

Consequences for Infants of Parental Disagreement In Pregnancy Intention

By Sanders Korenman, Robert Kaestner and Ted Joyce

Sanders Korenman is professor of public affairs, Baruch College, New York, and research associate, National Bureau of Economic Research (NBER), New York. Robert Kaestner is professor of public health, University of Illinois at Chicago, and research associate, NBER. Ted Joyce is professor of economics, Baruch College, and research associate, NBER.

CONTEXT: Despite the well-established literature on couples' pregnancy intentions and on the consequences of unintended pregnancy, the effects of parents' disagreement in fertility intentions has not been explored. Parental disagreement in pregnancy intention, as well as a father's pregnancy intention, may affect infant health.

METHODS: Logistic regression analyses using 1979–1992 data from the National Longitudinal Survey of Youth assess effects of unintendedness and parents' disagreement on outcomes related to infants' health and development. Analyses are conducted separately for married and unmarried women; for women of each marital status, one set of analyses includes extensive controls for socioeconomic background, and a second compares effects of intended and unintended pregnancies within the same family.

RESULTS: Infants whose conception was intended by their mother but not their father are at elevated risk of adverse health events. When a pregnancy was not intended by the mother, risks are higher than they are if both parents intended the pregnancy, but they differ little according to father's intention. Thus, it may be useful to classify pregnancies as intended by both parents or not intended by at least one. In comparisons of siblings, unintended fertility (so defined) is associated with delayed prenatal care and reduced initiation of breastfeeding.

CONCLUSION: Information on both parents' fertility intentions is needed to identify infants at risk of adverse health and developmental outcomes.

Perspectives on Sexual and Reproductive Health, 2002, 34(4):198–205

What are the consequences for infants' health and development of disagreement in fertility intentions between parents? Is it better to be born as the result of a pregnancy that at least one parent intended or one that neither parent intended? If intentions diverge, do infants whose conception was intended by their mother fare better than those whose conception was intended by their father? Despite the well-established literature on couples' fertility intentions¹ and on the consequences of unintended pregnancy,² these questions have never been subjected to scholarly investigation. In this article, we provide the first analysis of the effects of unintended pregnancy on infants to consider the pregnancy intentions of both parents.

BACKGROUND

The literature on couples' fertility intentions has examined the relationship between intended and achieved or expected fertility.³ One key conclusion from this literature is that wives report fairly accurately the fertility intentions of their husbands.⁴ Another is that individuals' reported intentions may in part embody the resolution of partners' disagreements about intentions,⁵ but partners' intentions have significant independent effects on actual fertility.⁶ The research also shows that intentions are correlated with actual or expected fertility, and that some pregnancies that are unintended by mothers are intended (or at least not unintended) by fathers.⁷

This body of work suggests that fathers' intentions "matter" in that they are predictive of achieved fertility. But fathers' intentions may also affect infants' health outcomes; consequently, understanding fathers' intentions can help shape public policies aimed at improving such outcomes.

The literature on the consequences of unintended pregnancy was the subject of a detailed review in a 1995 Institute of Medicine (IOM) report.⁸ The report documented that unintended pregnancy is associated with delayed initiation of prenatal care, maternal cigarette smoking during pregnancy, low birth weight and other detrimental effects in infancy and childhood. However, in the chapter on the consequences of unintended birth, no mention was made of differences in fertility intention between spouses or partners. This omission is of concern because, for example, a substantial proportion of births that are unwanted by mothers are wanted by fathers.⁹ As a result of this finding, some researchers have questioned a definition of unwantedness that is based on the mother's fertility intentions alone.¹⁰ Montgomery has gone so far as to argue that "in an area as important as unintended pregnancy, very little additional progress can be expected without serious attention to men's perceptions and behavior."¹¹

Additionally, the IOM report acknowledged that most studies of the consequences of unintended pregnancy lack an adequate research design to distinguish the effects of fertility intention from those of disadvantaged family back-

ground, with which it is associated. Disadvantaged background is a risk factor for poor infant health and may account for adverse childhood outcomes after an unintended pregnancy. Recent investigations of these hypotheses have compared health and developmental outcomes among siblings who differ in their mother's pregnancy intention, or have included detailed controls for family background.¹² Estimates based on these methods suggest few adverse effects of unintended pregnancy on infant and child health and development. But this work also relied exclusively on the mother's pregnancy intention.

In this article, we have two objectives. First, we seek to broaden the set of outcomes used to evaluate the utility of incorporating men's fertility intentions. Rather than study whether fathers' intentions help determine achieved or expected fertility, we ask whether such information is useful in predicting child well-being. Second, we seek to expand the literature on the consequences of unintended fertility for children to include fathers' intentions.

HYPOTHESES

Pregnancy intention may be associated with infant and child health for several reasons. Women with unintended pregnancies may fail to engage in healthy behaviors, such as obtaining prenatal care, because of delay in recognizing the conception or denial that it has occurred.¹³ Parental disagreements over the desirability of the pregnancy could exacerbate or mediate such consequences. For example, a father who wanted the pregnancy could motivate a mother who did not to seek timely prenatal care, whereas if neither partner intended to conceive, the mother's motivation to get proper care may remain low.

Furthermore, children whose conception was unintended may receive a reduced share of family resources if the cost of adjustment to the unplanned birth falls most heavily on them. Studies of European women denied abortion have emphasized this mechanism to explain poor social development associated with unwanted pregnancy.¹⁴ Again, parents' disagreement regarding pregnancy intentions may affect the severity of the consequences. More resources may be withheld from the child if both parents did not want the pregnancy than if one or both parents intended it.

Assuming that unintended pregnancy is harmful to infant health, two hypotheses regarding the effects of parents' diverging fertility intentions are plausible. The dose-response hypothesis posits that it is better for a child if both parents wanted the pregnancy than if one or both did not, and it is better if at least one parent intended the pregnancy than if neither did. According to the maternal predominance hypothesis, if only one parent intended the pregnancy, it is better for the child if that parent was the mother.

The justification for the maternal predominance hypothesis is evidence that mothers' characteristics, such as educational attainment, are stronger predictors of children's health and development than are fathers' characteristics.*¹⁵ Presumably, mothers have greater influence on health and development in infancy and early childhood because they

are more directly involved than fathers in the care of children at these ages. By the same reasoning, we would also expect the effect of mothers' intention (relative to fathers') to be stronger for children born to unmarried women.

While we believe that these hypotheses are sensible, others are possible. For example, if mothers treat infants and children equally well regardless of fertility intention, but fathers favor their intended children, then fathers' intention might have greater influence on infant and child outcomes.

One principal goal of our research is to identify associations between different combinations of parental pregnancy intentions and infant health. The results could form the empirical basis of future research on specific causal mechanisms underlying these associations.

DATA AND METHODS

Outcomes and Control Variables

To examine these hypotheses, we use data from the 1979–1992 National Longitudinal Survey of Youth (NLSY). The NLSY collects detailed information on the outcomes and controls needed for this study, including marital status at birth and pregnancy intention of mother and father for each child, as well as infant health outcomes and parental behaviors during pregnancy and infancy that may be related to health and development.

We focus on infant health for several reasons. First, adverse outcomes such as low birth weight and detrimental parental health behaviors such as cigarette smoking during pregnancy have known long-term effects on children's health and development.¹⁶ Second, because pregnancy intentions are temporally proximate to behaviors in pregnancy and infancy, we expect them to have a larger effect on these outcomes than on outcomes later in childhood. Outcomes later in childhood are affected by contemporary attitudes toward the child and the mediating influences of public interventions, most notably, schools. Consistent with this expectation, most evidence for adverse effects of unintended pregnancy is related to pregnancy behaviors and infant outcomes.¹⁷ The outcomes we study are delayed initiation of prenatal care (after the first trimester, after the second trimester or not at all); cigarette smoking during pregnancy (any and one or more packs per day); whether the mother ever breastfed; and low birth weight (less than 5.5 pounds).

The NLSY oversamples black, Hispanic and disadvantaged white women. Because minority status and disadvantaged background are associated with unintended birth, this sample design yields a relatively large number of unintended births and thus increases the precision of estimates of their effects. Therefore, we included race, Hispanic identification and variables related to family background in regression analyses. The unweighted sample statistics are intended to describe the sample only, and not the corresponding cohort in the U.S. population.

A sufficiently large number of siblings are included in

*The literature on this point is quite large for developing countries but is more equivocal for the United States.

**...some
researchers
have questioned
a definition of
unwantedness
that is based on
the mother's
fertility intentions alone.**

the NLSY to permit examination of differences in health among siblings according to pregnancy intention. In the NLSY, all household members aged 14–21 were eligible for inclusion in the sample. Beginning in 1986, children of female sample members were included in biennial child assessments. We use data through the 1992 interview. The mothers of the children in our analyses had at least one birth after 1978. For analyses of siblings, the mothers had more than one birth after 1978. We selected children born after 1978 for two reasons. First, several of the control variables and outcomes pertain to the year of the child’s birth, and the survey began in 1979. Second, pregnancy intentions were collected beginning in 1982, and recall bias in pregnancy intentions appears to increase with length of recall.¹⁸

Sample sizes vary according to the outcome under consideration. For outcomes related to infant health, sample sizes range from 7,400 to 7,800 children. About 75% of these children have at least one sibling who is also in the sample. Thus, in most of our analyses, the sizes of the full sample and the sample of children with a sibling are similar.

Partner’s Intentions

In the NLSY, the mother is asked to report the fertility intention of the father when she reports her intention. Researchers have been divided over whether such proxy information (or even direct information) on fathers’ intentions is worth collecting. Thomson, McDonald and Bumpass¹⁹ note that the rationale often provided for excluding male partners from fertility surveys is that men’s desires explain “only small *marginal* variance in couple fertility beyond that explained by wives’ desires.” But they contend that this conclusion fails to appreciate that the woman’s reported fertility intention may represent, in part, the outcome of a joint decision, which could account for why the husband’s intention adds little explanatory power. In any case, they find evidence for an important independent role of husbands’ intentions on fertility.

Morgan also finds that wives report husbands’ intentions accurately, and concludes that models of fertility including both parents’ intentions can be estimated with information

gathered from the mother.²⁰ Williams and Thomson reach a similar conclusion, and suggest that random measurement error in either self-reports or proxy reports of intention is a more significant problem than any systematic error in proxy reports about spouse’s intentions.²¹ Finally, Goldscheider and Kaufman conclude that the utility of proxy reports of spouse’s intention depends on the couple’s social situation, and that proxy reports are more reliable for married than for unmarried couples; they also strongly encourage demographers to study male pregnancy intentions.²²

Ideally, then, we would have independent information on pregnancy intention from a child’s mother and father. Unfortunately, we are limited by available data. Nonetheless, since the questions we attempt to answer have never been addressed empirically, let alone addressed with independent assessments of each partner’s intention, we believe that proxy information on fathers’ pregnancy intentions provides a valuable first step. Given that mothers’ reports of fathers’ intentions are more reliable for married couples than for others, and that, for smoking and breastfeeding, chi-square tests rejected equality across marital statuses of the effects of parents’ intentions at the 10% level, we analyze births to married and unmarried women separately.

In most interview years, the NLSY collected information on pregnancy intentions from women who identified themselves as pregnant at the time of their annual interview. In years when questions about intentions were not asked, or in cases where a woman did not know or did not acknowledge that she was pregnant when interviewed, questions about pregnancy intentions were asked at the first interview following the birth. As a result, in our sample, about two-thirds of intentions were reported retrospectively (after birth), and one-third prospectively (during pregnancy).

Investigators of unintended pregnancy have for many years questioned the validity of retrospective reports of pregnancy intention. The consensus has been that mothers tend to engage in “ex post rationalization” and therefore understate unintended pregnancy in retrospective reports.²³ Furthermore, some researchers have worried that retrospective reporting and ex post rationalization can lead to biased estimates of the consequences of unintended births (although the direction of such bias is unclear).²⁴ However, we believe that retrospective reports of pregnancy intentions are unlikely to affect our results, for three reasons.

First, information on both parents’ intentions is collected from the mother at the same interview; we know of no evidence or other reason to think that mothers would rationalize their own and their partners’ intentions differently. Second, the period of retrospective recall in our sample is short (generally one year or less after the birth), and ex post rationalization is thought to increase with time since conception.²⁵ Third, in a related study, we conducted an extensive analysis of the effects of retrospective reporting in the sample used here.²⁶ We found no evidence that retrospective reports lead to biased estimates of the extent or consequences of unintended fertility, including in an analysis of a small subsample of births for which intentions were

TABLE 1. Percentage distribution of births, by father’s pregnancy intention, according to mother’s intention and marital status, 1979–1992 National Longitudinal Survey of Youth

Mother’s intention	N	Father’s intention				Total
		Intended	Mistimed	Unwanted	Not determined	
Married women	5,514	66.8	16.2	3.5	13.5	100.0
Intended	3,556	92.1	3.2	0.6	4.1	100.0
Mistimed	1,149	26.9	63.9	4.4	4.8	100.0
Unwanted	241	26.6	13.7	50.6	9.1	100.0
Not determined	568	6.2	1.8	0.0	92.1	100.0
Unmarried women	2,614	41.8	21.3	14.6	22.3	100.0
Intended	920	79.2	8.4	2.9	9.5	100.0
Mistimed	928	29.1	45.9	14.7	10.3	100.0
Unwanted	418	20.8	11.2	51.2	16.8	100.0
Not determined	348	2.0	2.0	1.4	94.5	100.0

Notes: Marital status is measured as of the first interview after the birth. Father’s intention is based on mother’s report.

assessed both during pregnancy and after birth. Nonetheless, we include a control for retrospective (versus prospective) report of pregnancy intention in all of our analyses.

Analytic Techniques

To estimate the effects of parents' pregnancy intention on maternal health behaviors and infant health, we specify an empirical model to relate the various outcomes to parents' pregnancy intentions, controlling for possibly confounding factors.* There are four possible combinations of (known) parental intentions: mother and father both intended, neither intended, only the mother intended and only the father intended the pregnancy. Accordingly, the parental intention variables in our statistical models are estimated using three dummy variables relating to these categories. Pregnancies that were intended by both parents form the reference category.

An important statistical problem with the estimation of the effects of parental pregnancy intentions on outcomes related to infant health is the presence of unmeasured characteristics that affect both pregnancy intention and infant health, and therefore might account for estimated associations. To address this problem, we estimate fixed-effects models for mothers, using a sample of women with at least two children. These models identify effects of unintended pregnancies by comparing outcomes of intended and unintended pregnancies in the same family (i.e., between-sibling or within-mother comparisons).

We estimate logit regression models, adjusting standard errors for heteroskedasticity and clustering within families,²⁷ using algorithms contained in the software Stata.²⁸ For models with mother fixed effects (sibling differences), we estimate conditional (fixed-effects) logit models.²⁹ Families contribute to the likelihood function for an outcome only if some siblings differ in the outcome (e.g., at least one sibling was low-birth-weight, and at least one was normal-weight).³⁰ As a result, sample sizes are significantly smaller for the fixed-effects logit models than for the full sample. Nonetheless, the estimates are consistent (unbiased in large samples) for the parameters of interest in the population represented by the entire cross section of siblings.[†]

RESULTS

Descriptive Analyses

Consistent with findings from previous studies,³¹ we found that in the vast majority of cases, parents' pregnancy intentions at the time of conception agreed (Table 1). Among the 5,514 marital births, 92% of conceptions that had been intended by the mother had also been intended by the father. When the mother had intended the pregnancy and the father had not, most often he had considered it mistimed (3%) or his intention could not be determined (4%); in fewer than 1% of cases had the father not wanted a pregnancy at any time. In accordance with the findings of earlier studies,³² in about one-quarter of cases in which the mother considered the pregnancy mistimed or unwanted, the father had intended it. The reverse, however, is not true:

TABLE 2. Selected outcomes of pregnancies among NLSY respondents, and child and maternal characteristics, by parents' pregnancy intention

Variable	Both intended (N=4,004)	Neither intended (N=1,763)	Father only intended (N=730)	Mother only intended (N=239)
Outcomes				
Prenatal care initiated (%)				
After 1st trimester	15.1	23.2*	26.7*	21.8*
After 2nd trimester	4.9	6.5*	6.5	5.0
Smoked during pregnancy (%)				
Any	26.3	35.2*	33.9*	37.3*
≥1 pack/day	7.6	11.1*	8.3	9.9
Low birth weight (%)	7.0	7.7	8.2	10.4*
Ever breastfed (%)	51.8	39.6*	33.3*	43.9*,†
Child characteristics				
Male (%)	51.4	50.5	49.2	56.5†
Firstborn (%)	47.8	42.4*	35.3*	47.3*,†
Maternal characteristics				
Hispanic (%)	19.6	16.2*	19.5	19.2
Black, non-Hispanic (%)	17.8	33.7*	45.5*	28.0*,†
AFQT score (percentile)	39.5	33.4*	25.8*	30.2*,†
Lived with both parents, age 14 (%)	69.3	58.4*	53.0*	57.7*
Age (mean)‡	24.6	23.2*	23.8*	23.2*,†
Education (mean years)‡	12.3	11.8*	11.7*	11.5*
Never-married (%)‡	11.6	34.8*	34.2*	31.8*
Divorced/separated (%)‡	6.6	11.9*	14.7*	11.7*
AFDC recipient (%)‡	9.7	22.0*	23.6*	23.1*
Retrospective pregnancy intention	66.3	69.4*	66.2	74.1†

*Significantly different from the figure for "both intended" at $p < .05$. †Significantly different from the figure for "father only intended" at $p < .05$. ‡Measured in year of child's birth. Notes: Results for couples for which either parent's intention was not determined are not shown. AFQT=Armed Forces Qualifications Test. AFDC=Aid to Families with Dependent Children.

When the pregnancy was unintended by the father, only about one in 10 mothers reported the pregnancy to be intended (not shown).

The 2,614 nonmarital births were characterized by greater parental disagreement than those occurring within marriage. In particular, only 79% of pregnancies that had been intended by the mother had also been intended by the father.

*The equation is $Y_{ij} = \alpha_0 + X_{ij}\beta + \gamma_1 \text{Mom}U_{ij} + \gamma_2 \text{Dad}U_{ij} + \gamma_3 \text{Mom}U_{ij} * \text{Dad}U_{ij} + \phi_j + \varepsilon_{ij}$, where i is an index of children, and j an index of mothers. Y_{ij} is an outcome related to infant health (e.g., birth weight or maternal smoking during pregnancy), and X_{ij} are exogenous measures of family background and maternal and child characteristics (e.g., the child's sex and year of birth, the mother's race and whether she lived with both parents at age 14). $\text{Mom}U$ and $\text{Dad}U$ are indicator variables for a pregnancy unintended by the mother and father, respectively. We interacted mother's and father's intentions ($\text{Mom}U * \text{Dad}U$) to study the consequences of parental disagreement or agreement in pregnancy intention. Also, ϕ_j represents unmeasured, fixed maternal characteristics (i.e., mother fixed effects) associated with maternal behaviors and infant health.

†We also estimated linear probability models with and without fixed effects that include all observations. Our conclusions are not sensitive to the choice of model (logit or linear probability).

TABLE 3. Coefficients from logit analyses (and standard errors) indicating the effects of parents' pregnancy intentions on maternal behaviors related to infant health, by mother's marital status and type of analysis

Outcome	Unmarried		Married	
	Cross-sectional	Fixed-effects	Cross-sectional	Fixed-effects
Prenatal care after first trimester				
Neither parent intended	(N=2,369)	(N=687)	(N=5,058)	(N=1,051)
Mother only intended	0.46* (.13)	0.65* (.26)	0.18† (.11)	0.16 (.20)
Father only intended	0.48* (.25)	1.43* (.52)	-0.03 (.25)	0.21 (.50)
Both intended	0.64* (.16)	0.59* (.29)	0.48* (.14)	0.55† (.28)
Both intended	ref	ref	ref	ref
<i>p-value from χ^2</i>				
Father irrelevant‡	.08	.02	.20	.42
Equality of effects§	.50	.29	.10	.47
Smoked during pregnancy				
Neither parent intended	(N=2,427)	(N=292)	(N=5,176)	(N=440)
Mother only intended	-0.02 (.12)	-0.14 (.41)	0.36* (.10)	0.01 (.32)
Father only intended	0.14 (.23)	1.10 (.99)	0.29 (.23)	1.47† (.82)
Both intended	0.10 (.16)	0.37 (.49)	0.29* (.15)	-0.02 (.54)
Both intended	ref	ref	ref	ref
<i>p-value from χ^2</i>				
Father irrelevant‡	.61	.33	.44	.20
Equality of effects§	.64	.35	.90	.24
Ever breastfed				
Neither parent intended	(N=2,476)	(N=286)	(N=5,273)	(N=923)
Mother only intended	0.04 (.14)	-0.88* (.45)	-0.13 (.09)	-0.28 (.22)
Father only intended	0.57* (.25)	-0.74 (1.26)	-0.27 (.21)	-1.83* (.74)
Both intended	-0.12 (.17)	-0.93† (.55)	-0.25† (.14)	-0.29 (.31)
Both intended	ref	ref	ref	ref
<i>p-value from χ^2</i>				
Father irrelevant‡	.06	.84	.31	.05
Equality of effects§	.05	.98	.63	.11

*p≤.05. †p≤.10. ‡Test of the joint hypothesis that the effect of mother only intended equals the effect of both parents intended and the effect of father only intended equals the effect of neither parent intended. §Test that the three coefficients shown are equal. Notes: ref=reference group. Standard errors are adjusted for heteroskedasticity and clustering among siblings. In addition to the categories listed in the table, analyses control for undetermined mother's pregnancy intention, undetermined father's pregnancy intention (if mother's intention is determined); region and urban residence in the year following the birth; mother's race and ethnicity; child's sex, birth order and year of birth; and characteristics of the mother's household when she was 14 (whether both parents were present, whether the household received newspapers or magazines, whether any household member had a library card and educational attainment of the mother's mother). The model also includes a control for the mother's score on the Armed Forces Qualifications Test, administered to the sample in 1980, and for whether the mother reported pregnancy intention during pregnancy or after delivery. In the unmarried sample, one marital status dummy (divorced/separated vs. never married) is included. In the fixed-effects analyses, effects are identified by variation among siblings; effects of explanatory variables that do not vary among siblings cannot be estimated; and observations contribute to the likelihood function only if there is variation within mother (i.e., among siblings) in the outcome.

Table 1 contains a large number of categories, and many of the cell sizes are small. In the remainder of the article, we collapse these categories into six: Both parents intended the pregnancy; neither intended the pregnancy; only the mother intended it; only the father intended it; the mother's intention was not determined; and the father's intention was

not determined (if the mother's intention was determined). Thus, we combine mistimed and unwanted pregnancies into a single category for unintended pregnancies.

Maternal behaviors during pregnancy and infant outcomes appear to be best when both parents intended the pregnancy (Table 2, page 201). Children whose conception had been intended by both parents are the least likely to have mothers who delayed prenatal care beyond the first trimester (15% vs. 22–27%) and who smoked during pregnancy (26% vs. 34–37%); they also are the most likely to have been breastfed (52% vs. 33–44%). They and their mothers have the most advantaged backgrounds. For example, their mothers are the least likely to be black or to have been on welfare during the year of the child's birth; these mothers are the most likely ever to have been married and to have lived with both parents at age 14. Differences in family background could account for differences in child and infant outcomes independent of pregnancy intention. We explore this possibility in our regression models, described below.

More interesting, perhaps, are comparisons regarding pregnancies that were intended by the father only and those intended by the mother only. Consistent with the maternal predominance hypothesis, children whose conception had been intended only by their father were less likely to have been breastfed (33%) than were those whose conception had been intended by their mother alone (44%). They also appear to be less likely to have mothers who smoked and who smoked heavily during pregnancy, but these differences were not statistically significant. This pattern could reflect that a much larger proportion of these children have mothers who are black (46%, compared with 28% of those whose conception had been intended only by their mother), because black women were less likely to breastfeed and less likely to smoke, especially heavily (not shown). In sum, the descriptive data demonstrate the need to control for possibly confounding variables in comparing outcomes between births following intended and unintended pregnancies.

Multivariate Analyses

Results from the logistic regression analyses show that among infants born to unmarried women, those whose conception had been intended by neither parent were significantly more likely than those whose parents had both wanted the pregnancy to have a mother who delayed prenatal care (coefficient, 0.5 for the entire sample and 0.7 in the fixed-effects model—Table 3). This finding is consistent with the dose-response hypothesis, since not being wanted by both parents (relative to being wanted by both) may be the strongest indicator of an unintended pregnancy. On the other hand, there is no consistent evidence for other elements of the dose-response hypothesis: A pregnancy's being intended by only one parent is not clearly better than its being intended by neither. Nor is there evidence to support the maternal predominance hypothesis.

A question raised in the literature is whether fathers' in-

TABLE 4. Coefficients from logit analyses (and standard errors) indicating the effects of a pregnancy's being unintended by either parent on selected outcomes, by mother's marital status and type of analysis

Outcome	Unmarried				Married			
	Cross-sectional		Fixed-effects		Cross-sectional		Fixed-effects	
	N	Coefficient	N	Coefficient	N	Coefficient	N	Coefficient
Prenatal care								
After first trimester	2,369	0.52* (.12)	687	0.69* (.23)	5,058	0.25* (.09)	1,051	0.27† (.17)
After second trimester	2,369	0.23 (.21)	232	0.16 (.51)	5,058	0.16 (.15)	420	0.01 (.30)
Smoked during pregnancy								
Any	2,427	0.03 (.11)	292	0.14 (.35)	5,176	0.33* (.08)	440	0.19 (.27)
≥1 pack/day	2,427	-0.04 (.02)	208	0.45 (.50)	5,176	0.27* (.13)	253	0.39 (.38)
Low birth weight	2,444	0.01 (.17)	356	-0.21 (.35)	5,203	-0.24 (.15)	427	0.47 (.31)
Ever breastfed	2,476	0.05 (.12)	286	-0.89* (.41)	5,273	-0.17* (.07)	923	-0.33† (.19)

* $p \leq .05$. † $p \leq .10$. Notes: Standard errors are adjusted for heteroskedasticity and clustering among siblings. In addition to the categories listed in the table, analyses control for undetermined mother's pregnancy intention, undetermined father's pregnancy intention (if mother's intention is determined); region and urban residence in the year following the birth; mother's race and ethnicity; child's sex, birth order and year of birth; and characteristics of the mother's household when she was 14 (whether both parents were present, whether the household received newspapers or magazines, whether any household member had a library card and educational attainment of the mother's mother). The model also includes a control for the mother's score on the Armed Forces Qualifications Test, administered to the sample in 1980, and for whether the mother reported pregnancy intention during pregnancy or after delivery. In the unmarried sample, one marital status dummy (divorced/separated vs. never married) is included. In the fixed-effects analyses, effects are identified by variation among siblings; effects of explanatory variables that do not vary among siblings cannot be estimated; and observations contribute to the likelihood function only if there is variation within mother (i.e., among siblings) in the outcome.

tentions add explanatory power to mothers' intentions in the determination of pregnancy-related outcomes and infant health. To examine this issue, we tested the joint hypothesis that the effect of a pregnancy's being intended only by the father equals the effect of its being intended by neither parent and the effect of a pregnancy's being intended only by the mother equals that of its being intended by both parents. Put differently, we tested whether, if the mother did not intend the pregnancy, there is no benefit if the father did and if the mother intended the pregnancy, there is no harm if the father did not. The p-values for the chi-square test corresponding to this hypothesis are presented in the table rows labeled "father irrelevant." For prenatal care, since this test is significant ($p \leq .05$) in the fixed-effects analysis (Table 3), we reject the hypothesis that the father's intention is irrelevant.

We also tested the restriction, suggested by the pattern of results in Table 3, that children do better if their conception was intended by both parents than if it was not intended by one or both parents. Specifically, we tested for equality of all three effects (coefficients) listed in the table for each model and report the p-values from the associated chi-square tests in the rows labeled "equality of effects." We cannot reject the hypothesis of equality, which suggests that a two-category classification of parental intentions is sufficient.

Estimates related to the incidence of nonmarital women's smoking during pregnancy are not statistically significant regardless of the estimation procedure. For breastfeeding, the results are mixed. Fixed-effect estimates indicate that infants whose conception was unintended by both parents are less likely to be breastfed than are those whose conception was intended by both (coefficient, -0.9). This evidence is consistent with the dose-response hypothesis, but the dose-response hypothesis is not supported by the es-

timates associated with the other two categories. Estimates related to breastfeeding also do not support the maternal predominance hypothesis. Finally, we cannot reject the hypothesis that father's intention is irrelevant or the hypothesis that what matters is whether both parents intended the pregnancy. We prefer the fixed-effect estimates because they are not biased by unmeasured family background factors. However, since they were based on a relatively small sample, they are imprecise, and statistical tests have less power to detect true differences.

For births to married women, few results from the regression analyses are statistically significant. Furthermore, only the estimates associated with breastfeeding suggest a substantial relationship—albeit an imprecisely estimated one. For breastfeeding, all of the estimates are negative, suggesting that children whose conceptions were unintended are relatively unlikely to be breastfed. Tests of whether fathers are irrelevant and whether what matters is that both parents intend the pregnancy are mixed. For the fixed-effects model, we reject the hypothesis that fathers are irrelevant.

Generally, there appears to be little statistical basis for discriminating among the three categories in which at least one parent did not intend the pregnancy. We therefore combined these into a single category, representing pregnancies that were unintended by either parent, and present the results of this alternative classification in Table 4. We include three outcomes that were excluded from the previous analysis because they occurred infrequently and sample sizes in some categories of parental pregnancy intention were too small for meaningful analysis (initiated prenatal care after the second trimester, smoked one or more packs per day and low birth weight).

There is relatively robust evidence that when either parent did not intend the pregnancy, the woman has an elevated likelihood of initiating prenatal care after the first

trimester and a reduced likelihood of breastfeeding. There is little evidence of an increased risk of any smoking during pregnancy, and the evidence regarding the risk of heavy smoking during unintended pregnancies is mixed, showing a statistically significant effect for marital births in the cross-sectional analysis. When mother fixed effects are included, the effect is not statistically significant, but the size of this effect may be considered important for two reasons. First, a small proportion of women smoke heavily during pregnancy (about 9% in this sample). Evaluated at this sample mean, the logit coefficient of about 0.4 translates into an increase in the probability of heavy smoking of about three percentage points, or about one-third. Second, since the evidence for adverse effects of heavy smoking during pregnancy for infant health and development is overwhelming,³³ even small changes in such behavior may have important health consequences.

DISCUSSION

Unintended pregnancy is thought to increase risks for adverse health outcomes in infancy. Previous research, including our earlier work, found much less evidence for such effects after controlling for mothers' socioeconomic disadvantage (i.e., in comparisons of siblings). However, all studies of the effects of unintended fertility on infant health that we are aware of have relied exclusively on mothers' pregnancy intentions. Ours is the first to investigate the effect of fathers' intentions on infant health and related behaviors during pregnancy.

We found some evidence that fathers' pregnancy intentions matter. Specifically, a child whose conception was intended by her mother generally appears to do better if the pregnancy was also intended by her father. However, there was no evidence that a child whose conception was not intended by his mother does better if the pregnancy was intended by his father. This pattern of results suggests a new classification of unintended pregnancy: conceptions intended by both parents and those not intended by one or both parents. Children born following an unintended pregnancy so defined are at elevated risk of having a mother who delayed prenatal care, did not breastfeed and, possibly, smoked heavily during pregnancy.

These findings are consistent with earlier literature that has examined couples' pregnancy intentions and achieved fertility, in that they reveal statistically significant, meaningful differences between some categories of pregnancies that can be identified only by using information on each parent's pregnancy intention.

Our results are based on mothers' reports of fathers' pregnancy intentions. Therefore, we cannot contribute to the debate over the value of collecting independent information on pregnancy intention from fathers as compared with obtaining information from mothers about both parents' pregnancy intentions. But our results do suggest that future research should examine the value of such information for studies of the consequences of unintended pregnancy for infant and child health and development.

REFERENCES

1. Thomson E, McDonald E and LL Bumpass, Fertility desires and fertility: his, hers and theirs, *Demography*, 1990, 27(4):579–588; Morgan SP, Individual and couple intentions for more children: a research note, *Demography*, 1985, 22(1):125–132; and Williams L, Determinants of couple agreement in U.S. fertility decisions, *Family Planning Perspectives*, 1994, 26(4):169–173.
2. Brown SS and Eisenberg L, eds., *The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families*, Washington, DC: National Academy Press, 1995.
3. Thomson E, McDonald E and Bumpass LL, 1990, op. cit. (see reference 1); Clifford WB, Lake JL and Brannon YS, Spousal agreement on the value of children and fertility behavior, *Population and Environment*, 1987, 9(2):148–159; Thomson E, Individual and couple utility of children, *Demography*, 1983, 20(4):507–518; and Williams R and Thomson E, Can spouses be trusted? a look at husband/wife proxy reports, *Demography*, 1985, 22(1):115–123.
4. Morgan SP, 1985, op. cit. (see reference 1); and Williams L and Thomson E, 1985, op. cit. (see reference 3).
5. Thomson E, McDonald E and Bumpass, LL, 1990, op. cit. (see reference 1); and Thomson E, 1983, op. cit. (see reference 3).
6. Thomson E, McDonald E and Bumpass LL, 1990, op. cit. (see reference 1).
7. Williams L, 1994, op. cit. (see reference 1); and Thomson E, McDonald E and Bumpass LL, 1990, op. cit. (see reference 1).
8. Brown SS and Eisenberg L, 1995, op. cit. (see reference 2).
9. Williams L, 1994, op. cit. (see reference 1); and Thomson E, McDonald E and Bumpass LL, 1990, op. cit. (see reference 1).
10. Thomson E, McDonald E and Bumpass LL, 1990, op. cit. (see reference 1), p. 586.
11. Montgomery MR, Comments on men, women, and unintended pregnancy, *Population and Development Review*, 1996, 22(Suppl.):100–108.
12. Joyce T, Kaestner R and Korenman S, The effect of pregnancy intention on child development, *Demography*, 2000, 37(1):83–94.
13. Brown SS and Eisenberg L, 1995, op. cit. (see reference 2).
14. David HP et al., *Born Unwanted: Developmental Effects of Denied Abortion*, New York: Springer, 1988.
15. Bledsoe CH et al., eds., *Critical Perspectives on Schooling and Fertility in the Developing World*, Washington, DC: National Academy Press, 1999; Duflo E, Grandmothers and granddaughters: old age pension and intra-household allocation in South Africa, Working Paper, Cambridge, MA: National Bureau of Economic Research, 2000, No. 8061; and Hanson TL, McLanahan SS and Thomson E, Economic resources, parental practices, and children's well-being, in: Duncan GJ and Brooks-Gunn J, eds., *Consequences of Growing Up Poor*, New York: Russell Sage Foundation, 1997.
16. Chaikind S and Corman H, The impact of low birth weight on special education costs, *Journal of Health Economics*, 1991, 10(3):291–311; and Hack M et al., Outcomes in young adulthood for very-low-birth-weight infants, *New England Journal of Medicine*, 2002, 346(3):149–157.
17. Brown SS and Eisenberg L, 1995, op. cit. (see reference 2).
18. Bankole A and Westoff CF, The consistency and validity of reproductive attitudes: evidence from Morocco, *Journal of Biosocial Science*, 1998, 30(4):438–455.
19. Thomson E, McDonald E and LL Bumpass 1990, op. cit. (see reference 1), p. 579.
20. Morgan SP, 1985, op. cit. (see reference 1).
21. Williams R and Thomson E, 1985 op. cit. (see reference 3).
22. Goldscheider FK and Kaufman G, Fertility and commitment: bringing men back in, *Population and Development Review*, 1996, 22(Suppl.): 87–99.
23. Westoff CF and Ryder NB, The predictive validity of reproductive intentions, *Demography*, 1977, 14(4):431–453.
24. Rosenzweig MR and Wolpin KI, Maternal expectations and ex post

realizations, *Journal of Human Resources*, 1993, 28(2):205–227.

25. Bankole A and Westoff CF, 1998, op. cit. (see reference 18).

26. Joyce T, Kaestner R and Korenman S, On the validity of retrospective assessments of pregnancy intention, *Demography*, 2002, 39(1): 199–213.

27. White H, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica*, 1980, 48(4): 817–838.

28. Stata Corp., *Stata Reference Manual Release 7*, College Station, TX: Stata Press, 2001.

29. Chamberlain G, Analysis of covariance with qualitative data, *Review of Economic Studies*, 1980, 47(1):225–238.

30. Ibid.

31. Williams L, 1994, op. cit. (see reference 1).

32. Ibid.

33. Abel EL, Smoking during pregnancy: a review of effects on growth

and development of offspring, *Human Biology*, 1980, 52(4):593–625; Li CQ et al., The impact on infant birth weight and gestational age of cotinine-validated smoking reduction during pregnancy, *Journal of the American Medical Association*, 1993, 269(12):1519–1524; and Sexton M and Hebel RH, A clinical trial of change in maternal smoking and its effect on birth weight, *Journal of the American Medical Association*, 1993, 251(7):911–915.

Acknowledgments

An earlier version of this paper was presented at the annual meeting of the Population Association of America, Mar. 31, 2001, Washington DC. The research on which this article is based was supported by grant HD-35353 from the National Institute of Child Health and Human Development. The authors thank Steven P. Martin and seminar participants at Baruch College and Columbia University for comments on this work.

Author contact: sanders_korenman@baruch.cuny.edu

CALL FOR PAPERS

30 Years After Roe

January 2003 marks the 30th anniversary of *Roe v. Wade*, the U.S. Supreme Court decision legalizing abortion. To commemorate this anniversary, *Perspectives on Sexual and Reproductive Health* will devote part of its January/February issue to commentaries addressing how abortion-related policies and practices have affected the lives of American women, their health care providers, their partners and their families; what difficulties exist for women who wish to obtain abortions or providers who wish to offer them today; and the prospects for overcoming these obstacles. We welcome submissions of up to 3,500 words. *Deadline for submissions is September 13, 2002.*

Men's Sexual and Reproductive Health: Recognizing and Meeting the Needs

As recognition grows that men have distinct sexual and reproductive health needs, but that few services are tailored to meet them, providers and educators are adapting old programs and developing new ones to enable men to obtain the information and care that they require. The November/December 2003 issue of *Perspectives on Sexual and Reproductive Health* will include a special section addressing the need for men's services, the scope and effectiveness of existing programs, and approaches to closing remaining gaps in services. We will consider original research or review articles (with a maximum length of 6,000 words), as well as commentaries (up to 3,500 words). *Deadline for submissions is April 15, 2003.*

To submit a manuscript for either of these special issues, please send one copy to Patricia Donovan, Editor in Chief, *Perspectives on Sexual and Reproductive Health*, 120 Wall Street, New York, NY 10005, or e-mail it to articles@guttmacher.org. Detailed guidelines for authors may be found elsewhere in this issue.