Longitudinal Patterns of Consistent Contraceptive Use: Preliminary Findings from the Continuity and Change in Contraceptive Use Study

Introduction

Contraception is a key strategy adopted by women and couples in order to control their fertility and prevent unintended pregnancies. In turn, numerous social scientific studies have examined contraceptive use, many of them with the goal of understanding nonuse and inconsistent use of methods. But most of these studies use cross-sectional data, and the factors affecting contraceptive use—interpersonal relationships, disruptive events, the desire to have children—are dynamic and can change even over a short period of time. Using data from an ongoing longitudinal national study of women, this paper examines factors associated with consistent contraceptive use over a six month time period as well as factors associated with movement from consistent to inconsistent use.

Methods

Data for this analysis come from the first two waves of the Continuity and Change in Contraceptive Use study, administered online to a national sample of women aged 18-39. We opted for online administration because it is the most efficient way to collect information from large, national samples as the changing dynamics of home and cell phone use have made phone surveys less representative (Kempf and Remington 2007). We subcontracted with GfK (formerly Knowledge Networks) to administer the survey using their KnowledgePanel, a national household panel recruited using a probability-based methodology. The panel totals approximately 50,000 individual household members older than 13 and is representative of the U.S. population. GfK uses address-based sampling to recruit panel members; if a household invited to participate in the panel lacks a computer or Internet access, GfK provides them free of charge.

The survey instruments contained approximately 60 questions covering four broad areas: romantic relationships, pregnancy intentions and attitudes, sex and contraception and health care. In order to identify women likely to be at risk of pregnancy, our baseline survey population was restricted to women aged 18-39 who had ever had vaginal sex with a man, were not currently pregnant, had not had a tubal ligation and whose main sexual partner had not had a vasectomy. Over a three week period in November and December of 2012, 11,365 women between the ages of 18-39 were invited to participate in the survey. Of those, 6,658 answered the four screening items yielding a response rate of 59%; 4,647 of those were eligible to participate, and 4,643 eligible respondents completed the full survey. Over a three week period in May and June of 2013 baseline respondents were invited to participate in a follow up survey; 3,207 did so for a follow up response rate of 69%.¹ For both waves, respondents could choose whether to take the survey in English or Spanish and received \$10 remuneration. GfK obtains informed consent from all individuals prior to including them in their panel; because we did not obtain any identifying information from respondents (e.g., name, date of birth), we were able to obtain expedited approval from the Guttmacher Institute's Institutional Review Board.

Comparison of our baseline sample to a comparable group in the 2006-2010 NSFG (e.g, 18-39, sexually experienced, not currently pregnant, not sterilized and male partner not sterilized) showed that a higher proportion of women in our sample were married (48% vs 39%) and were high school graduates (94% vs 85%). Our sample resembled the NSFG on race and ethnicity and prior births, and there were only small differences according to age. These differences became somewhat more pronounced between Wave I and Wave II (see Background Table).

Measures. To measure contraceptive use, we adapted the strategy developed by Barber et al. for the Relationship Dynamics and Social Life Survey (Barber, Kusunoki, and Gatny 2011), asking about

¹ Subsequent surveys will be conducted in November and December 2013 and May and June of 2014.

hormonal and coital methods separately. All women in our sample were first asked if they had used any of six hormonal methods in the last 30 days--pill, patch, ring, Depo, the implant or the IUD--even if for reasons other than birth control--- and we also assessed consistency of use for each method.

Next, all respondents were asked if they had had vaginal sex with male partners in the last 30 days, and women who reported recent sexual activity were asked if they or their partner had used any of five coital methods: withdrawal/pulling out, condoms, NFP/calendar, spermicide or some other barrier method and vasectomy. We purposely placed withdrawal first on the list of barrier methods; some individuals do not consider withdrawal to be a "real" method (Jones, Fennel, Higgins and Blanchard, 2009), and we expected that this would result in more accurate reporting as. For each coital method reported, women were asked how often it was used in the last 30 days: every time, more than half, about half or less than half the time they had sex.

Our analysis incorporates several measures of contraceptive use. **Type of method** refers to any use of a method in the last 30 days, including dual or overlapping use of one or more methods (e.g., condoms and withdrawal). For each survey wave, we constructed a measure of **recent consistent use**. Women who reported using a hormonal or coital method perfectly in the last 30 days were considered to be consistent users, as were women who only missed one pill (or were one day late with the patch or ring) and those who reported missing 3 or fewer pills but also used a coital method. Women who used multiple coital methods in the last 30 days were considered consistent users if they reported use of methods in a way that suggested they were protect during every act of intercourse (e.g., reported using condoms more than half the time they had sex and reported using withdrawal more than half the time).

Based on this measure of recent consistent use, we examine whether women reported consistent use in the last 30 days at one, both, or neither Time 1 or Time 2. We refer to women who were not consistent users in either time period as "chronically inconsistent." A related measure is whether women's contraceptive use consistency was worse at Time 2 than Time 1—that is, did she shift from being a consistent user to inconsistent (or nonuser) at Time 2?

Our current analyses are limited to women who were sexually active at T1 and T2 (437 were not sexually active at either time and 482 were only sexually active at one), were not trying to get pregnant at either time (N=313), were not pregnant at T2 (N=166) and were not postpartum (N=19). These restrictions reduced the sample to 1,796 women. The data were weighted to account for the non-response bias of Wave 2 data due to sample attrition.

We examine bivariate associations between these outcome measures and the four domains of explanatory variables measured in the survey: relationships, pregnancy intentions and attitudes, sex and contraception and health care. In addition to exploring how baseline characteristics are associated with contraceptive consistency, we examine how *changes in* these characteristics are associated with *changes* in contraceptive use and consistency. Clearly, this makes a complicated set of analyses which we plan to further refine prior to PAA, including multivariate analysis. For now, we present a broad description of the bivariate associations we are exploring.

Findings

Contraceptive methods. The below focuses on ANY use of a method in the last 30 days (as opposed to most effective method, though the latter is shown in Table 1), as these measures reveal a substantial amount of overlapping or switching of methods within a 30-day time period. In both time periods, the pill was the most commonly used method (38%-40%) followed by condoms (33%-38%) and withdrawal (33%-34%).² Approximately one-quarter of all women at risk of unintended pregnancy were using a

² This is a substantially higher level of use of withdrawal than found on prior national surveys. We attribute this to the fact that we listed "withdrawal" first on the list of coital methods. We have a manuscript under review that examines this issue in some depth, and, for example, we found that the majority of women who reported that

hormonal and coital method, and 15%-16% used multiple barrier methods in the last 30 days. The majority of women were using the same method at T1 and T2, though there was some method switching and discontinuation. Use of the same method at both T1 and T2 was highest for users of long-acting reversible contraception (LARC) (88%) and the pill (85%). Users of other barrier methods and of no method did not account for many women in either time period, and these users were most likely to switch/discontinue between T1 and T2 (43%-53%). That "only" 66% of "dual" hormonal and coital users used these methods at both time periods could reflect relationship transitions, or transition from one method to another. That users of multiple barrier methods had one of the lowest levels of sustained use over time (48%) could also reflect transition to only one of the methods.

Contraceptive methods and consistency of use. Table 2a includes the two key measures of consistency of contraceptive use: consistent use of one or more methods in the last 30 days at T1 and T2 and movement from consistent to inconsistent (or nonuse). Some 79% of women used one or more methods consistently during both time periods, 15% were consistent at only one time and 6% were chronically inconsistent. Among the subset of the 94% of women who used a method consistently at T1 (N=1,559), there was a remarkably high rate of stability; only 10% of women used contraception consistently at T1 but not T2, and 90% used consistently at both times.

The cross tabulations reveal that several contraceptive methods and method dynamics were associated with consistency of use. Nearly all users of long-acting reversible methods at Time 1 were consistent users at both T1 and T2 (96%), more so than were women of all other methods combined (the comparison group, not shown), and a significantly lower proportion transitioned to worse use (4%) over the six month time period. Levels of consistent use were higher among T1 condom users (83%) than among those who used all other combined methods. Women who reported using both a hormonal and coital method in the last 30 days at T1 were more consistent users (88%), and virtually none were inconsistent users during both time periods. The opposite association was found for women/couples that used *only* coital methods at T1; a lower proportion used consistently, and higher proportion became worse users over time (13%).

Seven percent of women switched off a hormonal method between T1 and T2, and this group seemed particularly likely to be inconsistent users (68%) and to transition from being protected to being unprotected (27%). Women who started using a hormonal method between T1 and T2 were better off than those who stopped, comparable to non-hormonal users and worse of than those using a hormonal methods at both times.

When all methods—and not just hormonal ones—were taken into account, it appears that women who did not use the same method at T1 and T2 (including those who transitioned to/from using no method) were particularly likely to be an inconsistent users (52% and a higher proportion transitioned to worse use (34%). However, when women who were nonusers at T1 **OR** T2 were excluded (bottom rows), the patterns changed somewhat. Similar proportions of those who switched and those who did not were recent consistent users, though a slightly higher proportion of women/couples that used the same method used inconsistently during both time periods (3% vs 0%).

Demographics and consistency of use. Many of the baseline demographic characteristics were associated with both, and a few are worth noting (Table 2b). In regards to short and long-term consistent use women in the oldest age group had the highest levels of "chronically inconsistent" use (12%), but the relationship was reversed for worsening use, where a higher proportion of women in younger age groups transitioned from consistent to inconsistent or nonuse. Black women had lower levels of consistent use, but not higher levels of chronically inconsistent use. Instead, they seem to use more "sporadically" relative to women in all other racial and ethnic groups. Black women were two to

their partners used withdrawal in the last 30 days also reported use of one or more other methods, most commonly condoms or the pill.

four times more likely to transition from consistent to inconsistent use relative to other racial and ethnic groups.

Women who agree that "it doesn't matter whether I use birth control, when it is my time to get pregnant it will happen" had lower levels of consistent use, and 16% transitioned from consistent to inconsistent/nonuse. Recent exposure to more disruptive events at baseline was not associated with consistent use, but a higher proportion of women who had more problems at T2 compared to baseline transitioned to worse use.

Relationship characteristics and consistency of use. Most of the women in our restricted sample were married, cohabiting or dating at T1, though 3% were sexually active during both time periods and did not fit into any of these relationship categories (Table 2c). (These women are excluded from most of the subsequent cross tabulations as they were not asked about relationship dynamics.) We were surprised to find that only a few of the relationship characteristics (examined thus far) were associated with consistency of contraceptive use. Ten percent of women at T2 indicated it was somewhat to very likely that their current partner had had another romantic or sexual partner in the last six months, and higher proportions of this group were inconsistent users and transitioned to worse use.

Pregnancy attitudes and use patterns. In contrast to the relationship measures, we found evidence of many significant associations between our multiple measures of pregnancy intentions and attitudes and contraceptive consistency (Table 2d). Women who did not want (any more) kids at baseline had higher levels of consistent use, while women who expected to try in the future were less consistent users and a higher proportion transitioned to worse use. However, shifts in pregnancy intentions over time—which were not uncommon even among women who indicted they were not trying to get pregnant—were not associated with the two outcomes.

At baseline, one-third of women strongly agreed with the three pronatalist attitude items on the survey³, and higher proportions of this group were inconsistent users; changes in these attitudes were not associated with consistency of use.

A higher proportion of women who reported that they would be happy if they got pregnant were inconsistent users, and nearly one in five who used consistently at T1 were not doing so at T2. Changes in happiness were also associated with these outcomes; as women reported they would be less happy if they got pregnant, they reported more consistent use, and they were less likely to transition to worse use.

Women who reported at baseline that it was not important to avoid pregnancy had substantially higher levels of inconsistent use (46%), and one in five transitioned to worse use. Changes in pregnancy avoidance show some somewhat intuitive patterns. Women who had a change in pregnancy avoidance had lower levels of consistent use, and a higher proportion of women for whom it became less important to avoid pregnancy transitioned to worse use (17%) compared to women who had no change in attitudes (8%).

Finally, women's perceptions of their partners' pregnancy intentions were associated with all three measures and in the expected way.

Insurance and consistency of use. Women without health insurance at baseline had lower levels of consistent use and, in particular, 10% used inconsistently in both time periods (Table 2e). Seven percent of women experienced a change in their health insurance status over the six month time period; this group had higher levels of consistent use than those who were consistently uninsured but lower than those who were not.

³ "Being a mother and raising a child is the most fulfilling experience a woman can have;" "The rewards of being a parent are worth it, despite the cost and work it takes;" and "One of the best things about having a baby is that it gives you someone to love." The five response categories ranged from "strongly agree" to "strongly disagree."

Future analyses

In the coming months we will (1) finalize bivariate analyses, constructing additional variables that measure change over time, (2) conduct multivariate analyses to determine the relative importance of these characteristics and (3) gather Wave III data. In the future, we will make the data available for public use. This paper begins to demonstrate the rich array of measures available, and we hope it will spur thoughts of future research.

Conclusions

Our findings are too preliminary to determine which factors impact consistent contraceptive use over a 6-month time period. However, already we can show and consider the complexity and dynamic nature of sexual activity and contraceptive use patterns. Measuring contraceptive use, and determining who is at risk of unintended pregnancy, is not as straightforward as previously assumed. For example, even over a relatively short 30-day time period, one-third of women at risk of unintended pregnancy use more than one contraceptive method. While most women were using same methods at T1 and T2, substantial minorities were not, and future analyses will explore whether, and which groups of women, discontinued methods altogether, switched to another one and transitioned from using multiple methods to only using one. Our preliminary findings suggest that the emphasis that many researchers place on most effective method used (Dehlendorf et al. 2011; Frost and Darroch 2008; Rocca and Harper 2012; Santelli et al. 2008) is missing the dynamic nature of contraceptive use patterns and narrows our understanding of the factors associated with consistent use.

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Jennifer J. and Jacqueline E. Darroch. 2008. "Factors associated with contraceptive choice and inconsistent method use, United States, 2004," *Perspectives on Sexual and Reproductive Health* 40(2):94-104. *Reproductive Health* 43(3):181-187.

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Background Table. Sociodemographic profiles of
respondents in Wave I and Wave II

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Notes: Chi-square test between T1 v T2 subsample p value: <.05 *, <.01 **, <.001 ***

Table 1. Distribution of contraceptive use in the last 30 days by any use at T1 and T2, among women at risk of unintended pregnancy at T1 & T2⁺

	T1	T2	% using T1
Most effective method used			and T2
Male or female sterilization	NA	2	NA
LARC	16	16	88
Pill	40	37	85
Depo	4	5	76
Other hormonal	3	4	74
Condom	20	18	67
Withdrawal	12	12	71
Other barrier	1	1	42
No method	3	5	53

Any use of method in last 30 days

LARC	16	16	88
Pill	40	38	85
Depo	5	5	74
Other hormonal	4	4	71
Condom	38	33	71
Withdrawal	34	33	76
Other barrier	5	5	43
Sterilization (F or M)	na	2	na
No method	3	5	53
Hormonal and coital	27	23	66
Multiple coital	16	15	48
Unweighted N	1,796	1,796	1,796
	()		

[†]Refers to women who were (1) sexually active at both T1 and T2, (2) not trying to get pregnant at T1 or T2 and (3) not pregnant at T2 T2a. Cross tabulations of contraceptive consistency by select contraceptive method characteristics among women at risk of unintended pregnancy[†]

		Consistent use in last 30 days					
	% dist		T1 & T2		Change to inconsistent		
	(col)	Neither	Either	Both	No	Yes	
Total		6	15	79	90	10	
Excl those who were nonusers T1 8	a T2	4	16	81	90	10	
Method used at T1+							
LARC	18	0	4	96 ***	97	4 ***	
Pill	40	5	13	82	90	10	
Condom	44	1	16	83 ***	90	10	
Withdrawal	41	3	17	80	89	11	
Hormonal and coital (T1)	27	0	11	88 ***	92	8	
Multiple coital (T1)	16	3	17	81	90	10	
Only hormonal (T1)	38	6	13	82	91	10	
Only coital (T1)	34	4	20	76 **	87	13 *	
Switched hormonal methods T1 a	nd T2†			***		***	
No	53	3	10	87	94	6	
Swithced off	7	5	28	68	73	27	
Switched on	8	2	22	76	88	12	
Not hormonal user	30	5	22	73	87	13	
Nonuser T1 AND T2	2	100	0	0			
Used same method at T1 and T2 [†]				***		***	
No	13	8	40	52	66	34	
Yes	85	3	12	85	93	7	
Nonuser T1 and T2	2						
Used same method at T1 and T2 ⁺				***			
No	8	0	16	84	91	9	
Yes	85	3	12	85	93	7	
Nonuser T1 OR T2	7	20	80	0	0	100	

[†]Women who didn't use any method at T1 or T2 are excluded from chisq stats

[†]Refers to women who were (1) sexually active at both T1 and T2, (2) not trying to get pregnant at T1 or T2 and (3) not pregnant at T2

T2b. Cross tabulations of contraceptive consistency by baseline demographic
characteristics among women at risk of unintended pregnancy+
Consistent use in last 30 days

characteristics among women at risk of unintended pregnancy+									
Consistent use in last 30 days									
	% dist		T1 & T2		Change to	inconsistent			
	(col)	Neither	Either	Both	No	Yes			
		6	15	79	90	10			
Age group (baseline)				**					
18-24	31.5	5	15	79	89	11			
25-29	28.1	3	20	77	87	13			
30-34	22.3	4	15	82	90	10			
35-39	18.1	12	10	79	97	3			
Race/ethnicity				***		***			
White, NH	59.7	6	13	81	92	8			
Black, NH	10.4	2	31	67	76	24			
Other, NH	7.9	5	7	88	94	6			
Hispanic	22	6	17	77	90	10			
Poverty status (baseline				**		*			
<100% poverty	-) 16	8	22	70	85	15			
100-199% poverty	10	6	14	80	90	10			
200+% poverty	66	5	14	80 81	91	9			
2001/0 poverty	00	5	14	01	51	5			
Education (baseline)				**		(.06)			
< HS	5.9	6	10	84	96	4			
High school graduate	22.8	8	16	76	87	13			
Some college	35.7	7	17	77	91	9			
College graduate	35.5	3	15	83	90	10			
Pregnancy fatalism(bas	eline)			**		**			
Agree	32.7	6	21	73	84	16			
Neither	20.8	8	16	76	92	8			
Disagree	46.5	4	10	85	93	7			
N of problems at baseling	ne								
0	45.3	8	14	78	91	9			
1	29.9	4	14	82	91	9			
2	11.9	4	22	74	83	17			
3 or more	12.9	3	17	80	90	10			
Change in N of problem	s					*			
Same	44.8	6	13	80	92	8			
More	25.4	6	20	74	85	15			
Fewer	29.8	4	14	82	92	9			
						-			

[†]Refers to women who were (1) sexually active at both T1 and T2, (2) not trying to get

T2c. Cross tabulations of contraceptive consistency by selected relationship characteristics among women at risk
of unintended pregnancy†

of unintended pregnancy†						
				sistent use	in last 30 days	
	% dist		T1 & T2		Change to inconsister	
	(col)	Neither	Either	Both	No	Yes
Total		6	15	79	90	10
Union status (baseline)						
Married	52	7	15	79	91	9
Cohabiting	24	5	17	78	87	13
Dating	22	4	16	80	89	11
No relationship	3	4	9	87	94	6
Length of current relationship (baseline)						
< 6 months	3	2	25	73	84	16
6 mos to <1 yr	5	1	23	76	88	12
1-2 years	10	6	19	75	83	17
2 or more years	81	6	14	80	91	9
Change in relationship status (relchange)						
No	91	6	15	79	90	10
Yes	9	7	21	73	84	16
Happiness with relationship at baseline (hannv1)					
Less 1-3	6	7	15	78	89	11
More 4-5	34	, 6	15	78	90	10
Happiest 6	60	5	15	78	90	10
Arguments at baseline (argue1)	20	c	45	70	01	0
0	38	6	15	79	91	9
1	37	4	15	81	90	10
2 or more	26	7	18	74	88	12
How committed to P at baseline (commit	1)					
Not very	14	6	18	76	88	13
Very	86	6	15	79	90	10
How likely P had other partner (T2)				**		*
Not likely (1-3)	90	5	15	81	90	10
Somewhat to very likely (4-6)	10	14	21	65	81	19
Change in "monogamy" between T1 and	т2					
Same	81	5	15	80	91	9
Less likely P had other P at T2	13	9	16	74	85	15
More likely had other P at T2	5	1	25	74	86	13
Frequency of sex at baseline (sexmo1)						
1	7	6	15	79	90	10
2-5	46	5	15	80	89	11
6-10	28	6	15	79	92	8
11 OR MORE	19	6	17	77	88	12

¹¹ The first to women who were (1) sexually active at both T1 and T2, (2) not trying to get pregnant at T1 or T2 and (3) not pregnant at T2

T2d. Cross tabulations of contraceptive consistency by pregnancy intentions and attitudes among women at risk of unintended pregnancy⁺

among women at tisk of dimitent	Consistent use in last 30 days						
	% dist	T1	& T2		Change to	inconsistent	
	(col)	Neither	Either	Both	No	Yes	
Total		6	15	79	90	10	
Pregnancy intentions at T1 (inten	d1)					***	
Expect to try in future	51.1	6	19	75	85	15	
No more kids	22.7	7	7	86	98	2	
Not sure	26.2	4	15	82	93	7	
Pregnancy intentions over time							
Same at both	79.7	6	15	80	90	10	
Decreased intention	12.7	5	18	76	86	14	
Increased intention	7.6	8	14	78	94	6	
Pronatalist (SA on all 3 items, bas	eline)			*			
Not SA on all 3	68	5	14	81	91	9	
SA on all 3	32	7	18	75	88	12	
Change in pronatalist attitude							
Not pronatalist	59.8	5	14	81	91	10	
Less at T2	11.1	8	20	73	83	17	
More at T2	8.2	7	13	80	91	9	
Consistently pronatalist	20.9	6	17	77	92	8	
How feel if pregnant, baseline (fe	elpg1)			***		***	
Not at all happy (1, 2)	34.7	2	11	87	95	5	
Neutral (3, 4)	38.9	6	14	80	90	10	
Нарру (5, 6)	26.4	10	23	67	82	18	
How feel if pregnant now (change	e)			*		***	
Less happy	39.7	4	10	86	95	5	
More happy	17.8	4	17	79	90	10	
Consistent happiness	42.5	8	20	73	85	15	
How important to avoid pregnan	cy T1 (avoid	1)		***		***	
Not at all (1,2)	7.1	25	21	54	80	20	
Neutral (3, 4)	19.6	6	27	67	81	19	
Important (5, 6)	73.3	4	12	85	93	7	
How important to avoid pregnan	cy (change)			***		*	
Less important	24.2	9	22	69	83	17	
More important	13.4	13	15	71	89	11	
Always important T1&T2	62.3	3	13	84	92	8	
P wants to have (more) children	with R			*		***	
Agree	57.1	7	19	74	86	14	
Disagree	23.3	5	9	87	97	3	
Unsure/not in relationship	19.6	4	13	83	93	7	

[†]Refers to women who were (1) sexually active at both T1 and T2, (2) not trying to get pregnant at T1 or T2 and (3) not pregnant at T2

T2e. Cross tabulastions of contraceptive consistency according to health insurance status among among women at risk of unintended pregnancy[†]

	Consistent use in last 30 days						
	% dist		T1 & T2		Change to inconsistent		
	(col)	Neithe	Either	Both	Neithe	Yes	
Total			6	15	79	90	10
Private	66.7	,	4	14	81	91	9
Medicaid	14.8	:	5	17	78	88	12
Other	0.5		11	22	67	75	25
None	18	1	10	18	72	87	13
Changes in health insurance (histatus)							
Continuously insured	75.4	Ļ	5	15	81	91	9
Churner (T1 and T2)	7.1		3	20	77	86	14
Continuously uninsured	17.4	Ļ	10	17	73	88	12

⁺Refers to women who were (1) sexually active at both T1 and T2, (2) not trying to get pregnant at T1 or T2 and (3) not pregnant at T2