



DEMOGRAPHIC RESEARCH

A peer-reviewed, open-access journal of population sciences

DEMOGRAPHIC RESEARCH

VOLUME 43, ARTICLE 35, PAGES 1049–1066

PUBLISHED 6 OCTOBER 2020

<https://www.demographic-research.org/Volumes/Vol43/35/>

DOI: 10.4054/DemRes.2020.43.35

Descriptive Finding

Reconsidering (in)equality in the use of IUDs in the United States: A closer look across the reproductive life course

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Reconsidering (in)equality in the use of IUDs in the United States: A closer look across the reproductive life course

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BACKGROUND

Long-acting reversible contraceptives (LARCs), such as the intrauterine device (IUD), have received increased attention for their contraceptive effectiveness and reversibility. Although demographers have long acknowledged the importance of parity and childbearing intentions for contraceptive choice, we know little about how contraceptive use varies across the reproductive life course.

OBJECTIVE

Guided by the expectation that contraceptive method characteristics (e.g., reversibility, effectiveness) contribute to method choice—and that the salience of method characteristics vary by reproductive life stage and education—we investigate variability in IUD use patterns.

METHODS

We use 2008–2010 and 2011–2013 National Survey of Family Growth data to compare women’s IUD-use patterns across educational groups and at three reproductive life stages: before a first birth occurs (“starters”), between births (“spacers”), and after planned childbearing ends altogether (“limiters”).

RESULTS

IUD use is more common among spacers than among starters or limiters. Moreover, IUD use is associated with educational advantage among starters and limiters, but not among spacers. Educational differences in IUD use among starters and limiters persist when demographic background characteristics are controlled.

CONCLUSIONS

Our understanding of variability in IUD use changes considerably when viewing educational gradients through the lens of the reproductive life course.

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CONTRIBUTION

We shed new light on variability in IUD use across the reproductive life course. To best support women's contraceptive preferences, it is important to consider the ways in which structural determinants (e.g., education, reproductive health policies and programs) shape women's contraceptive choices at various stages of the reproductive life course.

1. Introduction

Long-acting reversible contraceptives (LARCs) – including intrauterine devices (IUDs) and implants – offer safe, low-maintenance, and highly effective protection against pregnancy, while also allowing future childbearing after removal of the method (Dean and Schwarz 2011; Raymond 2011). Rates of both unintended pregnancy and desire for sterilization reversal are highest among economically disadvantaged women in the United States (Eeckhaut, Sweeney, and Feng 2018; Finer and Zolna 2016; Grady et al. 2013), pointing to a possible role for LARCs in reducing these dimensions of inequality (Sawhill 2014). However, LARC use is less common in the United States as compared to other high-income countries (Eeckhaut, Sweeney, and Gipson 2014), and prior research finds no evidence of higher (or lower) use of LARCs among economically disadvantaged women (Finer, Jerman, and Kavanaugh 2012; Jones, Mosher, and Daniels 2012; Kavanaugh et al. 2011; Mosher and Jones 2010).

When examining the association between social class and LARC use, however, prior work has not accounted for major social class differences in the reproductive life course – notably the timing of births (Martinez, Daniels, and Febo-Vazquez 2018; Rindfuss, Morgan, and Offutt 1996). For example, economically disadvantaged women tend to begin and end childbearing earlier in life than advantaged women, and thus they spend fewer years attempting to delay the onset of parenthood and more years in a life stage when no more children are desired and sterilization becomes a viable alternative to LARCs. Moreover, although recent arguments regarding the potential for LARCs to reduce inequality center on delaying entry into parenthood (e.g., Sawhill 2014), existing research on social class disparities in LARC use aggregates women across reproductive stages. This suggests that a more nuanced look at the educational patterning of LARC use may be called for, one focused on potential differences within reproductive life stage groups.

Drawing on data from the 2008–2010 and 2011–2013 cycles of the National Survey of Family Growth (NSFG) – the first years of the IUD reemergence (IUD use increased from 2.0% of contraceptive use in 2002 to 5.6% in 2008 and 10.3% in 2012;

Daniels et al. 2015) – we consider how the relationship between women’s education and IUD use varies across the reproductive life course. Given evidence of social class variation in the broader context of contraceptive decision-making – including the salience of various contraceptive method characteristics (e.g., reversibility, effectiveness, and disease prevention) – across the reproductive life course (e.g., Forrest 1993), we expect that contraceptive use and its links with education may tend to differ for women wanting to delay the onset of parenthood (childbearing “starters”), women wanting to space births (childbearing “spacers”), or women wanting to stop childbearing altogether (childbearing “limiters”). We focus on IUD use rather than LARC use more generally because of the very low levels of implant use in this period (1.3% among women using contraceptives in 2012) and evidence of a distinct socioeconomic profile for implant users (Kavanaugh and Jerman 2018).

2. A reproductive life course lens on contraceptive choice

Contraceptive method choice is shaped by multiple factors. Considerable past research on IUD use has focused on the roles of method cost, availability, and the role of physicians (e.g., Ali, Folz, and Farron 2019; d’Arcangues 2007). For example, both the relatively high upfront cost of insertion and provider bias against IUDs for nulliparous women are thought to contribute to low rates of IUD use in the United States relative to other high-income countries (e.g., Eeckhaut, Sweeney, and Gipson 2014). Recommendations for IUDs by health providers are shown to vary depending on patient characteristics, such as race/ethnicity and socioeconomic status (Dehlendorf et al. 2010). Concerns regarding possible side effects may also influence contraceptive decision-making, particularly among women with relatively less education (Littlejohn 2012).

Less attention has been paid to the ways in which intrinsic characteristics of contraceptive methods – such as reversibility, effectiveness in preventing pregnancy, disease prevention, convenience of regular use, and convenience of initiation and discontinuation – may be associated with method choice (Condelli 1986; Delavande 2008; Grady, Klepinger, and Nelson-Wally 1999; Trussell and Guthrie 2011). No individual contraceptive is preferred with respect to all these method characteristics simultaneously – for example, no single method can simultaneously offer maximum levels of contraceptive effectiveness and disease prevention. Hence, users may consider and prioritize among multiple method characteristics, unless they use multiple methods simultaneously – which only about 8% of reproductive-aged women (and 5.5% of IUD users) report doing (authors’ tabulations, 2008–2013 NSFG; Eisenberg et al. 2012). For example, all else equal, contraceptive users seeking method reversibility, effectiveness,

and convenience of regular use may find LARC methods such as the IUD to be particularly attractive (see Table A-1 in the Appendix).

More so than for factors such as cost and access, there are reasons to expect variations in the relative salience of contraceptive method characteristics over the reproductive life course. For example, all else equal, we expect that reversibility will be least salient as a contraceptive method characteristic for childbearing limiters, who plan no future births. We expect that contraceptive effectiveness will be particularly salient for childbearing starters, given the major restructuring of the subsequent life course that generally accompanies the transition to parenthood (Michael and Willis 1975; Rossi 1968). We also expect contraceptive effectiveness to be particularly salient among childbearing limiters, as an unplanned pregnancy in this group results in exceeding the total desired number of births (Rindfuss, Swicegood, and Bumpass 1989). The relative importance of other method characteristics, including disease protection and the convenience of method initiation and discontinuation, may also be shaped by the reproductive life course stage through mediating factors such as the likelihood of being in a long-term coresidential relationship (less common among childbearing starters than for other women).

Finally, attention to the reproductive life course may also shed fresh light on the educational patterning of contraceptive use. For example, prior research identifies surprisingly little aggregate difference across educational groups in the likelihood of using an IUD (Daniels et al. 2015). Yet a generally accelerated pace of childbearing among less-educated than better-educated women (Hayford, Kissling, and Guzzo 2020) means that the average time women expect to spend within each reproductive life stage will vary across educational groups. In particular, highly educated women tend to spend more time trying to delay a first birth but less time between completion of desired childbearing and the end of fecundity. A relatively longer expected duration of pregnancy prevention may tend to increase salience of contraceptive effectiveness and convenience of regular use but decrease the salience of convenience of initiation and discontinuation – all of which would be a better match for LARCs such as the IUD than for other reversible methods. Thus, within the group of childbearing starters, we might expect the IUD to be more commonly used among better-educated than less-educated women. To the extent that a longer period of desired pregnancy prevention affects the salience of method characteristics for contraceptive choice, education-based gradients in contraceptive use may exist within reproductive life stages even when no such gradient exists for all women overall.

3. Data and methods

Data for this study were drawn from the 2006–2010 and 2011–2013 rounds of the NSFG. We do not use data from interviews conducted before July 2008, as the proportion of female contraceptive users relying on LARC methods such as the IUD increased markedly after the 2006–08 NSFG survey round, and the sociodemographic profile of LARC users also shifted (Finer, Jerman, and Kavanaugh 2012). We limited the analytic samples to women using contraceptives, which included a total of 7,221 respondents based on the recoded measure of current contraceptive status at time of interview, as our main focus is on method choice rather than the decision regarding whether to use contraception.

We consider LARC use at three distinct stages of a woman’s reproductive life course, as determined based on women’s parity and reported childbearing intentions. Women who were married or cohabiting were asked about their joint intentions for a birth, whereas all other women were asked about their own birth intentions. We categorized women as “starters” if they are nulliparous and intend a future birth or do not know their childbearing intentions; as “spacers” if they have had a child and intend a future birth or do not know their childbearing intentions; and as “limiters” if they do not intend a future birth, are themselves surgically sterilized, or have a spouse or partner who is surgically sterilized.

Our primary dependent variable is current contraceptive use. In cases where multiple methods were reported, we selected the most effective method used based on documented differentials in failure rates (Trussell 2011). Our focal independent variable is educational attainment. We group respondents into three categories: (1) less than high school, (2) completed high school, and (3) completed college. All other study variables are summarized in Table A-2 in the Appendix.

Our analysis first presents descriptive statistics on use of IUDs and other contraceptives, paying particular attention to possible educational gradients in IUD use within reproductive life stage groups. We then use multinomial logistic regression models to compare the use of an IUD to other specific methods and to evaluate the extent to which controls for basic demographic background factors and childbearing history explain any observed educational gradients in IUD use.

4. Results

We begin by describing overall patterns of IUD use, shown in the context of broader contraceptive use by US women. As shown in Table 1, only a minority of all US women using contraceptives used the IUD for birth control in 2008–2013 (8.9%). Childbearing spacers displayed the highest levels of IUD use (20.9%), compared to childbearing starters (3.0%) and limiters (8.6%). Among limiters, a majority of women using contraceptives rely on either female or male sterilization (59.7%, combined). Among starters, we see high levels of condom use (23.2%), which is consistent with a preference for disease prevention and less emphasis on convenience of regular use, but also an exceptionally high level of use of pills and other hormonal methods (65.9%).

Next, we consider potential educational gradients in IUD use. Consistent with prior research, we first note that overall levels of IUD use vary little across educational groups in the total population of women using contraceptives: IUD use ranges from nearly 8% of women with less than a high school education to 10% of women who have completed a four-year college degree (Table 1). However, the story changes when we consider patterns of contraceptive use within each of our three reproductive life stages, with the direction of the association between IUD use and educational level varying across the reproductive life course. We observe a positive association between education and IUD use among childbearing starters and limiters, but not among childbearing spacers. For example, among childbearing starters, IUDs are used by 0.2% of women with less than a high school education, but 5.4% of women with a college degree. Among childbearing limiters, IUDs are used by 6.2% of women with less than a high school education, but 10.8% of women with a college degree. Among childbearing spacers, on the other hand, we see that IUDs are used by 24.1% of women with less than a high school education, but 18.8% of women with a college degree.

Table 1: Percent distribution of female contraceptive users aged 15 to 44 by method, reproductive life stage, and education: 2008–2010 and 2011–2013 NSFG

	Percent distribution								
	N	Female sterilization	Male sterilization	IUD	Implant	Pill or other hormonal	Condom	Other less effective methods	Total
All contraceptive users	7,221	26.2	8.7	8.9	1.0	32.9	15.8	6.5	100.0
Less than high school	1,459	35.8	2.1	7.7	1.0	30.6	15.6	7.2	100.0
Completed high school	4,129	28.8	7.9	8.8	1.4	31.6	15.2	6.4	100.0
Completed college	1,633	14.2	14.8	10.0	0.3	37.2	17.2	6.3	100.0
		<i>P</i> <0.001	<i>P</i> <0.001	<i>P</i> =0.352	<i>P</i> <0.010	<i>P</i> <0.010	<i>P</i> =0.336	<i>P</i> =0.700	
Childbearing starters	1,926	0.0	0.0	3.0	0.6	65.9	23.2	7.4	100.0
Less than high school	369	0.0	0.0	0.2	0.8	64.3	25.2	9.4	100.0
Completed high school	988	0.0	0.0	2.4	0.8	65.3	23.9	7.7	100.0
Completed college	569	0.0	0.0	5.4	0.0	67.8	20.9	5.9	100.0
				<i>P</i> <0.010	<i>P</i> =0.156	<i>P</i> =0.681	<i>P</i> =0.519	<i>P</i> =0.298	
Childbearing spacers	1,272	0.0	0.0	20.9	2.8	37.8	26.5	12.0	100.0
Less than high school	302	0.0	0.0	24.1	2.6	33.7	27.5	12.2	100.0
Completed high school	760	0.0	0.0	20.6	3.4	41.1	25.4	9.6	100.0
Completed college	210	0.0	0.0	18.8	1.1	31.7	29.2	19.2	100.0
				<i>P</i> =0.621	<i>P</i> =0.336	<i>P</i> =0.110	<i>P</i> =0.690	<i>P</i> <0.050	
Childbearing limiters	4,023	44.8	14.9	8.6	0.8	16.4	9.7	4.8	100.0
Less than high school	788	61.9	3.5	6.2	0.7	15.0	7.9	4.9	100.0
Completed high school	2,381	48.5	13.3	8.4	1.1	14.9	8.8	5.0	100.0
Completed college	854	25.1	26.1	10.8	0.3	21.0	12.8	4.0	100.0
		<i>P</i> <0.001	<i>P</i> <0.001	<i>P</i> <0.100	<i>P</i> <0.100	<i>P</i> <0.010	<i>P</i> <0.050	<i>P</i> =0.597	

Note: The analyses were limited to women using contraceptives, based on the recorded measure of current contraceptive status at time of interview. (Among those who reported having had sex in the past three months, 24.9%, 33.1%, and 17.0% of childbearing starters, spacers, and limiters, respectively, were contraceptive nonusers.) Childbearing starters are using contraception to delay parenthood, childbearing spacers are using contraception to space births, and childbearing limiters are using contraception to stop childbearing altogether. *P*-values indicate results of *F*-test of null hypothesis that there is no association between education and use of the method. Percentages are weighted.

Finally, we use multinomial logistic regression models to evaluate the extent to which controls for basic demographic background factors and childbearing history explain any observed educational gradients in IUD use. Because our focus is on educational differences within reproductive life course groups, and to allow for differences in the broader context of contraceptive decision-making at each stage, we estimated separate regression models for starters, spacers, and limiters. Because sterilization will appear in the contraceptive choice set of only childbearing limiters, we include it as an outcome category for only this group.

Key results from our models are displayed in Table 2. In short, we identify positive educational gradients in IUD use for starters and limiters, but not for spacers, even after adjusting for age, early childbearing, union status, parity, and other background factors. College-educated starters are considerably more likely than starters who did not complete high school to rely on an IUD rather than any other reversible method as their most effective method. The odds of using an IUD rather than a birth control pill or other hormonals are nearly seven times greater (1/0.15) for women who completed a four-year college degree as compared to women who did not finish high school. Education-group differences with respect to an IUD versus condoms and other less effective methods are larger still. (We cannot exclude, however, that the IUD group may include dual-method IUD and condom users.) For childbearing limiters, educational gradients persist with respect to trade-offs between IUD use and sterilization: Women who have completed college are four times as likely (1/0.25) as those with less than a high school education to rely on IUDs rather than female sterilization. We also see greater odds of using IUDs rather than other less effective methods among women who completed college.

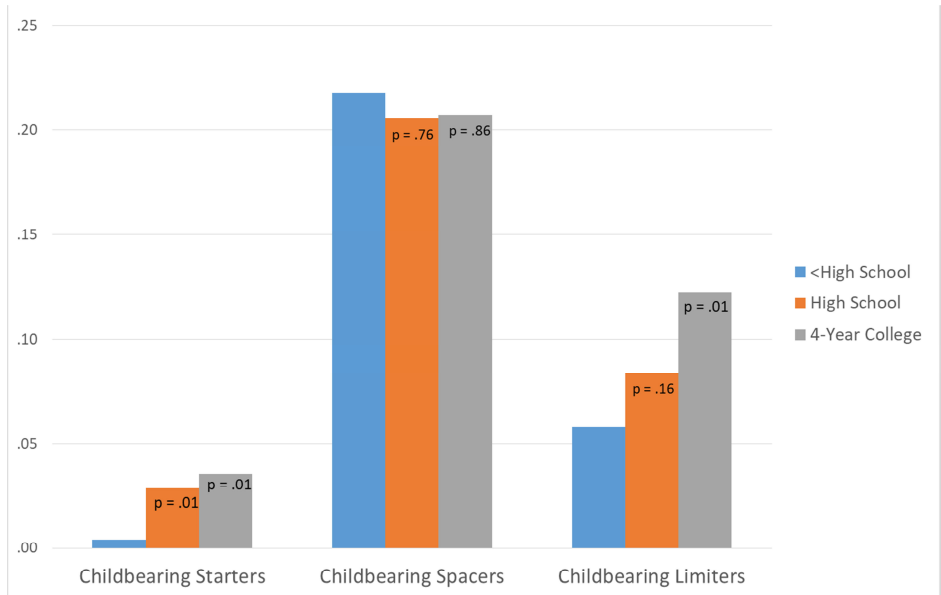
Average predicted probabilities based on the regression model, complemented with tests of average marginal effects (see Figure 1), confirm the positive association between IUD use and education for childbearing starters and limiters and the lack of a similar association for spacers. At the same time, they also show a remarkably low level of IUD use among women attempting to delay a first birth, regardless of their educational level.

Table 2: Selected results from multinomial logistic regression analyses of contraceptive use (reference = IUDs) for female contraceptive users aged 15 to 44: Odds ratios and 95% confidence intervals for education, 2008–2010 and 2011–2013 NSFG

	Childbearing starters		Childbearing spacers		Childbearing limiters	
Female sterilization						
Less than high school	-----		-----		1.00	
Completed high school	-----		-----		0.55	(0.29–1.06)
Completed college	-----		-----		0.25	(0.12–0.53)
Male sterilization						
Less than high school	-----		-----		1.00	
Completed high school	-----		-----		1.92	(0.80–4.62)
Completed college	-----		-----		1.54	(0.48–4.08)
Pill or other hormonals						
Less than high school	1.00		1.00		1.00	
Completed high school	0.16	(0.04–0.62)	1.34	(0.80–2.25)	0.57	(0.31–1.06)
Completed college	0.15	(0.03–0.67)	1.16	(0.51–2.65)	0.61	(0.28–1.33)
Condom						
Less than high school	1.00		1.00		1.00	
Completed high school	0.12	(0.03–0.47)	0.92	(0.50–1.72)	0.74	(0.38–1.43)
Completed college	0.07	(0.02–0.31)	0.84	(0.37–1.91)	0.64	(0.30–1.37)
Other less effective methods						
Less than high school	1.00		1.00		1.00	
Completed high school	0.09	(0.02–0.43)	0.71	(0.34–1.46)	0.71	(0.32–1.60)
Completed college	0.04	(0.01–0.25)	1.14	(0.48–2.67)	0.30	(0.11–0.80)
pEduc	<.001		0.401		<.001	
N	1,926		1,272		4,023	

Notes: pEduc = results of Wald test of null hypothesis that full set of education coefficients in a particular model are jointly equal to zero. Outcome also includes category for implants, with results not shown here due to small sample sizes. Boldface indicates coefficient differs significantly from zero, at $p < .05$ level. Childbearing starters are using contraception to delay parenthood, spacers are using contraception to space births, and limiters are using contraception to end childbearing altogether. Other covariates included in the model are age, school enrollment, race/ethnicity, nativity, union status, parity (not in the model for childbearing starters), and early childbearing (not in the model for childbearing starters).

Figure 1: Average predicted probabilities of intrauterine-device (IUD) use, by reproductive life stage and education: US female contraceptive users aged 15 to 44, 2008–2010 and 2011–2013 NSFG



Note: Based on models displayed in Table 2. P-values refer to tests of difference in the average marginal effect of the specified educational category versus less than high school category.

Sensitivity checks assessed the robustness of our results to an alternate specification of our educational outcome (i.e., we considered whether women had completed any additional schooling after high school, and we limited our sample to those who were at least age 19 at the time of interview). These checks also reviewed the possibility that IUDs and implants might be substitutes for one another, thus violating the independence of irrelevant alternatives assumption of the multinomial logistic regression model (i.e., we reestimated the previously described models without implant users, which compose roughly 1% of the sample). We also reestimated models based on the full sample of all women, not just contraceptive users, adding a separate outcome category for nonusers. All of these showed that the general pattern of findings remained robust (results available upon request).

Overall, our results highlight the importance of the reproductive life course stage as a context for contraceptive decision-making. We find a positive relationship between education and IUD use among childbearing starters and limiters, but not among childbearing spacers, even after adjusting for basic demographic background factors

and childbearing history. The positive education gradient among childbearing starters and limiters may reflect the importance of social and financial resources in facilitating women's uptake of new technologies (Link and Phelan 1995) and in navigating barriers such as provider bias against IUDs for childbearing starters (Tyler et al. 2012). In addition, policy-based biases (e.g., as related to Medicaid) likely contribute to high reliance on nonreversible contraception among disadvantaged childbearing limiters (Baldwin, Rodriguez, and Edelman 2012). That this positive education gradient does not extend to childbearing spacers might be due to targeted interventions to prevent rapid repeat births among disadvantaged women, such as reforms to Medicaid policy on immediate postpartum LARC insertion (Steenland et al. 2019). Such interventions could also help explain why IUD use is comparatively high among childbearing spacers. Future research should consider if the recent emergence of a (weak) education gradient (Kavanaugh and Jerman 2018) could have been driven by changes in the distribution of IUD users by reproductive life stages (e.g., comparatively large increases in IUD use among nulliparous women).

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Appendix

Table A-1: Expected impact of prioritizing each of the five contraceptive method characteristics on relative preference for long-acting reversible contraceptives (LARCs) versus other methods

Contraceptive method characteristic	How do LARCs compare?
Reversibility	LARCs > sterilization
Effectiveness	LARCs > pill/other hormonals > condom, other less effective methods
Disease prevention	LARCs < condoms
Convenience of regular use	LARCs > pill/other hormonals > condom, other less effective methods
Convenience of initiation and discontinuation	LARCs > sterilization LARCs < condoms, pill/other hormonals, other less effective methods

Table A-2: Distribution across categories of independent variables, among female contraceptive users aged 15 to 44 (2008–2010 and 2011–2013 NSFG)

Independent variable	Percent distribution
<i>Reproductive life stage</i>	
Starter	26.9
Spacer	14.7
Limiter	58.4
Total	100.0
<i>Education</i>	
Less than high school	16.5
Completed high school	57.7
Completed college	25.8
Total	100.0
<i>Age</i>	
15–24 years	25.1
25–29 years	18.3
30–34 years	17.5
35–39 years	19.0
40–44 years	20.2
Total	100.0
<i>School enrollment status</i>	
Not currently enrolled	78.7
Currently enrolled	21.3
Total	100.0
<i>Race/ethnicity</i>	
Non-Hispanic white	62.5
Hispanic	17.5
Non-Hispanic black	12.4
Non-Hispanic other or multiple race	7.6
Total	100.0

Table A-2: (Continued)

Independent variable	Percent distribution
<i>Nativity</i>	
US-born	86.0
Foreign-born	14.0
Total	100.0
<i>Union status</i>	
Marriage	47.0
Cohabitation	15.7
No coresidential partnership	37.3
Total	100.0
<i>Parity</i>	
0	33.7
1	15.8
2	25.9
3+	24.5
Total	100.0
<i>Early childbearing</i>	
First birth, 15–19 years	22.2
First birth, 20–24 years	23.1
No early birth	54.7
Total	100.0
<i>N</i>	7,221

Note: Percentages are weighted.