



Research Roundtable Summary

14

FOURTEENTH

Predicting Teenage Pregnancy

in a Series of Seminars

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on MCHB-funded

Research Projects

Joel Ager, Ph.D.

Professor
Department of Psychology
Wayne State University
Department of Obstetrics and
Gynecology
Wayne State University School
of Medicine

Eli Saltz, Ph.D.

Professor
Department of Psychology
Wayne State University
Director
Merrill-Palmer Institute

Reaction

Catherine Stevens-Simon, M.D.

Associate Professor
Department of Pediatrics
University of Colorado School of
Medicine

Robert Terry, Ph.D.

Assistant Professor
Department of Psychology
University of Oklahoma, Norman

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For more information, please contact Michelle Keyes-Welch, NCEMCH, (703) 524-7802.



Research Roundtable #14 Summary

Predicting Teenage Pregnancy

About This Series

The Research Roundtable Series, sponsored by the Maternal and Child Health Bureau (MCHB), disseminates the results of MCHB-funded research to policymakers, researchers, and practitioners in the public and private sectors. The results of these projects influence future service, research, and policy development. The Research Roundtable sessions provide an opportunity for researchers to discuss their findings with policymakers, MCH program directors, service providers, and other health professionals.

The Maternal and Child Health Research Program is directed by Dr. Gontran Lamberty and administered through the Division of Systems, Education and Analysis, Maternal and Child Health Bureau, Health Resources and Services Administration (HRSA). HRSA is a component of the Public Health Service (PHS), part of the U.S. Department of Health and Human Services (DHHS). The purpose of the research program is to support applied research relating to maternal and child health services that shows promise of making a substantial contribution to the advancement of those services.

Introduction

Dr. Woodie Kessel, director of the Division of Systems, Education and Analysis at MCHB, introduced the speakers for the Research Roundtable. Dr. Eli Saltz, a professor of psychology at Wayne State University and the director of the Merrill-Palmer Institute, has published extensively on adolescent pregnancy and juvenile delinquency. Dr. Joel Ager holds dual appointments as professor in the Department of Psychology and the Department of Obstetrics and Gynecology at Wayne State University School of Medicine. Dr. Ager served as a statistical consultant for this project.

Serving as reactors to the research presented were Dr. Catherine Stevens-Simon and Dr. Robert Terry. Dr. Stevens-Simon is an associate professor of pediatrics at the University of Colorado School of Medicine; her research interests include adolescent pregnancy and parenting. An assistant professor in the Department of Psychology at the University of Oklahoma, Dr. Terry's research interests include measurement and methodological issues in sociometry and multimode models of social development.

Presentation

Statement of the Problem

Adolescent pregnancy is a serious social problem in the United States, particularly because it often relates to subsequent poverty for the adolescent mother and seriously diminished life prospects for her children (e.g., high rates of school dropout, delinquency, poverty). Many researchers have attempted to determine the crucial factors related to adolescent pregnancy. The relationships between the variables investigated and adolescent pregnancy have tended to be low (particularly in prospective studies), and some relationships have proven inconsistent from study to study. In the absence of basic information on the crucial variables leading to adolescent pregnancy, there has been a lag in the development of effective interventions for reducing the adolescent pregnancy rate.

Research Objectives and Hypotheses

The project's perspective differs from most previous studies of adolescent pregnancy. The investigators propose that adolescent pregnancy may be a symptom or an outcome that is common to several diverse sets of problems, with each set of problems relevant to a different subgroup of adolescent females. If different complexes of variables were the critical instigators of adolescent pregnancy for different subgroups of adolescents, this could account for the low and inconsistent relationships found in previous studies. Additionally, the research team proposes that personal characteristics may interact with milieu. Some girls may be at high risk for adolescent pregnancy only in high-risk milieus; others may be at high risk in both high- and low-risk milieus.

Population Sample, Study Design, and Methodology

More than 2,000 adolescent girls from a socioeconomically diverse sample of 21 high schools across 17 school districts in the Detroit metropolitan area were assessed in the ninth grade. When these girls reached 11th grade, 1,749 of the original sample were located and retested, for a retention rate of 85.9 percent. Because of missing data (i.e., some girls failed to answer all the items on all the scales), the final cluster analysis was based on 1,410 girls. The girls lost to the analysis because of missing data corresponded fairly well to the final sample on the various scales used in the cluster analysis. For the sample on which data are available for both 9th and 11th grade, the mean age at 9th grade was 14 years 11 months. The mean age at 11th grade was 16 years 9 months.

Household incomes in the highest socioeconomic status (SES) school averaged \$103,800; incomes in the lowest SES school averaged \$14,600. Of the students who were retested in 11th grade, 47 percent were African American, 48 percent were white, and 5 percent were other (predominantly Hispanic and Asian).

Students were given questionnaires in small groups in their schools. To ensure anonymity, students wrote their names on a coded cover sheet that was torn off and collected separately from the questionnaire. Two years later the testers returned to the schools and administered a short self-report measure of life events, including questions about pregnancy experiences, psychological resources, parental control, problem behaviors, dating, school experiences, home experiences, social influences, and future expectations.

The selection of schools was based on two criteria. First, to identify variables that might characterize different subgroups of girls who would become pregnant, the researchers wanted to examine a population in which they would find a sufficient number of adolescents who would become pregnant by 11th grade. Second, the researchers wanted a population diverse enough to prevent a restriction of range on the variables measured, so that relationships between variables and adolescent pregnancy could be measured.

The prospective study employed a profile analysis technique that measured many of the variables identified as related to adolescent pregnancy in previous research. Each profile characterized a different subset of girls. School achievement level was chosen as the milieu variable in this study. The milieus in schools with high achievement levels are known to be very different from schools with low achievement levels.

How honest and accurate were the adolescents in the study? The researchers had one easily verifiable piece of information: Student grades. In the ninth-grade testing, both adolescents' and teachers' reports of grades were obtained for the previous semester; the Pearson Product Moment correlation was .86 between these two reports. On this one variable, at least, the students tended to be accurate in their reports.

Findings

Of the 1,410 girls on whom the final cluster analysis was based, 166 (11.7 percent) became pregnant by the 11th grade. The total sample was randomly divided into two groups: Sample A (the model-building sample) and sample B (the cross-validation sample).

Profile Analysis

No single variable was implicated in the high-risk profiles. Several variables (e.g., dating, poor grades) were positively related to pregnancy rates in some profiles and inversely related in other profiles. This finding is very consistent with the assumption that adolescent pregnancy may be a symptom or an outcome that is common to several diverse sets of problems, with each set of problems relevant to a different subgroup of girls.

Ten profiles were identified in the profile analysis. Results showed that pregnancy rates varied greatly from profile to profile (Table 1). Furthermore, several very different profiles of variables were associated with high rates of pregnancy. Some profiles were associated with high rates of pregnancy at both milieu levels, some profiles were associated with high rates of pregnancy only in the high-risk milieu, and other profiles were at low risk for adolescent pregnancy in either milieu.

No single variable is critical to all high-risk profiles; this is seen by examining the three variables that were identified as the significant predictors of adolescent pregnancy in a linear multiple regression: (1) The achievement level of the school attended by a girl, (2) grade point average, and (3) ninth-grade dating status. The achievement level of the school that a girl attended was the best predictor in the linear multiple regression (with girls from low-achievement schools at greater risk). Despite this, three profiles indicate that girls were at relatively low risk even if they attended one of the low-achievement schools.

Low grade point average had the second highest weight in the multiple regression for predicting adolescent pregnancy. Yet the z scores for one high-risk profile indicated that most adolescents in this profile had above-average grades. In fact, the z scores for grades in this high-risk profile were the same as or better than those of the four lowest risk profiles. Furthermore, the average z scores for three other high-risk profiles were only marginal indicators of low grades.

The third significant variable was ninth-grade dating status. Although the average z scores indicated a strong tendency for frequent dating in two high-risk profiles, the average z score for one high-risk profile was approximately zero and was only marginal for another high-risk profile. Furthermore, one low-risk profile also had a moderately elevated z score for dating.

The pregnancy rates for girls in each profile were ordered from lowest to highest risk. Pregnancy rates for the 10 profiles ranged widely. These profiles can be characterized as involving three risk levels for pregnancy: (1) Girls characterized by some profiles were at higher-than-average risk for adolescent pregnancy regardless of the achievement level of the schools they attended;

(2) girls characterized by a second set of profiles had high adolescent pregnancy rates if they attended low-achievement schools, but had very low rates of pregnancy if they attended high-achievement schools; and (3) girls characterized by a third set of profiles had relatively low rates of pregnancy at both high- and low-achievement schools. To predict risk for adolescent pregnancy from the current data, it appears necessary to consider both the profile that characterizes a girl and the achievement level of the school that she attends (i.e., 20 clusters).

The research team included household income in the analysis because previous studies have often implicated income in adolescent pregnancy. In this study, income does not contribute significantly to the multiple regression because it correlates highly with high- versus low-achievement schools, and the latter is a stronger predictor of adolescent pregnancy. Note that income is not a strong index of which profiles are high risk. Household income was markedly lower and the pregnancy rate at least somewhat higher for girls from low-achievement schools. Despite this, household income was a very inconsistent predictor of high risk. Across the low-achievement clusters, the z scores for household income were very homogeneous, ranging from .44 to .65. The z scores for the three lowest risk profiles were virtually identical to those for the three highest risk profiles. Because of this, the household-income variable would have incorrectly predicted that girls from low-achievement schools in three profiles would be at high risk for adolescent pregnancy as compared with the girls from other profiles. Furthermore, for the girls from high-achievement schools, those with one profile had a higher pregnancy rate than 9 of the 10 profiles of girls from low-achievement schools. Yet their z scores indicated a much higher average household income than that of any of the profiles from low-achievement schools. Although adolescent pregnancy is more frequent in low-income than in high-income families, the majority of girls from low-income families do not become pregnant. Although not a psychological variable, income is related to some psychological variables.

Despite the fact that none of the variables identified in the multiple regression was a consistent marker for high-risk profiles, each variable did appear more frequently in these profiles as compared with the low-risk profiles. This suggested to the researchers the possibility of using these variables to identify girls at highest risk within a profile. For example, since low grade point average is strongly implicated in one high-risk profile, the girls who rank high on this variable should account for a disproportionate number of the pregnant adolescents in that profile. The results proved negative for the small sample on which the researchers tested this hypothesis. This suggests that the pattern of variables in a profile is the critical factor in the prediction of risk for pregnancy, not the presence or absence of some specific variable as a marker.

Basis of the Milieu Effect

For all 10 profiles, adolescent pregnancy rate is at least minimally greater in low- achievement schools than in high-achievement schools. This differential is not reflected in any of the other adjustment measures. For any given profile, if an adjustment problem exists in the low-achievement milieu, it will be approximately as great in the high-achievement milieu. This suggests that being in the high-achievement schools did not reduce the general disruptive and delinquent tendencies of these girls and did not increase attempts at control by their parents. Attending high-achievement schools was effective specifically in reducing pregnancy rates.

Why the reduced pregnancy rate for girls from high-achievement schools? The hypothesis is that this probably results from an assimilation of the attitudes held by the majority of girls in the schools. It would be expected that girls who perform well in school and have reasonable expectations for college and the future would adopt social attitudes against becoming pregnant while they are still adolescents. The personal consequences of such pregnancies would be potentially catastrophic. In this sample a large majority of girls from high-achievement schools are from profiles in which the girls

have these positive academic characteristics. In terms of numbers, these girls are in a position to establish a peer attitude environment for a school in which early pregnancy is seen as foolish, undesirable, and perhaps even frightening. The relatively lower pregnancy rate for girls from high-achievement schools suggests that the negative reaction toward adolescent pregnancy that predominates in these schools tends to inoculate many girls with high-risk profiles and may be a factor in the milieu effect. The researchers suggest that this type of inoculation is a factor in the differences in pregnancy rates between high- and low-achievement schools in most of the profiles that will be described.

Cross-Validation

The discriminant functions for the 10 profiles of a subset of sample A were used to partition the sample of 706 girls in sample B into 10 clusters, with each cluster in sample B corresponding to one of the 10 profiles in the subset sample. When the original 10 clusters are considered and school achievement level is ignored, the correlation between samples is $r=.82$, which is highly significant. For the 20 clusters (i.e., each profile at two achievement levels), the correlation between samples is $r = .84$, which is also highly significant. This stability is particularly impressive since the subset was a relatively small weighted subsample of sample A, selected such that the pregnancy rate was inflated to 25 percent; sample B, on the other hand, was a randomly selected half of the entire sample of girls tested and had a pregnancy rate of 11 percent.

The observed relationships between profiles, milieu, and pregnancy rates proved to be highly stable in the cross-validation sample of girls. Cross-validation of the percentages of “hits” versus “false alarms” also indicated surprisingly high consistency between the subset of sample A and sample B. In 8 of these 20 clusters, the pregnancy rate was higher than the mean pregnancy rate for the subset of sample A. Girls were considered at higher risk for pregnancy if they were in one of these eight clusters. This criterion resulted in correctly identifying 65 percent of the girls who would become pregnant by 11th grade and falsely predicting pregnancy for only 26 percent. These predictions cross-validated well to sample B. When pregnancy in sample B was predicted with the eight high-risk clusters identified in the subset of sample A, the hit rate in sample B was 67 percent for the girls who would become pregnant by 11th grade; only 31 percent were falsely predicted for pregnancy.

Characteristics of High-Risk Pregnancy Profiles

The research team examined the patterns of variables for some of the specific high- and low-risk profiles. Note, as the characteristics that define each profile are examined that a great majority of girls in high-risk profiles appear to have had relatively severe adjustment problems by ninth grade, prior to their pregnancies; this tends not to be the case for girls in the low-risk profiles. The adjustment problems differ for subsets of high-risk profiles, indicating that to intervene effectively different intervention programs should be tailored for subsets of profiles. Six of the 10 profiles are associated with high risk.

Profile VIII. This is the classic high-risk profile described by many investigators. The girls in this profile have poor psychological resources, including poor maternal relations, low self-esteem, external locus of control, and high levels of depression. These girls also exhibit a number of different problem behaviors such as troubled behavior (e.g., wrecked a car, hassled with parents, flunked a grade), school discipline problems, and substance-abusing friends (used as a proxy for personal use of drugs). It is significant to note that the grade point average of girls characterized by this profile was by far the lowest found in any of the 10 profiles, and the school stress level (items indicating extreme dislike for school) was the highest. Finally, girls in this profile had a tendency toward early initiation of dating, and they dated frequently in ninth grade. Although these girls are at higher-than-average

risk in both high- and low-achievement schools, that risk is markedly higher for those attending low-achievement schools. This indicates that milieus can influence girls with this profile to modify their behaviors.

Certain types of interventions are suggested by the pattern of variables that define this profile. The pattern suggests the possibility of early school failure as a cause for the problem behaviors exhibited by the girls. These girls had the lowest grade point averages and the greatest school stress of all of the profiles. The literature indicates that many types of problem behaviors frequently appear to have their origins in early classroom failures, often around fourth grade, when classroom materials start to become more meaning-oriented and less rote. Children may find that previous learning strategies are no longer effective. Prevention of later problems may occur with the initiation of tutoring assistance at the first signs of problem behaviors. For girls in this profile, it is likely that such a tutorial-based intervention would be most successful if it involved improving the poor relationships between these girls and their parents.

Profile X. Girls characterized by this profile are actually at the highest risk for adolescent pregnancy. Furthermore, this is the only high-risk profile in which risk is approximately equal in high- and low-achievement schools: The milieu variable does not appear to influence these girls. The girls in this profile are also anomalous in another way. This is also the only high-risk profile in which the girls tended to exhibit positive psychological resources (e.g., a tendency toward good maternal relations, assertiveness, positive self-esteem, internal locus of control, a negative z score on the depression scale). There was also a strong tendency for these girls to consider themselves very attractive.

This pattern of psychological resources is typical of girls who have good maternal relations and have internalized parental values. This suggests that many of these girls may have mothers who considered early pregnancy acceptable. This would explain the lack of impact of the milieu variable on pregnancy rates of girls in this profile. The strong z score indicating lack of parental monitoring of these girls is consistent with such an interpretation, as is the fact that these girls started dating early and their ninth-grade dating status was the highest of the 10 profiles, indicating that most of these girls dated frequently.

The parents of the girls in this profile had poor educational histories. These girls had a strong tendency toward poor grades and did not consider themselves college bound. These girls also exhibited other problems. They had a strong tendency toward troubled behavior, but not the more overtly rebellious behaviors that are characterized by school discipline referrals or by substance-abusing friends.

Of all the profiles, this one may be the least amenable to intervention: The critical traits appear to be internalized and part of the value systems of the girls, and the pregnancy rate for these girls was the least influenced by the environment of any of the 10 profiles. Unlike the girls in Profile VIII, where evidence suggests that the causative problems may have been early school failures, girls in this profile appear to have problems centered in their identification with maternal models that considered early pregnancy to be acceptable. On the surface, at least, it appears that an intervention would be most likely to succeed if it were initiated at the family level and included the parents and siblings of the adolescent.

Profile VII. If one were to interpret the discrepancy between the pregnancy rate for girls in low- versus high-achievement schools as an index of the potential for successful intervention, girls characterized by this profile are the most susceptible to being helped. Girls with this profile in low-achievement schools have over twice the pregnancy rate of the average for the total sample. On the other hand, in the current sample there were no pregnancies among the girls in this profile who attended high-achievement schools.

This profile represents an interesting pattern of traits. Based on the multiple regression, these girls would be considered relatively low risk. On the battery of ninth-grade measures, these were “good” girls who showed no tendency to get into trouble, have school discipline problems, or abuse substances. They did not initiate early dating and did not date frequently. They had only a marginal tendency toward poor grades. The extreme scores found for these girls were on negative expectations of being college bound and poor future expectations, perhaps related to the fact that their parents had the lowest educational levels of any of the profiles. Note that poor future expectations is a strong marker only for this profile. Based on the general pattern of traits, girls in this profile could be described as “good” girls who exhibited little troubled behavior, dated relatively little, had a tendency toward low assertiveness, engaged in relatively few organized social interactions (and consequently were probably relatively isolated), and had a very pessimistic view of their futures.

Girls in this profile, because of their low assertiveness and feelings of isolation and pessimism about the future, are likely to conform to whatever they feel is “cool” in the culture around them. If this were the case, interventions with the greatest likelihood of success would focus on increasing positive social involvement of these girls, perhaps with school clubs and activities with other girls.

Profile V. This profile is unique in that, of all the high-risk profiles, this is the only one in which the girls had good grades, were college bound, and had marginally good future expectations. These appear to be girls about whose promising futures mothers could be sanguine. Perhaps these mothers were excessively sanguine about the appropriateness of their daughters’ behavior: Parental monitoring was low, while early and frequent dating was high. In high-achievement schools, girls in this profile had low pregnancy rates, despite the early and frequent dating. This is further evidence to support the contention that in milieus in which the population as a whole tends toward low-risk profiles, the majority of attitudes against risky sexual practices are relatively effective deterrents even for girls who have started dating early.

These data suggest a potentially powerful intervention with girls from low-achievement schools who fit this profile: Convince their parents that greater parental supervision is advisable, and that early dating should be discouraged.

Profiles VI and IX. Although these two profiles differ in some ways, they share characteristics that suggest a common intervention might be appropriate for both profiles. Both have the highest scores for external stress of all the profiles. This is accompanied by scores on the locus of control variable that indicate that in both profiles the girls have feelings of lack of control over their lives. Furthermore, girls in these profiles have the highest scores for doing chores. Although the researchers had originally hypothesized that assisting with many household chores would be an index of positive social adjustment, the opposite proved to be the case. Analysis of zero-order correlations over the entire sample of girls indicated that assisting with many chores was related to living in single-parent households with little family support.

This pattern suggests that girls with these two profiles have experienced some sort of trauma or loss (e.g., death of a parent, parental divorce, parental alcoholism, parental loss of a job) and feel that they have lost control of their lives. In profile IX, for example, there is a surprising coupling of high parental education with low-family income, suggesting a family that has recently had a drop in its living standard. Profile VI has the highest score for lack of social support found in the 10 profiles. The high scores for troubled behavior, found in both profiles, are typical consequences of trauma.

Girls in these profiles appear to be traumatized by events in their environment over which they feel they have no control. This appears to call for social worker intervention to deal with the emotional states of the girls and to provide whatever environmental supports are appropriate. This might include working with the girls’ parents to improve their relationships with daughters.

Characteristics of Low-Risk Pregnancy Profiles

Four profiles of girls were at low risk for adolescent pregnancy at both milieu levels. If the variables constituting the profiles are conceptualized as indicating personal problems versus resilience, girls with these profiles had relatively few problems and great resilience. In three of the four low-risk profiles, the psychological resources variables were positive, and variables such as behavior problems were relatively infrequent. In Profile II, in which these psychological resources were weak, parental control was moderately strong; consistent with this control, the girls began dating late, and dated little by ninth grade. Although none of the four profiles is characterized by extremely good grades, grades are at least average in all four profiles.

Girls in Profile III resemble girls in high-risk profile V, experiencing early and frequent dating and having relatively good grades. Surprisingly, girls in the low-risk profile had a moderate tendency toward troubled behavior, but girls in the high-risk profile did not. What might account for the lower risk in Profile III? Several explanations can be offered: (1) Although girls with both profiles dated frequently, girls in the high-risk profile experienced low parental control while girls in the low-risk profile did not; (2) girls in the low-risk profile were highly involved in approved social activities, so that much of their out-of-school behavior was probably under surveillance; and (3) lack of school stress and the amount of parental education were stronger in the low-risk profile as compared with the high-risk profile. Finally, variables constituting psychological resources were strongly positive for girls in the low-risk profile but only average for girls in the high-risk profile.

The research team believes it is possible to start developing interventions that are profile-specific based on the information obtained from the study.

Reaction

Dr. Stevens-Simon congratulated the researchers on the wealth of data obtained from this prospective study. The researchers recognized the complexities of adolescent pregnancy, which is shown in the analysis. The researchers also recognized that the more disenfranchised adolescents are at a higher risk for pregnancy.

However, Dr. Stevens-Simon did have some concerns with the study. The researchers used two mutually exclusive groups: pregnant versus nonpregnant adolescents. Access to birth control and sexual activity levels can play an important role in determining pregnancy. Some adolescents who become pregnant will have no access to birth control; some may have access to birth control but for whatever reason decide not to use it; other girls may use birth control but become pregnant. Girls who do not become pregnant may have access to and use birth control or may not be sexually active. Another group of girls who do not become pregnant may not even use birth control, and it is by chance that they are not pregnant. There are different mixes of sexual activity levels and usage (and access) to birth control within each of the 10 profiles. Dr. Stevens-Simon suggested that future research include variables that quantify access and usage of birth control as well as level of sexual activity. This project only looked at whether or not the girl became pregnant; the researchers may have missed other interventions that influenced the girls' lives.

Dr. Terry pointed out that a crucial issue when using cluster analysis is the need to assure the reader that the solution is not entirely sample dependent, thus the need for cross-validation on a separate sample. Drs. Ager and Saltz accomplished cross-validation by dividing the sample in half and using linear discriminant analysis, which generates linear combinations of predictor variables to maximally separate clusters. However, Dr. Terry reminded participants that the output from any discriminant analysis does not identify clusters per se; it only provides predicted probabilities of cluster membership in a given cluster. In other words, it shows that an observation more likely belongs to one cluster than another. But the lines of demarcation are often murky and are dependent

on additional factors not accounted for in the typical discriminant analysis, such as population base rates of the various clusters. In effect, Dr. Terry suggested that one should take into account the prior probability of membership and use receiver operating curves to evaluate the efficacy of the cross-validation.

Another problem with this approach is the splitting of the sample into two parts. Researchers desire large calibration samples to reduce the error in estimating parameters and, hence, reduce validation error. At the same time, researchers desire large validation samples to ensure that the extent of validation error can be properly gauged. Splitting the sample into two parts compromises both of these goals. Dr. Terry suggested two alternatives: The jackknife and the bootstrap approaches.

The jackknife approach drops a single observation, computes the calibration on all other observations, and classifies the missing observation that did not contribute to the calibration of the model. This can be done for all of the sample, giving the researcher both large calibration and validation samples. This has been shown to provide a good empirical estimate of the validation error, while ensuring that near-optimal calibration is obtained. If the bootstrap approach suggested by Bradley Efron were used, the large sample in this project would be resampled many times (many computerized statistical packages can accomplish this) and the average of the simulations could be used to gauge the extent of validation error. Dr. Terry suggested that both of these approaches would give better estimates of the false-alarm rates via cross-validation, by capitalizing on the wealth of data and the law of large numbers.

Previous points notwithstanding, lines of demarcation have to be drawn somewhere, and Drs. Ager and Saltz used 20 clusters, 10 for the high-achievement school and 10 for the low-achievement school. They then used these clusters in a multiple-regression model to predict rates of pregnancy and achieved good results, especially when compared with a logistic regression model. Dr. Terry pointed out that the manner in which the multiple-regression model was conducted gave a statistical unfair advantage to the cluster model, since interactions were not included in the logistic model. The use of interactions between variables and school climate would provide an appropriate accounting of the milieu effect of school climate, potentially increasing the performance of the logistic model relative to the cluster model. Dr. Terry suggested that a fairer comparison would be to run the logistic models and compare the results with the cluster models, optimizing both models. The advantage would go to the model with the greatest predictive efficiency, with model parsimony controlled for. Dr. Terry then speculated that it is often the case that, when properly formulated, logistic models provide greater predictive efficiency.

Compared to the discrete meaning of clusters or profiles, how do logistic models provide information regarding etiology and treatment? Dr. Terry suggested that from a clinical standpoint, the researcher could look at a girl with a high predicted probability of pregnancy and look at the individual profile for the variables in the logistic model. This will assist the clinician in determining how to assist the adolescent, because each adolescent will have some markers that are favorable for risk of pregnancy and some that may compensate for this increased risk. This approach is more clinical and uniquely person oriented; it also recognizes the inherent complexity of behavior and that both risk and protective factors exist to shape behavior.

Discussion items focused on recognizing (1) learning disabilities in adolescents that may account for low grades and poor school performance, and (2) the costs of providing an intervention for girls who are incorrectly identified as being at high risk. Participants also recognized the complexities associated with adolescent pregnancy, including social, economic, and educational factors for the adolescent mother and her child.

Publications

Saltz E, Ager JW, Kopera-Frye K, Degirmencioglu SM. (Submitted.) Dimensions of adolescent delinquency: Richer boys steal, poorer boys fight.

Saltz E, Ager JW, Kopera-Frye K, Degirmencioglu SM, Poindexter JO. (Submitted.) Teen pregnancy: One set of predictors doesn't fit all girls.

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