# Career-Related Predictors of Work-Bound and College-Bound Status of Adolescents in Rural and Nonrural Areas

Jay W. Rojewski
*University of Georgia*

*Data from the National Education Longitudinal Study: 1988-94 was used to examine career-related characteristics and postsecondary attainment status (work-bound or college-bound) of rural and nonrural youth involved in the transition from school to work. Rural youth were more likely to be work-bound than nonrural youth. Socioeconomic status (SES) had considerable influence in predicting transition path status. Individuals in the lowest SES quartile were twice as likely to be work-bound, while adolescents in the highest SES quartile were four times more likely to be college-bound. Work-bound youth reported greater involvement in vocational education. Prediction accuracy and variable importance were fairly consistent for college-bound and work-bound adolescents, although somewhat dependent on rural and nonrural residence. Occupational aspirations was the single best predictor of transition status for college-bound individuals. SES was the best predictor for rural work-bound youths, while SES and participation in vocational education were the best predictors of work-bound status for nonrural adolescents.*

Despite increasing attention on the transition of adolescents from school to work and adult life, limited information is available about the unique career development needs and experiences of work-bound youth—those individuals who aspire to, or by default, enter the labor force immediately upon high school completion (Blustein, Phillips, Jobin-Davis, Finkelberg, & Roarke, 1997; Gysbers, 1997; Herr, 1995). The seminal report by the William T. Grant Foundation Commission on Work, Family, and Citizenship (1988), *The Forgotten Half*, was one of the first to critically examine the declining fortunes of American youth who do not receive a college education. In a 2-year study of 16-24 year-olds, the report concluded that noncollege-bound adolescents were likely to enter adulthood "in the economic limbo of unemployment, part-time jobs, and poverty wages" (p. 1). A recent follow-up to this report "The Forgotten Half Revisited" (Halperin, 1998)—noted that, despite a booming U.S. economy, prospects for work-bound youth have actually worsened in the past decade in a number of key areas including fewer available jobs offering stability and advancement, high unemployment, decreased wages for young adults, and little or no public assistance in helping adolescents with the transition from school to adult life. Indeed, many work-bound youth initiate their transition from school-to-work without a systematic plan of action or help and support from schools or employers, often resulting in a prolonged period of "floundering, trial and error, lingering unemployment, and general despair"

(Herr & Niles, 1997, p. 149). This bleak prospect has been fueled by a sense that American work-bound youth are undereducated, receive little or no career guidance, and lack the requisite skills needed to enter a high-skilled, high-tech work force (Herr, 1996; Smith & Rojewski, 1993; Worthington & Juntunen, 1997).

The approximately 20 million noncollege-bound youth in the United States are a heterogeneous group. Even so, past studies have found that work-bound adolescents are more likely to be enrolled in a general or vocational education curriculum during high school, reflect below average socioeconomic status (SES), disproportionately represent minority populations, and report having fewer college role models than their college-bound peers (Herr, 1995; Herr & Niles, 1997; Institute on Education and the Economy, 1992). Work-bound adolescents are also more likely to have personal characteristics similar to those of students labeled as at risk for school failure or dropping out.

Although more than one-third of all adolescents do not participate in postsecondary education programs immediately upon high school completion, an overwhelming majority aspire to some type of postsecondary education. In fact, almost three-fourths of the high school seniors studied by Choy, Alt, and Henke (1994) reported postsecondary education aspirations—one-half aspired to attend a 4-year college or university. In contrast, only 15% of adolescents indicated plans to go directly to work after they finished high school. Reasons these adolescents gave for not continuing their education at the postsecondary level included a lack of academic preparation (39%), financial limitations (55%), and personal preference or background (90%). Choy et al. found that, as a group, high school se-

---

Correspondence concerning this article should be addressed to Jay W. Rojewski, Department of Occupational Studies, University of Georgia, 210 River's Crossing, Athens, GA 30602. (rojewski@arches.uga.edu)

niors who stated work-bound aspirations were more likely to be male, in the lowest two SES quartiles, rural-based, enrolled in the vocational track, and less likely to have a parent with a 4-year college degree.

Work-bound youths may be particularly vulnerable to career-related problems as they prepare for and experience the transition from school to employment (Haller & Virkler, 1993; Rojewski, Wicklein, & Schell, 1995). Problems related to career development and occupational preparation of rural youth include reduced access to and pursuit of postsecondary education, narrowed school curricula, limited exposure to the world of work, and a lack of work-related role models (Apostal & Bilden, 1991). Ultimately, these problems can result in limited education or employment-related problems such as lower personal income and higher rates of unemployment and poverty, spurred by a general lack of economic vitality and the relative scarcity of high-skill, high-wage employment options found in many rural communities (Helge, 1991; Hobbs, 1994).

While rural youth experience as much diversity as their nonrural peers, several themes common to a majority of rural youth suggest a need for greater focus on the career development of rural adolescents. For example, as a result of limited job availability and lower occupational attainment, rural adolescents have traditionally faced a conflict between the pursuit of high educational or career aspirations and the need to move to a metropolitan area to attain such goals. The dilemma of these two competing goals—*aspirations versus residence*—have played a facilitative, albeit constraining, role in career development, especially if adolescents lower their aspirations to remain close to home (Hektner, 1995; Helge, 1991; Murray, Keller, McMorran, & Edwards, 1983; Sarigiani, Wilson, Petersen, & Vicary, 1990). The residence dilemma is further complicated in that the distinction between rural and nonrural locales has blurred in recent years due to expanding metropolitan areas and technology. Increasingly, rural youth are required to compete with better prepared, nonrural peers for high-skill, high-wage jobs based primarily in metropolitan areas (Elder, 1992; Hobbs, 1994).

Another theme that supports the need to examine rural career development was posed by Haller and Virkler (1993) who argued that many rural youth grow up exposed to formative experiences and family structures that are markedly different than nonrural peers. The increased likelihood of narrow school curricula, restricted labor markets, and fewer college and professional role models influence rural youth to disproportionately select agricultural, service, and manual occupations as adults. The career development of rural youth is also threatened by the higher rates of poverty found in rural areas (Ley, Nelson, & Beltyukova, 1996). Poverty has been consistently shown to negatively influence adolescents' career aspirations and attainment (Herr, 1995;

Hotchkiss & Borow, 1996; Jencks, Crouse, & Muesser, 1983).

Quaglia and Cobb (1996) used social comparison theory to explain the lowered aspirations expressed by rural youth. Social comparison theory posits that individuals tend to raise or lower their expectations, aspirations, and behavior to meet the collective standard of their primary reference group. The tendency toward uniformity is more pronounced in isolated cultures such as rural schools or communities. Thus, depending on the general level of expectations in a school or community, rural youth—particularly males—may experience greater pressures to lower aspirations, forego postsecondary education, and remain in their rural communities. The need to reconcile individual and collective expectations about acceptable postsecondary aspirations are compounded by negative societal messages about the desirability of aspirations that establish a sense of community, family, and friends (Howley, Harmon, & Leopold, 1996).

Due, in part, to recent national initiatives like the School to Work Opportunities Act of 1994, increasing attention has been focused on work-bound youth. Even so, there is a great deal we do not know or understand about individual and systemic processes involved in preparing for and implementing a successful transition from school directly to work and adult life (Gysbers, 1997). This is particularly true for rural youth who often face unique pressures and conflicting alternatives when forming occupational aspirations. Given the described context, the purpose of my inquiry was to examine select career-related precursors (in Grade 12) and indicators of initial career attainment (2-years postsecondary) of rural and nonrural adolescents in the early stages of the transition from school to work. A profile of career-related characteristics for work-bound rural youth is described: gender, race/ethnicity, socioeconomic status (SES), academic achievement, high school program, involvement in vocational education, educational and career expectations, views on relocation, work values, part-time work experience, locus of control, self-esteem, and career attainment (2-years postsecondary). Elements of this profile were analyzed to determine how the career-related experiences of college-bound and work-bound youth in rural and nonrural areas compare.

## Method

### Population and Sample

*NELS: 88-94 database.* The National Education Longitudinal Study: 1988-94 (NELS:88, 1996) database, administered by the National Center for Educational Statistics, U.S. Department of Education, was used for this study. NELS:88 is a nationally-representative, longitudinal database designed for study of the educational, vocational, and

personal development and transition of adolescents from secondary school to postsecondary environments (Ingels, Dowd et al., 1994). The data set represents an initial sample of over 25,000 adolescents attending 1,052 public and private schools across the nation. Participants have been followed at 2-year intervals since 1988 when they were in the eighth grade. Data is available from a variety of sources at each collection interval including school administrators, parents, teachers, and students, and allows for cross-sectional and longitudinal analyses (Ingels & Scott, 1993).

Selection of NELS:88 participants was initially based on a two-stage stratified sample with schools as the first-stage unit and a random sample of students (average $n =$ 25) within each selected school as the second stage-unit. A two-stage normalized sample weighting process was employed to obtain unbiased population estimates (Ingels, Dowd et al., 1994; Owings et al., 1994). I calculated a sampling weight for each participant equal to the average of NELS:88 sampling weights for Grade 12 and 2-years postsecondary (cross-sectional and panel weights) divided by the mean weight. When results are weighted using the calculation, the original sample size is preserved while correcting for the disproportionate sampling of minority students. Additional details can be found in NELS:88 user's manuals and technical reports (e.g., Ingels, Dowd et al.; Ingels, Scott, Lindmark, Franekel, & Myers, 1992; Ingels, Scott, Rock, Pollack, & Rasinski, 1994).

The NELS:88 data set was selected for this analysis because of several positive features. First, the database contains numerous items that specifically examine career-related activities and characteristics, as well as education- and work-related experiences of adolescents. Second, the database represents a nationally representative sample of thousands of high school seniors selected through a rigorous two-stage stratified, probability design. Finally, ease of access and use of data was considered.

*Sample identification.* The sample consisted of young adults who responded to NELS:88 questionnaires in both Grade 12 and 2 years after the completion of secondary school. Potential participants were eliminated from the final data pool for several reasons including questionnaire nonresponse, missing data, or dropping out of school. The identification process resulted in a total weighted data pool of 12,314 student-based cases which included 3,754 rural adolescents (work-bound, $n = 1,919$; college-bound, $n = 1,835$) and 8,560 considered nonrural (work-bound, $n = 3,544$; college-bound, $n = 5,016$). Participants were located throughout the United States—South (34.2%), Midwest (26.2%), West (20.6%), and Northeast (19.0%).

*Variable Conceptualization and Specification*

*Demographic data.* Information about gender, race/ethnicity, location of residence, and socioeconomic status

(SES) were obtained from Grade 12 student questionnaires. Racial/ethnic designation was recorded in two ways. First, on NELS:88 questionnaires, students indicated their racial/ethnic origins from six pre-developed categories, including Asian American (4.3%), African American (12.6%), Hispanic (10.3%), European American (71.1%), and Native American (1.1%). Second, racial/ethnic designation was recoded into two groups reflecting majority (White adolescents, $n = 8,817$) and minority group status (Non-white adolescents, $n = 3,485$). This categorization reflects the view that race/ethnicity is a socially developed construct that stimulates societal reactions such as discrimination and bias, occupational stereotyping, and restrictions on educational and occupational opportunities. Regardless of racial/ethnic group affiliation, individuals of minority status may, as a group, be more likely to encounter similar socialization experiences and environmental barriers (Hotchkiss & Borow, 1996; Lent, Brown, & Hackett, 1996; Osipow & Fitzgerald, 1996). Thus, common experiences between individuals from different minority groups—an *etic* perspective [i.e., seeking general principles across disparate groups (Leong & Brown, 1995)]—was of interest in this case.

The location of NELS:88 schools were originally classified by school administrators as urban, suburban, or rural. I combined those schools designated as urban and suburban to create a dichotomous variable—rural and nonrural. Thus, nonrural areas were defined as all communities within a metropolitan statistical area (Haller & Virkler, 1993; Hobbs, 1994). SES was conceptualized and calculated by NELS:88 researchers and reflects a composite score composed of five separate items including family income, parents' education levels, and parents' occupations. Responses to these separate measures were standardized to a mean of 0 and standard deviation of 1. Nonmissing components were averaged to yield a SES composite score for each student and arranged into quartiles.

*Determination of work-bound or college-bound status.* Several options were available in determining the transition path of participants, i.e., whether individuals were college-bound or work-bound. One option was to rely on postsecondary plans indicated by adolescents on NELS:88 questionnaires administered during Grade 12; "Do you plan to go on to school right after high school?" However, intended transition paths are not always a reliable indicator of actual postsecondary experiences. For example, although slightly over three-fourths of all adolescents ($n = 8,659$) planned to enroll in some type of postsecondary education or training, only 54.2% were actually enrolled 2 years after high school completion. Conversely, while 18.1% of respondents intended to go directly to work after high school, a small number ($n = 322$) had actually enrolled and participated in postsecondary education immediately after high school. Approximately 5% of adolescents were uncertain

about their transition plans in Grade 12, although most were categorized as work-bound 2 years postsecondary.

Given the inconsistent and somewhat unreliable nature of stated postsecondary plans, work-bound/ college-bound status was defined by actual labor force status one year after high school. Although eight responses were available to NELS:88 participants' to describe post-high school educational or occupational status, responses were grouped into two categories—*college-bound* (enrolled in postsecondary education/primarily a student regardless of employment status), and *work-bound* (either in or out of the work force but not in school/primarily focused on work activities or unemployed regardless of length of employment or past educational involvement).

*Academic achievement.* Grade 12 standardized reading, mathematics, and science achievement scores consisted of multiple choice items, and were timed and normed. Missing data for each variable in this section was imputed using residence (rural/nonrural) x transition path (college-/work-bound) group means. Reading, mathematics, and science achievement scores represent cross-sectional scores standardized across participants. Multiple forms of reading and mathematics achievement tests were developed and administered to target each student's ability level as reflected in previous test administrations. This significantly reduced the potentially serious problems of ceiling and regression effects (Owings et al., 1994). NELS:88 researchers utilized Item Response Theory (IRT) to link and vertically equate various forms of each cognitive test. IRT allows the three sets of reading, mathematics, and science achievement scores to be interpreted both within and across grade levels (Ingels, Dowd et al., 1994, p. H-40).

Two forms of the reading achievement test, an easier and harder version, were available for Grade 12 participants. Both versions maintained a similar format—a 21-minute time limit to read 5 separate passages of varying length and answer a total of 21 multiple choice test items. The reading test addressed students' ability to reproduce the details of text, translate verbal statements into concepts (comprehension), or draw conclusions (inference/evaluation). Reading achievement scores ranged from 29.01 to 68.35 ($M = 51.50, SD = 8.63$). Three forms of the Grade 12 mathematics achievement test—easy, moderate, and difficult versions—were used. Each version maintained a similar format that included a 30-minute time limit to complete 40 multiple choice questions. The test contained a mix of word problems, diagrams, and calculations covering a range of mathematical concepts such as algebra, arithmetic, geometry, probability, and advanced mathematics topics. Mathematics achievement scores ranged from 29.63 to 71.37 ($M = 51.89, SD = 8.65$). The science achievement test contained 25 multiple choice items with a time limit of 20 minutes for completion. The test contained verbal descriptions of a situation or charts and graphs followed by

questions based on the introduced premise. Science achievement scores ranged from 29.70 to 70.81 ($M = 51.56, SD = 8.71$; Owings et al., 1994).

Several reports extensively document the psychometric properties of NELS:88 measures (see Ingels, Scott et al., 1994; Kaufman, Rasinski, Lee, & West, 1991; Rock & Pollack, 1991). Kaufman et al. used several indicators to determine the validity and reliability of cognitive test batteries including the consistency among student responses to related items and the internal consistency reliability of scalable survey responses. They concluded that these measures exhibited acceptable validity and reliability. Ingels et al. (1992) reported acceptable Cronbach alpha coefficients for the cognitive tests including .78-84 for reading achievement, .79-90 for mathematics achievement, and .75-.83 for science achievement tests.

*Measures of personality.* Measures of self-esteem and locus of control at grade 12 each reflect composite scores of scale items. The measure of locus of control was calculated from 6 separate items that were similar to items used by Rotter (1966). Three items were included in previous national longitudinal studies and 3 new items were added to increase scale reliability. Examples of items include, "In my life, good luck is more important than hard work for success," and "Every time I try to get ahead, something or somebody stops me." A four point response scale was used to record students' level of agreement to each item (strongly disagree, disagree, agree, and strongly agree). NELS:88 researchers standardized each of the 6 locus of control items using a mean of 0 and a standard deviation of 1. Individual standardized item scores were averaged to yield a composite score. Locus of control scores ranged from -2.74 to 1.43 ($M = .05, SD = .61$).

The self-esteem scale was composed of 7 separate items and measured the totality of individuals' thoughts and feelings about themselves (Kanouse et al., 1980). Four self-esteem items were from taken directly from Rosenberg's (1965) 11-item self-esteem scale. Three additional self-esteem items were included to increase overall scale reliability (Ingels, Dowd et al., 1994). Examples of scale items include, "I feel good about myself," and "I feel I am a person of worth, the equal of other people." Level of agreement with each item was indicated using a four point response scale (strongly disagree, disagree, agree, and strongly agree). Each of the 7 self-esteem items was standardized using a mean of 0 and a standard deviation of 1, and then averaged to yield a self-esteem composite score. The range of self-esteem scores was from -3.69 to 1.24 ($M = .01, SD = .66$).

Validity and reliability of the self-esteem and locus of control scales has been extensively examined and confirmed over the past 25 years. Validity was initially determined by a combination of evidence already available from existing scales and the results of several principal components fac-

tor analyses which confirmed the existence of two distinct measures (Conger, Conger, & Riccobono, 1976; Conger, Dunteman, & Dunteman, 1977; Kanouse et al., 1980). In addition, an exhaustive series of comparisons on demographic and achievement-related factors have resulted in detailed personality profiles (Conger, 1976). These two scales have also demonstrated acceptable levels of reliability. Ingels et al. (1992) reported a Cronbach alpha reliability of .81 for the 7-item self-esteem scale and .71 for the 6-item locus of control composite scale.

*Work-related/career preparation variables.* Information about high school education program, involvement in vocational education, part-time work experience, residential preference, and educational and occupational aspirations of participants was obtained from Grade 12 questionnaires. Educational track was organized into four program categories—college preparation (academic), general education, vocational-technical preparation, and special programs (e.g., special education, alternative school, dropout prevention program). Student participation in high school vocational education coursework was categorized to represent three levels of involvement—no vocational coursework, one or more vocational courses but not in a vocational track, and one or more vocational courses and enrolled in a vocational track. Part-time work experience during high school was determined in Grade 12 and conceptualized as a trichotomous variable including no work experience, past work experience but currently unemployed, and currently employed. Adolescents' residential preference was ascertained by response to a single question, "After high school, how important is it for you to get away from this area?" For analysis, responses were treated as categorical variables; 1 = not important, 2 = somewhat important, and 3 = very important.

Educational aspirations were determined by asking adolescents in Grade 12 to denote the highest level of education they thought they would achieve. Educational aspirations were conceptualized as a categorical and interval-level construct (Haller & Virkler, 1993) with a low score of 1 representing aspirations less than high school and a high score of 6 representing aspirations for a graduate or other post-baccalaureate degree.

Occupational aspirations were assessed at Grade 12 and 2 years after high school by asking participants to indicate the job or occupation they expected to have at 30 years of age from a listing of 17 separate occupational categories. These categories represented the major occupational groupings typically used by governmental agencies such as the U.S. Bureau of the Census and U.S. Department of Commerce (Stevens & Cho, 1985). Two distinct ways of organizing data on occupational aspirations were used. Both categorization schemes reflect status/power expectations and ability estimates that individuals typically ascribe to various occupations (Hotchkiss & Borow, 1996; Saltiel, 1988).

First, occupational categories were collapsed into three groups that reflected high, medium, and low levels of education, prestige, and status attributed to these occupations. Occupational categories requiring a college degree and providing high prestige included high professional (e.g., doctor, accountant, scientist, lawyer), lower professional (e.g., social worker, clergy, registered nurse), school teacher, technical occupations (e.g., medical technician, computer programmer), and managerial positions. Moderate prestige occupations that require a high school diploma or some college education included small business owner and positions in sales, office/clerical, trades (e.g., auto mechanic, baker, carpenter), and military/protective services. Categories requiring less than a high school diploma for initial entry and offering low prestige included full-time homemaker, service positions (e.g., child care, waiter), machine operators (e.g., assembler, welder, bus driver), and laborers (e.g., construction worker).

Second, occupational aspirations were coded using the socioeconomic index (SEI) calculated by Stevens and Cho (1985). The SEI provides a 4-digit code that reflects the income and educational attributes of occupations, and as such represent prestige scores. SEI codes have a total range from 13.98 to 90.45 ($M = 34.48$) where occupations with SEI codes above the mean score represent white-collar jobs and scores below the mean represent blue-collar professions. The Grade 12 SEI codes for adolescents ranged from 0.00 to 68.51 ($M = 56.41$, $SD = 16.14$)—rural ($M = 53.71$, $SD = 17.55$), nonrural ($M = 57.60$, $SD = 15.33$), work-bound ($M = 50.72$, $SD = 17.88$), college-bound ($M = 60.98$, $SD = 12.90$). SEI codes obtained 2 years after high school ranged from 0.00 to 68.51 ($M = 54.35$, $SD = 17.03$)—rural ($M = 51.99$, $SD = 17.87$), nonrural ($M = 55.38$, $SD = 16.54$), work-bound ($M = 48.51$, $SD = 18.18$), college-bound ($M = 59.07$, $SD = 14.41$).

*Data Analysis*

*Data imputation.* Rather than delete cases that contained missing data on key variables (e.g., reading, mathematics, and science achievement, self-concept, and locus of control), missing values were imputed from existing data (Owings et al., 1994). The imputation method employed for this study involved the substitution of group mean values for missing data. Separate mean values were calculated for and applied to each of four groups developed on the basis of residence (rural or nonrural) and transition path (college- or work-bound).

*Comparative analyses.* Several statistical analyses were selected to describe career-related characteristics and postsecondary attainment of rural and nonrural work-bound adolescents. Two-way frequency tables were constructed and analyzed using chi-square analysis to examine the influence of select demographic and work-related variables

on postsecondary status (i.e., college- or work-bound) of rural and nonrural youths. Since $\chi^2$ tests are sensitive to sample size, $\chi^2$ adjusted residual values were used to determine the meaningfulness of statistically significant results. A critical value of 2.58 was selected which is the same value that, under ideal circumstances, allows a claim of significance at $p < .01$ (Bakeman & Robinson, 1994).

Two-way analysis of variance (ANOVA) procedures were performed to examine potential differences in the academic achievement and personality measures of adolescents based on residence and transition path. Planned contrasts using separate one-way ANOVA were conducted to determine the influence of residence and transition path on occupational aspirations in Grade 12 and 2 years after high school, and educational aspirations.

The two-stage cluster sampling strategy employed in the NELS:88 affects the probabilities associated with hypothesis testing, causing overestimated test statistics; i.e., $p$ values generated from statistical analysis are too small. To minimize the risk of Type 1 error that results from cluster sampling, a more stringent *a priori* alpha level was used, $p = .01$. In addition, the magnitude or practical significance of observed statistically significant differences was determined by calculating effect size coefficients to indicate the difference between two or more mean scores expressed in terms of standard deviation units (Cohen, 1988; Olejnik & Hess, 1997). Differences that are "highly significant statistically (i.e., is very unlikely to have occurred by chance) may nevertheless have a very small effect size (i.e., have virtually no practical effect on the outcomes of interest)" (Haller & Virkler, 1993, p. 173). This is especially true when large databases are analyzed, as statistically significant results are often more a reflection of sample size than practically significant differences.

*Predictive discriminant analysis.* Predictive discriminant analysis (PDA) was used to classify the current status of sample members 2 years after high school based on 11 predictor variables. Categorical predictor variables included race/ethnicity (1 = majority, 2 = minority), socioeconomic status (1 = lowest quartile, 4 = highest quartile), high school program (1 = college preparation, 2 = general track, 3 = vocational track, 4 = other program), participation in vocational education (1 = none, 2 = one or more vocational courses, no track, 3 = vocational track), part-time work experience (1 = no prior experience, 2 = past work experience, currently unemployed, 3 = currently employed), Grade 12 occupational aspirations (1 = low prestige, 2 = moderate prestige, 3 = high prestige), and residential preference (1 = no importance, 2 = some importance, 3 = high importance). Continuous variables included mathematics and science achievement, self-esteem, and locus of control.

The basic purposes of PDA are to determine a prediction rule, estimate classification accuracy of the rule, and assess the quality of the classification rule accuracy relative to chance. A classification rule is calculated for each criterion subgroup and then used to classify individual cases (Huberty & Wisenbaker, 1992). The dependent variable, postsecondary transition path was organized into two possibilities—college-bound (primarily in school) and work-bound (primarily working or unemployed/out of the work force). An internal linear classification rule (i.e., using prediction rules built from the same sample) was chosen to classify rural and nonrural individuals into one of the two status groups. While an internal classification rule minimizes the proportion of misclassification errors, the results in terms of hit rates are somewhat positively biased. This positive bias is acknowledged. The decision to use a linear rather than quadratic classification rule was based on assumptions that selected variables reflected multivariate normal distributions and that criterion groups had equal population covariance matrices (Huberty, 1994; Norusis, 1988).

The relative contribution of each predictor variable to overall classification accuracy was calculated by "deleting each predictor variable, in turn, and determining the predictive accuracy of the remaining set of predictors" (Huberty & Wisenbaker, 1992, p. 196). In the *leave-one-out* (L-O-O) approach, the most important variable causes the largest decrease in group hit rate when deleted. The calculation of $Z_{(i)}$ values were completed for rural and nonrural groups using the formula provided by Huberty (1994). $Z_{(i)}$ values for each predictor variable can be rank ordered to reflect variable importance—the best predictor is the variable with the lowest $Z_{(i)}$ value. Cut points for ranking were calculated using a difference of $[Z_{(i)} > .5 \div 2 ]$. Variables not decreasing all-variable hit rates were ignored in the final ranking process. The DISCRIMINANT program contained in the SPSS for Windows, Release 6.0 statistical package was used to run the PDAs.

## Results

### Descriptive Analysis of Participants

*Demographic data.* Table 1 provides demographic characteristics for participants by residence and postsecondary status. Overall, males (50.7%) and females (49.3%) were fairly equal in sample representation. However, planned nonparametric comparisons, designed to examine potential gender differences in postsecondary status, revealed several things. First, regardless of gender, a greater proportion of rural youth were work-bound than nonrural youth [51.1% vs. 41.4%; $\chi^2(1) = 100.09$, $p < .0001$, adj. res. = ±10.0]. Second, when the effects of residence were removed, rural males were more likely to be work-bound than rural females [54.5% vs. 47.6%; $\chi^2(1) = 18.02$, $p < .0001$, adj. res. = ±4.2]. Conversely, over one-half of all adolescents in nonrural settings were college-bound, al-

Table 1

*Demographic Characteristics of Rural and Nonrural Respondents in Grade 12*

| | Rural Adolescents | | | | Nonrural Adolescents | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Work-bound | | College-bound | | Work-bound | | College-bound | |
| | n | % | n | % | n | % | n | % |
| Gender | | | | | | | | |
| Male | 1,044 | (54.5) | 871 | (45.5) | 1,942 | (44.8) | 2,391 | (55.2) |
| Female | 875 | (47.6) | 964 | (52.4) | 1,602 | (37.9) | 2,625 | (62.1) |
| Race/ethnicity | | | | | | | | |
| African American | 205 | (60.6) | 133 | (39.4) | 622 | (51.2) | 592 | (48.8) |
| Asian American | 21 | (36.6) | 36 | (63.4) | 116 | (24.5) | 358 | (75.5) |
| Hispanic | 145 | (56.9) | 110 | (43.1) | 560 | (55.1) | 457 | (44.9) |
| Native American | 54 | (74.8) | 18 | (25.2) | 31 | (54.2) | 27 | (45.8) |
| White | 1,492 | (49.3) | 1,538 | (50.7) | 2,208 | (38.2) | 3,579 | (61.8) |
| Socioeconomic status | | | | | | | | |
| Quartile 1—low | 763 | (74.7) | 259 | (25.3) | 926 | (63.6) | 529 | (26.4) |
| Quartile 2 | 623 | (57.9) | 453 | (42.1) | 1,047 | (55.9) | 826 | (44.1) |
| Quartile 3 | 355 | (39.6) | 541 | (60.4) | 968 | (41.8) | 1,346 | (58.2) |
| Quartile 4—high | 149 | (20.6) | 575 | (79.4) | 502 | (18.2) | 2,249 | (81.8) |

| | M | SD | M | SD | M | SD | M | SD |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reading achievement | 47.95 | 8.53 | 53.22 | 8.28 | 49.21 | 8.32 | 53.89 | 8.09 |
| Mathematics achievement | 47.61 | 8.37 | 54.24 | 7.90 | 48.86 | 8.11 | 54.86 | 7.95 |
| Science achievement | 48.42 | 8.20 | 53.68 | 8.44 | 49.19 | 8.37 | 53.72 | 8.43 |
| Self-esteem | -.08 | .66 | .05 | .68 | -.02 | .64 | .06 | .67 |
| Locus of control | -.06 | .60 | .16 | .60 | -.06 | .64 | .13 | .59 |

*Note.* Totals may not equal 100.0% due to missing or incomplete data or rounding error.

though a greater percentage of nonrural females were in college than male counterparts (62.1% vs. 55.2%).

Race/ethnicity did have an influence on the postsecondary status of respondents, $\chi^2(4) = 231.68$, $p < .0001$—Asian Americans (74.2%, adj. res. = ±8.8) and European Americans (58.0%, adj. res. = ±8.4) were more likely to be college-bound than African American (46.7%, adj. res. = ±7.6), Hispanic (44.6%, adj. res. = ±8.4), or Native American youth (34.4%, adj. res. = ±4.9). These same transition status patterns were consistent in both rural, $\chi^2(4) = 40.82$, $p < .0001$, and nonrural locales, $\chi^2(4) = 211.57$, $p < .0001$, although the proportion of work-bound, minority youth was more pronounced in nonrural settings.

In general, SES had a substantial effect on postsecondary status, $\chi^2(3) = 1689.56$, $p < .0001$. Adolescents in the lowest quartile were twice as likely to be work-bound

(68.2% vs. 31.6%, adj. res. = ±27.1), while adolescents in the highest quartile were four times more likely to be college-bound (81.3% vs. 18.7%, adj. res. = ±35.6). Specific postsecondary status patterns for rural, $\chi^2(3) = 564.25$, $p < .0001$, and nonrural adolescents, $\chi^2(3) = 1069.59$, $p < .0001$, were similar.

*Academic achievement and personality measures.* A series of two-way analysis of variance (ANOVA) procedures compared participants' academic achievement and personality measures based on residence and transition path (see Table 1). No statistically significant interactions between location and transition path were obtained. However, several significant differences were found from separate analyses conducted on residence and postsecondary status.

Statistically significant differences existed between rural and nonrural individuals in Grade 12 on reading

achievement, $F(1,12311) = 34.81$ $p < .001$, and mathematics achievement, $F(1,12311) = 34.14, p < .001$. Rural youths reported lower reading and mathematics achievement scores than nonrural youth. Although statistically significant, effect size coefficients for reading ($ES = .17$) and mathematics achievement ($ES = .18$) revealed actual differences between rural and nonrural adolescents were negligible. Not unexpectedly, college-bound adolescents scored significantly higher than work-bound adolescents in the three areas of academic achievement examined—reading achievement, $F(1,12311) = 1091.28, p < .001$; mathematics achievement, $F(1,12311) = 1845.82, p < .001$; and science achievement, $F(1,12311) = 991.96, p < .001$. Effect size coefficients for reading ($ES = .60$), mathematics ($ES = .78$), and science achievement ($ES = .57$) scores indicated that statistical differences were also of considerable practical importance. Assuming that academic achievement is normally distributed, over half to three-fourths of work-bound adolescents in this sample scored below the academic achievement mean scores of college-bound youth.

Rural youth scored significantly lower on a measure of self-esteem than nonrural peers, $F(1,12311) = 7.73, p = .005$. However, the magnitude of the difference was negligible ($ES = .08$) suggesting that this difference had no practical importance. College-bound high school seniors reported a more internal locus of control, $F(1,12311) = 314.62, p < .001$, and higher level of self-esteem, $F(1,12311) = 66.06, p < .001$, than work-bound seniors. Effect size coefficients (locus of control, $ES = .33$; self-esteem, $ES = .15$) revealed the magnitude of statistical differences were of minimal practical importance.

### Work-related Characteristics and Preparation

*High school program.* Table 2 provides information on select work-related characteristics and preparation. One indicator of postsecondary preparation is high school education program. Are enrollment patterns similar for college- and work-bound students in rural and nonrural environments? Chi-square analyses revealed no significant differences in the high school academic programs of college-bound adolescents, regardless of residence, $\chi^2(3) = 3.86$, n.s. However, a greater percentage of work-bound rural youths were enrolled in a vocational track than nonrural youths—23.2% vs. 17.6%, $\chi^2(3) = 45.82$, $p < .0001$, adj. res. $= \pm 5.0$. Nonrural students were more likely to be enrolled in a special program, e.g., special education or an alternative/drop-out prevention program, than rural peers (16.0% vs. 11.0%, adj. res. $= \pm 5.1$).

*Involvement in secondary vocational education.* Significant differences existed between college-bound and work-bound youth in their involvement in secondary vocational education coursework. In rural settings, $\chi^2(3) = 262.10, p < .0001$, work-bound students were four times

more likely to be in a vocational track than their college-bound peers, (19.5% vs. 4.8%, adj. res. $= \pm 13.6$). Half of rural college-bound students had never enrolled in a vocational course or program, compared to one-third of work-bound respondents (adj. res. $= \pm 10.7$). Enrollment patterns in nonrural environments were similar, $\chi^2(3) = 647.52, p < .0001$—work-bound youths were three times more likely to be in a vocational track than college-bound youths (adj. res. $= \pm 16.0$). Almost two-thirds of nonrural college-bound students had never enrolled in vocational coursework, compared to one-third of work-bound youths (adj. res. $= \pm 21.5$).

*Part-time work experience.* An overwhelming majority of high school seniors (84.9%) reported having some current or prior part-time work experience. No statistically significant difference in the work experiences of rural and nonrural college-bound youths was found. However, significant differences were detected between rural and nonrural work-bound youths, $\chi^2(2) = 11.15, p < .004$. Work-bound rural adolescents were less likely to be currently employed (adj. res. $= \pm 2.7$) than their nonrural peers, but more likely to report having had previous work experience (adj. res. $= \pm 3.3$). Despite statistical significance, it is doubtful these differences are of great practical importance.

Three issues related to part-time work experiences—type of employment, hours worked per week, and wages—were also analyzed for employed high school seniors (see Table 3). In terms of employment type, nearly one-quarter of all youth reported working in a fast food occupation, regardless of their residence or transition path. Statistically significant differences between rural and nonrural adolescents were found for both college-bound, $\chi^2(9) = 63.12, p < .0001$, and work-bound groups, $\chi^2(9) = 88.85, p < .0001$. Nonrural adolescents were more likely to be employed in sales-related fields than rural peers (adj. res. work-bound $= \pm 5.1$, college-bound $= \pm 4.6$). Not unexpectedly, rural youth were much more likely to report farm-related employment than nonrural peers, irrespective of transition path (adj. res. work-bound $= \pm 7.5$, college-bound $= \pm 2.8$). Interestingly, college-bound rural youth were more likely than nonrural youth to be employed in construction (adj. res. $= \pm 4.0$) and grocery-related occupations (adj. res. $= \pm 3.2$).

Significant differences were identified in the number of hours worked per week between college- and work-bound adolescents in both rural, $\chi^2(2) = 115.17, p < .0001$, and nonrural locations, $\chi^2(2) = 322.34, p < .0001$. Almost one-half of all employed work-bound youth reported working more than 20 hours per week compared to only one-fourth of college-bound youth (adj. res. rural $= \pm 10.3$, nonrural $= \pm 16.3$). When the influence of residence was removed, college-bound seniors were more likely to report working fewer hours per week—1-10 hours per week (adj. res. rural $= \pm 6.8$, nonrural $= \pm 13.1$); 11-20 hours per week (adj. res. rural $= \pm 4.3$, nonrural $= \pm 5.0$).

Table 2

*Work-related Characteristics and Preparation of Rural and Nonrural Respondents*

| | Rural Adolescents | | | | Nonrural Adolescents | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Work-bound | | College-bound | | Work-bound | | College-bound | |
| | *n* | *%* | *n* | *%* | *n* | *%* | *n* | *%* |
| High school program | | | | | | | | |
| College preparation | 367 | (19.1) | 1,059 | (57.7) | 754 | (21.3) | 2,945 | (58.7) |
| General education track | 896 | (46.7) | 567 | (30.9) | 1,601 | (45.2) | 1,450 | (28.9) |
| Vocational track | 446 | (23.2) | 105 | (5.7) | 623 | (17.6) | 289 | (5.8) |
| Other educational programs | 211 | (11.0) | 104 | (5.7) | 566 | (16.0) | 332 | (6.60) |
| Participation in vocational education | | | | | | | | |
| No prior involvement | 632 | (33.5) | 925 | (50.9) | 1,315 | (38.1) | 3,062 | (62.0) |
| One or more courses, not in track | 678 | (35.9) | 702 | (38.6) | 1,081 | (31.4) | 1,334 | (27.0) |
| Vocational track (multiple courses) | 367 | (19.5) | 88 | (4.8) | 485 | (14.1) | 211 | (4.3) |
| Part-time work experience | | | | | | | | |
| No work experience | 285 | (15.0) | 223 | (12.2) | 543 | (15.6) | 641 | (12.9) |
| Past work experience, unemployed | 675 | (35.5) | 680 | (37.2) | 1,079 | (31.1) | 1,771 | (35.6) |
| Currently employed | 941 | (49.5) | 925 | (50.6) | 1,851 | (53.3) | 2,557 | (51.5) |
| Occupational aspirations in grade 12 | | | | | | | | |
| College degree required | 748 | (46.6) | 1,341 | (81.8) | 1,624 | (57.8) | 3,648 | (84.0) |
| HS diploma, some college required | 635 | (39.5) | 267 | (16.3) | 888 | (31.6) | 573 | (13.2) |
| Less than high school diploma required | 224 | (13.9) | 32 | (1.9) | 296 | (10.5) | 120 | (2.8) |
| Occupational aspirations 2 years PS | | | | | | | | |
| College degree required | 747 | (45.6) | 1,347 | (78.1) | 1,685 | (54.3) | 3,818 | (81.6) |
| High school diploma, some college required | 638 | (38.9) | 333 | (19.3) | 1,077 | (34.7) | 739 | (15.8) |
| Less than high school diploma required | 253 | (15.5) | 44 | (2.6) | 340 | (10.9) | 124 | (2.7) |

| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupational aspirations in grade 12 | 47.52 | 18.67 | 60.25 | 13.49 | 52.45 | 17.19 | 61.24 | 12.67 |
| Occupational aspirations 2 years PS | 46.55 | 18.51 | 57.81 | 15.14 | 49.58 | 17.92 | 59.53 | 14.10 |
| Educational aspirations | 3.79 | 1.36 | 5.15 | .89 | 4.23 | 1.27 | 5.30 | .80 |
| Residential preference | 1.82 | .76 | 1.87 | .77 | 1.82 | .77 | 1.70 | .73 |

*Note.* Totals may not equal 100.0% due to missing or incomplete data or rounding error.

Table 3

*Work Involvement and Experiences of Currently Employed Rural and Nonrural Adolescents in Grade 12*

| | Rural Adolescents | | | | Nonrural Adolescents | | | |
| | Work-bound | | College-bound | | Work-bound | | College-bound | |
| | $n$ | % | $n$ | % | $n$ | % | $n$ | % |
|---|---|---|---|---|---|---|---|---|
| Type of employment[a] | | | | | | | | |
| Fast food occupations | 220 | (26.9) | 212 | (25.1) | 443 | (28.1) | 493 | (21.6) |
| Service occupations | 54 | (6.6) | 65 | (7.7) | 129 | (8.2) | 170 | (7.4) |
| Sales occupations | 46 | (5.6) | 78 | (9.3) | 192 | (12.2) | 359 | (15.8) |
| Health occupations | 27 | (3.3) | 14 | (1.6) | 32 | (2.1) | 38 | (1.7) |
| General office occupations | 35 | (4.3) | 64 | (7.6) | 97 | (6.1) | 213 | (9.3) |
| Construction occupations | 22 | (2.7) | 17 | (2.0) | 39 | (2.5) | 11 | (.5) |
| Grocery clerk | 142 | (17.3) | 174 | (20.6) | 231 | (14.6) | 357 | (15.7) |
| Farm worker/laborer | 80 | (9.8) | 35 | (4.2) | 42 | (2.7) | 53 | (2.3) |
| Mechanic/general repair | 26 | (3.1) | 7 | (.8) | 38 | (2.4) | 9 | (.4) |
| Other, not specified | 168 | (20.4) | 178 | (21.1) | 333 | (21.1) | 577 | (25.3) |
| | | | | | | | | |
| Hours worked per week[b] | | | | | | | | |
| 1-10 hours per week | 127 | (15.0) | 177 | (10.6) | 249 | (28.5) | 656 | (27.5) |
| 11-20 hours per week | 316 | (37.3) | 668 | (40.0) | 415 | (47.5) | 1,145 | (48.0) |
| 21 or more hours per week | 405 | (47.8) | 822 | (49.3) | 209 | (24.0) | 586 | (24.6) |
| | | | | | | | | |
| Wages earned[c] | | | | | | | | |
| Less than $4.25 per hour | 101 | (12.1) | 98 | (11.4) | 75 | (4.7) | 138 | (6.0) |
| $4.25-$6.00 per hour | 651 | (78.4) | 694 | (80.7) | 1,291 | (80.8) | 1,844 | (79.5) |
| More than $6.00 per hour | 79 | (9.5) | 68 | (7.8) | 232 | (14.5) | 336 | (14.5) |

*Note:* Totals may not equal 1000.0% due to missing or incomplete data or rounding error.
[a]Missing date, $n = 708$.
[b]Missing data, $n = 527$.
[c]Missing data, $n = 695$.

Approximately three-fourths of all adolescents earned at or slightly above minimum wage. (The minimum wage was $4.25 in 1992 when these data were collected from high school seniors.). However, several differences did exist in the wages earned by rural and nonrural individuals who were college-bound, $\chi^2(2) = 4709$, $p < .0001$, or work-bound, $\chi^2(2) = 52.53$, $p < .0001$. For example, work-bound and college-bound youth in rural locales were two and three times more likely to report earning below the minimum wage than nonrural peers (adj. res. = ±6.7, ±5.2). Conversely, rural adolescents were less likely than nonrural adolescents to report earning wages of more than $6.00 per hour (adj. res. work-bound = ±3.5, college-bound = ±5.0).

*Occupational aspirations.* Focused contrasts with one-way ANOVA were used to determine if differences existed in the occupational aspirations of participants in Grade 12 and 2 years after high school completion on the basis of residence and transition path, respectively (see Table 2 for

descriptive data). Statistically significant differences were found for each of the four separate analyses. Rural youth in Grade 12 reported significantly lower occupational aspirations than nonrural youth, $F(1,12394) = 154.71$, $p < .0001$. The effect size coefficient for this comparison equaled .24, indicating that the difference between rural and nonrural youth was of some, albeit small, practical importance. The statistical difference between rural and nonrural youths remained 2 years later when occupational aspirations were next reported, $F(1,12394) = 105.26$, $p < .0001$. The effect size coefficient ($ES = .20$) revealed no changes in the practical importance of this difference.

As expected, statistically significant differences in the occupational aspirations of college-bound and work-bound adolescents in grade 12, $F(1,12313) = 1365.29$, $p < .0001$, and 2 years after high school completion, $F(1,12313) = 1292.62$, $p < .0001$, were found. In both instances, college-bound individuals held higher occupational aspirations than

Table 4
*Internal Classification Results for Predictive Discriminant Analysis*

| | Predicted Group Membership | | | |
| --- | --- | --- | --- | --- |
| Actual Group Membership | Work-bound | | College-bound | |
| Individuals in rural areas[a] | | | | |
| Work-bound (n = 1,919) | 1,387 | (72.3%) | 532 | (27.7%) |
| College-bound (n = 1,835) | 455 | (24.8%) | 1,380 | (75.2%) |
| Individuals in nonrural areas[b] | | | | |
| Work-bound (n = 3,544) | 1,968 | (55.5%) | 1,576 | (44.5%) |
| College-bound (n = 5,016) | 877 | (17.5%) | 4,139 | (82.5%) |

*Note.* Percents reflect row totals and may not equal 100.0% due to missing data or rounding error.
[a]Separate hit rates are given in parentheses. Overall hit rate for rural individuals is 2,767/3,754 = 73.71%.
[b]Separate hit rates are given in parentheses. Overall hit rate for nonrural individuals is 6,107/8,560 = 71.35%.

work-bound counterparts. Effect size coefficients revealed moderate to high differences both at Grade 12 ($ES$ = .64) and 2 years postsecondary ($ES$ = .62). These coefficients indicate that approximately 70% of work-bound adolescents aspired to occupations with mean scores below the mean aspiration scores reported by college-bound youths.

*Educational aspirations.* As expected, college-bound youth reported statistically higher educational aspirations than work-bound youth, $F(1,11240) = 3415.44, p < .0001$. In fact, the magnitude of this difference was quite substantial ($ES$ = .98). Rural youth reported significantly lower educational aspirations than nonrural youth, $F(1,11240) = 268.27, p < .0001$. In terms of practical significance, the effect size coefficient equaled .33 indicating some practical importance.

*Postsecondary residential preference.* Chi-square analysis was used to examine the importance that rural and nonrural high school seniors placed on staying or moving away from home. No statistically significant differences in residential preferences were found between rural and nonrural work-bound youth, $\chi^2(2) = .36$, *n.s.* Approximately 40.3% of work-bound youth indicated that moving away from the area in which they currently lived was not important, 37.4% attached some importance to moving away, and slightly less than one-quarter of respondents attached high importance (22.3%) to moving. In contrast, significant differences were noted between rural and nonrural college-bound youth, $\chi^2(2) = 64.45, p < .0001$. Moving away from the area where they lived was more important to college-bound rural adolescents than to their nonrural counterparts—not important [rural = 37.1%, nonrural = 46.4% (adj.

res. = ±6.8)]; very important [rural = 23.9%, nonrural = 16.7% (adj. res. = ±6.7)].

*Predicting Transition Path 2 Years After High School Completion*

Separate PDA were conducted with rural and nonrural groups. An internal classification rule—i.e., a prediction rule built on the same individuals to which it is applied— was used to classify participants' transition path as either college- or work-bound. Internal analysis is acceptable when the total number of cases is large (Huberty & Barton, 1989). The classification table provides an estimate of PDA hit rates (see Table 4). A hit occurs when an individual case is assigned to the same group from which it was originally drawn using the developed prediction equation.

The PDA equation resulted in the accurate classification of 80.6% of all college-bound youth (5,519 out of 6,851), regardless of residence. The overall hit rate for nonrural college-bound youths was almost 10% higher than for rural peers. Total hit rate accuracy for work-bound youth was calculated at 61.4% (3,355 out of 5,463)—prediction accuracy for work-bound rural youth was substantially higher than for nonrural youth (72.3% vs. 55.5%).

*Rural youth.* The PDA equation computed for adolescents living in rural areas allowed fairly accurate classification—approximately three-fourths of individuals were correctly assigned to either work-bound or college-bound status. While the prediction accuracy was slightly higher for college-bound rural youths, rates for work-bound and college-bound rural youths were comparable. Table 5 displays results of the L-O-O analysis to determine the rela-

Table 5

*Hit Rates of 11-Predictor Subset Linear Classifications Using Leave-One-Out Method*

| Predictor variable deleted | Number of Hits | | | | | | | Rank Based on $Z$ Values$_{(i)}$ | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Work-bound | | College-bound | | Overall | | | Work-bound | College-bound | Overall |
| | $n$ | $Z_{(i)}$ | $n$ | $Z_{(i)}$ | $n$ | % | $Z_{(i)}$ | | | |
| Individuals in rural areas | | | | | | | | | | |
| Race/ethnicity | 1,390 | 19.63 | 1,374 | 21.33 | 2,764 | 73.62 | 28.93 | 8 | 5 | 8.5 |
| Socioeconomic status | 1,299 | 15.49 | 1,368 | 20.99 | 2,667 | 71.03 | 25.76 | 1 | 5 | 1.5 |
| High school program | 1,366 | 18.58 | 1,379 | 21.59 | 2,745 | 73.11 | 28.31 | 3 | 10 | 4 |
| Participation in | | | | | | | | | | |
| vocational education | 1,358 | 18.14 | 1,376 | 21.42 | 2,734 | 72.82 | 27.95 | 3 | 5 | 4 |
| Part-time work experience | 1,392 | 19.72 | 1,376 | 21.42 | 2,768 | 73.73 | 29.07 | 8 | 5 | 8.5 |
| Occupational aspirations | | | | | | | | | | |
| —Grade 12 | 1,391 | 19.72 | 1,263 | 16.11 | 2,654 | 70.69 | 25.34 | 8 | 1 | 1.5 |
| Mathematics achievement | 1,373 | 18.84 | 1,363 | 20.82 | 2,736 | 72.87 | 28.01 | 3 | 5 | 4 |
| Science achievement | 1,389 | 19.54 | 1,379 | 21.59 | 2,768 | 73.72 | 29.05 | 8 | 10 | 8.5 |
| Self-esteem | 1,393 | 19.80 | 1,378 | 21.50 | 2,771 | 73.81 | 29.16 | 8 | 5 | 8.5 |
| Locus of control | 1,390 | 19.63 | 1,390 | 22.02 | 2,780 | 74.03 | 29.43 | 8 | 10 | 8.5 |
| Residential preference | 1,386 | 19.45 | 1,379 | 21.51 | 2,765 | 73.63 | 28.94 | 8 | 5 | 8.5 |
| Individuals in nonrural areas | | | | | | | | | | |
| Race/ethnicity | 1,966 | 18.84 | 4,145 | 32.67 | 6,111 | 71.38 | 36.40 | 7.5 | 5.5 | 8 |
| Socioeconomic status | 1,820 | 13.86 | 4,136 | 32.53 | 5,956 | 69.58 | 33.07 | 1.5 | 5.5 | 1 |
| High school program | 1,892 | 16.29 | 4,217 | 34.84 | 6,109 | 71.36 | 36.37 | 3.5 | 10.5 | 8 |
| Participation in | | | | | | | | | | |
| vocational education | 1,841 | 14.58 | 4,191 | 34.12 | 6,032 | 70.48 | 34.74 | 1.5 | 10.5 | 3 |
| Part-time work experience | 1,971 | 18.96 | 4,136 | 32.53 | 6,107 | 71.35 | 36.35 | 7.5 | 5.5 | 8 |
| Occupational aspirations | | | | | | | | | | |
| —Grade 12 | 2,028 | 20.90 | 4,014 | 28.91 | 6,042 | 70.59 | 34.94 | 11 | 1 | 3 |
| Mathematics achievement | 1,899 | 16.53 | 4,144 | 32.67 | 6,043 | 70.59 | 34.94 | 3.5 | 5.5 | 3 |
| Science achievement | 1,956 | 18.47 | 4,141 | 32.67 | 6,097 | 71.23 | 36.13 | 7.5 | 5.5 | 8 |
| Self-esteem | 1,966 | 18.84 | 4,132 | 32.38 | 6,098 | 71.24 | 36.14 | 7.5 | 5.5 | 8 |
| Locus of control | 1,949 | 18.23 | 4,142 | 32.67 | 6,091 | 71.16 | 36.00 | 7.5 | 5.5 | 8 |
| Residential preference | 1,969 | 18.96 | 4,137 | 32.53 | 6,106 | 71.34 | 36.33 | 7.5 | 5.5 | 8 |

tive contribution of each predictor to classification accuracy. SES was the most important variable in correctly classifying work-bound adolescents; as SES increased so did the likelihood of college attendance. Several other variables also resulted in decreased hit rates signifying some importance—participation in vocational education, type of high school program, mathematics achievement, and stated preferences to stay or relocate after graduation. A slightly different classification rule pattern was observed for college-bound rural youths. The single most important variable for classification accuracy of this group was the occupational aspirations held in Grade 12. SES and mathematics achievement were also important variables for maximizing prediction accuracy but to a lesser degree than aspirations.

*Nonrural youth.* The PDA equation for nonrural college-bound resulted in slighter higher classification accuracy than for rural college-bound peers. As with rural counterparts, the most important variable for nonrural college-bound adolescents was Grade 12 occupational aspirations. Interestingly, this predictor was the least important variable for nonrural work-bound youth. High school program and participation in vocational education were the least important predictors for nonrural college-bound participants, while several other variables—socioeconomic status, part-time work experience, and self-esteem—were of lesser importance for nonrural college-bound participants.

The internal classification rule for nonrural work-bound youth was different and much less accurate than for the other rural and nonrural subgroups. In fact, the established PDA equation was only slightly better than chance in correctly classifying nonrural work-bound individuals. SES and participation in vocational education were most important for correct classification—similar to findings for rural work-bound peers. Even so, the accuracy obtained in

predicting work-bound status for nonrural youth was not much better than flipping a coin.

## Discussion

The focus of this analysis was on describing select career-related characteristics (predictors) of work-bound rural youth; descriptions of college-bound rural youth and nonrural adolescents were also given. The importance of analyses like this one is the improved understanding of personal experiences and systemic influences that are indicators of work-bound or college-bound status. The differential effects that rural or nonrural residence present (e.g., types of job/career opportunities, availability of career-related role models, community economic base) to the career selection and preparation process are also important factors that need additional study. A better understanding of these issues can lead to the development or enhancement of programs and services designed to support the successful transition of adolescents from school to adult life.

Use of a nationally representative longitudinal database and a focus on work-bound youth are positive aspects of this study. However, since a limited number of career-related variables measured only in Grade 12 were used, results should be interpreted cautiously. Additional information about adolescents, measured earlier in their educational experiences, may also need to be considered in future analyses. Despite potential constraints, results do contribute to a better understanding of the influence of factors considered important in the transition from high school to adult life, whether work- or college-bound, rural or nonrural.

Demographic profiles for work-bound and college-bound youths were developed to provide a picture of these individuals based on rural or nonrural residence. Findings support prior descriptions (Choy et al., 1994; Herr, 1995) of youth engaged in work and college transition paths, revealing a general profile of adolescents who select one path over another. Here, rural youth were more likely to be work-bound than nonrural youth. In addition, African American and Hispanic students were more likely to be work-bound than European or Asian American students. SES had a substantial importance in transition path status. Individuals in the lowest SES quartile were twice as likely to be work-bound, while adolescents in the highest SES quartile were four times more likely to be college-bound than youths in lower SES quartiles.

Regardless of residence, work-bound youth reported greater involvement in vocational education than college-bound youth. However, given the limitations of PDA analysis, it is not possible to determine whether this situation is a result of proactive decisions by work-bound youths to receive vocational preparation prior to high school completion, limited educational alternatives for adolescents who have either ruled out or cannot successfully complete col-

lege preparation curricula, or, as has been suggested by structural sociology (Meyer, 1987) and status attainment theories (Hotchkiss & Borow, 1996), the result of systemic bias. Attention focused on determining whether adolescents participate in vocational programs because of personal reasons and decisions (e.g., academic ability or interests in obtaining vocational skills training) or as a result of systemic (institutional) practices that tend to place economically disadvantaged and less academically able youth in vocational programs appears warranted. "Given that disadvantaged adolescents and vocational program participants tend to express lowered aspirations, and as a result presumably limit their secondary and postsecondary opportunities to acquire advanced work skills and employment, this issue assumes a critical concern" (Rojewski, 1997, p. 56).

A number of authors have studied the potential conflict that exists for rural adolescents between the desire to pursue postsecondary goals and need to move to a more metropolitan area to achieve them—aspirations versus residence (Elder, 1992; Hektner, 1995; Hobbs, 1994; Sarigiani et al., 1990). This conflict was apparent when comparing rural and nonrural college-bound adolescents. However, work-bound rural youths did not attach more or less importance to moving away than nonrural counterparts. It would be interesting to determine whether greater certainty about immediate post-school plans, or other variables contributed to the perceived unimportance attached to residence expressed by work-bound rural youths.

Dissimilarities between rural and nonrural work-bound youth could reflect several things. Perhaps rural youth share similar experiences that help to shape or identify traditional career/transition paths such as a family business (farming) or rural-based industry traditionally offering employment to rural youths upon high school graduation. It is possible that more clearly identified work options exist in rural areas that also do not require advanced training or education as opposed to those found in nonrural areas. Finally, the increasingly diverse urban population—high minority concentrations, low socioeconomic status, immigrants and limited English proficient—and accompanying issues, problems, and concerns may serve to confound the influences of making transition-related decisions, not identified in rural residents. Fouad (1997) observed that unique forces operate on urban, inner-city youths that are then compounded by extensive poverty and racism. "These forces may lead to less planful, less introspective behavior, and may lead youth to be more buffeted by environmental factors" (p. 410).

These findings, coupled with the results of prior studies, hold several implications for those involved in rural school-to-work programs—education commissions and boards, local business and community leaders, teachers, parents, and students. Without doubt, the problem is com-

plex. Developers of successful school-to-work programs in rural areas must contend with a myriad of confusing, and sometimes contradictory, realities. And, while solutions must be tailored to meet the uniqueness of presented by different rural communities, rural constituents face common problems, e.g., Can work-bound youth continue to be prepared for high-tech, high-wage jobs only to see them move to more metropolitan areas in search of the types of jobs for which they were trained? How can educators address the seemingly insurmountable problem of persistent poverty found in many rural areas and the pronounced influence of SES on adolescents' transition path? Can or should secondary school-to-work programs promote goals other than higher education and employment for rural youth, e.g., nurture aspirations for a sense of family and community? (Howley et al., 1996).

Given the fear that rural school-to-work programs may undermine local economic development efforts, an essential element in successful programs must be the active and sustained involvement of community leaders representing employers, secondary and postsecondary educators, and families, viz., parents and students. Collectively, representatives of these different groups must identify the goals and outcomes of local school-to-work programs. Harmon (1998) suggested that rural programs promote community stewardship, a better understanding of rural life, encourage entrepreneurship, and develop a sense of community among students. In contrast, others may opt to prepare adolescents for high-tech, high-wage jobs that may require them to relocate to metropolitan areas. Regardless of outcomes, rural leaders must ensure that parents, students, and community residents are aware of, have been involved with, understand the consequences of program implementation, and support program initiatives.

A report published by the National School-to-Work Opportunities Office (1996) recommended that rural-based programs start early, identify educational and economic opportunities in the community, strengthen entrepreneurial opportunities for young people, and build networks with other rural schools. Economic development and the expansion or promotion of entrepreneurship opportunities may encourage more young people to remain in their rural communities after graduation or return after completion of postsecondary education or training.

In my analysis, SES was the single best predictor of postsecondary transition path for work-bound rural (and nonrural) youth. The negative effect of poverty on postsecondary educational and occupational attainment has been consistently documented (Hotchkiss & Borow, 1996; Jencks et al., 1983). Expanding economic opportunities may also, at least partially, address the persistent poverty found in many rural areas. This solution does not represent a quick fix to a chronic problem. Rather, community residents must take a committed and active role in the long-term growth of economic opportunities for all citizens.

Finally, the influence of teachers and others on postsecondary decisions cannot be overlooked. In rural areas, schools are often the focal point for the community (D'Amico, Matthes, Sankar, Merchant, & Zurita, 1996). As such, educators can actively promote a "sense of place" as a legitimate aspiration for young people, as well as academic and occupational achievement. However, rural educators need to be sensitive to the issues facing students initiating the transition from school to adult life. Ley et al. (1996) observed that "teachers' expectations may be more limiting than those of students and parents who value their community but also recognize their probable mobility" (p. 139). Teachers must also be involved in developing programs and curricula that look broadly at a variety of options for rural youth, and that they avoid reinforcing the stereotype that rural youth who remain in their community after graduation have somehow failed.

## References

Apostal, R., & Bilden, J. (1991). Educational and occupational aspirations of rural high school students. *Journal of Career Development, 18,* 153-160.

Bakeman, R., & Robinson, B. F. (1994). *Understanding log-linear analysis with ILOG: An interactive approach.* Hillsdale, NJ: Erlbaum.

Blustein, D. L., Phillips, S. D., Jobin-Davis, K., Finkelberg, S. L., & Roarke, A. E. (1997). A theory-building investigation of the school-to-work transition. *The Counseling Psychologist, 25,* 364-402.

Choy, S. P., Alt, M. N., & Henke, R. R. (1994). Profile of the target population for school-to-work initiatives. In *School-to-work: What does research say about it?* (pp. 97-130). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED 371 206)

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, NJ: Erlbaum.

Conger, A. J. (1976, September). *Group profiles on self-esteem, locus of control, and life goals.* Paper presented at the 84th annual meeting of the American Psychological Association, Washington, DC. (ERIC Document Reproduction Service No. ED 151 386)

Conger, A. J., Conger, J. C., & Riccobono, J. A. (1976). *National Longitudinal Study of high school class of 1972. Reliability and validity of National Longitudinal Study measures: An empirical reliability analysis of selected data and a review of the literature on the validity and reliability of survey research questionnaires.* Durham, NC: Research Triangle Institute, Center for Educational Research and Evaluation.

Conger, A. J., Dunteman, S. S., & Dunteman, G. H. (1977). *National Longitudinal Study of high school seniors, group profiles on self-esteem, locus of control, and life goals*. Durham, NC: Research Triangle Institute, Center for Educational research and Evaluation. (ERIC Document Reproduction Service No. ED 151 395)

D'Amico, J. J., Matthes, W., Sankar, A., Merchant, B., & Zurita, M. (1996). Young voices from the rural Midwest. *Journal of Research in Rural Education, 12*, 142-149.

Elder, W. L. (1992). The use of census geography and county typologies in the construction of classification systems for rural schools and districts. *Journal of Research in Rural Education, 8*(3), 47-68.

Fouad, N. (1997). School-to-work transition: Voice from an implementer. *Counseling Psychologist, 25*(3), 403-412.

Gysbers, N. C. (1997). Involving counseling psychology in the school-to-work movement: An idea whose time has come. *The Counseling Psychologist, 25*, 413-427.

Haller, E. J., & Virkler, S. J. (1993). Another look at rural-nonrural differences in students' educational aspirations. *Journal of Research in Rural Education, 9*, 170-178.

Halperin, S. (Ed.). (1998). *The forgotten half revisited*. Washington, DC: American Youth Policy Forum.

Harmon, H. (1998). *Building school-to-work systems in rural America*. Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.

Hektner, J. L. (1995). When growing up implies moving out: Rural adolescent conflict in the transition to adulthood. *Journal of Research in Rural Education, 11*, 3-14.

Helge, D. (1991). *Rural, exceptional, at-risk*. Reston, VA: Council for Exceptional Children.

Herr, E. L. (1995). *Counseling employment bound youth*. Greensboro, NC: ERIC Clearinghouse on Counseling Student Services. (ERIC Document Reproduction Service No. ED 382 899)

Herr, E. L. (1996). Career development and work-bound youth. In R. Feller & G. Walz (Eds.), *Career transitions in turbulent times: Exploring work, learning, and careers* (pp. 245-256). Greensboro, NC: ERIC Clearinghouse on Counseling Student Services.

Herr, E. L., & Niles, S. (1997). Perspectives on career assessment of work-bound youth. *Journal of Career Assessment, 5*, 137-150.

Hobbs, D. (1994). Demographics trends in nonmetropolitan America. *Journal of Research in Rural Education, 10*, 149-160.

Hotchkiss, L., & Borow, H. (1996). Sociological perspectives on work and career development. In D. Brown & L. Brooks (Eds.), *Career choice and development* (3rd ed., pp. 281-334). San Francisco: Jossey-Bass.

Howley, C. B., Harmon, H. L., & Leopold, G. D. (1996). Rural scholars or bright rednecks? Aspirations for a sense of place among rural youth in Appalachia. *Journal of Research in Rural Education, 12*, 150-160.

Huberty, C. J. (1994). *Applied discriminant analysis*. New York: Wiley.

Huberty, C. J., & Barton, R. M. (1989). An introduction to discriminant analysis. *Measurement and Evaluation in Counseling and Development, 22*, 158-168.

Huberty, C. J., & Wisenbaker, J. M. (1992). Discriminant analysis: Potential improvements in typical practice. In B. Thompson (Ed.), *Advances in social science methodology* (Vol. 2, pp. 169-208). Greenwich, CT: JAI Press.

Ingels, S. J., Dowd, K. L., Baldridge, J. D., Stipe, J. L., Bartot, V. H., Frankel, M. R., Owings, J., & Quinn, P. (1994). *National education longitudinal study of 1988: Second followup—Student component data file user's manual*. Washington, DC: U.S. Department of Education, National Center for Educational Statistics.

Ingels, S. J., & Scott, L. A. (1993). *Exclusion of students with barriers to participation in NELS:88—Baseline excluded students two and four years later*. Chicago: National Opinion Research Center. (ERIC Document Reproduction Service No. ED 360 371)

Ingels, S. J., Scott, L. A., Lindmark, J. T., Franekel, R. R., & Myers, S. L. (1992). *National education longitudinal study of 1988: First followup—student component data file user's manual*. Washington, DC: U.S. Department of Education, National Center for Educational Statistics.

Ingels, S. J., Scott, L. A., Rock, D., Pollack, J., & Rasinski, K. (1994). *NELS:88 first followup final technical report*. Washington, DC: U.S. Department of Education, National Center for Educational Statistics. (ERIC Document Reproduction Service No. ED 379 315)

Institute on Education and the Economy. (1992, March). *Post-high school employment and schooling patterns of non-college bound youth* (IEE Brief Number 3). New York: Columbia University. (ERIC Document Reproduction Service No. ED 363 693)

Jencks, C., Crouse, J., & Muesser, P. (1983). The Wisconsin model of status attainment: A national replication with improved measures of ability and aspiration. *Sociology of Education, 56*, 3-19.

Kanouse, D. E., Haggerstrom, G. W., Blaschke, T. J., Kahan, J. P., Lisowski, W., & Morrison, P. A. (1980). *Effects of postsecondary education on aspirations, attitudes, and self-conceptions*. Santa Monica, CA: Rand Corporation. (ERIC Document Reproduction Service No. ED 214 430)

Kaufman, P., Rasinski, K., Lee, R., & West, J. (1991). *Quality of the responses of eighth-grade students in*

*NELS:88.* Washington, DC: U.S. Department of Education, National Center for Educational Statistics.

Lent, R. W., Brown, S. D., & Hackett, G. (1996). Career development from a social cognitive perspective. In D. Brown & L. Brooks (Eds.), *Career choice and development* (3rd ed., pp. 423-475). San Francisco: Jossey-Bass.

Leong, F. T. L., & Brown, M. T. (1995). Theoretical issues in cross-cultural career development: Cultural validity and cultural specificity. In W. B. Walsh & S. H. Osipow (Eds.), *Handbook of vocational psychology: Theory, research, and practice* (2nd ed., pp. 143-180). Mahwah, NJ: Erlbaum.

Ley, J., Nelson, S., & Beltyukova, S. (1996). Congruence of aspirations of rural youth with expectations held by parents and school staff. *Journal of Research in Rural Education, 12*, 133-141.

Meyer, K. A. (1987). The early labor market experiences of adolescents: Differences in status and monetary reward. *Journal of Industrial Teacher Education, 24*, 45-61.

Murray, J. D., Keller, P. A., McMorran, B. J., & Edwards, B. L. (1983). Future expectations of rural American youth: Implications for mental health. *International Journal of Mental Health, 12*, 76-88.

*National Education Longitudinal Study: 1988-94* [CD-ROM database]. (1996). Washington, DC: National Center for Educational Statistics, Office of Educational Research and Improvement, U.S. Department of Education [Producer and Distributor].

National School-to-Work Opportunities Office. (1996). *Building school-to-work systems in rural areas.* Washington, DC: U.S. Department of Education, Author.

Norusis, M. J. (1988). *SPSS/PC+ advanced statistics v2.0.* Chicago: SPSS International.

Olejnik, S., & Hess, B. (1997). Top ten reasons why most omnibus ANOVA F-tests should be abandoned. *Journal of Vocational Education Research, 22*, 219-232.

Osipow, S. H., & Fitzgerald, L. F. (1996). *Theories of career development* (4th ed.). Boston, MA: Allyn and Bacon.

Owings, J., McMillan, M., Ahmed, S., West, J., Quinn, P., Hausken, E., Lee, R., Ingels, S., Scott, L., Rock, D., & Pollack, J. (1994). *A guide to using NELS:88 data.*

Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Quaglia, R. J., & Cobb, C. D. (1996). Toward a theory of student aspirations. *Journal of Research in Rural Education, 12*, 127-132.

Rock, D. A., & Pollack, J. M. (1991). *Psychometric report for the NELS:88 base year test battery.* Washington, DC: U.S. Department of Education, National Center for Education Statistics. (ERIC Document Reproduction Service No. ED 334 241)

Rojewski, J. W. (1997). Effects of disadvantaged status and secondary vocational education on work experience and postsecondary aspirations. *Journal of Vocational and Technical Education, 14*(1), 43-59.

Rojewski, J. W., Wicklein, R. C., & Schell, J. W. (1995). Effects of gender and academic-risk behavior on the career maturity of rural youth. *Journal of Research in Rural Education, 11*, 92-104.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Rotter, J. B. (1966). Generalized expectancies for internal and external control of reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1-28.

Saltiel, J. (1988). The Wisconsin model of status attainment and the occupational choice process. *Work and Occupations, 15*, 334-355.

Sarigiani, P. A., Wilson, J. L., Petersen, A. C., & Vicary, J. R. (1990). Self-image and educational plans of adolescents from two contrasting communities. *Journal of Early Adolescence, 10*, 37-55.

Smith, C. L., & Rojewski, J. W. (1993). School-to-work transition: Alternatives for educational reform. *Youth & Society, 25*, 222-250.

Stevens, G., & Cho, J. H. (1985). Socioeconomic indexes and the new 1980 census occupational classification scheme. *Social Science Research, 14*, 142-168.

William T. Grant Foundation Commission on Work, Family, and Citizenship. (1988). *The forgotten half: Pathways to success for America's youth and young families.* Washington, DC: Author.

Worthington, R. L., & Juntunen, C. L. (1997). The vocational development of noncollege-bound youth: Counseling psychology and the school-to-work transition movement. *The Counseling Psychologist, 25*, 323-363.