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Opportunity, community, and teen pregnancy in an Appalachian state

Teen pregnancy has become an issue that educators and public policy makers are obliged to treat as a serious problem. Too often, explanations of teen pregnancy have included uncritical use of the notion of adolescents at risk. Recently, however, attention has been given to structurally-determined contextual factors in explaining teen pregnancy. Such contextual factors include economic and educational opportunities and costs, as well as chances for valued participation in socially and culturally stable communities. This interest in contextual factors parallels a development in the literature on high school dropouts. A data set previously employed to study variability in drop-out rates among school districts in the Appalachian state of West Virginia was used. Results show that teen pregnancy can be explained in much the same way as dropping out. Explanation in terms of contextual factors helps to avoid the victim-blaming accounts sometimes associated with the notion of teenagers at risk. It also suggests that conventional pregnancy prevention programs may be constrained by these same contextual factors in ways that are not typically appreciated.

The percentage of adolescent mothers in the United States is remarkably high compared with other industrialized nations. For example, the rate in Sweden is 35 per 1,000 girls aged 15 to 19. In Canada the same rate is 44 per 1,000. The United States, by contrast, leads all developed nations with a rate of 96 per 1,000. Approximately 1 million teenaged girls in the United States become pregnant each year (Johnson, 1992). As a result, teen pregnancy prevention programs, focusing on ostensibly at-risk adolescent girls, are now nearly as commonplace as dropout prevention programs aimed at adolescents of both sexes (Astroth, 1994).

The analysis that follows, however, suggests that conventional teen pregnancy prevention programs aimed at nominally at-risk students may be constrained in ways that typically are not recognized. Specifically, social and economic contextual factors, rather than individual and family traits, may be of overriding importance in determining the incidence of teen pregnancy. Such contextual factors include the presence or absence of occupational opportunities and the presence or absence of communities that provide a durable sense of membership and valued participation.

In short, prudent behavior, such as avoiding teen pregnancy, is most likely to occur when there are strong incentives for being prudent. When opportunity and community are missing, teen pregnancy and other manifestations of imprudence-even recklessness-may be much more common.

Explanations of Teen Pregnancy

Conventionally, explanations of variability in teen pregnancy focus on at-risk characteristics of individuals and families. These include factors such as income, ethnicity, parents' education, and family composition (Dryfoos, 1990).

Recently, however, attention has been given to the importance of contextual factors in accounting for variation in teen pregnancy and births to adolescents (Billy & Moore, 1992; Brewster, Billy, Grady, 1993). In this way, variables such as structurally determined economic and educational opportunities, and factors that counter or exacerbate the normative uncertainty and social and economic instability that accompany modern life, can be incorporated into empirical explanations.

Parallels between Teen Pregnancy and Dropping Out

A similar literature has appeared regarding another at risk behavior associated with the same age group, though not limited to girls: dropping out of high school. Previous research on dropouts indicates that high school completion rates in both Florida and West Virginia vary with structurally

determined contextual factors, which we interpret as anticipated economic opportunities and social and psychological costs (Bickel & Papagiannis, 1988; Fine, 1986; Papagiannis, Bickel, & Fuller, 1983; Willis, 1981). In some instances, post-high school educational opportunities were also positively associated with high school completion rates (Bickel, 1989b; Bickel & Lange, 1995). Specifically, as post-high school economic opportunities increased, high school completion rates increased. Economic opportunities took the form of relatively high average incomes and an increased likelihood of employment. As these opportunities decreased, high school completion rates also decreased.

Less consistently, a similar, though weaker, relationship existed between post-high school educational opportunities and high school completion rates. Post-high school educational opportunities took the form of an increased likelihood of enrolling in a college or university.

In a perhaps unselfconscious way, high school students seem to ask themselves if a diploma makes any difference with regard to their economic or other prospects. If it does not, they may have little or no incentive to stay in school.

High school completion rates also varied inversely with the social and psychological costs of staying in school. Costs identified in earlier work were associated with being placed in a devalued curriculum track; belonging to a devalued racial or ethnic minority group; and attending a large high school with a high student-teacher ratio (Bickel, 1989a; Bickel & Lange, 1995).

One interpretation of these earlier findings is that dropping out varies not only with anticipated opportunities and costs but also with prospects for valued participation in a socially, economically, and culturally viable community. High school students who have a valued place and a positive sense of affiliation with peers, teachers, and other consociates are less likely to drop out than others (Bryk & Thum, 1989). Community diminishes costs of participation and provides incentives for continued participation (Coleman & Hoffer, 1987; Nyden, 1994b).

Teen Pregnancy in West Virginia

Do teen pregnancy rates vary with the same factors and in the same way as dropout rates? In the following analysis, we use a data set previously employed to study district-to-district variability in high school completion rates in West Virginia (Bickel & Lange, 1995). That work was a near replication of research done with Florida data, that had yielded similar results on the connections between high school completion rates and opportunities and costs. (Bickel, 1989b; Bickel and Papagiannis, 1988).

Our unit of analysis was the school district. School districts in West Virginia are coterminous with the state's 55 counties, facilitating the matching of education measures with social and economic measures produced by state agencies. Data are for the school year 1987-88.

All variables used in the analysis are defined in Table 1. Descriptive statistics are reported in Table 2.

All our variables were based on data that had been aggregated to the school district level. Therefore, this was an investigation of the effects of contextual factors on aggregates of individuals, a valuable strategy that is too often neglected (Miethe & McDowall, 1993). This was the approach used in our earlier work on dropouts.

Focus on Girls

Table 1.-Definitions of All Variables

Table 2.-Descriptive statistics

The focus throughout this study was on the responses of female adolescents to opportunities, costs, and community. The assumption that justifies this focus is that adolescent girls are the ones whose responses to structurally determined contextual factors will be most important in determining the rate of teen pregnancy and birth. The rationale for this is that insofar as opportunities, costs, and community play a role in determining teen pregnancy, these factors will be experienced more intensely and directly by girls because they cannot ignore being pregnant.

Obviously, however, this ignores numerous factors that might help to explain variation in males' participation in contributing to teen pregnancy. Although there is a more or less plausible rationale for our focus on girls, we were also constrained by limitations of our data.

The Outcome Measure

We used births per 1,000 girls aged 15 to 19 as a proxy for pregnancies per unwed girls in the same age range. Information concerning this latter variable was not available in our data set.

By proceeding in this way, we introduced measurement error in the dependent variable into our analysis; girls who became pregnant in one geographical area may have given birth in another area. Furthermore, not all teenage mothers are unmarried, and not all teen pregnancies result in births. Nationally, 15% of teen pregnancies result in miscarriage; 40% are voluntarily terminated (Turner & Helms, 1992).

One advantage of working with a West Virginia data set, however, is that this state has the lowest rate of abortions per live births (12%) in the United States (Nyden, 1994a). In addition, West Virginia teenagers are typically immobile, unlikely to move from state to state or even county to county (Spatig & Bickel, 1993).

We assumed, moreover, that measurement error in the outcome measure was random, leaving the partial regression coefficients unbiased, though their standard errors may have been inflated (Berry & Feldman, 1985). Because we worked with just one homogeneously Appalachian state, the assumption of random measurement error was more plausible than otherwise might have been the case (Blalock, 1982; pp. 252-259).

Independent Variables

As explained above, the independent variables were selected under the tentative assumption that teenage pregnancy can be explained in the same terms as those used for dropping out of high school. For an adolescent, avoiding becoming pregnant, much as staying in school, is a prudent investment in a valued future. If likely prospects are much the same whether one becomes pregnant or not (or drops out of high school or not), teen pregnancy (as with dropping out) becomes more likely (Scott-Jones, 1991).

The independent variables have been divided into five categories (see Table 1). Independent variables corresponding to prevailing levels of economic opportunities and postsecondary educational opportunities are clearly labeled.

We used the variable MEANSIZE, referring to average secondary school size in each district, as a measure of in school community. Average school size may seem to be a crude proxy for community. However, Bryk and Thum (1989) found strong positive correlations between school size and the incidence of tracking, discipline problems, and staff absenteeism and morale. In addition, Fine

(1986) and Stroughton and Grady (1978) reported that school size is directly correlated with dropout rates. This finding apparently resulted from an enhanced sense of satisfaction and involvement in smaller schools (Wagenaar, 1989).

In Appalachian West Virginia, moreover, local schools have served as centers of community life in a fashion reminiscent of the traditional 19th-century common school (Perkinson, 1993). "For whole communities, the school is the center of the community. Take away the school and there is no longer a community" (Nyden, 1994b). This central role of the community school, however, is gradually being undercut by school consolidation, which yields larger schools and has met with intense political resistance at the local level (McCarthy, 1995).

Traditional Communities and Modernity

Community as a positive sense of affiliation and valued participation for adolescent girls is not limited to school settings. In this connection, one should think in terms of the characteristics of traditional West Virginia communities. Geographically they have been small and rural. Extended families have persisted. Racially and ethnically they have been homogeneous, made up almost exclusively of native born Whites. Educationally they have been marked by low levels of attainment. College enrollment rates have been low, and vocational education has been a high school staple, though high school dropout rates have not been higher than the U.S. average (Fitzpatrick & Yoels, 1992). Most jobs have been in mining, manufacturing, and agriculture. Service sector jobs have been relatively uncommon. Permanent migration out of the area in search of improved employment prospects has been a near last resort response to economic necessity (Bickel, Arthur, & Spatig, 1994; Fleishman, 1994).

To capture this dimension, or continuum, of having traditional community characteristics and nontraditional or modern characteristics as polar opposites, we used principal components analysis with the following seven variables: Percentage of the district's population that is urban (URBAN), percentage of the district's population that is Black (BLACK), percentage of the district's population that is neither Black nor White (ETHNIC), average level of educational attainment (EDAVG), the percentage of high school students enrolled in a college preparatory program (COLLPREP), percentage of students who enroll in a college or university after graduation from high school (MATRIC), and the percentage of employed workers in service-sector jobs (SERVICE).

Traditional West Virginia communities have comparatively low values on each of these variables (Bormann & Mueninghoff, 1983). However, as manufacturing industries have relocated and coal mines have been mechanized, social relations constitutive of traditional communities have been replaced by shifting labor market relations (Fleishman, 1994; Lewis, Johnson, and Askins, 1978). The institutions and cultures of traditional communities have, in a real sense, come under siege. Such processes are typically characterized as inevitable, and, for the long term, often claimed to be a desirable part of the process of becoming modern (Inkeles & Smith, 1974).

Whether or not these characterizations are accurate, areas in which traditional norms, practices, and social relations no longer prevail (having been replaced by nominally modern alternatives) would be more likely to have higher values on the seven variables.

If the seven variables merit interpretation as manifestations or indicators of the presence or absence of traditional community characteristics, all seven would load heavily on the same principal component, and all would have the same sign (Stevens, 1993). Negative signs would correspond to the presence of traditional community characteristics. Positive signs would correspond to the absence of traditional community characteristics.

Modern Patterns of Organization as a Principal Component

In Table 3, the first principal component (labeled Factor 1) explains 46.5% of the total variation in the set of variables that we construed as indicators of the presence or absence of traditional patterns of community social organization and composition in West Virginia counties. Further, each of the seven variables loads heavily and positively on Factor 1. If we adopt the widely used convention of including each variable with a loading of .30 or greater in interpreting the component, the results seem substantively consistent with the claim that this component represents a single dimension that can be construed in the terms we have used. Moreover, even if we adopt the more stringent, sample size-dependent criterion presented by Stevens (1993, pp. 382-384) concerning retention of variables in interpreting principal components, all of the seven variables would be retained. As a result, we interpreted this component to represent departures from traditional community characteristics, and we labeled it MODERN.

We used the variable MODERN as a proxy for the decline of traditional communities-the relative absence of out-of-school community. Consequently, we expected the incidence of teen pregnancy to vary directly with factor scores on this component (Petee & Kowalski, 1993).

The second component (labeled Factor 2) does not readily lend itself to substantive interpretation, and explained only 17.6% of the variation in the set of seven variables. None of the other components have eigenvalues of one or greater, and they have been deleted.

Given that the first component seems legitimately understood as representing departures from traditional patterns of community organization, whereas the other components explain comparatively little of the variation in the data and are difficult to interpret, we use only the first component in subsequent analyses. This is consistent with Kennedy's (1985, p. 154) observation that most of the distinctive variance in a data set is usually captured in the first principal component.

Natural Logarithms of "WAGE" and "BIRTHRATE"

In examining scatterplots of all bivariate relationships, we discovered that the relationship between WAGE and BRTHRATE is curvilinear. With WAGE plotted along the horizontal axis and BRTHRATE plotted along the vertical axis, the relationship is concave. As a result, as recommended by Wittink (1988, pp. 141-148), we have taken natural logarithms of WAGE and BIRTHRATE and succeeded in linearizing this relationship.

Table 3.-Factor Matrix

Modifying the functional form of the regression model in this way yields what Mirer (1988, pp. 135-142) termed a hybrid specification, an equation in which the dependent variable has been logged, and some, but not all, independent variables also have been logged.

With a hybrid specification, unstandardized partial regression coefficients corresponding to relationships wherein both the dependent and independent variables have been logged were interpreted as elasticities. Elasticities tell us how a proportional change in the dependent variable, in this case BRTHRATE, is related to a proportional change in the independent variable, in this case WAGE. For example, in the analysis presented immediately below, the unstandardized partial regression coefficient corresponding to LOGWAGE (the natural logarithm of WAGE) was -1.74. This means that for every 1% increase in WAGE, BRTHRATE decreased, on average, by 1.74%.

Unstandardized partial regression coefficients corresponding to relationships between a logged dependent variable and an independent variable that has not been logged are interpreted as percentages. For example, in the analysis below, the unstandardized partial regression coefficient

corresponding to mean size was 0.08. This means that for every increase of 100 students in average school size, birth rate increases, on the average, by 8%.

Determinants of Teen Births in West Virginia

We used births per 1,000 teenage girls in each school district as the outcome measure (see Table 4). The independent variables in the regression equation were those that were defined in Table 2. However, URBAN, BLACK, ETHNIC, EDAVG, COLLPREP, MATRIC, and SERVICE were represented as one independent variable-the principal component MODERN. MODERN, thus, was a linear composite of the original seven variables, which were weighted to maximize the sum of their squared correlations with the principal component (Dunteman, 1989).

Four of the independent variables, WAGE, UNEMPLOY, MEANSIZE, and MODERN, worked as expected. LOGWAGE and the incidence of teen pregnancy varied inversely. This was consistent with the claim that young women who live in areas where economic opportunities are comparatively lucrative are more likely to perceive incentives to behave prudently and avoid teen pregnancy. When opportunities are comparatively limited, incentives to avoid teen pregnancy are missing.

Table 4.-Regression Results

Similarly, UNEMPLOY, the average unemployment rate for each district, and the incidence of teen pregnancy varied directly. This is consistent with the claim that young girls who live in areas where economic opportunities are comparatively inaccessible are less likely to perceive incentives to prudently avoid teen pregnancy.

Some might argue that the relationships between the dependent variable, the natural logarithm of BRTHRATE, and the independent variables LOGWAGE and UNEMPLOY are merely manifestations of variability in school districts' socioeconomic character and have nothing to do with incentives as we have used that concept. However, these statistically significant relationships held even though our regression equation contained a control for household income (HOUSEINC). This enhances the plausibility of our interpretation of LOGWAGE and UNEMPLOY as manifestations of district-to-district variation in economic incentives.

The statistically significant and positive coefficient corresponding to MEANSIZE indicates that, from district to district, the average number of students per secondary school and the rate of teen pregnancy rise and fall together. This is consistent with the claim that as schools become larger, they also become less able to provide a sense of valued participation in a socially and culturally stable community, and teen pregnancy becomes more likely. Young girls who have a valued place and a positive sense of affiliation with their peers and teachers are less likely to become pregnant than others (Campbell & Lee, 1992; Oakes, 1985).

Furthermore, the variable MODERN, our first principal component, also had a positive, statistically significant regression coefficient. As the value of factor scores for MODERN increased, the teenage birth rate also increased. MODERN, again, represents departures from traditional patterns of community organization. Our provisional claim is that the decline of opportunities for community membership and participation, out of school as well as in school, increases the social and psychological costs of everyday life. As we expected, factor scores for MODERN and teenage birth rates rose and fell together.

Limitations and Cautionary, Observations

Beyond our observation that community provides a positive sense of affiliation and valued participation, our discussion of this concept has been largely descriptive and peculiar to West

Virginia. Others have noted that community is difficult to define and is too frequently romanticized (e.g., Marshall, 1994, pp. 72-73). We agree that community is an easily misunderstood construct.

In the present instance, however, the characteristics of traditional communities that are most important seem clear enough: a more or less predictable, reasonably hopeful future in a socially and culturally familiar place, where established roles are more or less readily assumable (see Mead, 1934, pp. 260-273). This contrasts sharply with the "hard egotism, anonymous individualism, and narrow self-seeking" of social settings wherein traditional community relations have been superseded by impersonally modern and unpredictable labor market relations (Novak, 1978, p. 69).

The independent variable MATRIC is also troublesome. In two other research reports (Bickel, 1989b; Bickel & Lange, 1995) post-high school economic opportunities were not the only incentives that seemed to promote high school completion: post-high school educational opportunities, as gauged by the percentage of graduates enrolling in a college or university, also were interpreted as incentives for continued high school participation.

Although the results for educational prospects were not as consistent or as strong as those for economic prospects, it does seem odd that, in the present analysis, MATRIC, as a constituent of the variable MODERN, loaded positively on a composite variable that was positively related to the incidence of teen pregnancy.

This anomaly may be related to a tension between educational opportunity and community in West Virginia. Specifically, we have noted that comparatively high levels of educational attainment are at odds with traditional patterns of community social organization and composition. As a result, if we try to use MATRIC as a measure of educational opportunity that would work against teen pregnancy, we may be overlooking the fact that this same factor is associated with increases in teen pregnancy because it is at odds with community.

In a sense, MATRIC could be driving teen pregnancy downward as a measure of opportunity, but driving it upward as a measure of departure from traditional patterns. This may explain our anomalous finding with regard to this measure of postsecondary opportunity.

As noted above, in our work with dropouts, the connection between high school completion and economic opportunity was stronger and more certain than the connection between high school completion and educational opportunity. The former relationship was comparatively insensitive to model respecifications and was interpretably stable from one data set to another. The latter relationship was less robust and consistent. Perhaps we are beginning to see why.

Within West Virginia, economic opportunity is still tied closely to traditional mining and manufacturing jobs. Unfortunately, the number of such jobs has declined sharply over the past 2 decades. However, where they still exist, they provide material support for those wishing to live traditional community and family lives.

When adolescents respond to educational opportunities, however, they may be doing so because traditional economic opportunities are missing, and they are preparing to leave. Those who remain behind may be living in socially and economically decimated areas.

Discussion and Conclusions

In previous work on dropouts in Florida and West Virginia, we provisionally concluded that high school students' decisions to stay in school or to drop out were based, in part, on perhaps unselfconscious reference to opportunities and costs of schooling. In the present study, we applied a similar interpretation to teen pregnancy.

Using births to teenage mothers as a proxy for our dependent variable of interest, we accounted for district-to-district variability in teen pregnancy. We used a data set and a complement of independent variables taken from earlier work on district-to-district variability in high school completion rates.

Tentatively, we conclude that the same factors that contribute to explaining dropping out or completing high school also contribute to explaining teen pregnancy. Specifically, the presence or absence of opportunities-a futureand valued participation in a socially and culturally stable community, both in school and out of school, contribute to diminishing teenage pregnancy, much as they contribute to diminishing dropout rates.

Our results are inconsistent with the usual victim-blaming explanations of teen pregnancy that focus on characteristics of individuals, ignoring structurally determined contextual factors. Furthermore, our findings suggest that commonplace explanations of teen pregnancy in Appalachia are simply wrong.

Rather than being a manifestation of welfare dependency and a debilitating culture of poverty, teen pregnancy reflects an absence of opportunity and the decline of traditional community patterns, the replacement of traditional social relations by shifting labor market relations.

Further, as traditionally small schools are replaced by large consolidated schools, where curriculum tracking is pursued aggressively and a sense of valued membership and participation is harder to find, teen pregnancy becomes still more likely. As with dropouts, when opportunity and community become more difficult to find, teen pregnancy becomes more common.

Our findings seem consistent with the judgment that teen pregnancy and teen births are more usefully construed as consequences of disadvantage and disruption than as causes. Teen pregnancy and teen births may play both roles, but the former-that of consequence or outcome-seems more conspicuous.

This suggests that conventional teen pregnancy prevention programs, focusing on at-risk individual students, may face obstacles that are not commonly appreciated. The success of the prevention programs may be severely constrained by contextual factors such as those discussed above.

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