

Dads and cads: parental cohabitation and the human sex ratio at birth

Karen Norberg, MD

Boston University

National Bureau of Economic Research, 1050 Massachusetts Ave., Cambridge, MA 02138

norberg@nber.org

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Abstract:

Modern sex allocation theory predicts that parents may be able to vary the sex of their offspring according to the prospects for two-parent care. Using data pooled from four publicly available longitudinal studies, I find that parents who were living with an opposite-sex spouse or partner before the child's conception or birth were significantly more likely to have a male child than parents who were living apart (X^2 17.35, $df=1$, $p < .0001$). The effect is observable even when the comparisons are made between siblings (odds ratio 1.14, $p = .001$), and even when the sibling comparisons are made before the children's conceptions (odds ratio 1.14, $p = .01$). This "partnership status effect" may be the result of modern reproductive exposures, but a paternal investment effect would fit closely with the predictions of adaptive sex allocation theory.

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Modern sex allocation theory predicts that parents may vary the sex of their offspring according to the offspring's prospects for reproductive success (1, 2). Two-parent care is a widespread, but not universal, feature of human reproduction; if the consequences of one-parent care were different for sons and for daughters, then it might be adaptive for parents to vary the sex of their offspring according to signals forecasting the prospects for two-parent care. Sex differences in the consequences of one-parent care could also arise if offspring derive special benefits from contact with a same-sex parent, if males have a higher variance in reproductive success associated with parental resource investments, or if sons were more or less likely than daughters to assist their kin under conditions of hardship (1, 2, 3). Regardless of the reasons, if mother-only care were more of a disadvantage for the inclusive fitness of sons than of daughters, then parents should produce fewer sons under conditions forecasting one-parent care, and more sons under conditions forecasting two-parent care.

Marriage and paternity acknowledgement are human social institutions closely tied to the prospects for two-parent care (4, 5). The present study was motivated by nineteenth century reports of a lower percentage of boys among illegitimate births; several of these studies were mentioned by Charles Darwin in his discussion of the sex ratio at birth in *The Descent of Man* (6). However, twentieth century studies no longer find an association between the mother's marital status and offspring sex (7, 8). Many factors might explain this change; most obviously, the disappearance of a "legitimacy status" effect could be the result of the dramatic decline in the incidence of stillbirth for both married and unmarried mothers around the end of the nineteenth century. However, there are other possibilities: in particular, a rise in "shotgun marriage" as a resolution to pre-marital conception, and non-marital cohabitation as an alternative to marriage,

could have confounded previous efforts to find a “legitimacy status” effect in recent western populations. Paternal investment has received surprisingly little attention from twentieth-century sex allocation theory, perhaps because of this lack of evidence from human populations.

In the present study, I investigate whether parents who were living together before a child’s birth were more likely to have a male child than parents who were living apart, whether or not the parents were legally married. Since it is possible that child sex might influence the parent’s prenatal behavior, I use observations of the parent’s household composition before conception when this information is available. The analysis makes use of data pooled from four publicly available US surveys: the 1959 National Collaborative Perinatal Project (NCPP), the 1969 National Longitudinal Survey of Young Women, (NLS-YW), the 1979 National Longitudinal Survey of Youth (NLSY), and the 1995 National Survey of Family Growth (NSFG) (9,10,11). Together, these surveys yield a sample of 80,715 children born to 58,104 US families over a span of four decades, from 1959 to 1998; each study has important strengths and weaknesses for the present purpose. The NLS-YW, the NLSY, and the NSFG were designed to be statistically representative of specific US cohorts, and yield information about the presence or absence of a spouse or unmarried partner in the respondent’s household before the child’s conception. The earliest survey, the 1959 NCPP, is important to the present study because it predates the legalization of abortion, but it is based on a convenience sample, and household composition is first recorded when the mother registers for prenatal care. The NSFG collects data retrospectively, rather than prospectively, but provides the exact month of the start and stop of non-marital cohabitation, as well as dates of marriage. The NLSY collects information from male respondents as well as female respondents. I consider these four studies separately and

together; the pooled sample (with or without the NCPP) is large enough to control for many background factors by comparing siblings within the same family. These within-family comparisons estimate the difference in the likelihood of having a male child associated with differences in the responding parent's partnership status before each conception or birth. Such comparisons control for a wide range of factors, including the responding parent's genetic endowment, fixed propensities to produce male or female offspring, and conditions of rearing. However, such comparisons do not control for the characteristics of the second parent among half-siblings; nor do they control for household income, other aspects of household composition, or mother's nutritional status, psychological stress, occupational exposures, contraceptive exposures, access to medical care, and other factors which might vary from one pregnancy to another.

Table 1 describes the four samples, and the appendix gives further details. In spite of differences in the prevalence of marriage, there was a nearly constant association between child sex and parent household composition across the four surveys. Specifically, there were consistently fewer boys among children whose parents were living apart. In the pooled sample, there were 51.5 % boys among children whose parents were living together, whether married or unmarried, before conception or at the first prenatal visit, and 49.8 % boys among children whose parents were living apart, with a X^2 value (stratified by study) of 17.35, $df=1$, $p < .0001$. The association remained significant in the non-NCPP pooled sample when the parent's household was observed before the child's conception, with a stratified X^2 value of 9.71, $df=1$, $p=.002$. Although a test of the homogeneity of the odds ratios suggests that there is no significant difference between samples, ($p=.76$), thus justifying the pooling of samples, the

difference in sex ratios is greatest in the NSFG sample, where the estimates are based on the most exact dating of the start of cohabitation: 47.8% males among children conceived by parents who were living apart, and 52.5% boys among children conceived by parents who were living together.

In Table 2, Models 1 and 2 present a multivariate analysis using the pooled sample, with logistic regression models predicting the odds of a male versus female birth, and adjusting for parental age, sex, education, and ethnicity, and child birth order and year of birth. The control variables were selected because they were available in all four surveys, and because, except for parent's sex, they were among the few demographic factors that have been associated with offspring sex in other human studies (7, 8). It would have been of interest to control for household income, but comparable measures were not available across studies; however, parental education is highly correlated with income and may serve as a proxy for the income earning potential of the responding parent. Only ethnicity and partnership status significantly predicted child sex, with partnership status as the strongest predictor. In Model 1, children whose parents were living together before pregnancy or, in the NCPP, at registration for prenatal care, were 5.9 % more likely to be male than children whose parents were living apart (odds ratio 1.059, 95% c.i. 1.023 to 1.095, $p < .001$; $Z=3.27$, $n=80,715$). The partnership status estimates did not differ by study sample, year of child's birth, or parent age, sex, parity, or ethnicity. Quadratic terms, interaction terms, categorical transformation of covariates and other changes in specification did not yield other significant associations, and did not modify the association between partnership status and child sex. In Model 2, which is based on the more recent, non-NCPP pooled sample using observations before conception, children whose parents were living

together before the child's conception were 7.4 % more likely to be male than children whose parents were living apart (odds ratio 1.074, 95% c.i. 1.0137 to 1.140, $p=.016$, $Z=2.42$, $n=27,216$).

The estimates were slightly larger in magnitude – although measured with less precision- when the comparisons were made within families. Models 3 and 4 use conditional logistic regression to make comparisons among siblings. Model 3 indicates that siblings whose parents were living together before or during early pregnancy were 14.4% more likely to be male than siblings whose parents were living apart (odds ratio 1.144, 95% c.i. 1.053 to 1.242, $p< .001$). Again, the estimate changes little in Model 4, which is limited to household observations before the child's conception.

In summary, girls start out in families that differ from the families of boys. The observed effect is small -the sibling comparisons in model 4 would correspond to a prevalence of about 53% male births among siblings who were conceived when the parents were living together (whether married or unmarried) before the child's conception, compared to a prevalence of about 50% male births among siblings conceived when the parents were living apart; more exact measures of cohabitation might yield larger estimates. The "partnership status" effect was not explained by paternal bias against the acknowledgment of girls, nor by the parent's ethnicity, age, sex, race, education, or parity, and it was not explained by the fixed genetic, behavioral or environmental background factors that would be shared among full and half siblings within the same family.

It would be hazardous to jump to an adaptive conclusion in the face of modern reproductive exposures. Even if the "cohabitation effect" were not the result of exposure to modern technologies, the present study does not indicate whether the underlying mechanism operates at conception or later in gestation; sex-selective miscarriage may be adaptive, but could

also be the non-adaptive byproduct of sex differences in fetal development (4, 8). All the same, the partnership status effect is discernable in the early 1960's, well before the legalization of abortion in the US, and resembles the "legitimacy status" effect reported in the nineteenth century, long before the introduction of modern hormonal contraception. A paternal investment effect would be consistent with the importance of two-parent care in the biology of human reproduction, and would fit closely with the predictions of modern sex allocation theory.

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**Table 1: Partnership Status and Likelihood of a Male Child:
Descriptive statistics**

	NCPP ^b	NLS-YW ^a	NLSY ^a	NSFG ^a	Pooled ^a	Pooled ^a
<i>N: parents</i>	43,721	3206	8438	2739	58,104	14,383
<i>N: live births</i>	53,515	6696	17160	3360	80,715	27,216
<i>Birth year range</i>	1959-1966	1970-1997	1980-1998	1991-1995	1959-1998	1970-1998
Timing of household observation:	First prenatal visit	9 months or more before birth	9 months or more before birth	At 9 months before birth	Mixed	Before conception
Sampling frame:	low income patients, longitudinal survey	US cohort, longitudinal survey	US cohort, longitudinal survey	US cohort, retrospective survey	All four samples	Excludes NCPP
Partnership status:						
<i>Married</i>	73.3%	77.6 %	65.5 %	63.3%	71.6 %	68.3%
<i>Cohabiting</i>	3.2%	0.5 %	8.0 %	11.3 %	4.3 %	6.6%
<i>Living apart</i>	24.5%	21.9 %	26.5 %	25.3 %	24.1 %	25.2%
% Male births:						
<i>Married</i>	51.5%	53.4 %	51.6 %	52.7 %	51.5 %	52.2%
<i>Cohabiting</i>	51.0%	46.4 %	52.8 %	51.7 %	51.7 %	52.4%
<i>Either m. or c.</i>	51.1 %	53.1 %	51.8 %	52.5 %	51.5 %	52.3%
<i>Living apart</i>	49.7%	51.0 %	50.3 %	47.8 %	49.8 %	50.0%
<i>Odds ratio^a:</i>	1.061	1.119	1.058	1.205	1.071 ^a	1.089 ^a
<i>Odds ratio^b:</i>	1.061	1.100	1.065	1.142	1.069 ^b	1.081 ^b
<i>X²: (df=1)</i>	8.54*** (p=.004) ^b	3.05 (p=.081) ^b	3.91* (p=.048) ^b	3.00 (p=.083) ^b	17.35***** (p<.0001) ^b	9.13*** (p=.003) ^b

*p <= .05 **p<=.01 ***p<=.005 **** P<=.0001

a: weighted b: unweighted, stratified by study

NLS-YW: National Longitudinal Survey of Young Women-1969

NLSY: National Longitudinal Survey of Youth-1979

NSFG: National Survey of Family Growth-1995

NCPP: National Collaborative Perinatal Project

Mixed: household status is reported nine months or more before birth in NSFG, NLSY and NLS-YW; and any time before birth in NCPP.

Before conception: household status is reported nine months or more before birth; the NCPP sample is not included

**Table 2: Partnership status and likelihood of a male child:
Ordinary and Within-Family Logistic regressions**

	Model 1	Model 2	Model 3	Model 4
	Ordinary	Ordinary	Within-family	Within-family
Timing of household observation ^a	Mixed	Before conception	Mixed	Before conception
N births	80715	27216	80715	27216
N families	58104	14383	58104	14383
Parents married or living together	.057*** (.017)	.072* (.030)	.134*** (.043)	.127** (.050)
Parent's age (years)	.0003 (.002)	.006 (.005)	.008 (.030)	.017 (.045)
Parent's education (years)	.0001 (.002)	-.003 (.006)	-.010 (.006)	.029 (.051)
Child's birth order	-.003 (.005)	-.003 (.010)	-.011 (.021)	-.012 (.029)
Child's birth year	-.003 (.002)	-.008 (.005)	-.007 (.030)	-.014 (.045)
NSFG	.021 (.043)	.045 (.048)	---	---
NLSYW	.022 (.044)	-.030 (.062)	---	---
NCPP	-.082 (.063)	----	---	---
Parent female	-.0006 (.031)	.003 (.031)	---	---
Parent Black	-.037* (.016)	-.013 (.032)	---	---
Parent Hispanic	-.008 (.026)	.017 (.038)	---	---

*p <= .05 **p<=.01 ***p<=.001 ****p<=.0001

The ordinary logistic regression models use robust standard errors (allowing for correlations among siblings), and sampling weight. Within-family models stratify by responding parent's id. Standard errors are in parentheses.

Mixed: household status is reported nine months or more before birth in NSFG, NLSY and NLS-YW; and any time before birth in NCPP.

Before conception: household status is reported nine months or more before birth; the NCPP sample is not included

Dads and Cads: APPENDIX:

Data sources:

This study is based on four publicly available data sets which collected information about the presence or absence of unmarried partners as well as marital partners, and which included multiple siblings within the same family. Each of the four data sets has strengths and weaknesses for the present purpose.

The 1969 National Longitudinal Survey of Young Women (NLS-YW) and the 1979 National Longitudinal Survey of Youth (NLSY) belong to a family of nationally representative cohort studies sponsored by the US Bureau of Labor Statistics; subjects are interviewed annually, permitting observation of the parents' marriage or non-marital cohabitation status at the most recent interview before the child's conception. Both samples were drawn to represent the civilian, non-institutionalized US populations in the designated age group at the time of the surveys. Births reported in these surveys were included in the present study if the sample parent was at least 15 years old at the time of the child's birth, if there was at least one interview between 9 and 37 months before the child's birth, and if there were no missing values for child's date of birth, child sex, and parent's education. The NLS-YW began with a cohort of young women between the ages of 14 and 24 in 1968; non-marital cohabitation was still uncommon at the time this survey began, and the NLS-YW did not collect information about unrelated household members in 1975, 1977, and 1980. The NLSY began with a cohort of young men and women between the ages of 14 and 21 in 1979. The NLSY does identify unmarried opposite-sex partners living in the household in every survey year, and distinguishes "partners" from other unrelated household members. Because of the NLS cohort design, children born early in each cohort had younger mothers, on average, than the average child born in the US, and children born later in each cohort had older mothers than the average child born in the US.

In contrast, the 1995 NSFG is a nationally representative, retrospective survey of US women who were between the ages of 15 and 45 when they were interviewed in 1995, and asks directly about month and year of marriages, separations, and divorces, and start and stop dates of non-marital cohabitations. Births reported in the NSFG were included in the present study if the pregnancy ended in a live birth between 1991 and 1995, and if the child's mother was at least 15 years old at the time of the child's birth. The NSFG also provides an explicit

estimate of the date of conception for all pregnancies. This survey has been the basis for official US estimates of the prevalence of cohabitation among non-marital births .

Lastly, the National Collaborative Perinatal Project (NCPP) represents a diverse and primarily low-income women registered for prenatal care between 1959 and 1965 at collaborating sites across the US; it is still the largest prospective study linking perinatal risk factors and developmental outcomes ever conducted in the US. The NCPP is important to the present study because the focal pregnancies predate the legalization of abortion in the US, and predate the widespread legalization of contraception for unmarried couples.

Measures of parents' partnership status:

For the purposes of the present study, subjects in all four samples could be classified into three mutually exclusive household types: (1) responding parent married, with spouse present in the household; (2) responding parent unmarried, with an opposite sex partner living in the household; and (3) other. However, the timing of the observations differed across studies.

In both NLS surveys, household composition "before conception" was coded from the sample parent's reported household composition at the most recent interview falling nine months or more before the child's birth, and household composition "before six months" was coded from the most recent interview falling six months or more before the child's birth. The median interval from preconception interview to birth was 16 months. Because households are usually forming rather than dissolving around the time of conception, information from annual interviews will underestimate the actual proportion of couples who were sharing a household at conception. For example, if a couple started a joint household ten months before a child's birth, and if the most recent interview were twelve months before the child's birth, then the couple's status at the time of the child's conception would be misclassified as living apart. This misclassification would tend to bias effects towards the null.

The NSFG collects information about the exact month and year of marriages, separations, and divorces, the start and stop dates of non-marital cohabitations, and the estimated month and year of conception for each reported pregnancy in the focal period from 1991 to 1995. Among the four surveys, the NSFG yields the most sensitive and specific measure of the parent's household status at the time of the child's conception.

In contrast, the NCPP collects its first household information at the mother's first prenatal visit. The timing of the household report is therefore correlated with the quality of the mother's prenatal care. To avoid selection bias, I make no effort to restrict observations from the NCPP by timing of the first prenatal interview.

Other measures:

The multivariate regression models in Table 2 of the main text also include measures of the age, education, sex, study sample and black or Hispanic ethnicity of the responding parent, and the child's birth order and year of birth. Age, education, birth order, and black ethnicity were selected because they were available in all four surveys, and because they were among the few demographic factors that have been associated with offspring sex in other human studies (12, 13). The NLS-YW did not record Hispanic ethnicity. The parent's age and highest grade completed were measured at the time of the child's birth, and are expressed in years. It would have been possible to report mother's and father's age and education separately, but missing information about the non-respondent parent is almost perfectly collinear with the classification of household composition; restriction to female respondents, or inclusion of information about the non-responding parent when this information was available, resulted in no significant change in the results that are reported here.

Statistical methods and sampling weights:

The ordinary logistic regression models in this study used sampling weights and robust standard errors, which take account of the possible clustering of variation among siblings. Individual weights were adjusted so that each of the four weighted populations was equal to its original sample size, not to the populations from which they were drawn. There were no significant differences in point estimates, whether the regression models were evaluated with or without the use of weights.

Results:

Sample description:

Appendix Table 1 describes weighted means and frequencies for the key variables in the four studies. Responding parents were divided about equally between mothers and fathers in the NLSY; all of the respondents in the other three samples were female. 51% of the offspring in the pooled sample were males; after appropriate weighting, the NLSYW, NLSY, and NSFG samples included between 12.4% and 14.8% Blacks, and zero to 15.6% Hispanics; however, the NCPP sample was 47.0% Black and 6.5% Hispanic. Mothers in the NCPP were also slightly younger, with less education and larger families, than parents in the other samples.

Comparisons among measures:

Appendix Table 2 compares the effects of using different measures and different observation dates for the parent's household composition. Models 1, 2, and 3 compare marriage and cohabitation status before conception as separate indicators. These models indicate that married and unmarried couples who are living together before the child's conception have very similar odds of having a male child, compared to parents who are living apart, thus justifying the use of the combined measure. The estimates for marriage and non-marital cohabitation are also similar to each other in the NCPP, when household composition is first observed during pregnancy, and they are similar with and without inclusion of other variables in the model.

Models 4, 5, and 6 compare the effects of using different observation dates using the full, pooled sample. Model 4 takes observations at registration in the NCPP, and before conception in the other three samples; Model 5 takes observations at registration in the NCPP, and observations from 6 months or more before the child's birth in the other samples; and Model 6 takes the most recent observation before the child's birth in all four samples. Median observation-to-birth intervals from the NLS samples in these four models were 16, 15, 12, and 4 months, respectively. Overall, the magnitude of effect does not seem very sensitive to differences in the timing of observation, within the margins of error of these measures. However, a cutoff at six months (which yielded a median observation interval of about 12 months before the child's birth in the NLS) produced a slightly better "hit rate" in predicting child sex compared to other cutoffs in the pooled sample.

Comparisons among samples:

Appendix Table 3 compares the results of logistic regression models examined separately in the four samples, using observations six months or more before the child's birth (for the NLS and NSFG samples), or at the first prenatal visit (for the NCPP). Of the various cutoffs that could be used, this choice produces the greatest differences in estimates among studies; the coefficients correspond to odds ratios ranging from 1.021 to 1.285. Never the less, formal tests of homogeneity of the effects, including the use of a full set of interaction terms between study sample and partnership status, yield no significant differences between studies. The effect sizes do correspond to the probable sensitivity of the measures in each study. For example, the smallest estimate comes from the NLS-YW; in this study, interviews were not conducted every year, and information about non-marital cohabitation was not collected at all interviews. Likewise, the largest estimate comes from the NSFG; the NSFG provides information about the start and stop dates of both marriages and non-marital cohabitation, allowing the most exact estimate of partnership status at conception and birth.

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Appendix Table 1: Sample description

	NCPP ^a	NLS-YW ^a	NLSY ^a	NSFG ^a	Pooled
N: parents	43,721	3206	8438	2739	58,104
N: live births	53,515	6696	17160	3360	80,731
Birth year range	1959-1966	1970-1997	1980-1998	1991-1995	1959-1998
<i>Frequencies:</i>					
Parent= female	100.0%	100.0 %	52.0%	100.0 %	90.0 %
Child= male	50.8%	52.5 %	51.0 %	51.2 %	51.0 %
Black	47.0%	12.4 %	14.8 %	14.3 %	40.4 %
Hispanic	6.5%	N/a	7.9 %	15.6 %	9.4 %
<i>Means:</i>					
Birth year	1962.6	1976.8	1988.3	1992.6	1970.0
Parent's age (yrs)	24.2	27.3	27.4	26.0	24.9
Parent's ed'n (yrs)	10.8	12.8	13.2	12.6	11.4
Birth order	2.9	2.5	2.1	2.6	2.7
Earliest observation used in present study:	First prenatal visit	9 months or more before birth	9 months or more before birth	At conception	Mixed
<i>Median interval from observation to birth: (in months)</i>					
Last observation before conception	N/a	17.0 months	15.0 months	9.1 months	15.0 months
Last observation six months or more before birth	N/a	14.0	12.0	6.0	12.0
Last observation before birth	4.0 months	8.0	6.0	0.0	4.0

^a NCPP: National Collaborative Perinatal Project
 NLS-YW: National Longitudinal Survey of Young Women-1969
 NLSY: National Longitudinal Survey of Youth-1979
 NSFG: National Survey of Family Growth-1995

N/a= not available

**Appendix Table 2: Partnership Status and Likelihood of a Male Child:
Comparisons among measures ^a**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Timing of observation (NLS ^b and NSFG)	9 months before birth	9 months before birth	9 months before birth	9 months before birth	6 months before birth	Birth
Sample	NLS ^b , NSFG	NLS ^b , NSFG	NLS ^b , NSFG	Whole	Whole	Whole
N births	27216	27216	27216	80715	80715	80715
	Coefficients (s.e.)	Coefficients (s.e.)	Coefficients (s.e.)	Coefficients (s.e.)	Coefficients (s.e.)	Coefficients (s.e.)
Parents married, living together	.078** (.027)	.064* (.031)				
Parents unmarried, living together	.100* (.050)	.108* (.052)				
Parents married or living together		----	.072* (.030)	.057*** (.017)	.062*** (.017)	0.058*** (.018)
Parent Black		-.016 (.032)	-.013 (.032)	-.037* (.016)	-.035* (.016)	-.036* (.016)
Parent Hispanic		.017 (.037)	.017 (.037)	-.008 (.026)	-.009 (.026)	-.009 (.026)
Parent's age (years)		.007 (.005)	.006 (.004)	.0002 (.002)	.0002 (.002)	.0003 (.002)
Parent's education (years)		-.003 (.006)	-.003 (.006)	.0001 (.002)	.0001 (.002)	.0001 (.002)
Child's birth order		-.003 (.010)	-.003 (.010)	-.003 (.005)	-.003 (.005)	-.0024 (.005)
Child's birth year		-.008 (.005)	-.008 (.005)	-.003 (.002)	-.003 (.002)	-.003 (.002)
NSFG		.045 (.048)	.045 (.048)	.021 (.040)	.019 (.040)	.019 (.043)
NLSYW		-.029 (.062)	-.030 (.062)	.023 (.044)	.019 (.043)	.027 (.044)
NCPP		----	-----	-.082 (.064)	-.079 (.063)	-.069 (.064)
Parent female		.004 (.032)	.003 (.032)	-.0006 (.031)	-.0002 (.031)	-.0001 (.031)

*p <= .05 **p<=.01 ***p<=.001 ****p<=.0001

^a Ordinary logistic regression models use pooled sample, robust standard errors and sampling weight, and within-family models use conditional logistic regressions stratifying by responding parent's id. Standard errors are in parentheses.

^b "NLS" = NLS -YW and NLSY; see list of study samples in footnote to Appendix Table 1

**Appendix Table 3: Partnership status and likelihood of a male child:
Comparisons among samples ^a**

	Pooled sample	NCPP	NLS-YW	NLSY	NSFG ^d
Timing of household observation ^b	Mixed ^c	First prenatal visit	6 + months before	6 + months before	6 months before
N births	80715	53499	6696	17160	3360
Married OR living together	.062*** (.017)	.046* (.022)	.021 (.067)	.088* (.037)	.251** (.097)
Parent = Black	-.035 * (.016)	-.048* (.019)	-.067 (.067)	.004 (.040)	.119 (.093)
Parent = Hispanic	-.009 (.026)	-.034 (.037)	----	.022 (.042)	.003 (.091)
Parent's age (years)	.0002 (.002)	-.0007 (.002)	.007 (.011)	.010 (.007)	.001 (.008)
Parent's education (years)	.0001 (.002)	.0003 (.002)	.017 (.014)	-.010 (.007)	-.008 (.014)
Child's birth order	-.003 (.005)	-.002 (.006)	.011 (.017)	-.001 (.014)	-.025 (.025)
Child's birth year	-.003 (.002)	-.005 (.005)	-.009 (.010)	-.011 (.007)	-.034 (.028)
Parent= female	-.0002 (.031)	----	----	.005 (.032)	----

*p <= .05 **p<=.01 ***p<=.001 ****p<=.0001

^a Ordinary logistic regression models use robust standard errors and sampling weight. Standard errors are in parentheses.

^b "Mixed": household status is reported at six months before birth in the NSFG; six months or more before birth in NLSY and NLS-YW; and any time before birth in NCPP.

^c Model 1 also includes dummy variables indicating study; all are non-significant. Model 1 is identical to Model 5 in Appendix Table 2

^d NCPP: National Collaborative Perinatal Project
 NLS-YW: National Longitudinal Survey of Young Women-1969
 NLSY: National Longitudinal Survey of Youth-1979
 NSFG: National Survey of Family Growth-1995