

11-11-2016

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Jessica E. Yorks

Graduate Student, jessica.yorks@uconn.edu

Recommended Citation

Yorks, Jessica E., "Beyond Economics: The Effects of Religion, Migration, and Women's Education on Nonmarital Fertility in Poor Counties" (2016). *Master's Theses*. 1016.

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Beyond Economics: The Effects of Religion, Migration, and Women's Education on Nonmarital
Fertility in Poor Counties

Jessica E. Yorks

B.A., Millersville University, 2013

A Thesis

Submitted in Partial Fulfillment of the
Requirements for the Degree of

Master of Arts

At the

University of Connecticut

2016

APPROVAL PAGE

Master of Arts Thesis

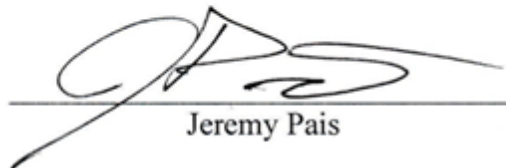
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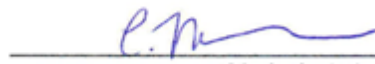
Jessica E. Yorks, B. A.

Major Advisor



Jeremy Pais

Associate Advisor



Christin Munsch

Associate Advisor



Mary Fischer

University of Connecticut

2016

Beyond Economics: The Effects of Religion, Migration, and Women's Education on Nonmarital Fertility in Poor Counties

Existing research shows that poor economic conditions such as job loss, low wages, and financial insecurity increase nonmarital fertility. However, there are economically-depressed areas of the United States that have low levels of nonmarital fertility. Why are these areas unique, and what can they tell us about the significance of place in shaping fertility outcomes? Although much of the current research focuses on economic explanations, some attention has been given to other factors that play a role in influencing nonmarital fertility rates. These studies show that religion, migration, and education are also significant predictors of nonmarital fertility. This study builds off of economic explanations and considers whether these other factors help explain low nonmarital fertility rates in socioeconomically deprived counties. To examine this topic, this research combines data from various sources on 2,989 counties across the United States in conjunction with a multinomial logistic regression analysis. Overall, this study makes important contributions for researchers interested in the role of places in structuring demographic outcomes.

Introduction

Economic conditions play an important role in shaping family life, often by pushing individuals into and out of new family arrangements such as marriage or the birth of a child (Cherlin et al. 2013). One important way that economic conditions constrain family choices is by increasing rates of nonmarital fertility (Cherlin 2010, 2015; Kearney and Levine 2014). Research shows this relationship has occurred primarily through structural changes, especially deindustrialization and loss of manufacturing jobs. That is, as economic insecurity has increased, so too has nonmarital fertility. Indeed, data supports this argument. From 1940-1965, the percent of all births to unmarried women hovered around 3-6% until the late 1960s, it jumped to 10%, which has been steadily increasing ever since to a record-high rate of 40.6% today (Curtin, Ventura, and Martinez 2014).

Conversely, research also points to cultural factors as a determinant of nonmarital fertility. These cultural shifts reflect the idea that it is not just structural changes, such as the economy, that matter in shaping fertility outcomes. One study situated within this literature focuses on a small poor rural town in Iowa that is primarily a poor agrarian economy. Within this community, individuals tend to marry early (in their early twenties) and have children within those marriages. When asked what creates this environment of having children within the context of marriage, individuals highlight the importance of collective beliefs and the influence of their social contacts. For instance, individuals from this community argue that early marriage is an inevitable outcome of a romantic relationship. Many people from the town said that they married at young ages before having children for several reasons such as: “the time was right,” it was the “next expected stage of their relationship,” and “there was nothing else to do.” Therefore, these cultural beliefs about marriage created an environment in which early marriage was seen as the

“norm” and the “expected” thing for young adults to do. In turn, these norms and expectations act as informal mechanisms of social control that influence community members’ decisions to get married and start a family. One person from the town even argued that, “around here, age 24 is old to be getting married.” Thus, cultural norms about when to marry matter a great deal in these community members’ decisions to marry early (Kefalas et al. 2011).

This research examines how different kinds of community factors other than the economy shape nonmarital fertility rates. This analysis is cross-sectional and takes into account contextual factors at a particular point in time, the year 2010. This time point is important because it provides the most recent estimates for the variables used in this analysis. However, it is directly after the Great Recession, which research shows suppressed fertility in the U.S. (Cherlin et al. 2013; Morgan, Cumberworth, and Wimer 2011; Schneider 2015; Schneider and Hastings 2015). The unit of analysis for this study is the county, which was chosen for several reasons. First, individual-level factors cannot get at the contextual and collective factors influencing nonmarital fertility that this study seeks to examine. Also, census tracts, a level below counties, is restricted data while counties are not. Finally, many people live their daily lives outside of their census tracts (i.e. they may go to church farther farther away from their homes) but they primarily stay within or reasonably close to their counties of residence. Indeed, research has shown that counties are a good unit of analysis to use for understanding collective action at the local level (Rupasinga, Goetz, and Freshwater 2006). Moreover, this inquiry is sociologically important because it moves the conversation about nonmarital fertility beyond issues of economic insecurity and examines cultural shifts. Capturing several important cultural dimensions of nonmarital fertility factors as an alternative explanation to structural shifts helps answer broad questions about the complexity of family life throughout the last half century.

The overall goal of this study is to examine economically-insecure areas in the United States that do not have high nonmarital fertility rates. Why do these places not fit within the expected relationship? What can these areas tell us about structural changes in the economy, fluctuations in informal mechanisms of social control, and increasing women seeking higher education? Ultimately, these questions are tied to the basis of this research, which is an argument about the significance of place. While nonmarital fertility is expected to be high due to poor economic conditions, this work isolates economically insecure places with low nonmarital fertility. By examining places that are exceptions to the “rule,” this study is able shed put light on other determinants of non-marital fertility than simply economic conditions. This work also fits within a long line of research that demonstrates places are extremely important in shaping individuals’ life outcomes (Massey and Denton 1993; Sampson 2012; Sharkey 2015; Wilson 1987, 1996).

This paper proceeds as follows. To test how informal mechanisms of social control influence rates of nonmarital fertility, this paper will first discuss the well-established association between depressed economic conditions and nonmarital fertility before presenting the research question. Then, with this background information, both informal mechanisms of social control, religion and migration, as well as women’s education will be explained in relation to nonmarital fertility. After that, six hypotheses related to religion, migration, and women’s education will be presented before a discussion of the data and methods as well as the findings from the study. Finally, a discussion about the findings, limitations, and contributions of this study is described.

Economic Insecurity and Nonmarital Fertility

One of the biggest issues discussed in sociology of the family research today is the dramatic rise in nonmarital fertility (hereafter referred to as NMF) in recent years (Cherlin 2015).

Rates of births to unmarried women have increased nearly 450% in the last 50 years (Curtin, Ventura, and Martinez 2014). While several researchers are currently studying various mechanisms that may cause NMF, one of the most widely-accepted views is that poor economic conditions and economic insecurity are main contributing factors. For example, issues such as stagnating wages (Johnson and Sum 1987), poverty (Abrahamson 2000; Schneider and Hastings 2015), high unemployment, limited job opportunities, poor working conditions, the mechanization of work (Abrahamson 2000), per capita GDP (Luci-Greulich and Thevenon 2014), and economic exclusion and instability (Abrahamson 2000; Raley 1996) have all been linked with having children before marriage. Perhaps one of the foremost authorities on this topic, Andrew Cherlin, has written two books, *The Marriage-Go-Round* (2010) and *Labor's Love Lost* (2015), both of which detail the relationship between economic insecurity and NMF. He argues that families are largely responding to the drastic changes in the labor market that have occurred due to deindustrialization, especially the massive loss of manufacturing jobs. These changes in the labor market are driven by increased globalization with jobs moving offshore to save employers on labor costs and automation, which displaces human workers. Because so many jobs are now gone, workers today are facing insecurity due to unemployment or are involuntarily employed part-time (Cherlin 2010, 2015). Moreover, while the cost of living has risen considerably in the last 40 years, wages have stagnated for most Americans (Johnson and Sum 1987). Cherlin (2010, 2015) argues that this large-scale job insecurity creates an environment of economic insecurity in which individuals choose to delay marriage because they want to be financially stable when they get married (Morgan, Cumberworth, and Wimer 2011; Schneider 2015). Indeed, research shows that many individuals believe the practical value of marriage has declined considerably, meaning that there are few practical reasons to marry today. Additionally,

many others are postponing marriages until they can afford expensive weddings (Cherlin 2004). However, these individuals still value having children, especially since parenting provides a sense of gratification and accomplishment, both of which are currently lacking from their jobs, which makes nonmarital rates rise (Kearney and Levine 2014). Additionally, research shows that many of these individuals do not take adequate action to prevent pregnancy (Edin and Nelson 2013). Thus, while these individuals delay the long-term investment in marriage, they do not postpone having children.

Informal Mechanisms of Social Control

As the case study above shows, culture plays some role in shaping NMF. This research seeks to interrogate this relationship further by examining how cultural factors discussed in the literature such as religion, migration, and women's education impact NMF decisions. To understand these relationships, this research presents an informal mechanisms of social control hypothesis. This hypothesis emphasizes how certain social contexts shape individuals relationships with one another which, in turn, influence their decisions (Maxwell 1996). Thus, the informal mechanisms of social control hypothesis is that the social connections shared among community members prevent people from having children before they marry. This hypothesis will focus on three specific contexts, religion, migration, and women's education, which have all been discussed in the literature directly and indirectly as highly influential in shaping individuals' fertility. The first component of this argument, religion, suggests that areas with conservative Protestants as well as areas with highly religious individuals will decrease the rates of NMF. Additionally, the other component, migration, states that areas with less migration are more stable and have more enduring social ties, which ultimately creates stronger connections between people and leads to lower rates of NMF. Finally, the last component, women's

education, is that women with higher educational levels are more likely to have lower rates of NMF although adherence to traditional gender roles plays some role in decreasing these rates. All of these are explored in detail below.

Religion

There is a great deal of research on the role of religion and fertility, which is divided into studies that focus on how religiosity in general as well as different religious affiliations affect fertility.

Overwhelmingly, research on religiosity shows that higher degrees of religiosity as measured by frequency of prayer (Lyons and Smith 2014), frequency of attending church services (Lyons and Smith 2014; Pearce 2010; Wildeman and Percheski 2009), and self-reported religiosity (Hayford and Morgan 2008; Jeynes 2003) all reduce the likelihood of having a child before marriage.

Research suggests that having a higher degree of religiosity is associated with lower NMF mainly through learned attitudes that influence behavior. For example, being more highly religious is often associated with traditional gender and family values that emphasize the role of marriage and parenthood and the prohibition of premarital sex and abortion (Hayford and Morgan 2008; Jeynes 2003). Therefore, more highly-religious individuals are less likely to have a child before marriage. Since high religiosity is associated with lower rates of NMF, the first hypothesis is: H1: Counties with a higher rate of churches per 1,000 people will have lower nonmarital fertility.

While research has shown a strong link between religiosity and fertility, religious affiliations and NMF is not widely discussed in the literature. However, there are a few studies that examine religious affiliation and NMF. Overall, research shows that conservative Protestants have high rates of marriage before having children (Lehrer 2004a, 2004b). Interestingly, Uecker's (2014) research found that adolescents who attended high school with a higher

proportion conservative Protestants regardless of their religious beliefs were more likely to marry earlier before having children. This study shows it is not about specific religious beliefs; it is about the collective influence those beliefs have on communities. Thus, it provides excellent support that the religious culture individuals are surrounded by can have a significant impact on their fertility.

There are a few key reasons why conservative Protestants have high rates of marriage before having children. Since this religious affiliation tend to be very conservative and traditional, their practices often emphasize the significance of marriage while also forbidding sex before marriage, abortion, and, sometimes, contraception, which makes adherents more likely to marry before having children (Cohen, Dehejia, and Romanov 2009; Ellison and Xu 2014; Lehrer 2004a, 2004b).

On the other hand, research has also shown that mainline and liberal Protestants tend to get married later (Ellison and Xu 2014; Lehrer 2004a, 2005a; Uecker 2014) so there is more opportunity for them to have children first. Interestingly, while Catholics traditionally have had high rates of marriage before having children, especially because of their strict beliefs about birth control, research shows this effect is largely diminishing over time (Ellison and Xu 2014; Lehrer 2004a; Uecker 2014).

The only study on religious affiliation and NMF conducted by Pearce (2010) found that conservative Protestant and Catholic affiliations were positively related to NMF, which could be due to their intentional focus on abstinence-based sex education and lack of contraception. However, these findings are a bit puzzling since research about marriage patterns shows that conservative Protestants tend to get married earlier, which would suggest they would be less likely to have children before marriage. Clearly, more research is needed to better understand

this relationship. Taken together, research on religiosity, religious affiliations, and fertility suggest that areas with higher proportions of the highly religious and conservative Protestants will have lower rates of NMF. Moreover, the main mechanism through which these religious factors matter is through the collective beliefs about marriage and childbirth shared among community members that profoundly influence on individuals' lives.

Thus, because Catholics and conservative Protestants tend to have low rates of NMF while liberal Protestants tend to have higher rates of NMF, the second, third, and fourth hypotheses are: H2: Counties with a higher percentage of Catholics will have lower nonmarital fertility; H3: Counties with a higher percentage of liberal Protestants will have higher nonmarital fertility; H4: Counties with a higher percentage of conservative Protestants will have lower nonmarital fertility.

Migration

Much of the literature on migration¹ shows that people moving in and out of communities can have a significant impact on NMF, primarily through its influence on social capital. First, it is important to note how migration impacts the social capital of communities. Many studies show that having a low amount of migration into and out of communities preserves social ties and leads to higher levels of social trust. For example, a study by Sampson (1988) showed that residential stability, or the lack of moving into and out of communities, was positively related to increasing local friendship ties, collective attachment to community, and participation in local social and leisure activities. Another study by David, Janiak, and Wasmer (2010) found that local social interaction, measured by being a member of a local sport, entertainment, or neighborhood group, talking frequently with neighbors, and gathering at a friend or relative's house,

¹ Migration used here refers to the movement of people in and out of counties through immigration, internal migration, or residential mobility

significantly decreases geographic mobility out of communities. That is, having high levels of social engagement in a community prevents people from moving out of their neighborhoods. Other studies have supported these findings and shown that having high social capital in another community makes people more likely to leave their own community (Asad 2015; Kan 2007; Palloni et al. 2001).

While many studies test how migration has impacted the social networks of communities, several other studies have looked at the impact of migration and residential mobility on NMF . One study by Landale and Hauan (1996) found that Puerto Rican women who migrated to America were more likely to have sex earlier, delay marriage, and have children before their first marriage compared to nonmigrant women in mainland Puerto Rico. Additional research has corroborated this finding (Singley and Landale 1998). Also, Sucoff and Upchurch (1998) report a positive effect of residential mobility, measured by two or more moves, on premarital childbearing among black adolescents. Although they do not explicitly hypothesize why this occurs, the authors find that social exclusion is responsible for increased NMF in segregated neighborhoods. South and Baumer (2000) also report that moving to another place to live during childhood and teenage years significantly increases the risk of having a child before marriage. They suggest that communities with stronger social ties are less likely to have high rates of premarital childbearing although they could not empirically verify these results. This research follows in line with Sucoff and Upchurch's (1998) and South and Baumer's (2000) arguments and proposes that areas with low migration are more likely to have higher social capital and, therefore, experience lower rates of NMF.

Moreover, social ties matter in reducing NMF largely because they positively influence norm enforcement and social sanctioning as well as enhance community members' mutual trust,

social connectedness, and ability to achieve shared common goals. For example, Browning and Olinger-Wilson (2003) find support for the influence of strong social ties and social cohesion in reducing short-term sexual partnering in communities. These researchers argue that stronger social ties within a community allow individuals to experience higher levels of mutual trust and solidarity (social cohesion), which enhances the capacity of community members to achieve shared goals. Moreover, socially-organized communities with strong social ties are more likely to enforce norms and regulate behavior that may be potentially harmful. They also argue that communities with strong ties and cohesiveness promote the development of social networks that discourage short-term sexual partnerships. Alternatively, less stable communities with lower social cohesion are more likely to be characterized by higher partner turnover and more casual acquaintances, which may increase the likelihood of short-term sexual partnerships. Additional research by Houseknecht and Lewis (2005) has corroborated this idea by finding that strong primary and community ties are associated with fewer incidences of teen cohabitation and nonmarital fertility. They argue that these factors encourages teens to internalize expectations and avoid sanctions, such as not engaging in nonmarital childbearing. Thus, stronger social ties are theorized to reduce the likelihood of nonmarital fertility behavior because of mutual trust, expectations, and sanctioning. Community ties reinforce these pathways since they provide channels through which people can exchange information about community members' behaviors and impose shared norms. Thus, when families move frequently or don't maintain strong social ties to their communities, social cohesion breaks down, expectations about behavior are looser, and nonmarital childbearing is more likely to rise. Thus, drawing upon research which shows that communities with little in- or out-migration are more likely to be stable and have stronger

social ties, which decrease nonmarital fertility, the fifth hypothesis is: H5: Counties with a higher percentage of in- and out-migration will have higher rates of nonmarital fertility.

Women's Education

The vast majority of research on women's education shows that higher rates of education leads to lower NMF (Cherlin 2010, 2015; Kefalas et al. 2011; Monstad, Propper, Salvanes 2008; Musick et al. 2009). However, this paper isolates the effect of education on NMF by examining this effect in poor and nonpoor counties.. Thus, this research asks if this relationship holds true even in economically-deprived areas. If this relationship does not follow with established literature and shows that lower education actually decreases NMF in poor counties, one mechanism by which this relationship may exist is through adherence to traditional gender roles. That is, because some lower-educated women hold traditional values such as being a wife and mother, they may have some effect on reducing NMF (Albrecht and Albrecht 2004; Kefalas et al. 2011; Snyder, Brown, and Condo 2004; Snyder 2006). These ideas are explored in detail below.

The majority of research on education's impact on NMF shows that women obtaining a higher education have lower rates of NMF than their lower-educated counterparts. This relationship is posited to exist for several reasons. First, because the majority of manufacturing jobs are taken by high-school or lower-educated workers, they are primarily the group that has been most affected by deindustrialization and job loss. So, with limited economic opportunities, this group often chooses not to marry and, therefore, they are more likely to have higher NMF than higher-educated workers (Cherlin 2010, 2015). Another reason this relationship is posited to occur is due to the fact that pursuing college naturally builds in delays for having children until one's education is finished (Kefalas et al. 2011; Monstad, Propper, Salvanes 2008; Musick et al.

2009). Finally, another reason for the highly educated to have lower NMF is because this group tends to engage in extensive family planning. Research shows that those who attend college tend to believe that marriage can only occur after each partner achieves their economic and educational goals and they acquire a marriage mentality (Kefalas et al. 2011). Indeed, research by Musick et al. (2009) shows that lower-educated women were more likely to have higher NMF than higher-educated women and proposed that one of the main mechanisms driving this finding was economic uncertainty. That is, because well-paying jobs are not widely available to this group, many women decided to forgo the long-term financial commitment to marriage but they did not postpone having children.

While this research dominates current academic literature, some research shows that changing gender norms may play some role in influencing NMF. For example, not adhering to traditional gender norms could boost NMF. Prior to the 1950s, women have experienced a massive expansion of their freedoms, primarily through the Women's Rights Movement, the growth of women moving into jobs and higher education, and the widespread availability of birth control. As women's rights have expanded considerably, women no longer need to rely on a husband and now have more opportunity to have children whenever they want. Thus, as they move away from traditional gender roles, women may also have more freedom to have children before getting married (Cherlin 2010, 2015). However, given the vast amount of literature on education reducing NMF, this turn away from gender norms is unlikely to increase NMF.

Alternatively, adherence to traditional gender norms would predict that a portion of women with lower educations may actually have lower NMF rates. That is, traditional gender roles, such as marrying shortly after high school before having children, could decrease NMF among those with lower educations (Albrecht and Albrecht 2004; Snyder, Brown, and Condo

2004; Snyder 2006). For example, research by Snyder et al. (2006) found that individuals from poor rural areas are more likely to hold traditional values of family life and are therefore more likely to marry before having children than their metro counterparts. Other studies have supported this finding (Albrecht and Albrecht 2004; Snyder, Brown, and Condo 2004). For example, research shows that, even when women are not married at the time of conception, women who hold traditional gender roles are more likely to marry before their children are born than those who do not hold traditional values (Albrecht and Albrecht 2004). Since research shows some areas with traditional values are more likely to have low rates of NMF (Albrecht and Albrecht 2004; Snyder, Brown, and Condo 2004; Snyder 2006), certainly adhering traditional gender roles plays some role in reducing NMF.

However, one issue with existing research is that it is difficult to truly test the impact of education on NMF because income and education are not separated and tested independent of one another. Thus, this research seeks to fill this gap by testing the impact of women's education on NMF in poor counties only to see if current research still holds true. If this research shows the opposite effect of education on NMF, adherence to traditional gender roles may be one mechanism through which this relationship occurs. Thus, since research shows that lower-educated women who adhere to traditional gender roles tend to get married before having children, the sixth hypothesis is: H6: Counties with a higher percentage of women with a high school degree or less will have lower nonmarital fertility.

Overall, informal mechanisms of social control hypothesis emphasizes how social contexts and local cultures influence the timing of marriage and parenting. In particular, areas with highly-religious individuals and conservative Protestants are expected to have lower rates of NMF. Areas with little in- and out-migration are also expected to have lower rates of NMF due

to stronger social ties and higher social trust. Moreover, while adherence to traditional gender roles plays some role in decreasing NMF rates, women who achieve higher levels of education are more likely to have lower rates of NMF. This research builds upon previous work and asks whether these factors predict low NMF rates in economically-depressed areas of the United States. This question is explored in the analysis below.

Data

The primary data for this study comes from the American Community Survey (ACS) five-year estimate (2008-2012). The ACS is a nationally-representative sample of 3.5 million Americans across U.S. counties. The ACS data is merged with several other county-level data sources. Contraceptive data comes from the Guttmaher Institute's 2010 Survey of U.S. Publicly-Funded Family Planning Clinics. This research is a nationally-representative study that documents the services provided by family planning clinics. Religious data comes from the 2010 U.S. Religion Census' Religious Congregations and Membership Study. This data estimates the number of congregations and adherents across the counties in the United States. Data was downloaded from these three sources and merged together to create a new dataset used in this analysis. All of the data is centered around the year 2010 because this year contains the most recent data for all necessary variables. After dropping counties with missing data, a total of 2,898 counties (92.2% of all counties in the United States) are included in the analysis.

Dependent Variable

The dependent variable, *earnNMF*, was created using nonmarital fertility rates and median earnings. The first component of the dependent variable, nonmarital fertility, represents the number of nonmarital births of women aged 15-50 per county divided by the total population of that county. This rate was then logged to reduce skew and heteroscedasticity. The other

component is economic insecurity, which is measured by the median earnings of the county. Median earnings serves as an indicator of the economic health of the county. Using these two measures, all counties were sorted into one of four categories for the earnNMF variable. First, all counties above the 50th percentile in median earnings and below the 50th percentile in nonmarital fertility were categorized “non-poor counties with low nonmarital fertility” to serve as the reference group since research shows non-poor counties tend to have lower NMF (Cherlin 2010, 2015). Further, all counties above the 50th percentile in median earnings and nonmarital fertility were designated “non-poor counties with high nonmarital fertility.” Next, all counties below the 50th percentile in median earnings and above the 50th percentile in nonmarital fertility were categorized “poor county with high nonmarital fertility.” Finally, all counties below the 50th percentile in median earnings and below the 50th percentile in nonmarital fertility were designated “poor county with low nonmarital fertility.”² The distinction in these four categories is important since this research is primarily interested in observing how various factors may operate differently in poor counties that produce low rates of nonmarital fertility.

Key Independent Variables

To examine the informal mechanisms of the social control hypothesis, this research first investigates the impact of religion and migration. The first measure of religiosity, *church rate*, is the number of religious institutions per 1,000 people within the county. The other variables measure the percent Catholic, the percent liberal Protestant, and the percent conservative Protestant in each county and are named accordingly. Other faiths were not included in this analysis due to small sample sizes. Next, *migration* was used to assess the amount of transition in

² As discussed in Appendix A, a variety of cut-off points besides the 50th percentile were used to create the category “poor county with low nonmarital fertility.” However, none of the findings at these different points were substantively different than the findings at the 50th percentile. Because the findings were largely the same, I chose to make the cut-off at the 50th percentile to increase sample size.

the population that counties experience. Migration is measured by adding the number of people per county that lived in a different county, a different state, or abroad one year ago, then dividing by the total population of the county.

Women's education is used to test the effect of education on NMF by separating income from the analyses and focusing only on poor counties. Women's education is measured by the percent of females in each county with a less than high school education or a high school degree. Women's education is an important factor to test in poor counties because, to date, no study has systematically examined how education impacts NMF in poor places.

Control Variables

The control variables used in this paper include a variety of variables that have been correlated with NMF in previous literature. First, black population concentration in a county has been shown to be associated with higher NMF rates (Wilson 1987, 1996). This is measured by the variable, *percent black*. Research also shows that sex ratio, or the number of women to men in a given area, is thought to increase NMF due to lack of available men (Willis and Haaga 1996). Rurality is measured by creating a dichotomous variable, with 1 = counties with fewer than 50,000 inhabitants and 0 = counties with 50,000 or more inhabitants, a standard cut-off in ACS data. This study controls for rurality because these areas are more likely than urban centers to be associated with low NMF (Albrecht and Albrecht 2004; Snyder 2006; Snyder et al. 2004). Sex ratio is measured by the total female population divided by the male population. Local labor market conditions have been extensively studied, with research demonstrating that poor employment opportunities increases NMF (Cherlin 2010, 2015). Local labor market conditions in this study are measured by the percent aged 16 and up employed in each county as well as the percent in each county who are employed by the government, or the public sector. The next

variable, demand and potential supply of contraception, is an important factor to consider when examining fertility rates. This variable has two measures – one is the number of females needing contraception in each county (which is women who are fertile, sexually active, and within childbearing years) divided by the total female population of each county and the other is the total number of health clinics where contraception is available per 1,000 people in a county. These clinics include Planned Parenthood clinics, federally-qualified health clinics, health department clinics, hospital-based clinics, and other clinics where contraception is available. Furthermore, male education is included since low education is positively correlated with NMF (Willis and Haaga 1996). This variable is measured by the percentage of men in each county with a high school degree or less. Median age is the median age of each county since younger ages are highly correlated with NMF (South and Lloyd 1992). Finally, foreign born is included in the model because being born in a foreign country has been shown to be correlated with a decrease in nonmarital fertility compared to being born in the United States. It is also imperative to control for cultural variations among other countries (Wildsmith and Raley 2006). This variable is measured by the percent of people in each county who were born in another country.

Methods

First, correlations are run to measure the strength of the relationship between NMF and median earnings with all of the independent variables and examine whether the correlations are significant in both directions across NMF and median earnings. Next, a multinomial logistic model (MNL) is estimated to measure how the independent variables impact the odds of a county falling into one of the four categories of the dependent variable, non-poor-low NMF, non-poor-high NMF, poor-high NMF, or poor-low NMF. In this scenario, all non-poor-low NMF counties are treated as the reference group so the coefficients reflect the likelihood of a county

falling into one of the three categories relative to a non-poor-low NMF county. The goal of the MNLM is to illuminate the factors that predict counties being poor-low NMF compared to non-poor-low NMF counties and thereby show which factors are most important in decreasing NMF rates. Finally, a Wald test (Freese and Long 2000) tests for a significant difference between the coefficients for poor counties only in order to formally test each hypothesis. A finding of significant difference would reveal that a county is significantly more or less likely to be a poor-low NMF county compared to a poor-high NMF county.

Results

Figure 1 about here

Figure 1 shows a map of the United States with 706 counties in the poor-low NMF category highlighted in blue (Minnesota Population Center). The median earnings of these counties is \$26,013 and the nonmarital fertility rate is .789%. These counties are primarily located in the Midwest and Southern states, with nearly 50% of the cases concentrated in Arkansas, Kansas, Kentucky, Michigan, Missouri, Montana, Nebraska, North Carolina, Tennessee, and Texas. The mean population in these counties is 26,678 people. Additionally, these counties have a significantly lower percentage of females with a Bachelor's Degree and percentage of Catholics, as well as a significantly higher percentage of liberal and conservative Protestants than other counties in the United States.

Table 1 about here

Tables 1, 2, 3, and 4 presents the descriptive statistics for the variables used in the analysis. Table 1 shows the descriptive statistics for non-poor-low NMF counties. In these counties, the nonmarital fertility rate is .73, which means that there is an average of .73 nonmarital births per person. There are an average of 1.74 churches per 1,000 people as well as

15.11%, 12.24%, and 18.20% of the county population who identified as Catholic, liberal Protestant, and Conservative Protestant. Additionally, migration averaged 6.77% while 46.84% of the counties had females with lower education. Finally, these counties are about 6.44% black on average, are slightly more likely to be non-rural than rural (mean = .46), and the average percent employed is 60.18%

Table 2 about here

Table 2 shows the descriptive statistics for non-poor counties with high NMF. In these counties, the average NMF rate is much higher than the previous group at 1.36 nonmarital births per person. There are an average of 1.76 congregations per 1,000 people and Catholics, liberal Protestants, and conservative Protestants make up 15.12%, 11.43%, and 20.29%, respectively, all of which are similar to the non-poor-low NMF category. Also similar to the first category are migration, which averaged 7.03% and females with a high school degree or less, at 49.68%. The black population is only slightly higher at 8.58%, being rural remains the same at .47, and the average percent employed is similar at 59.77% of the population.

Table 3 about here

Table 3 shows the descriptive statistics for poor counties with high NMF. The NMF rate is 1.34, which is an average of 1.34 nonmarital births per person. The average rate of congregations per 1,000 people in these counties is 2.99, which is almost double that of the non-poor counties. The percentage of liberal Protestants in these counties is roughly the same as the non-poor counties at 11.15% while the percentage of Catholics is much lower at 10.48% and conservative Protestants is much higher at 28.27. Migration is about the same at 6.61% while the percentage of women with a high school degree or less is much higher at 55.67%. Moreover, the

percentage of blacks is much higher at 10.92%. These counties are far more likely to be rural at .87, and the percent employed is 52.39%, which is quite a bit lower than the non-poor counties.

Table 4 about here

Table 4 shows the descriptive statistics for poor counties with low NMF. Similar to the non-poor-low NMF counties, the nonmarital fertility rate for poor-low NMF counties is .70, which means that there is an average of .7 nonmarital births per person. Overall, the rest of the trends in this table are very similar to poor counties with high NMF with only a few exceptions. The rate of congregations is similar to poor-high NMF counties at 3.04 per 1,000 people. Also, the percentages of religious adherents in poor counties with low NMF are also similar to the other poor economic conditions category, with an average of 11.44% Catholics and 12.75% of liberal Protestants. The average percentage of conservative Protestants, however, is slightly lower in the low NMF category than the high NMF one at 25.42%. Also similar to the previous poor category, the average percentage of migration experienced by these counties is 6.78% and the percentage of females with a high school degree or less is 55.52%. However, one of the main differences between the poor and low NMF category and high NMF category is the share of black population, which is lower at 7.55%. The average percent employed in the low NMF category is 53.32%. Finally, these counties are also much more likely to be rural (mean = .89) than non-poor counties, which suggests that rural counties are more likely to be poor and also have lower nonmarital fertility, as was expected from the Kefalas et al. 2011 study. It also corroborates a plethora of other studies which find that poor rural areas with traditional values have lower NMF rates than urban areas (Albrecht and Albrecht 2004; Snyder 2006; Snyder, Brown, and Condo 2004).

Table 5 presents a correlation matrix showing how each of the independent variables in the model are correlated with logged NMF and median earnings as well as whether these relationships are significant. This research is primarily concerned with the directionality of the correlations and whether the independent variables are correlated with NMF and median earnings in the same direction.

Table 5 about here

The first variable that decreases for both NMF and median earnings is rate of congregations, which means that, as the rate of congregations increases, NMF rates and median earnings decrease. The correlation between congregations and NMF is $-.0177$ and the correlation between congregations and median earnings is $-.5217$. However, only the relationship between congregations and median earnings is significant at the $p .05$ level. The next variable that decreases for both NMF and median earnings is the percentage of liberal Protestants, with an association of $-.0543$ and $-.0642$, respectively. This finding indicates that, as the percentage of liberal Protestants increase, NMF rates and median earnings decrease. Indeed, both of these relationships are significant at the p level of $.05$. Finally, migration is positively correlated with both NMF and median earnings at $.0091$ and $.0345$, respectively, which means that, as the percentage of migration increases, so does NMF and median earnings. However, neither of these variables are significant at the $p .05$ level. The other key independent variables, percentage of Catholic, percentage of conservative Protestants, and percentage of females with lower education are not correlated with logged NMF and median earnings in the same direction.

Table 6 about here

Table 6 presents the multinomial logit model (MNL) displaying how each of the independent variables impact the odds of a county falling into a non-poor-high NMF, poor-high

NMF, or poor-low NMF county relative to a non-poor-low NMF county. The MNLM model shows that a higher rate of congregations significantly increases the odds of the county being a poor-high NMF (.9350) and poor-low NMF (.9242) county compared to a non-poor-low NMF county, which are both significant at the p .0001 level. The model also reveals that a higher percentage of Catholics significantly increases the odds of a county being a non-poor-high NMF county and a poor-high NMF county relative to a non-poor-low NMF county. The odds increase by .01 for the non-poor-high NMF counties, which is significant at the p .05 level while the odds increase by .0098 for the poor-high NMF counties, which is marginally significant at p .10. Next, a higher percentage of liberal Protestants significantly decreases the odds of the county being a poor-high NMF and a poor-low NMF county versus a non-poor-low NMF county. The odds decrease by .0208 for poor-high NMF while the odds decrease by .014 for poor-low NMF counties. Additionally, the MNLM reveals that a higher percentage of conservative Protestants increase the odds of a county being non-poor high NMF (by .0123) while they decrease the odds of a county being poor-low NMF (by .0105) compared to a non-poor-low NMF county. The finding for non-poor-high NMF counties is significant at the p .05 level while, for the poor-low NMF counties, this relationship is marginally significant at the p .10 level. A higher percentage of females with a high school degree or less significantly increases the odds of a county being a poor-high NMF county relative to a non-poor-low NMF county. The odds increase by .0116, which is significant at the p .05 level. Finally, the MNLM shows no significant findings between any of the categories for migration.

Table 7 about here

Table 7 presents Wald posttests that are conducted on each key independent variable individually to formally test each of the six hypotheses. The Wald test is used to test for a

significant difference between the coefficients for the poor-low NMF and poor-high NMF conditions. In testing for significant differences between the poor conditions, this research can answer whether the factors explored in this analysis influence the likelihood of a county being poor-low NMF, which would illuminate the impact these variables have on NMF rates. In this analysis, the coefficient for the poor-low category is subtracted from the coefficient for the poor-high category to test for a significant difference between the two categories. Thus, a positive number signifies a higher coefficient for the poor-high condition, which suggests an increased likelihood of being a poor-high county. A negative number signifies a higher coefficient for the poor-low condition, which suggests an increased likelihood of being a poor-low county.

The first set of hypotheses tests whether religiosity and various religious affiliations impact NMF. The first variable, *congregations*, shows no significant difference (.0108) in the rate of churches per 1,000 people between poor counties with high and low NMF. Therefore, the data does not support hypothesis 1 and shows no impact of religiosity on NMF rates in poor counties. The table shows that hypotheses 2 and 3, the impact of percent Catholics and percent liberal Protestants on NMF, are also not significant with differences of coefficients of .0051 and -.0069, respectively. Thus, the percent of Catholics and liberal Protestants also has no impact on NMF rates in poor counties. However, the difference of coefficients for the fourth variable, *Conservative Protestants*, is .0098, which is significant at the .05 level. Because this coefficient is positive, the coefficient for the poor-high category is higher than the coefficient for the poor-low category. Thus, counties with higher levels conservative Protestants are more likely to fall into the poor-high rather than the poor-low category. However, this relationship is in the opposite direction than expected; conservative Protestants were hypothesized to decrease NMF. Thus, Hypothesis 4 is not supported. The next variable, *migration*, shows no significant difference in the

percentage of migration between poor counties with high and low NMF with a difference in coefficients of $-.0281$. Thus, hypothesis 5 is also not supported by the data and shows no impact of migration on NMF rates in poor counties. Finally, with a difference of coefficients of $.0026$, the sixth variable, *women's education*, shows no significant difference in the percentage of women with lower educations between poor counties with high and low NMF. Hypothesis 6 is therefore not supported since there appears to be no impact of women's education on NMF rates in poor counties.

Discussion

Despite overwhelming research on the impact of poor economic conditions and economic insecurity increasing NMF, research has yet to examine economically-depressed areas of the United States with low levels of NMF. The little research that provides case studies of low-income agricultural areas with high marriage and low NMF are all qualitative. This research seeks to fill this gap by using quantitative analysis on nationally-representative data. Although the main hypotheses from this study are not supported by the data, several results are worth highlighting.

First, the findings show that a higher rate of congregations significantly increases the odds of the county being a poor-high NMF and poor-low NMF county compared to a non-poor-low NMF county while a higher percentage of liberal Protestants significantly decreases the odds of the county being a poor-high NMF and a poor-low NMF county versus a non-poor-low NMF county. Moreover, a higher percentage of Catholics significantly increases the odds of a county being a non-poor-high NMF county and a poor-high NMF county relative to a non-poor-low NMF county. However, when Wald tests were conducted for significant differences in these

variables between poor counties only, all of the aforementioned results were no longer significant.

These findings suggest that poor counties have significantly more congregations, non-poor counties have a significantly higher percentage of liberal Protestants, and counties with high NMF also have a higher percentage of Catholics. These first two findings are not surprising given that they corroborate previous research on religion and economic inequality. For example, research has long-shown a positive association between economically insecure areas and high levels of religiosity (Solt, Habel, and Grant 2011) and higher family incomes are associated with liberal Protestantism such as Episcopalianism, Congregationalism, and Presbyterianism than most other faiths (Gockel 1969). What is worth noting, however, is that counties with high NMF have higher percentages of Catholics. This research, too, follows in line with previous literature mentioned above which found that Catholics traditionally having high rates of early marriage before having children has been diminishing over time (Ellison and Xu 2014; Lehrer 2004a; Uecker 2014). Future studies should continue to explore the relationship between Catholicism and NMF in an effort to understand the mechanisms driving this change.

The MNLM also showed that a higher percentage of conservative Protestants increases the odds of a county being non-poor high NMF while it decreases the odds of a county being poor-low NMF compared to a non-poor-low NMF county. A Wald test for significance between poor counties also revealed that conservative Protestants are significantly more likely to fall into the poor-high rather than the poor-low category although the difference between poor-low NMF and poor-high NMF is small (.0098). Additionally, this relationship is in the opposite direction than expected. According to most previous research, conservative Protestants were hypothesized to decrease NMF (Lehrer 2004a, 2004b; Uecker 2014). However, one study by Pearce (2010)

found that conservative Protestantism was positively related to high NMF. She speculated one reason for this outcome could be because this group is less likely to abort pregnancies out of wedlock compared to other religious affiliations. Another reason she highlighted was that conservative Protestants received more abstinence-only education than education about effective contraceptive methods. This research suggests that religion may have both a prohibiting and inhibiting effect on NMF. Because of the complicated relationship and conflicting findings, future research should continue to explore the relationship between conservative Protestants and nonmarital fertility.

It is also worthwhile to note that the only significant finding about women's education was that it increased the likelihood of a county being poor-high NMF relative to a non-poor-low NMF. This finding indicates that the relationship between decreased women's education and high NMF holds even in poor counties. That is, a higher percentage of women with lower education does not make a county more likely to have low NMF rates as was hypothesized. Finally, the percentage of migration in a county had no noteworthy significant relationships. This finding was surprising given that migration decreases social ties within a community which, in turn, is theorized to increase NMF. The likely reason for this finding was that, according to the descriptive statistics, the percentage of migration among all four categories was roughly the same.

Overall, the results from this study suggest that culture plays a smaller role on NMF than was hypothesized. That is, although previous case studies demonstrate the various ways that culture matters in shaping NMF, this study largely does not corroborate those findings. These results could be due to the fact that other cultural variables that matter in shaping NMF were not chosen in this study. Another reason why these findings may not follow previous literature could

be due to the fact that the main cultural aspects discussed in this study, religiosity, religious affiliation, social ties, and adherence to traditional gender roles, are not truly being captured by the variables chosen for this study. Indeed, the fact that none of the hypotheses about cultural influences were supported is perplexing. To illuminate some of the reasons these arguments may not have held up, it is important to highlight some limitations of this study.

One important limitation of this study is that it doesn't capture individual-level factors that influence NMF although individual-level factors certainly matter in shaping NMF. This study, instead, focuses on contextual factors that influence NMF at the county level. Thus, it is imperative not to make an ecological fallacy, which confuses different levels of analysis and treats them as one. That is, results from this study cannot be used to make inferences about individuals' behavior when the data is collected at the county level. So, although individual-level factors do matter, a limitation of this study is that we cannot draw conclusions about individuals.

A major limitation of this study is the lack of available data. One reason the data was difficult to obtain was because there is not a wide selection of variables at the county level. The vast majority of research related to NMF is available at the individual-level while some others are at the household and neighborhood levels. I had to piece together different data sets to create a new county-level data set. Unfortunately, many variables are not available at this level of analysis so many important variables were left out of this research. For example, I would have liked to include a variable for cost of living since this variable varies widely across the United States. It would have also been informative to have a variable for the Great Recession, which lasted officially from 2007-2009, since this data is centered on the year 2010 and research has shown that the recession played a profound role in shaping fertility (Cherlin et al. 2013; Morgan, Cumberworth, and Wimer 2011; Schneider 2015; Schneider and Hastings 2015). Unfortunately,

I was not able to include either of these controls since they were not available at the county level.

A multilevel approach that examines both individual and contextual factors would give a more holistic understanding of nonmarital fertility. Thus, future research should build on this study and use a multilevel approach. Another reason data was difficult to obtain was due to the difficulty in quantifying the concepts in this study. Because this research is primarily focused on cultural and social contexts that shape NMF rates, variables such as social capital and social cohesion would have been ideal to obtain. While there are some quantitative data sets that tap into social capital and social cohesion, these factors are more often explored using qualitative methodologies. Hence, these variables were not available at the county level. In addition to building up quantitative data sets, it would be prudent for future research to continue to explore this phenomenon through a qualitative and mixed methods lens as well.

Despite the lack of overall findings in support of the hypotheses and the limitations of this study, this work still makes a valuable contribution to the field of sociology. In addition to corroborating previous research about the complicated relationship between conservative Protestantism and high NMF, this research opens up many avenues for future research. In many ways, this study explores uncharted territory since no previous research has examined economically insecure areas of the United States with low NMF. This research is also the first to move beyond qualitative case studies discussing low nonmarital fertility in poor areas to make broader generalizations by using nationally-representative data sets. Finally, because the foundation of this research is based on the argument that place matters for shaping life trajectories and outcomes, it contributes in important ways to the literature on the importance of local context. While much of the current research in this area has been focused on major U.S. cities (as evidenced by lack of datasets at the county-level), this study purposefully seeks to

examine place in a wider context than just metropolitan areas. By including only metropolitan areas in research, there are entire groups of people not living in these areas that are left out of the inquiry even though their residences likely matter just as much in shaping their life trajectories and outcomes. Thus, this study seeks to understand how place shapes particular outcomes for all Americans, which would be a worthwhile model for other sociological studies to follow.

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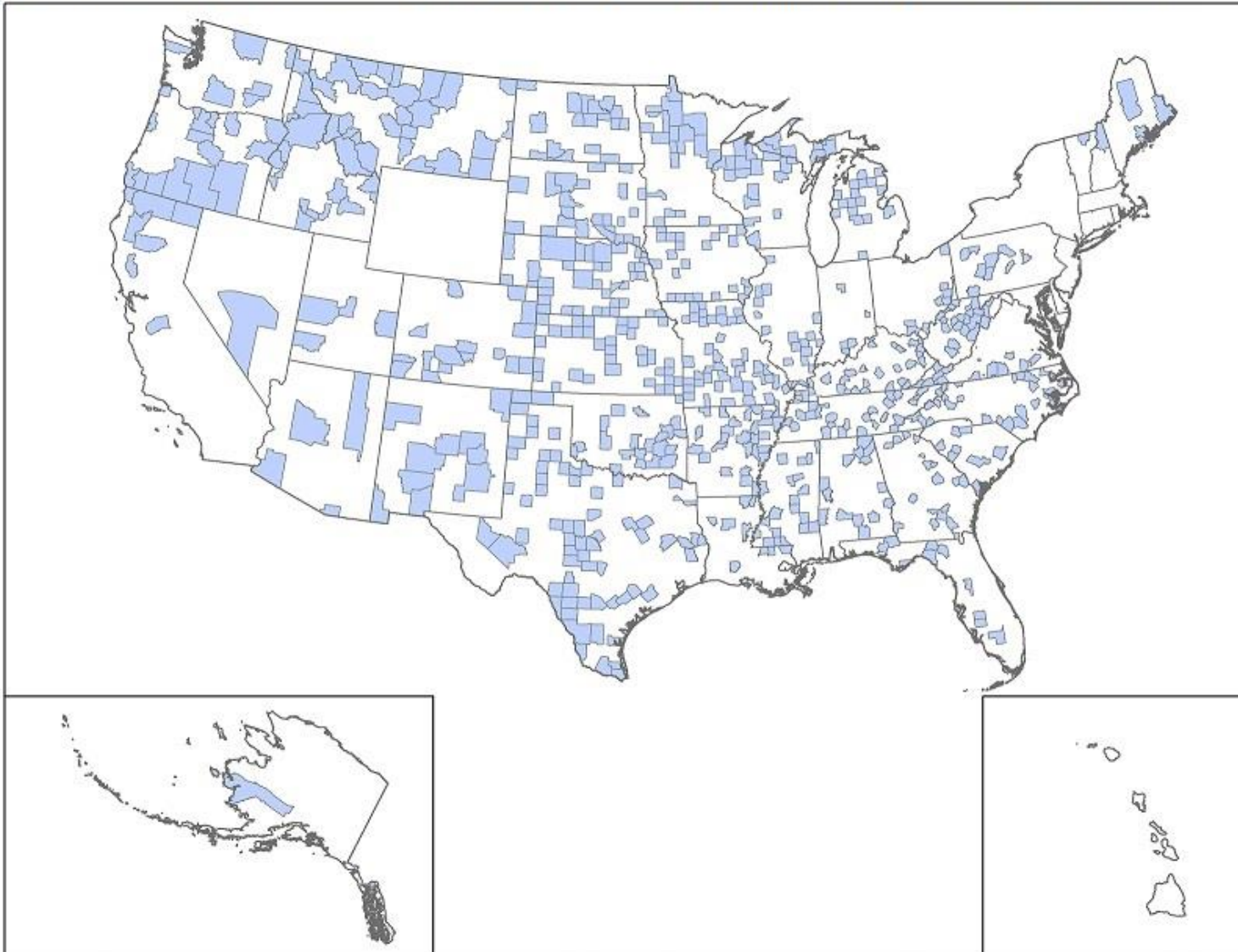
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Figure 1. Counties in the United States below the Fiftieth Percentile in Median Earnings and Nonmarital Fertility



Source: Minnesota Population Center. *National Historical Geographic Information System: Version 2.0*. Minneapolis, MN: University of Minnesota 2011.

Table 1. Summary Statistics for the Variables in Non-Poor-Low NMF Counties

Variables	Mean	SD	Min	Max	Description/Coding
Dependent Variable					
Nonmarital Fertility	.73	.27	0	1.05	Average nonmarital fertility for all non-poor-low NMF counties
Independent Variables					
Congregations	1.74	1.08	.41	9.80	Number of religious congregations in a county per 1,000 people
Catholic	15.11	12.90	.12	99.35	Percentage of people in a county who are Catholic
Liberal Protestant	12.24	10.21	.08	81.75	Percentage of people in a county who are Liberal Protestant
Conservative Protestant	18.20	13.23	.49	84.07	Percentage of people in county who are Conservative Protestant
Migration	6.77	2.64	1.72	21.16	Percentage of people in a county who previously lived in different county, a different state, or abroad
Lower Education	46.84	12.96	0	100	Percentage of females in a county who have a high school degree or less
Black	6.44	9.50	0	63.70	Percentage of people in a county who are Black
Rural	.46	.50	0	1	Whether county is rural - 50,000 people or fewer (1 = yes, 0 = no)
Sex Ratio	1.04	.07	.48	1.29	Ratio of female population to the male population in a county
Employed	60.18	6.18	32.70	81.90	Percentage of people 16 and up in a county who are employed
Government Employed	16.01	5.63	7	62.20	Percentage of people 16 and up in a county who are employed by the government
Contraception	27.70	5.90	.23	49.82	Percentage of females 15-44 in a county who need contraception
Contraceptive Clinics	.05	13.87	0	1.63	Number of contraceptive clinics in a county per 1,000 people
Male Education	57.79	13.87	7.20	100	Percentage of males in a county who have a high school degree or less
Median Age	38.89	4.32	22.40	50.60	Median age in a county
Foreign Born	5.29	5.78	0	47.31	Percentage of people in a county who were born in another country

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

N = 748.

Table 2. Summary Statistics for the Variables in Non-Poor-High NMF Counties

Variables	Mean	SD	Min	Max	Description/Coding
Dependent Variable					
Nonmarital Fertility	1.36	.27	1.05	3.15	Average nonmarital fertility for all non-poor-high NMF counties
Independent Variables					
Congregations	1.76	1.03	.42	8.21	Number of religious congregations in a county per 1,000 people
Catholic	15.12	13.04	.04	75.26	Percentage of people in a county who are Catholic
Liberal Protestant	11.43	9.28	.37	67.55	Percentage of people in a county who are Liberal Protestant
Conservative Protestant	20.29	14.43	.19	100	Percentage of people in county who are Conservative Protestant
Migration	7.03	2.96	1.98	30.18	Percentage of people in a county who previously lived in different county, a different state, or abroad
Lower Education	49.68	12.38	7.50	87.5	Percentage of females in a county who have a high school degree or less
Black	8.58	11.74	0	66.10	Percentage of people in a county who are Black
Rural	.47	.50	0	1	Whether county is rural - 50,000 people or fewer (1 = yes, 0 = no)
Sex Ratio	1.04	.07	.47	1.26	Ratio of female population to the male population in a county
Employed	59.77	6.02	32.40	77.60	Percentage of people 16 and up in a county who are employed
Government Employed	16.56	5.83	7.20	44.90	Percentage of people 16 and up in a county who are employed by the government
Contraception	28.26	6.30	4.91	93.17	Percentage of females 15-44 in a county who need contraception
Contraceptive Clinics	.05	.15	0	2.86	Number of contraceptive clinics in a county per 1,000 people
Male Education	58.08	13.49	14.50	100	Percentage of males in a county who have a high school degree or less
Median Age	38.56	4.31	24.10	53.40	Median age in a county
Foreign Born	5.25	5.49	0.06	39.72	Percentage of people in a county who were born in another country

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

N = 731.

Table 3. Summary Statistics for the Variables in Poor Counties with High Nonmarital Fertility

Variables	Mean	SD	Min	Max	Description/Coding
Dependent Variable					
Nonmarital Fertility	1.34	.25	1.05	2.64	Average nonmarital fertility for all poor-high NMF counties
Independent Variables					
Congregations	2.99	1.34	.57	11.51	Number of religious congregations in a county per 1,000 people
Catholic	10.48	13.90	.06	99.40	Percentage of people in a county who are Catholic
Liberal Protestant	11.15	9.90	.05	70.21	Percentage of people in a county who are Liberal Protestant
Conservative Protestant	28.27	17.20	.43	99	Percentage of people in county who are Conservative Protestant
Migration	6.61	3.08	1.01	29.44	Percentage of people in a county who previously lived in different county, a different state, or abroad
Lower Education	55.67	15.12	0	100	Percentage of females in a county who have a high school degree or less
Black	10.92	17.80	0	85.70	Percentage of people in a county who are Black
Rural	.87	.34	0	1	Whether county is rural - 50,000 people or fewer (1 = yes, 0 = no)
Sex Ratio	1.03	.11	.46	1.37	Ratio of female population to the male population in a county
Employed	52.39	7.18	25.90	73.50	Percentage of people 16 and up in a county who are employed
Government Employed	18.74	6.58	8.20	65.40	Percentage of people 16 and up in a county who are employed by the government
Contraception	24.01	6.43	6.12	88.06	Percentage of females 15-44 in a county who need contraception
Contraceptive Clinics	.10	.12	0	1.11	Number of contraceptive clinics in a county per 1,000 people
Male Education	67.10	15.19	0	100	Percentage of males in a county who have a high school degree or less
Median Age	40.73	5.16	22.50	58.60	Median age in a county
Foreign Born	3.44	4.71	0	49.71	Percentage of people in a county who were born in another country

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

N = 713.

Table 4. Summary Statistics for the Variables in Poor Counties with Low Nonmarital Fertility

Variables	Mean	SD	Min	Max	Description/Coding
Dependent Variable					
Nonmarital Fertility	.70	.30	0	1.05	Average nonmarital fertility for all poor-low NMF counties
Independent Variables					
Congregations	3.04	1.34	.55	10.92	Number of religious congregations in a county per 1,000 people
Catholic	11.44	13.33	0	90.51	Percentage of people in a county who are Catholic
Liberal Protestant	12.75	11.26	.09	77.40	Percentage of people in a county who are Liberal Protestant
Conservative Protestant	25.42	17.04	0	100	Percentage of people in county who are Conservative Protestant
Migration	6.78	3.20	0.09	29.49	Percentage of people in a county who previously lived in different county, a different state, or abroad
Lower Education	55.52	15.97	0	100	Percentage of females in a county who have a high school degree or less
Black	7.55	14.84	0	84.40	Percentage of people in a county who are Black
Rural	.89	.31	0	1	Whether county is rural - 50,000 people or fewer (1 = yes, 0 = no)
Sex Ratio	1.02	.12	.27	1.45	Ratio of female population to the male population in a county
Employed	53.32	7.95	27.40	91.90	Percentage of people 16 and up in a county who are employed
Government Employed	18.36	6.25	4.20	61.20	Percentage of people 16 and up in a county who are employed by the government
Contraception	23.18	4.88	3.96	47.70	Percentage of females 15-44 in a county who need contraception
Contraceptive Clinics	.10	.14	0	1.2	Number of contraceptive clinics in a county per 1,000 people
Male Education	68.11	14.41	12.30	100	Percentage of males in a county who have a high school degree or less
Median Age	41.24	5.12	25	61.40	Median age in a county
Foreign Born	3.68	5.67	0	61.81	Percentage of people in a county who were born in another country

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

N = 706.

Table 5. Correlations between Logged Nonmarital Fertility and Median Earnings with Independent Variables

Variables	Logged Nonmarital Fertility	Median Earnings
Congregations	-.0177	-.5217 *
Catholic	-.0251	.2022 *
Liberal Protestant	-.0543 *	-.0642 *
Conservative Protestant	.0742 *	-.2714 *
Migration	.0091	.0345
Females with Lower Education	.0144	-.3474 *
Black	.1220 *	-.0529 *
Sex Ratio	.0382 *	.1227 *
Employed	-.0483 *	.5409 *
Government Employed	.0159	-.1657 *
Females Needing Contraception	.0599 *	.4011 *
Contraceptive Clinics	-.0085 *	-.2412 *
Male Education	-.0241	-.3634 *
Median Age	-.0527 *	-.2339 *
Foreign Born	-.0233	.3087 *

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

$N = 2,898$.

* $p < .05$

Table 6. Multinomial Logistic Estimates of Nonmarital Fertility in Poor Counties

Variables	Non-Poor Counties with High Nonmarital Fertility	Poor Counties with High Nonmarital Fertility	Poor Counties with Low Nonmarital Fertility
Congregations	.0116 (.0967)	.9350 *** (.0942)	0.9242 *** (.0935)
Catholic	.0100 * (.0048)	.0098 † (.0056)	0.0047 (.0056)
Liberal Protestant	-.0070 (.0075)	-.0208 * (.0084)	-0.014 † (.0080)
Conservative Protestant	.0123 * (.0052)	-.0007 (.0055)	-.0105 † (.0056)
Migration	.0253 (.0259)	.0116 (.0277)	.0397 (.0279)
Females with Lower Education	-.0005 (.0059)	.0116 * (.0058)	.0091 (.0057)
Black	.0147 ** (.0056)	.0077 (.0060)	-.0015 (.0063)
Rural	.1349 (.1454)	1.1166 *** (.1787)	1.2240 *** (.1868)
Sex Ratio	-.0618 (.8874)	2.1247 * (.9010)	2.0292 * (.9048)
Employed	.0021 (.0105)	-.1749 *** (.0128)	-.1641 *** (.0127)
Government Employed	.0055 (.0116)	-.0306 * (.0132)	-.0420 ** (.0132)
Females Needing Contraception	.0196 (.0149)	-.0187 (.0191)	-.0782 (.0223)
Contraceptive Clinics	.3693 (.6534)	-.1195 (.6446)	.1537 (.0223)
Male Education	.0010 (.0056)	-.0005 (.0059)	.0077 (.0058)
Median Age	.0172 (.0202)	-.0346 (.0232)	-.0759 ** (.0251)
Foreign Born	-.0098 (.0107)	.0462 *** (.0138)	.0599 *** (.0137)
Log Likelihood:		(-3232.5725)	

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

Note: Standard errors in parentheses

N = 2,898.

Table 7. Comparing the Effects of Independent Variables between Poor Counties with High and Low Nonmarital Fertility

Variables	Difference of Coefficients
Congregations	.0108 (.0572)
Catholic	.0051 (.0047)
Liberal Protestant	-.0069 (.0070)
Conservative Protestant	.0098 * (.0041)
Migration	-.0281 (.0203)
Females with Lower Education	.0026 (.0041)

Data Sources: 2008-2012 American Community Survey; 2010 Survey of U.S. Publicly-Funded Family Planning Clinics; 2010 U.S. Religion Census' Religious Congregations and Membership Study.

Note : Standard errors in parentheses

N = 2,898.

†p < .10; *p < .05; **p < .01; ***p < .001

Appendix A.

Below is a list of various exploratory methods and analyses that were used to test for significant differences in the results:

1. Different cut-off points were tested to create the dependent variable in two ways:
 - a. First, I kept the dependent variable as binary and tried different cut-off points to decrease the sample of poor counties with low nonmarital fertility (thereby truly capturing this small group of counties). In the paper, the cut-off is at the 50th percentiles but I tried making the cut-offs as low as 5th percentile. When these cut-offs were made, a firthlogit (a command in Sata that controls for small-sample bias) revealed no significant differences between poor-high NMF and poor-low NMF counties.
 - b. Second, I created three categories of the dependent variable by making three cut-off points: one at the 25th percentile (poor-low NMF) and one at the 75th percentile (poor-high NMF). A logistic regression between the 25th and 75th percentiles yielded no significant results.
2. The control variables “percent employed 16 and up” and “percent government employed” were taken out of the analyses since they are overcontrols that are highly correlated with median earnings. Not including them in the analyses made no difference in the significance levels of the key independent variables.
3. I used the Gini coefficient to measure inequality’s impact on NMF but results were not significant.
4. I tried to find other ways to measure nonmarital fertility (other variables) but could not find anything.
5. Categories 1 (poor with high NMF) and 2 (poor with low NMF) were combined and compared with the reference group, 0 (all non-poor counties). A logistic regression revealed the same patterns as the multinomial logistic regression, which confirms that observed differences in the multinomial logistic regression presented in paper were due to economic differences, not differences in nonmarital fertility.
6. Instead of creating a categorical dependent variable, I ran a linear regression with fertility rate as a continuous dependent variable. I tested interaction effects with median earnings and with all of the key independent variables, which still revealed no significant results.
7. I interacted education with religion and education with migration variables to see if any interesting patterns emerged. Doing so revealed only one marginally significant interaction and there were no noteworthy new patterns to discuss.