ABSTRACT
This study investigates the link between birth intendedness and maternal health and parenting behaviors. We incorporate two insights into research on birth intendedness: birth intention is shaped in context of union status at conception and union status has become a marker of socioeconomic (dis)advantage. These insights allow us to address causal heterogeneity in birth intention effects. Because women in the same union status are more likely to share common characteristics, within-group analysis provides an effective way to account for selection into intended and unintended pregnancies. Moreover, stratification by union status affords to assess differential processes by which birth intention is shaped. Results from the Add Health data indicate that the effects of birth intendedness are contingent on union status at conception. Unintended pregnancy has negative effects for cohabiting and married mothers but insignificant effects for single mothers. These findings suggest greater ambivalence about having a child among single mothers.
Birth Intendedness, Union Status at Conception, and Maternal Behaviors

Scholarship on fertility has expressed much interest in birth intendedness. In the United States, approximately one-third of all births have resulted from unintended pregnancies over the last thirty years (Mosher, Jones, and Abma 2012; Orr et al. 2000). As unintended childbearing occurs more likely among disadvantaged and unmarried mothers, a growing body of research has addressed its potential consequences for family and child wellbeing. Our knowledge base on this issue is not strong, however. On the one hand, studies have documented that unintended fertility has negative effects on maternal and child outcomes, including mothers’ prenatal health behaviors (e.g., smoking, drinking, and doctor visit) and children’s health and development (e.g., preterm birth, birth weight, and cognitive and socioemotional development) (Kost and Lindberg 2015). On the other hand, the strong correlations between socioeconomic disadvantage and unintended childbearing make these findings less clear. Many studies have reported that most of the associations between unintended childbearing and the outcomes examined are sensitive to target populations, covariates considered, and modeling strategies (Shah et al. 2011). Selection into intended and unintended pregnancies remains a serious concern in this literature.

While contributing to our understanding of the causes and consequences of unintended fertility, extant research has yet to address the role of birth intendedness in the context of family change. The decoupling of marriage and fertility coincides with a dramatic increase in nonmarital childbearing (Cherlin 2004; Rindfuss, Guzzo, and Morgan 2003; Wu and Wolfe 2001). The percentage of all births that were to unmarried women increased from 18 percent in 1980 to 41 percent in 2013 (Curtin, Ventura, and Martinez 2014). Moreover, nonmarital fertility has become more divergent. Recent estimates indicate that, while in 1980 nonmarital births were mostly to women aged 20-
24 (41 per 1,000) and aged 18-19 (39 per 1,000), in 2012 the nonmarital birth rates were highest for women aged 25-29 (67 per 1,000), followed by women aged 20-24 (65 per 1,000). Whereas 41 percent of nonmarital births occurred within cohabiting unions in 2002, this figure was 58 percent during the 2006-2010 period (Curtin et al. 2014). The fact that nonmarital childbearing occurs more likely among non-teen, cohabiting mothers has implications for birth intendedness. Indeed, from 1982 to 2006-2010, the percentage of intended nonmarital births increased from 28 percent to 40 percent, whereas the percentage of unintended nonmarital births decreased from 72 percent to 60 percent (Mosher et al. 2012:17). Although the majority of nonmarital births are still deemed unintended, a substantial fraction of nonmarital births are now regard as intended. However, we still do not know much about what role this increasingly heterogeneous childbearing behavior plays in the link between birth intendedness and family and child wellbeing.

In this paper, we examine the impacts of birth intention and maternal health and parenting behaviors. Rather than focusing exclusively on the role of birth intendedness, we adopt two critical insights: (1) birth intention is shaped not in isolation but in context of union status at conception (Edin and Kefalas 2005); and (2) union status has become a marker of socioeconomic (dis)advantage (Wilson 1987). These insights allow us to address causal heterogeneity in the effects of birth intendedness in two ways. First, most studies suggesting the causal effect of unintended pregnancy (and childbearing by extension) make an implicit assumption that its effect is homogeneous across population subgroups. For this assumption to hold true, the effect of unintended pregnancy also ought to be observed within the same family structure at conception. Because women in the same union status are more likely than their counterparts to share common socioeconomic characteristics, within-group analysis provides an effective way to account for selection into intended and unintended pregnancies.
Second, the intersection of birth intendedness and union status points to the possibility that the presence or absence of a spouse/partner influences the ways in which women’s fertility desire is defined and determined. For example, to the extent that the absence of a spouse/partner represents socioeconomic disadvantages facing single mothers, this group of women may be more uncertain and ambivalent about their desire for pregnancy (Sable 1999; Zabin 1999). Stratification by union status at the time of conception, thus, affords to assess differential processes by which birth intention is shaped.

DATA AND METHODS
To investigate whether and how the effects of birth intendedness vary mothers’ union status at conception, we draw on data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a longitudinal study of a nationally representative, school-based sample of adolescents in grades 7-12 in the US during the 1994-95 year (Harris et al. 2009). The Add Health cohort has been followed into adulthood with four in-home interviews, the most recent in 2008-09, when the sample was aged 24-32. The Wave I survey contains a rich array of variables that are measured at the individual-, family-, school-, and neighborhood-levels, many of which are unobservable in previous research. The Wave IV survey provides detailed life history data on birth intendedness, union status at conception, and fertility. The Add Health data enable us to examine the link between birth intendedness and mothers’ health and parenting behaviors among the most recent cohort of young women.

Of 8,352 women at Wave IV, we restrict our study sample to those who (1) were single and childless at Wave I; (2) had a first birth by Wave IV; (3) provided complete information on birth intendedness and union status at conception at Wave IV; and (4) had valid sampling weights. For missing observations on covariates due to item-
nonresponse, the analysis employs a multiple imputation (MI) procedure available in Stata. These sample restrictions yield the total analytic sample size of 4,149, and estimation is based on 10 MI data sets. To adjust for design effects in the sampling of Add Health, all analysis uses the sampling weights and standard errors adjusted for school-level clustering (Chantala and Tabor 1999).

Our outcome variables measure mothers’ health behaviors during pregnancy (all dichotomous), including smoking, drinking alcohol, and late doctor visit, and parenting stress (continuous). Next, mothers’ intendedness for their first birth is measured (intended or unintended), based on a retrospective question asked at Wave IV: “Thinking back to the time just before this pregnancy, did you want to have a child then?” We identify mothers’ union status at the time of conception (single, cohabiting, or married) by crosschecking the life history data on relationship status and fertility. Table 1 shows the distribution of intended and unintended first births by union status at conception. Finally, all covariates come from Wave I and include a variety of sociodemographic, relational, behavioral, school, and neighborhood characteristics.

This study employs propensity score weighting models to estimate the effects of birth intendedness on maternal prenatal and parenting behaviors. Recent literature on causal inference suggests that propensity score models outperform conventional regression models in minimizing serious mismatches between the treated and the control groups with respect to observed covariates (Morgan and Winship 2007). The propensity score weighting approach is known to be more efficient and stable than the matching in that it does not need to discard unmatched cases. Given the objective of our study, we construct the treatment (unintended) and control (intended) groups within the same union status at conception.

Specifically, we calculate the propensity score, \( p \), that a mother’s pregnancy carried to term is unintended, conditional on all covariates. Using an inverse-probability-of-
treatment (IPT) weighting framework (Imbens 2004; Robins 1999; Sato and Matsuyama 2003), we weight each mother by the inverse of her propensity score. Mothers in the treatment group are given a weight of $1/p$, thereby assigning lower weights to mothers with higher propensity scores and higher weights to mothers with lower propensity scores. Mothers in the control group are given a weight equal to $1/(1−p)$, thereby assigning higher weights to mothers with higher propensity scores and lower weights to mothers with lower propensity scores. In essence, the IPT weighting generates a pseudo-population in which birth intendedness is independent of all observed covariates within the same union status at conception.

Our propensity score weighting models estimate the effects of birth intendedness with the product of the IPT weights and sampling weights, fitting appropriate regression models.

PRELIMINARY RESULTS
Table 2 reports estimates of the overall effects of birth intendedness from unadjusted, regression-adjusted, and propensity score weighting models. For the last two models, we simply control for union status at conception alongside all measured covariates.

Results show that unintended pregnancy is significantly associated with maternal outcomes examined, indicating that it increases the likelihood of smoking, drinking alcohol, late doctor visit during pregnancy, and parenting stress.

However, we find that the effects of birth intendedness are contingent on union status at conception. As shown in Table 3, our propensity score weighting model indicates that unintended pregnancy has deleterious effects for cohabiting mothers (smoking and parenting stress) and married mothers (drinking alcohol and late doctor visit) but weaker and insignificant effects for single mothers. These preliminary results suggest greater ambivalence about having a child among single mothers.
NEXT STEPS

Before PAA, we will expand and sharpen our arguments about the intersection between birth intendedness and union status; re-estimate the effects of birth intendedness by union status at birth to explore the role of shotgun cohabitation/marriage; conduct a sensitivity analysis to address unobserved heterogeneity.

REFERENCES


Table 1. Distribution of Birth Intendedness, by Union Status at Conception

<table>
<thead>
<tr>
<th>Union Status</th>
<th>Intended Frequency</th>
<th>Intended %</th>
<th>Unintended Frequency</th>
<th>Unintended %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>515</td>
<td>12.41</td>
<td>1,102</td>
<td>26.56</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>616</td>
<td>14.85</td>
<td>614</td>
<td>14.80</td>
</tr>
<tr>
<td>Married</td>
<td>1,117</td>
<td>26.92</td>
<td>185</td>
<td>4.46</td>
</tr>
<tr>
<td>Total</td>
<td>4,149</td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Overall Effects of Unintended Pregnancy

<table>
<thead>
<tr>
<th>Model</th>
<th>Smoking</th>
<th>Drinking</th>
<th>Late doctor visit</th>
<th>Parenting stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td>0.590</td>
<td>0.193</td>
<td>0.897</td>
<td>0.115</td>
</tr>
<tr>
<td>Regression-adjusted</td>
<td>0.256 †</td>
<td>0.320</td>
<td>0.332 †</td>
<td>0.100 ***</td>
</tr>
<tr>
<td>PSW</td>
<td>0.280 *</td>
<td>0.364 †</td>
<td>0.393 *</td>
<td>0.094 ***</td>
</tr>
</tbody>
</table>

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001 (two-tailed tests).

Table 3. Effects of Birth Intendedness, by Union Status at Conception

<table>
<thead>
<tr>
<th>By union status</th>
<th>Smoking</th>
<th>Drinking</th>
<th>Late doctor visit</th>
<th>Parenting stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>0.097</td>
<td>0.190</td>
<td>0.254</td>
<td>0.071</td>
</tr>
<tr>
<td>Unintended</td>
<td>(0.202)</td>
<td>(0.334)</td>
<td>(0.250)</td>
<td>(0.047)</td>
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<tr>
<td>Cohabiting</td>
<td>0.337 †</td>
<td>-0.198</td>
<td>0.135</td>
<td>0.167 ***</td>
</tr>
<tr>
<td>Unintended</td>
<td>(0.192)</td>
<td>(0.295)</td>
<td>(0.254)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Married</td>
<td>0.313</td>
<td>1.092 **</td>
<td>1.324 *</td>
<td>0.093</td>
</tr>
<tr>
<td>Unintended</td>
<td>(0.302)</td>
<td>(0.372)</td>
<td>(0.533)</td>
<td>(0.057)</td>
</tr>
</tbody>
</table>

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001 (two-tailed tests).