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Inequalities in Teenage Pregnancy and Fertility by Race and Place

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Abstract

Despite declines in teen pregnancy and childbirth rates since 1990, inequalities by race and place persist. We focus on the intersectionality of race and place, specifically between urban or rural areas, to better understand teen reproductive behaviors. Using data from 1,808 young women in the Panel Study of Income Dynamics Transition into Adulthood Supplement, we find that teen pregnancy is highest among urban African-Americans and lowest among urban Whites, while rates are similar for African-American and White women in rural counties. There are no significant differences in the fertility rates of urban and rural African-Americans, but rural Whites are more than twice as likely as urban Whites to have a teen birth. Controlling for early childhood socio-economic and family conditions accounts for only some of these differences. These analyses highlight how race may moderate the divergent experiences of rural and urban adolescents to inform policies that address their different needs.

Introduction

The large and enduring racial inequalities facing African-American teenagers in the United States are well-documented. Extensive research has shown that compared to Whites, African-American youths are disadvantaged across multiple social and economic domains, including educational opportunities, economic resources, career prospects, family structure and family stability. In contrast, as Lichter, Roscigno, & Condron (2004) note the "problems of disadvantaged rural youth are often ignored, unrecognized, or poorly understood" (p. 98). Nonetheless, a small body of research shows that compared to their urban counterparts rural teenagers are more likely to have grown up in poverty, have lower educational aspirations, and face narrower and lower-paying job opportunities (Biddle, Mette, & Shafft, 2017; Lichter et al. 2004). Moreover, although the popular media often equates rural Americans with rural White Americans, this is an erroneous assumption. In 2010, minorities comprised 20.4% of rural populations, roughly half of the urban average of 39.3% (Lichter, 2012).

This intersectionality of race and place has attracted surprisingly little attention from academic research. The majority of studies focus on either racial or spatial inequality, but rarely both. Indeed, studies of racial inequalities are sometimes limited to a single urban area (Ngui et al., 2017; Browning, Leventhal, & Brooks-Gunn, 2004). The few studies which examine both typically explicitly or implicitly assume that the disadvantages are simply additive (Hogan, Sun, & Cornwell, 2000). In other words, the disadvantages faced by minorities in rural areas are similar in magnitude and direction as those experienced in urban settings. Nonetheless, there are reasons to expect that racial inequalities may be moderated by place. Specifically, place may either diminish or amplify racial differences. On the one hand, racial tensions and race-based discrimination is often perceived to be higher in rural areas than in urban ones, suggesting heightened levels of racial inequalities in more rural areas (Harvey, 2017; Wuthnow, 2018). On the other hand, economic and educational inequalities are typically lower in rural areas, primarily because of the near absence of the very wealthiest and most educated echelons of American society.

This paper examines the potential intersectionality of race and place through the lens of teenage pregnancy and childbirth. Using data from 1,808 young women in the Transition into Adulthood Supplement of the Panel Study of Income Dynamics (PSID), we begin by assessing differences in the risk of teen pregnancy and childbirth among four groups: urban Whites, rural Whites, urban African-Americans and rural African-Americans. [1] We then examine the extent to which variations in children's family structure at birth and age ten along with other measures of socioeconomic status in childhood account for observed racial and geographic disparities. Our findings shed new light on how place shapes racial differences in the transitions to adulthood.

Trends in teen pregnancy and childbirth by race and place

[1] Rural minorities encompass several races and ethnicities, including large numbers of Native Americans and Hispanics (Harvey, 2017; Lichter, 2012). This paper focuses exclusively on African-Americans due to sample size restrictions. Although the 1997 immigrant refresher sample of PSID contains a higher proportion of Hispanics, we are unable to identify their birth counties.

Teen pregnancy rates in the United States have fallen precipitously over the last three decades. At the peak in 1990, 118 per 1,000 women aged 15-19 became pregnant. By 2013, this rate had fallen by almost two-thirds to 43 pregnancies per 1,000 adolescents (Kost, Maddow-Zimet, & Arpaia, 2017). This pattern is echoed by a similar, if less steep, decline in births to women aged 15 to 19 (from 62 per 1,000 in 1991 to 26 per 1,000 in 2013) (Kost et al., 2017). Evidence suggests that both pregnancy and birth rates among teenagers have continued to fall since 2013 (Martin et al., 2018).

Despite these declines, concerns about teenage pregnancy and childbirth remain high. As many researchers have shown, teen pregnancy and birth rates are considerably higher in the U.S. than in most European countries (Darroch, Singh, & Frost, 2001; Sedgh et al., 2015). Compared to its neighbor, Canada, pregnancy rates in the U.S. are twice as high (Sedgh et al., 2015; McKay, 2006). Moreover, there are large differences among racial and ethnic groups. In 2013, the pregnancy rate for African-American teenagers was 76 per 1,000 and only 30 for Whites (Kost et al., 2017). Similar discrepancies are evident with respect to teen births (39 among African-American women and 19 among white women).

Trends in teen pregnancy rates by rural and urban counties are rarely reported. However, ethnographic work suggests that teen pregnancies, despite being more common in rural than urban areas, are viewed as "disturbing problems" and rural teenage girls are likely to be stigmatized as promiscuous (Wuthnow, 2018). Moreover, social sanctions against abortion coupled with limited access to safe abortion services would suggest that a higher proportion of rural pregnancies would be carried to term. Data on teen birth rates show higher rates in rural than urban countries and that rates have declined more rapidly in urban areas. Between 1990 and 2010, for example, teen birth rates fell by 50% in the largest metropolitan areas, while rural counties experienced a decline of only about 30% (Ng & Kaye, 2015). A subsequent report, covering the period from 2007 to 2015, found that these trends continued with the decline in teen births being more rapid in urban counties than in rural ones (Hamilton, Rossen, & Branum, 2016). By 2015, teen birth rates were 18.9 births per 1,000 females aged 15-19 in large urban areas, compared to 30.9 in rural countries (Hamilton et al., 2016).

These two studies also provided rare snapshots of teen birth rates by race and place. In both 2010 and 2015, urban Whites had the lowest teen birth rates and rural African-Americans had the highest (Hamilton et al., 2016; Ng & Kaye, 2015). However, the birth rate was more than twice as high for rural White teenagers compared to urban Whites. In contrast, place-based discrepancies for African-Americans was much more modest and had decline to roughly 10 births per 1,000 females aged 15-19 by 2015, representing only a 36% increase between urban and rural areas (Hamilton et al., 2016). Hence, by 2015 the teen birth rates of rural Whites and urban African-American teenage girls were similar, while those of urban Whites was distinctly lower than all other groups, raising questions about what is driving these different patterns.

Differences in family structures and stability by race and place

The risk of teenage pregnancy and childbirth is often transmitted across generations through elevated rates of childhood poverty and greater family instability. Earlier studies showed that children born to unmarried mothers become sexually active at younger ages (Albrecht 2003) and

those who are raised by single mothers are more likely to become pregnant and give birth before marriage (McLanahan & Bumpass, 1988; Wojtkiewicz, 1994). More recently researchers have argued that family instability, which measures the number of changes in family structure, rather than a static measure at one point in time, is independently predictive of adolescent developmental outcomes net of family structure at any point (Crosnoe & Cavanagh, 2010; Wu & Thomson, 2001; Cavanagh & Huston, 2008; Fomby & Cherlin, 2007; Osborne & McLanahan, 2007). Several studies have directly linked greater family instability to higher rates of early non-marital childbearing (Fomby, Mollborn, & Sennott, 2010; Hoffert & Goldscheider, 2010; Wu, 1996; Wu & Martinson, 1993). However, some studies have argued that unobserved family characteristics can substantially attenuate the link between family structure and early childbearing (Powers, 2005), while others have noted some of the challenges in measuring family instability yielding mixed results (Hadfield et al., 2018). For example, family change may matter more for children born to married parents than those in single parent families and union dissolutions may be more detrimental than entry into new unions (Ryan & Claessens, 2012). Similarly, although the creation of stepparents may increase economic resources, they may also exacerbate family tensions leading to worse child and adolescent outcomes (Cherlin & Furstenberg, 1994).

Studies consistently show that the effects of family structure and family instability are more closely associated with adolescent developmental outcomes for Whites than for African-Americans (Fomby & Cherlin, 2007; Fomby, Mollborn, & Sennott, 2010; Wu & Martinson, 1993; Wu & Thomson, 2001). African-American children are more likely to be born to single mothers and experience more changes in family structures compared to white children (Raley & Wildsmith, 2004). Whereas 13% of white children were born to a single mother, 40% of African-American children's mothers were neither married nor cohabiting at the time of their births (Brown, 2016). Furthermore, by age 12, 52% of white children lived with their married parents compared with only 20% of African-American children (Brown, Stykes, & Manning, 2016). Some scholars have argued that the muted effects of family structures for minority groups may reflect their higher levels of repeated exposure to socioeconomic stress (Fomby et al., 2010). Others have shown that African-Americans and Whites exhibit different norms, expectations, and attitudes about the likelihood and consequences of teen pregnancy (Barber, Yarger, & Gatney, 2015; Mollborn, 2009).

Considering rural and urban differences in family structure, rural American families have traditionally been perceived as being more stable with a higher percentage of children born into and raised by their married biological parents. Such an apparent advantage in family stability presents researchers with a paradox as greater family stability is usually associated with lower rates of teen pregnancy. However, this image of distinctly strong and stable rural families has faded as rural families have become increasingly similar to their more urban counterparts. From 1980 to 2000 the proportion of female-headed households rose more rapidly in rural than urban counties (McLaughlin, Gardner, & Lichter, 1999; MacTavish & Salamon, 2004). However, by 2000 female-headed households remained less common in rural than urban areas, although a higher proportion of female-headed households with children lived in poverty (Snyder & McLaughlin, 2004). More recent data on trends in rural and urban family structures are not

available,[2] but it is likely these trends have continued in the wake of ongoing economic restructuring (Lichter & Graefe, 2011).

Childhood socio-economic differences by race and place

Although family instability and economic hardship are inextricably linked, both factors appear to influence adolescent development, specifically early non-marital childbearing, net of each other (Wu 1996). Child poverty and other family-level socio-economic factors are known to put adolescent girls at greater risk of teen childbearing (Penman-Aguilar et al., 2013). Hogan, Sun, & Cornwell (2000), for example, find that teenagers are more likely to become sexually active, get pregnant, and have a child if their mothers did not complete high school. Lower household resources, including household income, can also increase the risk of early motherhood by foreclosing some alternative pathways to adulthood (i.e. going to college). Large racial disparities in household income and parental education persist. In 2014, the median household income for white families was $71,300 compared to only $43,300 for African-Americans (Pew Research Center, 2016). Whites are also significantly more likely to have a college degree (36% of Whites vs. 23% of African-Americans).

Place-based measures of socioeconomic disadvantage are not nearly so stark. Rich ethnographic work on poverty in rural areas illustrates similar links between early childhood poverty and adolescent sexual and reproductive behaviors (Duncan 1999; Sherman 2009). However, the official poverty rate in 2014 was about two percentage points higher in rural than in urban counties (Weber & Miller, 2017). Moreover, some researchers note that alternative measures to poverty, such as the supplemental poverty measures, show that rural residences fare at least as well, if not better, than their urban counterparts (Weber & Miller, 2017). This is mainly because such measures adjust for the local housing costs and include tax credits and transfers. Nonetheless, poverty is more persistent across generations, more rural children live in poverty, and educational levels tend to be significantly lower in rural than urban areas (Lichter, Roscigno, & Condron, 2004; Lichter & Schafft, 2016).

Poverty in rural counties, like urban ones, tends to be highest among minority groups, including African-Americans (Lichter & Schafft, 2016). Poverty rates (2006-2008) among rural African-Americans were 34% compared to 13.7% for rural Whites. In comparison, 24.7% of urban African-Americans lived in poverty comparted to 10.5% of urban Whites (Lichter & Schafft, 2016). These statistics suggest racial inequalities with respect to poverty are similar in urban and rural areas. If economic hardship has the same effect on teen sexual and reproductive behavior in both rural and urban counties, then it may help to explain observed variation in teen pregnancy and birth rates by place and race.

Data and Methods

Data

[2] We hope to be able to update these numbers after attending the conference on rural families at Penn State in October 2018.

For our analyses, we use data from the Panel Study of Income Dynamics (PSID), the longest running longitudinal household panel study conducted in the United States. Launched in 1968, the original survey was specifically designed to address then President Lyndon Johnson's 'War on Poverty'. This policy agenda focused on not only stark racial inequalities, particularly between African-Americans and White Americans, but also place-based inequalities. Rural poverty, which was often portrayed as primarily White rural poverty, was prominently featured and directly targeted in many of Johnson's policies.

Beginning with a nationally representative sample of 4,802 families, the survey has continued for five decades tracing not only the original individuals in these families, but importantly for our study, any children born or adopted into these families (for details see McGonagle et al., 2012). Hence, we can trace many of these descendants from the time of their birth into early adulthood and beyond.

In addition, to better understand the crucial period between late adolescence and early adulthood, PSID began the Transition into Adulthood Supplement (TAS) in 2005. Originally, the TAS sample included young adults born into PSID families between 1984 and 1997 who were surveyed during childhood and adolescence in PSID's Child Development Supplement (1997-2007). Young adults were eligible to participate in TAS after reaching age 18 and finishing high school, obtaining a GED, permanently leaving secondary school without a credential (for details see McGonagle & Sastry, 2015). Since 2005 these respondents have been interviewed every two years until reaching age 28. In total, 2,893 young adults (1,465 females and 1,428 males) participated in a least one of the original TAS surveys by 2015.

In 2017, the TAS sample was expanded to include PSID respondents born in 1998 and 1999. It also relaxed some of the eligibility criteria to include all young adults in PSID between the ages of 18 and 28 regardless of whether they participated in previous CDS or TAS surveys. In 2017, TAS interviewed a total of 2,521 young adults consisting of 1,359 who had been interviewed in previous waves of TAS and 1,162 new respondents. Hence, the total TAS sample across all waves (2005 to 2017) consisted of 4,055 young adults (2,058 females and 1,997 males). Although the TAS 2017 questionnaire closely corresponds to the original TAS questionnaire, there are important differences discussed below. Moreover, analyses of the TAS 2017 data used in our paper rely on the early released version of these data posted in July 2018. Hence, findings based on these data are subject to change and will be updated when the final release of these data becomes available.

Analytic Sample

Our analyses focus on female participants (n=2,058) who were interviewed in at least one TAS survey between 2005 and 2017. We exclude male TAS respondents because of inconsistencies between surveys in which men were asked questions about pregnancy and fertility. We further remove 175 young women who joined PSID in 1997 as part of the Immigrant refresher sample, since we are unable to determine the rural/urban status of these women's families at the time of their birth. An additional 69 women who describe themselves as belonging primarily to a racial group other than white or African-American were excluded as their small sample size yielded unstable estimates. Lastly, 6 women who were born into a PSID family in a foreign country are

not included because we cannot classify their location at birth as either urban or rural. Our final analytic sample consists of 1,808 women between the ages of 18 and 28 at the time of interview.

Measures

Outcome Measures

Our analyses focus on two outcomes, whether young women experienced a pregnancy or birth during their teenage years. Following the WHO definitions of teen pregnancy and teen birth, we assess whether these events occurred between the ages of 13 to 19 years (inclusive) (UNFPA, 2013).

Although both the TAS 2017 and original TAS (2005 to 2015) questionnaires inquire about young women's pregnancy experiences, there are important differences. In 2017, all women were asked "How many times have you been pregnant in your life?" Women who reported having had one or more pregnancies were then asked about when their first pregnancy ended. Determining whether a woman had a pregnancy between age 13 and 19 is therefore straightforward for the 1,313 women who were interviewed in 2017.

However, for the 745 women who were only interviewed in one or more of the original TAS surveys between 2005 and 2015, calculating women's precise age at first pregnancy is more challenging. In the original TAS questionnaires, respondents were asked "have you ever been pregnant?" but not when their first pregnancy occurred. For respondents, who were interviewed as teenagers, specifically at age 18 or 19, we can determine whether they had a teen pregnancy (n=516). However, we cannot determine their exact age when the teen pregnancy occurred. We, therefore, include a flag for these women in all of our regression analyses. In addition, about 30% of these women (n=229) were age 20 or above when they first participated in the original TAS surveys. Because we are unable to determine whether a pregnancy occurred before that age of 20, these women are excluded from our analyses of teen pregnancy.

Questions pertaining to childbirth are more consistent and complete across survey waves. In 2017, women were asked "[h]ow old were you when you first became a parent or step-parent?" Prior to 2017, women were asked a similar question, "[h]ow old were you when you had your first child?" To focus our analyses on childbirth (e.g. biological parenthood), the handful of women who report having at least one child but never being pregnant are removed. Agreement in the age of first childbirth reported by women in both the 2017 and previous waves of the TAS survey is strong. Women who report having a birth between the ages of 13 and 19 (inclusive) are classified as having had a teen birth and their age at first birth is recorded.

Independent Variables

Residence at Birth

One of the advantages of PSID's longitudinal study design is that we are able to know the birth place for individuals born into PSID families. Specifically, we are able to identify (using restricted access data) the county of birth for 94% of our sample. The county of residence for an

additional 3.4% can be determined within 5 years of the respondents' birth, leaving only 1.6% of young adult women whose residence at birth is unknown. In our regression analyses, we include a flag which indicates whether the respondent moved into their families' residence between birth and age five.

Every 10 years, the U.S. Department of Agriculture has assigned all countries in the U.S. a Beale Code, representing the level of urbanization within the county. Both 1983 and 1993 used the same coding scheme which is provided in Appendix A. We follow this coding scheme to classify respondents' counties at birth as either rural (nonmetro) or urban (metro). For more information, see
https://seer.cancer.gov/seerstat/variables/countyattribs/ruralurban.html#.W1eDAPqh5WY.email
To underscore the importance of using place of birth in this highly mobile population, we compared the indicator for rural residence at time of birth to that time when the respondent was last interviewed (between the ages of 18 and 28). Although 93% of native-urban residents continued to reside in an urban areas, only 60% of rural residents remained in rural counties.

In addition to whether adolescents were born in a rural or urban county, we also control for the region of their birth county. Because the experience of both urban and rural life may vary considerably across regions, we account for four main regions: the northeast, north central, south, and west.

Race

Participants in TAS were asked about their race and ethnicity. Although they were permitted to provide multiple responses, our analyses rely on the first race mentioned. Nearly all respondents in our sample identified as either African-American or White. As mentioned above, we remove the 69 individuals whose primary racial identity was something other than African-American or White.

Family Structure at birth and age 10

In our current analyses we capture the adolescent's family structure at two critical time periods: at birth and at age 10. Including both measures affords us a glimpse into both family composition and transition, but we intend to develop additional measures to better account for family instability such as the number of transition in parental union status and residence.

Our first measure denotes whether the adolescent's biological mother and father were in a cohabiting or marital union at birth. In our second measure, we assess mother's union status when the respondent (who is now a young adult) was approximately age 10. Unfortunately, since the PSID was conducted only every other year starting in 1997, not all PSID families were interviewed when the child was exact age 10. Specifically, only about half of all children born after 1987 would be expected to be exact age 10 when their parents were interviewed. Hence, we measure a child's family structure closest to age 10 by using available data between the ages of 8 and 12. Mother's union status is reported as 1) in either a cohabiting or marital union with the child's biological father, 2) single, or 3) in a cohabiting or marital union with a new partner.

In addition, for about 10% of our sample, data on parents' union status at age 10 is missing, primarily because the child did not reside with his or her biological mother. These respondents are coded as such as they represent a distinct living arrangement for children.

Socio-Economic Factors

Lastly, we include several socio-economic variables which may be related to the risk of teen pregnancy and childbirth. First to include a control variable for the religious denomination of the household head at the time of birth. In our future analyses, we intend to examine whether we can use a lagged measure of participant in religious activities reported by the adolescents as a more proximate indicator of religious beliefs. Second, we account for the educational level of the household head at the time of the child's birth. Third, because of the known sizeable differences in family income (which includes transfer income and social security income) by both race and place, we include a measure of total family income when the child was approximately age 10. As with our measure of family structure, to account for missing data at exact age 10, we use family income reported between the age of 9 and 11.

Methods

We begin with descriptive statistics of our analytic sample of 1,808 women by place of birth and then by both birthplace and race. Probability weights are used that most closely correspond to the wave when the respondent was age 18. To minimize missing values for weights, we impute the closest value from ages 15 to 19. For respondents who were interviewed in the original TAS surveys (2005-2015) or in both the original and 2017 TAS survey, we use the TAS sample weights provided. For respondents who were interviewed for the first time in TAS 2017, we use the PSID longitudinal core and immigrant sample weights closest to when the respondent would have been age 18. Note that for respondents ages 18 and 19 in TAS 2017, we necessarily had to use PSID weights from 2015 when they were ages 16 and 17 as sample weights for 2017 have not yet been released. Because our analytic sample is restricted to females in the core PSID sample, we use the svy, subpopulation() command in Stata 15.

For our multivariate analyses, we use discrete-time survival analyses to account for right censoring of individuals who were last observed before their 20th birthday. Individuals are observed starting at the age of 13 and are censored at the time they experience the event of interest (either pregnancy or childbirth), at the age when they were last interviewed, or at the age of 19.[3] The 2,058 women in our analytic sample contribute a total of 12,033 person years of observation for our analyses of teen pregnancy and 12,094 person years to our analyses of teen childbirth. Note that women in our original TAS sample only who reported having had a birth by age 18 or 19 are censored at these ages as the exact age of their pregnancy is unknown. This may slightly inflate the risk of pregnancy at these older ages compared to younger ones. To assess whether it biases our other estimates, we include a flag all women in the original TAS sample in all regression analyses. Excluding all of these women does not substantively alter our conclusions.

[3] Two women report having been pregnant and giving birth at the age of 11. These women are excluded from our analyses as they are not considered teenagers at the time of these events.

Logistic discrete-time survival models are used to estimate the hazard rate of becoming pregnant or having a child between the ages of 13 and 19. The svy command is used in all discrete-time regression analyses to account for probability weights and clustering within individual respondents over time. Although the use of sample weights has a pronounced effect of our descriptive statistics, their effect on the multivariate results is minimal.

Preliminary Results

Descriptive Characteristics of Adolescent Girls

Table 1 provides the descriptive characteristics of women in our sample by both place of birth and by race. On average, 16% of women in our sample became pregnant before reaching their 20th birthday and 10% had become mothers.[4] Girls born in rural counties (20%) are significantly more likely than those born in urban areas (14%) to become pregnant as a teenager. A similar pattern holds with respect to teen childbirth. Women from rural areas are 1.75 times as likely to have a child while a teenager than those in urban areas. Slightly, less than one-third (31%) of adolescent women in this sample were born in a non-metro county and 18% identify as being African-American. The percentage African-American varies from 20% of girls born in urban areas to 15% of those from rural counties.

(insert Table 1 about here)

At the time of their birth, 78% of respondents had married or cohabiting biological with no difference between urban and rural areas. By the age of 10, only 61% of respondents lived with their biological mothers and fathers. About a fifth of respondents had single mothers and about a tenth had mothers in a new partnership when they were age 10. Similarly, 9% of respondents were not living with their biological mothers at age 10. Although having cohabiting or married biological parents at age 10 was slightly less common among rural adolescents (60%) compared to urban girls (62%) these differences were not large or significant. There are, however, sizeable socio-economic differences. Protestants are more likely to live in rural areas, while a larger proportion of Catholics live in urban areas. Rural household heads were far less likely to have schooling beyond high school (53% urban vs. 39% rural) and they earned about $25,000 less than heads of urban households.

Further analyses of urban and rural reproductive behaviors and characteristics, however, reveal important differences by race. For white adolescents, there are very large and highly significant place-based discrepancies in the reproductive behaviors and outcomes. Native-born rural adolescents (20%) are more than twice as likely to be become pregnant as their urban counterparts (9%). They are also more than 2.5 times as likely to become teenage mothers (13% vs. 5%). This rural disadvantage does not exist among African-Americans. In fact, rural African-Americans are significantly less likely than those born in metropolitan areas to become pregnant

[4] These estimates underestimate the actual teen pregnancy and childbirth rates as some girls in our sample have not yet reached the age of 20. Restricting our sample to women aged 20 and above at time of last observation slightly elevates these estimates.

before the age of 20. Moreover, there are no statistically significant differences among African-American urban and rural adolescents with respect to childbirth.

To more directly compare differences in teen pregnancy and childbirth by race and place of birth, we restrict both our samples to mothers with data on teen pregnancies. (Specifically, we remove mothers with missing data on teen pregnancies from our analyses of teen births). Looking first at pregnancy, we find that that large racial disparities that exist between urban White and African-Americans (9% vs. 31%) are not present in rural areas (20% vs. 19%). These comparisons, however, change somewhat when we compare teen births. With respect to teen childbirth, we continue to find the lowest rates among urban White teenagers (significant with respect to all other groups). However, the difference between urban and rural African Americans is substantially diminished (and becomes insignificant) due primarily to the higher likelihood that rural African-American adolescents report carrying their pregnancies to term.

(insert Figure 1 about here)

Other place-based discrepancies are also more muted among African-Americans than Whites. For example, the urban-rural income gap is over $30,000 for Whites but less than $10,000 for African-Americans. The urban-rural gap in receiving some college education is also twice as large among Whites as it is among African-Americans. However, although we find the expected large differences in White and African-American family structures, there is no evidence of substantial differences in family structure by place of birth. To better understand whether these racial differences in family structures and race and place differences in socio-economic status can partially or fully accounts for observed racial and residential inequalities in the reproductive behaviors of adolescents, we turn to our multivariate analyses.

Teen Pregnancy

In Table 2, we examine the correlates of teen pregnancy using discrete-time survival analyses. Model 1 shows that both being African-American and being born in a rural county are significantly positively associated with becoming pregnant before the age of 20. In Model 2, we examine the combined effects of both place and race by comparing rural Whites, urban African-Americans, and rural African-Americans to urban Whites (equivalent to including an interaction between place and race). Confirming our results from Table 1, we find that being born in a rural area has a different impact on teen pregnancy for Whites than it does for African-Americans. Specifically, the odds of a rural White adolescent girl becoming pregnant are twice as high as those for an urban White girl. In contrast, rural African-American residents are about half as likely to become pregnant as urban African Americans ($p=0.038$). Consequently, rural White girls and rural African-American girls face nearly identical risks of becoming pregnant ($p=0.960$).

(insert Table 2 about here)

In Model 3, we control for the adolescent's family structure at birth and at age 10. Consistent with previous research, we find an intergenerational effect of family structure on children's subsequent reproductive behaviors. Adolescent girls whose biological parents are together at the

time of their birth are less likely to become pregnant, although after controlling for family structure at age 10, this effect is no longer significant (p=0.074). Similarly, adolescents whose mothers are single or in a union with a new partner at the age of 10 are more likely to become pregnant. Again, however, after controlling for family status at birth, the effect of single motherhood at age 10 is not significant that 5% level (p=0.069). Interestingly, children who do not reside with the mothers at the age of 10 experience the highest risk of teen pregnancy, The odds of becoming pregnant as a teenager are twice as high for children living with a single mother at age 10 than children whose biological parents are still in a union. The risk of teen pregnancy is even higher for children whose mothers have entered into a new relationship. There is little effect of controlling for family structure on either race or place of birth, although the coefficient on rural birth becomes slightly larger and the effect of race is slightly diminished. After controlling for the log of family income at age 10 in Model 4, the effect of single motherhood becomes insignificant suggesting that lower financial resources associated with single parenthood largely accounts for teen's increased risk of pregnancy. However, children with re-partnered mothers continue to be more likely to become pregnant even after adjusting for differences in family income. Children who do not reside with their mothers at age 10 experience a 2.4 fold increase in their risk of teen pregnancy compared to children living with both biological parents.

Controlling for family structure, and particularly the higher rates of single motherhood experienced by African-American children, accounts for nearly a third of the differences between urban African-Americans and urban Whites and over two-thirds of the difference in teen pregnancy between rural African-Americans and urban Whites. Indeed, after controlling for family structure, rural African-Americans are no longer significantly more likely than urban Whites to have pregnancy before age 20. In contrast, rural Whites remain significantly more likely than their urban counterparts to experience an early pregnancy.

In our final model (Model 4), we adjust for religious, educational, and financial differences. There are no detectable differences in teen pregnancy rates between Catholics and Protestants. However, as expected, the risk of teen pregnancy declines rapidly with household income and the education level of the household head. It is also worth noting that accounting for these social and economic factors renders the direct effects of family structure insignificant. Furthermore, accounting for socio-economic status further reduces relative risk of rural and African-American populations, but a new pattern emerges, whereby rural White and urban African-American girls face similarly elevated higher risks of pregnancy and urban Whites and rural African-Americans experience similarly low risks. In other words, we see a sharp difference in which the urban advantaged experienced by Whites is mirrored by the urban disadvantaged among African-Americans.

Teen Childbirth

In Model 1 of Table 3, we find that the odds of becoming a teen mother are twice as high for rural adolescents as they are for urban ones. In addition, the odds of having a child before age 20 are 2.8 times higher for African-American than for White adolescent girls. Nonetheless, place-based discrepancies in the risk of early motherhood are more pronounced for Whites than for

African-Americans (Model 2). Urban White adolescents are significantly less likely than all other groups of adolescents to become mothers while in their teenage years. Moreover, although the odds of becoming a teenage mother are lower for rural White adolescents than either urban or rural African-Americans, these differences are not statistically significant (p=0.1489 for rural African-Americans and p=0.110 for urban African-Americans).

Accounting for racial differences in family structure reduces the differences in teen childbirth between urban and rural African-Americans and urban Whites, but has no effect on the difference between urban and rural Whites (Model 3). Consequently, the magnitude of the risk of teenage mothers becomes somewhat lower for rural and urban African-Americans than for rural Whites, but the differences remain insignificant. In our final model, we show that controlling for socio-economic factors further reduces the relative risk of motherhood of all groups compared to urban Whites. However, unlike our analyses of teen pregnancy, we find that although the risk of motherhood is no longer significantly different for rural African-American adolescents compared to urban Whites (p=0.144), the magnitude of the coefficient is more similar to that of rural White and urban African-American girls.

Discussion/Conclusions

Our findings highlight the need to consider the intersectional effects of race and place. In particular, while we confirm a distinct rural disadvantage for Whites with respect to the risk of teen pregnancy and childbirth, these spatial inequalities do not exist between urban and rural African-Americans. In fact, with respect to teen pregnancy, there appears to be a distinct rural advantage for African-Americans. Furthermore, while variation in family structures account for a significant proportion of the comparative disadvantage experienced by rural and urban African-Americans, it explains none of the disadvantage of rural Whites compared to urban Whites. Even after accounting for large educational and income inequalities between urban and rural areas, rural White girls remains significantly more likely to become pregnant and have a child before reaching adulthood.

Limitations

Because of the longitudinal study design of PSID, which follows original families over time since 1968, the core sample of PSID (which excludes data from the refresher immigrant sample in 1997) is not necessarily representative of all Americans. Hence, our exclusion of Latino and Asian Americans. Moreover, the rural population of PSID constitutes less than 20% of our sample of women in TAS. As a result, despite oversampling for low-income minorities, our sample of rural African-American young women is fairly small (n=168). It is, therefore, important to identify potential differences in the PSID sample and national rates.

To our knowledge there are no nationally representative prior reports of teen pregnancy rates by both race and place. Therefore, it is difficult to provide external validation of our pregnancy results. One study of the only studies that reported pregnancy rates by both place and race is limited to 1990 data from nine southern states (Bennett 1997). More recent studies report pregnancy rates by racial groups, but do not further disaggregate them by urban and rural

residence (Kost et al,. 2017). With respect to teen childbirth, there are two recent reports from 2010 and one from 2015, which provide data by race and place using census and fertility data from the National Center for Health Statistics (NCHS). Teen fertility (which reports the number of births to females aged 15-19 in a given year) are, of course, not identical to the probability of becoming a mother before age 20, which is what we examine in this paper.

However, the comparatively low probability of teen childbirth reported among our rural African-American populations raises some concerns for two reasons. First, we find the lowest ratio of teen pregnancy to childbirth among rural African-Americans, suggesting a comparatively low abortion ratio of only 10% (see Figure 1). The aforementioned article using data from southern states also reported the lowest abortion ratio to be among rural African-Americans (roughly 13%) (Bennett 1990) and abortion rates have declined appreciably since 1990 (Kost et al., 2017). Hence, our limited discrepancy between reported pregnancies and childbirths in this sub-population is plausible.

A second, perhaps greater, reason for concern is that despite our different measurement methods of teen childbirth, we would expect to have the same rank order and possibly see similar trends in relative decline over time as those reported by using NCHS data. However, while the NCHS data shows higher rates of teen childbirth among rural African-Americans than among urban African-Americans (see Figure 2) (Hamilton et al. 2016), we find no statistically significant differences between the probability of having a teen birth for urban and rural African-Americans (see Table 1). If we examine reported teen fertility among 20 to 29 year olds in the full PSID sample in 2015, we find slightly, but not significantly lower risk of pregnancy among rural African-Americans (see Figure 3).

These discrepancies could suggest two sources of bias. First, rural African-Americans may be more likely than women in the other sub-populations to under-report teen childbirths. We think this is unlikely given qualitative research that suggests that adolescent childbearing is less consequential or stigmatized among African-Americans compared to Whites, although this work does not focus on rural African-Americans (Barber et al., 2015; Mollborn, 2009). Second, there may be differences in how PSID and NCHS measure urban and rural counties in 2015. Before PAA, we intend to compare the Beale codes assigned to each county in NCHS and PSID. For the PSID, this requires access to restricted geocoded data, which we are in the process of obtaining.

Bearing in mind, that our findings may slightly underestimate childbearing among rural African-Americans, they nonetheless reveal important differences in the urban/rural divide by race and raise some intriguing questions that require further investigation. Most importantly they challenge the assumption that the disadvantage associated with race and place in America are additive by showing that rural African-Americans are not at higher risk of early pregnancy or motherhood compared to rural Whites or urban African-Americans, especially after adjusting for differences in family structures and socio-economic status. More work on the important subpopulation of rural African-Americans is called for to better understand the mechanisms that enable them to fare better than expected with respect to teen pregnancy and childbirth. Future work could also examine whether similar patterns exist with respect to other important transitions to adulthood including completing schooling, finding a job, and getting married. Such

work is essential to develop policies and programs that meet the needs of all vulnerable groups and acknowledge the important intersectional effects of race and place.

Planned Future Analyses

In addition to more closely examining and comparing the trends in teenage fertility by race and place using the NCHS county-level data and full core sample of the PSID from 1980 to 2015, we intend to examine two other important additions to this paper prior to PAA. First, we plan to assess race and place variation in a third important outcome: timing of sexual debut. Second, we plan to link our data to county-level measures of access to health facilities and, if possible, specifically reproductive health services. Both of these additions will provide valuable insights into the extent to which these race and placed-based inequalities in pregnancy and fertility rates reflect differences in access to contraception and abortion services. We anticipate that differences in access to health services will help explain some of the urban-rural differences and it is possible that differences in exposure to risk via sexual activity combined with county specific measures of health facilities will provide new insights into why racial inequalities with respect to adolescent sexual and reproductive behaviors differ in rural and urban areas.

Appendix A: Beale Codes used in 1983 and 1993

Metro counties:
0 (Central counties of metro areas of 1 million population or more)
1 (Fringe counties of metro areas of 1 million population or more)
2 (Counties in metro areas of 250,000 to 1 million population)
3 (Counties in metro areas of fewer than 250,000 population)

Nonmetro counties:
4 (Urban population of 20,000 or more, adjacent to a metro area)
5 (Urban population of 20,000 or more, not adjacent to a metro area)
6 (Urban population of 2,500 to 19,999, adjacent to a metro area)
7 (Urban population of 2,500 to 19,999, not adjacent to a metro area)
8 (Completely rural or less than 2,500 urban population, adjacent to a metro area)
9 (Completely rural or less than 2,500 urban population, not adjacent to a metro area)

References

Barber, J., Yarger, J., & Gatny, H. (2015). Black-white differences in attitudes related to pregnancy among youg women. *Demography, 52*(3), 751-86. doi:10.1007/s13524-015-0391-4

Biddle, C., Mette, I., & Shafft, K.A. (2017). Education and information. In A. R. Tickamyer, J. Sherman, & J. Warlick (Eds.), *Rural Poverty in the United States* (pp. 322-348). New York: Columbia University Press.

Brown, S., Stykes, J., & Manning, W. (2016). Trends in children's family instability, 1995-2010. *Journal of Marriage and Family, 78*(5), 1173-1183. doi:10.1111/jomf.12311

Browning, C., Leventhal, T., & Brooks-Gunn, J. (2004). Neighborhood context and racial differences in early adolescent sexual activity. *Demography, 41*(4), 697-720.

Cavanagh, S., & Huston, A. (2006). Family instability and children's early problem behavior. *Social Forces, 85*(1), 551-581. doi:10.1353/sof.2006.0120

Cherlin, A., Furstenberg, F., Chase-Linsdale, P., Kiernan, K., Robins, P., Morrison, D., & Teitler, J. (1991). Longitudinal studies of effects of divorce on children in Great Britain and the United States. *Science, 252*(5011), 1386-1389.

Cherlin, A., & Furstenberg, F. (1994). Stepfamilies in the United States: A reconsideration. *Annual Review of Sociology, 20*, 359-381. doi:10.1146/annurev.so.20.080194.002043

Crosnoe, R., & Cavanagh, S. (2010). Families with children and adolescents: A review, critique, and future agenda. *Journal of Marriage and Family, 72*(3), 594-611. doi:10.1111/j.1741-3737.2010.00720.x

Darroch, J., Singh, S., & Frost, J. (2001). Differences in teenage pregnancy rates among five developed countries: The roles of sexual activity and contraceptive use. *Family Planning Perspectives, 33*(6), 244.

Duncan, C. (1999). *Worlds apart: Why poverty persists in rural America*. New Haven, Connecticut: Yale University Press.

Fomby, P., & Cherlin, A. (2007). Family instability and child well-Being. *American Sociological Review, 72*(2), 181-204.

Fomby, P., Mollborn, S., & Sennott, C. (2010). Race/ethnic differences in effects of family instability on adolescents' risk behavior. *Journal of Marriage and Family, 72*(2), 234-253.

Hadfield, K., Amos, M., Ungar, M., Gosselin, J., & Ganong, L. (2018). Do changes to family structure affect child and family outcomes? a systematic review of the instability hypothesis. *Journal of Family Theory & Review, 10*(1), 87-110. doi:10.1111/jftr.12243

Hamilton, B., Rossen, L., & Branum, A. (2016). Teen birth rates for urban and rural areas in the United States, 2007-2015. *NCHS Data Brief, 264*(264), 1-8.

Harvey, M. (2017). Racial inequalities and poverty in rural America. In A. Tickameyer, J. Sherman, & J. Warlick (Eds.), *Rural Poverty in the United States* (pp. 141-167). New York: Columbia University Press.

Hogan, D.P., Sun, R., & Cornwell, G.T. (2000). Sexual and fertility behaviors of American females aged 15–19 years: 1985, 1990, and 1995. *American Journal of Public Health, 90*(9), 1421-1425.

Kost, K., Maddow-Zimet, I., & Arpaia, A. (2017). *Pregnancies, births and abortions among adolescents and young women in the United States, 2013: National and state trends by age, race and ethnicity.* New York: Guttmacher Institute.

Lichter, D., Roscigno, V.J., & Condron, D.J. (2004). Rural children and youth at risk. In D.L. Brown & L.E. Swanson (Eds.), *Challenges for Rural America in the Twenty-First Century* (pp. 97-108). University Park, Pennsylvania: Pennsylvania State University Press.

Lichter, D., Graefe, D.R. (2011). Rural economic restructuring: Implications for children, youth, and families. In K. Smith & A. Tickamyer (Eds.), *Economic Restructuring and Family Wellbeing in Rural America* (pp. 25– 39). University Park, Pennsylvania: Pennsylvania State University Press.

Lichter, D. (2012). Immigration and the new racial diversity in rural America. *Rural Sociology, 77*(1), 3-35.

Lichter, D., & Schafft, K.A. (2016). People and places left behind: Rural poverty in the new century. In D. Brady & L.M. Burton (Eds.), *The Oxford handbook of the social science of poverty* (pp. 317-340). New York: Oxford University Press.

MacTavish, K., & Salamon, S. (2004). What do rural families look like today? In D.L. Brown & L.E. Swanson (Eds.), *Challenges for rural America in the twenty-first century* (pp. 73-85). University Park, Pennsylvania: Pennsylvania State University Press.

Martin, J., Hamilton, B., Osterman, M., Driscoll, A., & Drake, P. (2018). Births: Final data for 2016. *National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 67*(1), 1-55.

McGonagle, K., Schoeni, R., Sastry, N., & Freedman, V. (2012). The panel study of income

dynamics: Overview, recent innovations, and potential for life course research. *Longitudinal and Life Course Studies, 3*(2), 278-284.

McGonagle, K., & Sastry, N. (2015). Cohort profile: The panel study of income dynamics' child development supplement and transition into adulthood study. *International Journal of Epidemiology, 44*(2), 415-422. doi:10.1093/ije/dyu076

McKay, A. (2006). Trends in teen pregnancy in Canada with comparisons to USA and England/Wales. *Canadian Journal of Human Sexuality, 15*(3/4), 157-162.

McLanahan, S., & Bumpass, L. (1988). Intergenerational consequences of family disruption. *American Journal of Sociology, 94*(1), 130-152. doi:10.1086/228954

McLaughlin, D.K., Gardner, E.L., & Lichter, D.T. (1999). Economic restructuring and changing prevalence of female-headed families in America. *Rural Sociology, 64*(3): 394-416.

Mollborn, S. (2009). Norms about nonmarital pregnancy and willingness to provide resources to unwed parents. *Journal of Marriage and Family, 71*(1), 122-134.

Ng, A.S., & Kaye, K. (2015). *Sex in the (non) city: Teen childbearing in rural America*. Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy.

Ngui, E., Greer, D., Bridgewater, F., Salm, W., & Cisler, R. (2017). Trends and progress in reducing teen birth rates and the persisting challenge of eliminating racial/ethnic disparities. *Journal of Racial and Ethnic Health Disparities, 4*(4), 615-622. doi:10.1007/s40615-016-0265-5

Osborne, C., & McLanahan, S. (2007). Partnership instability and child well-Being. *Journal of Marriage and Family, 69*(4), 1065-1083.

Penman-Aguilar, A., Carter, M., Snead, M., & Kourtis, A. (2013). Socioeconomic disadvantage as a social determinant of teen childbearing in the U.S. *Public Health Reports, 128*, 5-22.

Pew Research Center (2016). *On views of race and inequality: Blacks and whites are worlds apart*. Washington, DC: Pew Research Centre.

Powers, D. (2005). Effects of family structure on the risk of first premarital birth in the presence of correlated unmeasured family effects. *Social Science Research, 34*(3), 511-537. doi:10.1016/j.ssresearch.2004.04.007

Raley, R., & Wildsmith, E. (2004). Cohabitation and children's family instability. *Journal of Marriage and Family, 66*(1), 210-219.

Ryan, R., & Claessens, A. (2012). Associations between family structure changes and children's behavior problems: The moderating effects of timing and marital birth. *Developmental Psychology, 49*(7), 1219-31. doi:10.1037/a0029397

Sedgh, G., Finer, L., Bankole, A., Eilers, M., & Singh, S. (2015). Adolescent pregnancy, birth, and abortion rates across countries: Levels and Recent trends. *Journal of Adolescent Health, 56*(2), 223-230. doi:10.1016/j.jadohealth.2014.09.007

Sherman, J. (2009). *Those who work, those who don't: Poverty, morality, and family in rural America.* University of Minnesota Press

Snyder, A., & McLaughlin, D. (2004). Female-Headed families and poverty in rural America. *Rural Sociology, 69*(1), 127-149.

Sucoff, C., & Upchurch, D. (1998). Neighborhood context and the risk of childbearing among metropolitan-Area black adolescents. *American Sociological Review, 63*(4), 571-571. doi:10.2307/2657268

UNFPA (2013). *Adolescent pregnancy: A review of the evidence*. New York: UNFPA.

Weber, B., & Miller, K. (2017). Poverty in rural America: Then and now. In A. R. Tickamyer, J. Sherman, & J. Warlick (Eds.), *Rural Poverty in the United States* (pp. 28-64). New York: Columbia University Press.

Wojtkiewicz, R. (1994). Parental structure experiences of children: Exposure, transitions, and type at birth. *Population Research and Policy Review, 13*(2), 141-159.

Wu, L., & Martinson, B. (1993). Family structure and the risk of a premarital birth. *American Sociological Review, 58*(2), 210-210. doi:10.2307/2095967

Wu, L. (1996). Effects of family instability, income, and income instability on the risk of a premarital birth. *American Sociological Review, 61*(3), 386-386. doi:10.2307/2096355

Wu, L., & Thomson, E. (2001). Race differences in family experience and early sexual initiation: Dynamic models of family structure and family change. *Journal of Marriage and the Family, 63*, 682-696.

Wuthnow, R. (2018). *The left behind: Decline and rage in rural America*. Princeton, New Jersey: Princeton University Press.

Table 1. Descriptive Characteristics of Adolescent Girls, weighted (n= 1,808).

		All Adolescents			White Adolescents			African-American Adolescents		
	Total	**Urban**	**Rural**	**Sig.**	**Urban**	**Rural**	**Sig.**	**Urban**	**Rural**	**Sig.**
Outcomes										
Teen Pregnancy	0.16	0.14	0.20	*	0.09	0.20	**	0.31	0.19	*
Teen Child Birth	0.10	0.08	0.14	**	0.05	0.13	**	0.19	0.20	
Teen Child Birth (preg sample)	0.10	0.08	0.13	*	0.05	0.13	**	0.20	0.17	
Independent Variables										
Place of Birth										
Rural (non-metro) county	0.31									
Race										
White	0.82	0.80	0.85	*						
African American	0.18	0.20	0.15	*						
Mother and father together at birth	0.78	0.78	0.78		0.88	0.87		0.36	0.31	
Mother's union status at age 10										
In union with child's father	0.61	0.62	0.60		0.70	0.65		0.27	0.28	
Single	0.21	0.20	0.23		0.13	0.17		0.51	0.57	
In new union	0.09	0.09	0.10		0.09	0.11		0.09	0.05	
Not in residence	0.09	0.09	0.08		0.08	0.07		0.13	0.10	
Religion of HH at Birth										
None	0.13	0.12	0.14		0.13	0.15		0.092	0.10	
Catholic	0.21	0.25	0.12	***	0.30	0.14	***	0.05	0.03	
Protestant	0.58	0.56	0.64	*	0.51	0.61	*	0.74	0.82	
Other	0.09	0.07	0.09		0.06	0.10		0.12	0.06	
Education of HH at birth										
Less than high school	0.18	0.16	0.24	**	0.11	0.20	**	0.35	0.42	
Completed high school	0.33	0.31	0.38		0.30	0.38	*	0.38	0.38	
More than high school	0.48	0.53	0.39	***	0.59	0.42	***	0.27	0.20	
Family Income at age 10	71,997	80,345	54,089	***	91,087	58,813	***	37,382	28,210	*
Region										
Northeast	0.21	0.26	0.10	***	0.30	0.11	***	0.13	0.05	
North Central	0.29	0.27	0.35	*	0.26	0.40	***	0.29	0.07	***
South	0.31	0.27	0.41	***	0.22	0.32	**	0.48	0.88	***
West	0.18	0.20	0.15		0.22	0.18		0.10	0.00	***
Age at last observation	18.88	18.87	18.89		18.87	18.89		18.86	18.88	

Sig.:†=p<0.10; *=p<0.05; **=p<0.01; ***=p<0.001

Tab 2. Predictors of Teen Pregnancy (Discrete Time Survival Analysis--Weighted at age 18)

	Model 1			Model 2			Model 3			Model 4		
	Coef.	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**
Place of Birth												
Urban County (ref)												
Rural County	0.41	0.19	*									
Race												
White (ref)												
African-American	0.97	0.19	***									
Race and Place of Birth												
Urban White (ref)												
Rural White				0.75	0.24	**	0.75	0.25	**	0.63	0.25	*
Urban African-American				1.34	0.23	***	0.91	0.29	**	0.79	0.28	**
Rural African-American				0.77	0.31	*	0.23	0.38		0.05	0.41	
Mother with Father at Birth							-0.43	0.24	†	-0.16	0.25	
Mother's Union Status												
In Union with Father (ref)												
Single							0.53	0.29	†	0.04	0.30	
In Union with New Partner							0.74	0.30	*	0.46	0.33	
Not in Residence							0.89	0.29	**	0.54	0.31	†
Religion of HH at Birth												
None (ref)												
Catholic										-0.40	0.38	
Protestant										-0.42	0.28	
Other										-1.06	0.53	*
Education of HH at Birth												
Less than High School (ref)												
Completed High School										-0.83	0.22	
More than High School										-1.03	0.27	
Log of Total Family Income										-0.34	0.12	***
Age												
13 years (ref)												
14 years	3.13	1.16	**	3.13	1.16	**	3.13	1.16	**	3.09	1.17	**
15 years	4.30	1.06	***	4.30	1.06	***	4.23	1.06	***	4.24	1.06	***
16 years	5.38	1.04	***	5.39	1.04	***	5.35	1.05	***	5.33	1.05	***
17 years	6.24	1.02	***	6.25	1.02	***	6.25	1.02	***	6.29	1.02	***
18 years	6.60	1.02	***	6.61	1.02	***	6.61	1.02	***	6.67	1.02	***
19 years	7.27	1.01	***	7.28	1.01	***	7.25	1.01	***	7.35	1.01	***
Region												
Northeast (ref)												
North Central	0.54	0.29	†	0.44	0.29		0.52	0.31	†	0.45	0.32	
South	0.35	0.30		0.36	0.29		0.43	0.31		0.30	0.32	
West	0.55	0.34		0.52	0.34		0.55	0.35		0.55	0.34	
Flag for moved in	1.39	0.32	***	1.29	0.34	***	1.10	0.40	**	1.46	0.58	*
Flag for originial TAS	0.13	0.19		0.12	0.19		0.29	0.19		0.22	0.19	
Constant	-10.55	1.03	***	-10.66	1.04	***	-10.66	1.07	***	-5.84	1.67	***
n	*10,407*			*10,407*			*10,275*			*10,030*		
F-stat	17.37		***	16.48		***	14.59		***	12.95		***

Sig.:†=p<0.10; *=p<0.05; **=p<0.01; ***=p<0.001

Tab 3. Predictors of Teen Childbirth (Discrete Time Survival Analysis--Weighted at age 18)

	Model 1			Model 2			Model 3			Model 4		
	Coef.	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**	**Coef.**	**Std. Er.**	**Sig.**
Place of Birth												
Urban County (ref)												
Rural County	0.58	0.21	**									
Race												
White (ref)												
African-American	0.95	0.20	***									
Race and Place of Birth												
Urban White (ref)												
Rural White				0.81	0.27	**	0.84	0.28	**	0.79	0.31	*
Urban African-American				1.20	0.25	***	0.75	0.32	*	0.64	0.34	†
Rural African-American				1.28	0.34	***	0.76	0.40	†	0.62	0.42	
Mother with Father at Birth							-0.48	0.28	†	-0.18	0.29	
Mother's Union Status												
In Union with Father (ref)												
Single							0.55	0.32	†	0.08	0.33	
In Union with New Partner							0.36	0.37		0.19	0.40	
Not in Residence							0.62	0.36	†	0.23	0.38	
Religion of HH at Birth												
None (ref)												
Catholic										0.28	0.44	
Protestant										-0.02	0.36	
Other										-0.71	0.61	
Education of HH at Birth												
Less than High School (ref)												
Completed High School										-0.78	0.26	**
More than High School										-1.25	0.33	***
Log of Total Family Income										-0.31	0.12	*
Age												
13 years (ref)												
14 years	3.89	1.11	***	3.89	1.11	***	3.89	1.11	***	3.88	1.11	***
15 years	4.41	1.09	***	4.41	1.09	***	4.37	1.10	***	4.37	1.10	***
16 years	5.12	1.06	***	5.12	1.06	***	5.12	1.06	***	5.12	1.06	***
17 years	5.75	1.02	***	5.75	1.02	***	5.74	1.02	***	5.76	1.02	***
18 years	6.35	1.02	***	6.35	1.02	***	6.29	1.02	***	6.29	1.02	***
19 years	6.64	1.01	***	6.64	1.01	***	6.60	1.01	***	6.66	1.02	***
Region												
Northeast (ref)												
North Central	0.81	0.34	*	0.74	0.34	*	0.84	0.37	*	0.70	0.39	†
South	0.62	0.34	†	0.62	0.34	†	0.73	0.36	*	0.53	0.41	
West	0.25	0.48		0.21	0.49		0.33	0.48		0.32	0.48	
Flag for moved in	1.34	0.34	***	1.27	0.35	***	0.95	0.39	*	1.31	0.70	†
Constant	-10.87	1.05	***	-10.94	1.05	***	-10.82	1.09	***	-6.69	1.75	***
n	*11,812*			*11,812*			*11,662*			*11,402*		
F-stat	13.48		***	12.00		***	11.84		***	10.98		***

Sig.:†=p<0.10; *=p<0.05; **=p<0.01; ***=p<0.001

Fig. 1. Percentage of Teen Pregnancies and Births by Place and Race

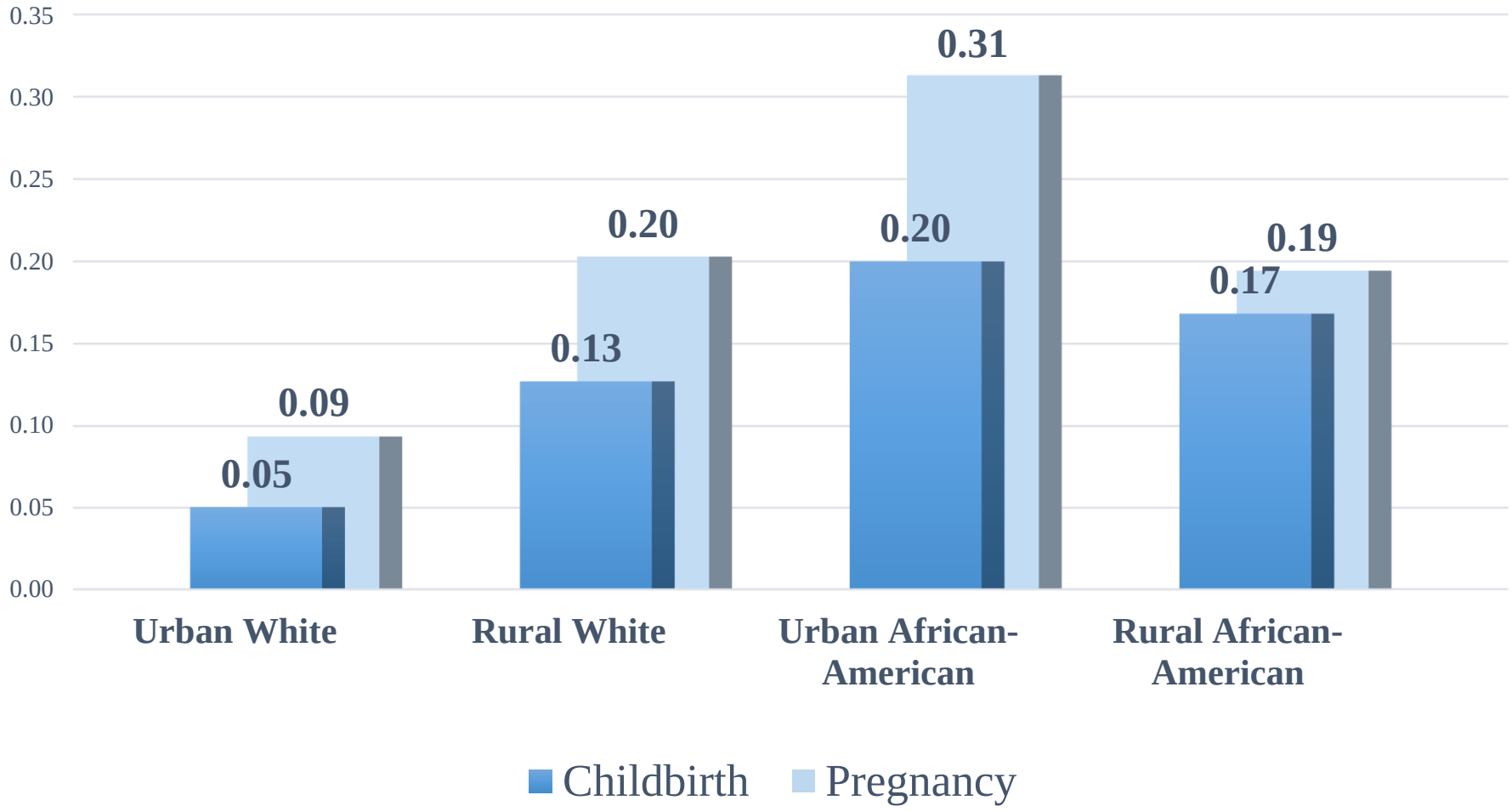
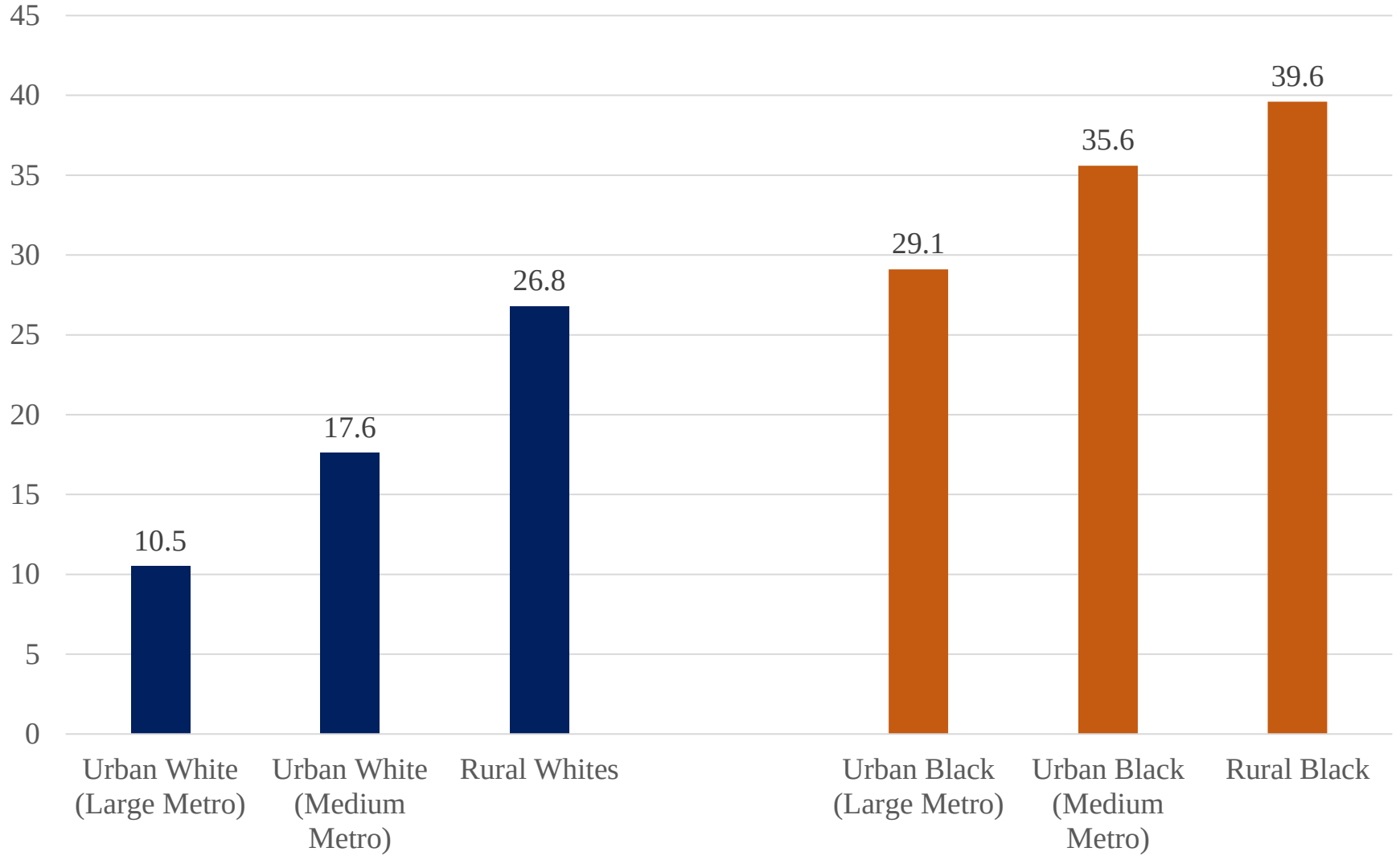


Fig. 2. NCHS Teen Birth Rates
(births per 1,000 among 15-19 year old females in 2015)



Source: Hamilton et al. 2016

Fig. 3. PSID Probability of Teen Birth
(among 20-29 year old females in 2015
-residence at birth-weighted)