.336***	0.210*	0.291**	0.306***	0.207**
	(0.052)	(0.122)	(0.109)	(0.118)	(0.120)	(0.117)	(0.062)	(0.099)
Read Almost Every Day	0.178***	0.125	0.11	0.497***	0.147	0.0233	0.222***	0.0985
	(0.063)	(0.149)	(0.134)	(0.148)	(0.134)	(0.143)	(0.072)	(0.141)
Read Every Day	0.153**	0.00192	-0.0844	0.481***	-0.158	0.463***	0.240***	-0.22
	(0.077)	(0.188)	(0.178)	(0.174)	(0.179)	(0.146)	(0.083)	(0.235)
Listen to Radio Less Than Once a Month	0.0613	0.00467	-0.095	0.154	-0.152	0.211	-0.00822	0.234
	(0.099)	(0.210)	(0.213)	(0.194)	(0.261)	(0.250)	(0.109)	(0.239)
Listen At Least Once a Week	0.0408	0.0197	-0.126	0.236*	0.0496	-0.0546	0.0058	0.124
	(0.068)	(0.155)	(0.146)	(0.137)	(0.158)	(0.174)	(0.078)	(0.145)
Listen Almost Every Day	0.0255	-0.113	-0.046	0.125	0.0491	0.0614	0.00519	0.0462
	(0.066)	(0.154)	(0.142)	(0.132)	(0.143)	(0.178)	(0.078)	(0.124)
Listen Every Day	0.101*	0.000402	0.0601	0.151	0.123	0.126	0.0482	0.216**
	(0.054)	(0.120)	(0.118)	(0.109)	(0.123)	(0.146)	(0.064)	(0.102)
Watch TV Less Than Once a Month	0.332	-0.827	0.0272	0.579	0.135	1.149*	0.233	0.39
	(0.259)	(0.834)	(0.460)	(0.443)	(0.585)	(0.630)	(0.329)	(0.427)
Watch At Least Once a Week	0.648***	0.550*	0.599**	0.383	0.822***	0.678**	0.573***	0.540***
	(0.126)	(0.320)	(0.257)	(0.243)	(0.284)	(0.315)	(0.168)	(0.199)
Watch Almost Every Day	0.592***	0.559**	0.247	0.347*	0.590**	0.935***	0.467***	0.595***
	(0.108)	(0.254)	(0.231)	(0.200)	(0.245)	(0.281)	(0.147)	(0.171)
Watch Every Day	0.677***	0.510**	0.634***	0.313*	0.737***	0.882***	0.568***	0.569***
	(0.092)	(0.218)	(0.191)	(0.169)	(0.210)	(0.246)	(0.132)	(0.129)
Observations	12,355	2,518	2,472	2,308	2,555	2,502	8,887	3,468
R-squared	0.0773	0.047	0.086	0.205	0.049	0.088	0.058	0.0999

Robust Standard Errors in Parentheses

*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level

note: (i) Main Results, (ii) Central Region, (iii) Northeastern Region, (iv) Northern Region, (v) Southeastern Region, (vi) Southern Region, (vii) Urban Only, (viii) Rural Only

Table 7. Excluding Number of Children

Independent Variable	Main Results	Without Children	Independent Variable	Main Results	Without Children
Read Newspaper/Magazine Less Than Once a Month	0.223***	**0.228*** **	Health Plan	-0.00394	0.0087
	(0.052)	(0.053)		(0.051)	(0.051)
Read At Least Once a Week	0.272***	**0.283*** **	Urban	0.247***	**0.256*** **
	(0.052)	(0.052)		(0.045)	(0.045)
Read Almost Every Day	0.178***	**0.189*** **	Central Region	0.0970**	**0.0985*** **
	(0.063)	(0.063)		(0.038)	(0.038)
Read Every Day	0.153**	**0.159** **	Northeastern Region	-0.109***	-0.108***
	(0.077)	(0.077)		(0.036)	(0.036)
Listen to Radio Less Than Once a Month	0.0613	0.0789	Northern Region	0.142***	**0.110*** **
	(0.099)	(0.099)		(0.039)	(0.039)
Listen At Least Once a Week	0.0408	0.0616	Southeastern Region	0.0169	0.0294
	(0.068)	(0.068)		(0.038)	(0.038)
Listen Almost Every Day	0.0255	0.0445	Southern Region	-0.139***	**-0.124*** **
	(0.066)	(0.066)		(0.040)	(0.040)
Listen Every Day	0.101*	**0.119** **	Years of Education	0.0852***	**0.0955*** **
	(0.054)	(0.054)		(0.006)	(0.006)
Watch TV Less Than Once a Month	0.332	0.338	In a Relationship	0.169***	**0.0943** *
	(0.259)	(0.262)		(0.052)	(0.051)
Watch At Least Once a Week	0.648***	**0.667*** **	Married	0.0654	0.00232
	(0.126)	(0.126)		(0.051)	(0.051)
Watch Almost Every Day	0.592***	**0.619*** **	Number of Other Women in Household	-0.0678**	**-0.0787*** **
	(0.108)	(0.108)		(0.026)	(0.027)
Watch Every Day	0.677***	**0.710*** **	Number of Children	-0.0984***	.
	(0.092)	(0.092)		(0.015)	.
Household Income (R$)	-1.52E-05	-1.38E-05	Constant	4.136***	4.114***
	(0.000)	(0.000)		(0.144)	(0.144)
Age	0.0301***	**0.0220*** **			
	(0.003)	(0.002)			
Observations	12,355	12,355			
R-squared	0.0773	0.0738			

Robust Standard Errors in Parentheses
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level