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Introduction

For decades, the U.S. has led the Western industrialized world in the rate of births to teenagers (Moore, Miller, Glei & Morrison, 1995). This rate of teen childbearing compounds a number of problems. Even after controlling for prior socioeconomic disadvantage, teenage mothers are less likely to graduate from high school and more likely to be poor (Hoffman, Foster & Furstenberg, 1993). In addition, children born to younger teen mothers (17 and younger) are at a significant disadvantage in terms of cognitive development and academic achievement when compared with children whose mothers were 20 to 21 at the time of their birth (Moore, Morrison & Greene, 1997).

In the 1990s, research on teen pregnancy has focused increasingly on structural influences on adolescent sexual behavior (Brewster, Billy & Grady, 1993; Ku, Sonenstein & Pleck, 1993). Studies provide compelling evidence that this behavior is not just shaped by individual- and family-level characteristics, but also by the surrounding social context (Billy, Brewster & Grady, 1994). While teen pregnancy occurs in all types of communities (Luker, 1996), it is especially high in inner city neighborhoods (Hogan & Kitagawa, 1985; Wilson, 1987).

Much of this research utilizes the theoretical work of William Julius Wilson (Hogan & Kitagawa, 1985; Ku, Sonenstein & Pleck, 1993; Brewster, Billy & Grady, 1993; Billy, Brewster & Grady, 1994), including his social isolation perspective (Wilson, 1987; 1989; 1996). Wilson posits that demographic changes in the black community led to a growing concentration of poor people in urban, high poverty areas. A large out-migration of nonpoor blacks removed a "social buffer" that helped shield neighborhoods from concentrated effects of economic shifts and joblessness, contributing to "ghetto-related cultural traits and behaviors" (Wilson, 1996). Thus,

although problems like unemployment, teenage pregnancy, family dissolution, school dropout, violent crime, and drug addiction are not unique to these neighborhoods, they are more heavily concentrated there due to economic marginality (Wilson, 1987) and rigid racial segregation (Wilson, 1989; Massey & Denton, 1993).

For adolescents in the inner city, social isolation not only means that they are deprived of role models who demonstrate more "mainstream" attitudes and behaviors toward sexuality, childbearing and family formation, but also that they are cut off from the educational and economic opportunities that enhance their life options for social and economic mobility. Thus, Wilson's theory of social isolation is consistent with the theoretical perspective of life options as it relates to adolescent sexual behavior and pregnancy.

The Life Options Theoretical Perspective

The life options perspective is a loosely defined theoretical framework which posits that opportunities for social and economic mobility impact an adolescent's expectations for his/her future, which, in turn, affect behavior. When opportunities (for example, in the areas of education and employment) are low, an adolescent's expectations are low, and he/she is more likely to engage in at-risk behavior (such as early sexual activity, substance use and delinquency) because of the perception that he/she has little to lose by doing so (Sherraden, 1991; Anderson, 1990). In operationalizing the construct of "opportunities for social and economic mobility," a number of researchers have explored neighborhood effects on sexual activity. Certain aspects of the neighborhood context (including socioeconomic characteristics of neighborhood residents as well as individuals' perceptions of the neighborhood) may comprise one dimension of an individual's real and perceived opportunities for social/economic mobility. Other dimensions of perceived opportunity are related to family and individual socioeconomic characteristics, like

levels of income, education and financial assets. For example, Sherraden (1991) suggests that assets have a number of positive effects on families, including improved stability, increased future orientation, stimulated development of human capital, enhanced personal efficacy, and increased well-being of children. Thus, the ownership of assets may increase an individual's life options by providing a foundation for evaluating and pursuing opportunities for social and economic mobility.

A number of social scientists have explored life options perspectives as they relate to the sexual behavior of teens. Billy, Brewster and Grady (1994), in a review of studies of social context and adolescent behavior, note that:

> Communities characterized by a paucity of economic resources, racial segregation, and social disorganization seem to provide young people with little motivation to avoid behaviors with potentially deleterious consequences, such as unprotected intercourse and a consequent nonmarital birth (p. 388).

Thus, community characteristics may influence sexual behavior by "providing a structure of constraints that shape the knowledge and attitudes that ultimately guide teens' choices about their sexual behavior" (Billy, Brewster & Grady, 1994, p. 388).

Ku, Sonenstein and Pleck (1993) note that researchers (including Brewster, Billy and Grady, 1993) often posit two mechanisms through which community traits affect individual behaviors. First, community traits give rise to residents' *norms or values,* which in turn influence behavior. A second mechanism, directly related to life options perspectives, involves the local opportunity structure: community traits are almost certainly related to *perceived social or economic opportunities,* and individuals presumably act on the basis of these perceived opportunities. Although conceptually distinct, the normative environment and local opportunity structure are enmeshed in complex ways. Both are embodied within community characteristics;

both have implications for adolescents' motivation to avoid early parenthood; and each shapes the other (Brewster, Billy and Grady, 1993).

A number of studies support the hypothesis that restricted life options impact adolescent sexual behavior and childbearing. A 1985 study (Hogan & Kitagawa, 1985) found that African-American teenagers from high-risk environments (defined as highly segregated neighborhoods where high percentages of residents live in poverty and opportunities are severely restricted) have rates of pregnancy that are eight times higher than those in low-risk environments. Ku, Sonenstein and Pleck (1993) found that young males in high unemployment areas have more sexual partners and are more likely to have made someone pregnant. In another study, black teenagers in neighborhoods with low percentages of married adult females and high proportions of teenagers neither in school nor working were more likely to be sexually active (Billy, Brewster & Grady, 1994).

Methodology

The current study examines the effects of neighborhood and family characteristics, as they are related to an individual's life options, on the teenage fertility of urban respondents, utilizing data from the University of Chicago's Urban Poverty and Family Life Survey of Chicago. These data, collected in 1987 under the supervision of William Julius Wilson consist of 2,490 personal and telephone interviews conducted with a multistage, stratified probability sample of Chicago residents aged 18 to 44 years. Respondents resided in census tracts with 1980 poverty rates of at least 20 percent.

Because the relationship between life options and sexual behavior is likely to vary by gender, only females (for whom childbearing is more costly) were selected for analysis. Further, only women who reported they had experienced a first pregnancy before the age of 20 (which

ended in a live birth) were included. In addition, because data are available only for the neighborhoods in which respondents currently resided, the sample is restricted to respondents who lived in the same neighborhood at the time of the survey and at the time of the birth of their first child. These restrictions created a final sample of 349. (See Table 1 for sample characteristics.)

Table 1: Sample Characteristics

	N	*%*
Individual-level characteristics		
Had first baby before age 20	216	56%
Had job as teen	292	75%
Ethnicity:		
African American	161	46%
Mexican	59	17%
Puerto Rican	56	16%
White	73	21%
Family-level variables		
Mother's education level:		
8th grade or less	154	44%
Some high school	80	23%
High school graduation and over	115	33%
Family received public assistance	464	33%
Family owned assets	209	60%
Neighborhood-level variables		
Percent of households in poverty:		
0-25%	119	34%
26-50%	202	58%
More than 50%	24	7%
Rating of neighborhood as place to live:		
Very good/Good	84	24%
Fair	192	55%
Bad/Very bad	73	21%
Number of men working steadily:		
Almost all/most	122	35%
Some	105	30%
Very few/none at all	122	35%

Notes: N=349. Frequencies may not add up to 100% due to missing responses.

Variables for Analysis

The dependent variable in this study is the probability of experiencing a pregnancy as a teenager that resulted in a live birth. Two hundred and sixteen females (56%) indicated that they had been pregnant during or before their nineteenth year and had consequently given birth. Age at first pregnancy ranged from 13 to 43 years of age, with a mean of 20 years.

Independent variables selected for analysis pertain to neighborhood, family and individual characteristics related to education, employment and opportunities for economic mobility. Neighborhood variables include the percent of households living in poverty (measured at the census tract level) as well as respondents' perceptions of their neighborhoods. Perceptual variables were included because statistical definitions of neighborhood areas (such as census tracts) may not be meaningful designations for residents (see Coulton, Korbin & Su, 1996). In addition, individuals' perceptions of their neighborhoods may be mediating variables between actual community conditions and individual behavior. In this analysis, perceptual variables include the respondent's overall perceptions of her neighborhood as a place to live and the respondent's perception of the percentage of neighborhood men who were working. Perception of the neighborhood is measured by the question, "How would you rate your neighborhood as a place to live?", where 1=very good, 2=good, 3=fair, 4=bad, and 5=very bad. It is assumed that respondents consider perceived opportunities for social and economic mobility when they rate their neighborhoods.

Perception of neighborhood employment rates for men is measured by the question, "Of the men in this neighborhood, how many do you think are working steadily?", where 1=almost all, 2=most, 3=some, 4=very few, and 5=none at all. Although all sample members are female

(and the survey did not ask about perceptions of the number of women working), this variable is assumed to be a proxy for perceived employment opportunities in the neighborhood.

Poverty rates are measured at the census-tract level. This variable is also assumed to reflect employment opportunities and opportunities for economic mobility available to neighborhood residents.[1]

Because neighborhood variables were measured at the time of the survey (and not at the time respondents first became pregnant and gave birth), it is assumed that these measures are proxies for neighborhood conditions which existed prior to respondents' first pregnancies. To explore this assumption, a variable was computed which indicated the number of years since respondents' first pregnancies. This variable ranges from zero to 31 years with a mean of 12.9 (median=12.0). Although it is certain that neighborhoods change over time, it is assumed that the urban neighborhoods in this study were similar enough in characteristics that they changed in similar fashion (for a description of Chicago's central city decline, see Wilson, 1987; 1996). To see if there were significant differences between respondents' perceptions of neighborhood change by the number of years since first pregnancies, the sample was divided into three groups: those who had experienced their first pregnancies zero to nine years prior to the study; 10 to 19 years prior, and 20 to 31 years prior. Analysis of variance indicated that there were no significant differences between the three groups in terms of perceptions of how neighborhoods had changed.[2]

Family-level variables in this analysis include mother's education level, whether or not the respondent's family of origin received public assistance, and whether the respondent's family

[1] A fourth neighborhood variable (the percentage of residents receiving public aid) was omitted due to multicollinearity with neighborhood poverty rates.

[2] The survey question asked, "Over the years, how has this neighborhood changed as a place to live? Has it gotten a lot better, somewhat better, stayed the same, gotten somewhat worse, or a lot worse?"

of origin owned assets (property). Mother's education level is included because a mother's educational level is likely to affect her expectations for her daughter, which in turn is likely to affect her daughter's own educational expectations. A daughter may also perceive the educational attainment of her mother as a realistic goal for herself. In the original survey, the educational attainment of mothers (or mother-substitutes) was coded into six categories (eighth grade or less; some high school; high school diploma or GED; some college, and college graduation and higher). Because this variable was severely skewed (with 47% reporting their mothers had completed the eighth grade or less), it was recoded into a dichotomous variable in which 0=less than high school diploma or GED and 1=high school diploma, GED or more.

Receipt of public aid in the respondent's family of origin is included because it is assumed that families who received public assistance faced constrained employment opportunities, due either to community economic conditions or to low levels of human capital. Both constrained opportunities and lack of human capital are assumed to decrease an individual's real and perceived life options. The original survey question asked respondents if their families of origin received public assistance at any time while the respondent was growing up. Responses were dummy coded so that 1=received public aid and 0=did not receive public aid.

Ownership of assets in the respondent's family of origin is a dichotomous variable of property ownership created from responses to three survey questions: 1) whether the respondent's parents owned a home; 2) whether the respondent's parents owned land, and 3) whether the respondent's parents owned a business. If the respondent answered "yes" to any of these questions, the assets variable was coded as "1." All others were coded as "0."

Individual-level variables include racial/ethnic background and work experience. Racial/ethnic background is included because people of color are more likely to face racism and discrimination that limit their real and perceived life options (Wilson, 1996; Massey & Denton, 1993). In addition, teen pregnancy rates and trends differ significantly by race, with Hispanic teens at 107 teen births per 1,000, Black teens at 99 teen births per 1,000 births, and white teens at 39 teen births per 1,000 in 1996 (Moore et al., 1997).

Job experience as a teenager is included because those who have had jobs are more likely to anticipate being in the job market in the future, hopefully with skills that enhance their future employment options. Specifically, the survey asked respondents if they had: 1) performed odd jobs; 2) held summer jobs, or 3) held after-school jobs as a teenager. A dichotomous variable was created in which "yes" responses to any of these items were coded as "1," with all others coded as "0."

Other relevant individual-level variables include a measure of school performance or academic achievement during adolescence or a measure of educational and occupational aspirations as an adolescent; however, the dataset does not include such variables. While the dataset does include the highest grade completed in school, this variable was not selected because some teen mothers may have dropped out due to pregnancy; thus, educational attainment may not adequately reflect educational ability or aspirations.[3]

A number of empirical analyses were conducted using these variables. First, individual, family and neighborhood characteristics were analyzed on a bivariate level using chi square and t-tests. Next, logistic regression was used to determine which variables were associated with teen motherhood. This method was selected because, when the dependent variable is

dichotomous, logistic modeling better represents the underlying functional form in a manner more "statistically efficient" than linear models (Cleary & Angel, 1984).

To meet the assumptions of logistic regression, the neighborhood variable "percentage of poor residents" was respecified using a square root transformation.[4] Because independent variables were entered as blocks (with neighborhood-level, family-level and individual-level variables entered separately), it was possible to examine models as each class of variable was added. This approach is designed to address both the total effects of neighborhood/census tract characteristics and the extent to which these effects are mediated by family and individual attributes (see Billy, Brewster & Grady, 1994).

Results

Table 2 shows a number of bivariate differences between respondents who were pregnant as teenagers and gave birth and those who did not. The two groups differed significantly by racial/ethnic background. African American women had the highest rates of teen motherhood (68%), followed by Puerto Ricans (57%), Caucasians (42%), and Mexicans (40%).

There were also significant differences between the groups in two family characteristics. Teen mothers' were more likely to have grown up in families which had received public assistance (44% versus 20%) and less likely to have grown up in families that owned their own homes, land, or businesses (52% versus 70%).

Finally, there were significant differences between the two groups on all three neighborhood indicators. Teen mothers lived in neighborhoods with higher percentages of poor

[3] It should be noted that, in this sample, educational attainment was not significantly related to teen motherhood. Teen mothers completed an average of 11.0 years of school, while those who had their first babies after the age of 20 had completed an average of 11.3 years of school.

[4] The original variable had a skew of 1.6. The square root transformation decreased the skew to .67.

families. Teen mothers also gave significantly lower ratings to the overall quality of their neighborhoods and perceived lower male employment rates in their neighborhoods.

Table 2: Differences in Individual, Family and Neighborhood Characteristics

	Had First Child Following Teen Pregnancy	Had First Child after Age 20	χ^2/t value
Individual Characteristics:			
Had job as teen	77%	73%	.29
Race/ethnicity:			24.35***
Mexican	40%	60%	
Puerto Rican	57%	43%	
Caucasian	42%	58%	
African American	68%	32%	
Family Characteristics:			
Mother graduated from high school	32%	31%	.02
Family received public aid	44%	20%	24.43***
Family owned assets	52%	70%	12.78***
Neighborhood Characteristics:			
Poverty rate	33.5	28.1	-4.14***
Rating of neighborhood+	3.11	2.80	-3.65***
Perception of employment rate++	2.96	3.31	3.06**

+Measured on a scale of 1-5 where 5=very bad.
++Measured on a scale of 1-5 where 4=very few and 5=none at all.
**p<.01*
****p<.001*

In the first multivariate model, only the neighborhood-level variables were included. This model was significant (χ^2=27.12, df=3, p=.0000), as were two independent variables: the percent of neighborhood residents who were poor (χ^2=9.62, p=.0019) and the respondent's perception of neighborhood quality (χ^2=6.65, p=.0099). Both relationships are in the direction hypothesized by a life options framework: women living in neighborhoods with higher poverty rates, and women who perceive their neighborhoods to be of lower quality, are more likely to have been teen mothers.[5]

[5] In examining coefficients, recall that higher numbers equal more undesirable conditions.

The model containing both neighborhood and family-level variables was also significant (χ^2= 22.21, df=3, p=.0001). The influence of neighborhood poverty rate declined slightly from the first model but remained significant (χ^2= 3.95, p=.0468). The respondent's perception of the neighborhood also remained significant (χ^2= 6.17, p=.0130). This suggests that neighborhood context exerts influence on teen childbearing even when selected family background characteristics are accounted for. Two family-level variables were significant: whether or not the respondent's family of origin received public assistance (χ^2=13.10, p=.0003) and whether or not the respondent's family of origin owned assets (χ^2=4.28, p=.0386). According to the odds ratios, respondents whose families had received public assistance were 2.6 times more likely to have been teen mothers than respondents whose families had not received such assistance. In addition, respondents whose families did not own property were 1.64 times more likely to have been teen mothers than those whose families did own property.

Unlike the previous models, the final model containing individual variables in addition to neighborhood and family variables was not significant (χ^2=7.17, df=4, p=.1270). Neither of the two individual-level variables (racial/ethnic background, and whether or not the respondent had a job as a teen) is significant. This is surprising in light of the significant bivariate differences in teen childbearing among racial/ethnic groups. With the addition of the individual-level variables, the family variable pertaining to the ownership of assets is no longer significant (χ^2=3.13, p=.0770).

Table 3: Logistic Regression Coefficients and Wald Chi Square Values for Models Predicting Teen Childbearing

	Neighborhood-Level Model		Neighborhood- and Family-Level Model		Full Model	
Variable	Coefficient	Wald Chi Square	Coefficient	Wald Chi Square	Coefficient	Wald Chi Square
Neighborhood variables:						
Poverty rate	3.339	9.62**	2.258	3.95*	1.379	1.30
Perception of neighborhood	.3596	6.65**	.359	6.17**	.4150	7.84**
Perception of male employment rate	-.1087	1.08	-.0426	.15	.0144	.02
Family variables:						
Mother's education			.2286	.89	.0395	.02
Receipt of public aid			.9431	13.10***	.9089	10.83***
Assets (property)			-.4887	4.28*	-.4265	3.13+
Individual variables:						
Job experience as teen					-.1446	.27
Racial/ethnic background:						
Afr-American (reference group)						6.96++
Mexican					-.2111	.76
Puerto Rican					-.1637	.45
Caucasian					-.1396	.40
Model Chi Square		27.12***		22.21***		7.17
Degrees of freedom		3		3		4

N=349

*p<.05; **p<.01; ***p<.001; +p=.08; ++p=.07

Also, in the final model, neighborhood poverty rate is no longer significant (χ^2=1.30, p=.2533). This is probably due to the strong correlation between racial/ethnic background and poverty rate (polyserial correlation=.65). A one-way ANOVA revealed significant differences in neighborhood poverty rates by racial/ethnic background (F=24.61, p=.0000). Post-hoc tests revealed that African Americans lived in neighborhoods with average poverty rates of 37 percent. This percentage was significantly higher than percentages for Puerto Ricans, Mexicans and Caucasians (30%, 26% and 24%, respectively). Puerto Ricans also lived in neighborhoods with significantly higher poverty rates than those of Mexican and Caucasian respondents. It is possible neighborhood poverty rates exert an indirect effect on the dependent variable through racial/ethnic background.

The variables which remained significant in the final model predicting teen motherhood are the respondent's perception of neighborhood quality (χ^2=7.84, p=.0051) and the respondent's family of origin's receipt of public assistance (χ^2=10.83, p=.0010). However, because the overall model is not significant, it is questionable whether coefficients for the independent variables should be interpreted at all.

Discussion

These results provide some support for a life options approach to understanding teenage childbearing. Many of the neighborhood and family-level variables associated with economic opportunity were significantly related to teen motherhood. These findings have important implications for our understanding of teenage childbearing and for planning effective interventions for the prevention of teen pregnancy.

First, as other researchers have shown (Billy, Brewster & Grady, 1994; Ku, Sonenstein & Pleck, 1993), neighborhood or community context does matter in predicting adolescent behavior.

The neighborhood variable that retained significance in all three models is the respondent's perception of the quality of her neighborhood. When a respondent perceived her neighborhood as being a "bad" or "very bad" place to live, she was significantly more likely to have been a teen mother. This means that resident perceptions (subjective measures) are important when analyzing the impact of community characteristics, and that researchers should not rely solely on census data or other administrative/archival sources in exploring neighborhood contexts. This also means it is necessary to continue exploring resident's perceptions of the specific geographic areas that constitute their neighborhoods, and whether their perceptions match in a meaningful way the administrative breakdowns available in other data sources (like census blocks, census tracts and zip code areas, which are often used in measuring community context). Beyond measurement issues, the association of living in a "bad" neighborhood and having an early birth raises questions about why young women would want to have children if they perceive their neighborhoods to be of such poor quality. If a neighborhood was perceived to be a "bad" or "very bad" place to live, wouldn't it be a poor environment for raising a child? Or did young mothers hope to escape their neighborhoods for someplace better? It is also possible to interpret this finding within a life options perspective – that poor neighborhoods offered so few opportunities to teens that having a baby seemed to be the best option open to young women at the time they became pregnant.

The percentage of poor residents in a neighborhood was also a significant predictor of teen motherhood in the neighborhood and family-level models. This finding is consistent with previous research and points to the close relationship between teen childbearing and poverty, a relationship that has been discussed at length by Luker (1996). The high correlation between percentage of poor neighborhood residents with racial/ethnic background also suggests that

differences in teen pregnancy and childbearing by race/ethnicity are closely linked to economic conditions and the neighborhoods in which people of color live. Such neighborhoods are often racially segregated and isolated from meaningful social and economic opportunities (Massey & Denton, 1993). Of course, all results related to neighborhood context must be interpreted with caution because measures addressed conditions at the time of the survey rather than conditions at the time immediately preceding respondents' first pregnancies.

With regard to family variables, this analysis did not find support for the relationship between mother's education level and teen childbearing. However, this could be due to characteristics of the sample and how the variable was coded. This dataset concentrated on poverty neighborhoods in a central city; thus, variables like education were not normally distributed like they would be expected to be in a broader sample. Almost half (47%) of respondents in the sample for analysis reported their mothers had an eighth grade education or less, and coding the variable as a dichotomous variable due to the extreme left-censored distribution lost information distinguishing between levels of education. It is also possible that the restricted range of education in the sample led to downward bias in the relationship between mother's education and teen motherhood.

The finding that whether or not a respondent's family of origin received public assistance significantly predicted teen childbearing in all three models could have a number of interpretations. One is in keeping with the life options perspective that receiving public assistance reflects a lack of economic opportunities or lack of human capital, and thus translates into fewer real and perceived options for women living in these families. A second interpretation is that public assistance actually creates dependence and dysfunctional behavior in families, like teen pregnancy (see Murray, 1985). A third interpretation is that some teens, who grew up in

families in which receiving public assistance represented the norm, may have chosen to have babies in order to establish their own independent households with the support of public assistance. Finally, teens who had mothers who received public assistance (and thus could stay at home during the day) may have perceived childbearing as less costly because they had someone in the household to provide childcare (see Burton, 1990). The current analysis cannot adequately address causal relationships or firmly support any of these interpretations.

The finding that the respondent's families' ownership of assets (property) was significantly associated with teen motherhood (in the neighborhood and family-level models) lends some support to the perspective that family assets are related to life options and individual behavior. At least one other study has found a similar relationship between home ownership and teen pregnancy (Green & White, 1994). The assets variable was close to significance in the final model ($p=.08$); if the variable had been measured more precisely (perhaps measuring the value of the assets or also including financial assets such as savings accounts or investments), it may have retained its significance.

Finally, the results of this study suggest that further research into the relationship of life options and adolescent at-risk behavior is needed. Longitudinal datasets are needed that ask respondents about their goals and expectations for the future in addition to standard questions about education, employment and sexual behavior. More advanced statistical techniques (like structural equation modeling) can better measure indirect relationships (for example, the relationship between racial/ethnic background and neighborhood poverty) and better assess the viability of a life options theory of teen childbearing.

In closing, our primary approach to preventing teen pregnancy has involved sex education and encouraging adolescents to "just say no." However, evidence from evaluations of

programs focusing on knowledge of reproduction and attitudes toward sex show that they are largely ineffective in significantly changing adolescent sexual behavior (Moore et al., 1995). Given the results of this study on the contextual factors surrounding teen childbearing, more promising interventions may be policies that address neighborhood development and poverty. Future research should also examine the link between public assistance and teen pregnancy; changes in eligibility for teen mothers under welfare reform legislation may provide an opportunity for comparisons, particularly between states that instituted stringent eligibility requirements for teen mothers (or made teen mothers non-eligible altogether) and those that did not adopt more stringent requirements.

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