Changes in Students’ Academic Performance and Perceptions of School and Self Before Dropping Out of Schools

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This study was designed to investigate changes in personal attributes of high-school dropout students between 8th grade and 12th grade. Students who participated in 3 waves of data collection in the “National Educational Longitudinal Study: 1988–1994” in the 8th, 10th, and 12th grades, but who dropped out before completing high school, were identified. Scales were developed on rational and empirical grounds that measured the following personal attributes: academic performance, relationships with teachers, relationships with peers, perceptions of school, participation in school activities, motivation for school work, effort expended in school work, self-esteem, and locus of control. Longitudinal comparisons in the personal attributes showed a gradually deteriorating process. Except in academic performance, the students scored at the national average in eighth grade. However, their academic performance, relationship with teachers, perception of school, motivation in school work, and participation in school activities were significantly below the national average in the 10th and 12th grades. The study showed a developmental pattern of the personal attributes of dropout students and identified that the transition to high school is a critical yet neglected time when interventions should be provided.

The high-school dropout rate is a major educational problem for dropout students and for society. Technological advancements have placed a demand for a highly educated work force and decreased demand for unskilled labor. Dropout students

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will find that the lack of a high-school diploma puts them in a disadvantageous position in the competition with more educated applicants in the job market (Aley, 1995; Alspaugh, 1997). They may also find that their lack of education may deny them entry into the workforce altogether (Alspaugh, 1997). As a result of their low competitiveness in the labor market, dropout students tend to be hired for jobs with incomes lower than high-school graduates and are more likely to live in poverty situations (Alexander, Entwisle, & Horsey, 1997).

These personal consequences of dropping out have inevitable implications on a national level. Dropouts who are unemployed or employed in lowly paid jobs don’t earn sufficient income to keep them from living in poverty, so they are more likely to be in need of public assistance from the Welfare system (Alexander et al., 1997). Researchers have also found that being a dropout increases the probability of becoming involved in criminal activities and spending time in prison (Alexander et al., 1997).

To address the dropout problem that costs individuals and society, educational researchers have devoted a great amount of effort to understanding the phenomenon and preventing students from dropping out (see Alexander et al., 1997; Rumberger’s reviews, 1987, 1995). These efforts have reached a convincing conclusion: The high-school dropout rate is a complicated problem that is related to environmental factors, such as characteristics of school, family, and community, as well as personal attributes of students who drop out.

With regard to the environmental factors, researchers have found that some school characteristics are related to students’ dropout. Variables such as school size, school climate, and academic quality of schools were important predictors of students’ dropout status in high school. Students from large schools (Fetler, 1989; Gardner, Ritblatt, & Beatty, 1999; Marsh, 1991; Pittman & Haughwout, 1987), schools that restrict student autonomy (Vallerand & Fortier, 1997), and schools with poor academic quality (Fetler, 1989) are more likely to have dropouts. Researchers have also found that these school factors interact in how they predict the school-dropout rate. For example, although finding that school size is positively related to dropout rate, Pittman and Haughwout also found that the impact of the school factor could be almost totally attributed to the social climate of the school. Merritt (1983) reported that school size and school organization interacted in predicting the school dropout rate of secondary schools in Mississippi: Although large schools in general had a higher dropout rate than small schools, large schools including Grades 7 to 12 actually had a lower dropout rate than schools including Grades 9 to 12 or Grades 10 to 12.

Family is another important environmental factor related to dropping out. It has been found repeatedly that students from families with low socioeconomic status (SES; Ensminger & Slusarcick, 1992; Jordan, Lara, & McPartland, 1996; Kaplan, Peck, & Kaplan, 1997; Rumberger, 1995) and single-parent families (Alexander et al., 1997; Barrinton & Hendricks, 1989; Kortering, Haring, & Klockars, 1992; Rumberger, 1995) bear a greater risk of leaving school prematurely. Some re-
searchers investigating the impact of the family environment on dropping out focused their attention on the interaction between children and parents. They found that parents’ expectations for children’s education (Rumberger, 1995), parents’ involvement in children’s school work (Ensminger & Slusarick, 1992; Rumberger, 1995), and parents’ support of students’ autonomy (Rumberger, Ghatak, Poulos, Ritter, & Dornbusch, 1990; Vallerand & Fortier, 1997) were positively related to the likelihood that the children would graduate from high school.

Features of the community where students live are environmental characteristics related to dropping out as well. Figueira-McDonough (1992) found that community characteristics, such as the number of children per household, percentage of community residents who did not complete high school, percentage of unattached individuals, and the concentration of minorities within a community were positively related to the dropout rate of the community. Her later study (Figueira-McDonough, 1993), further identified the proportion of Latinos in the population, poverty, the need for public assistance, male unemployment, and single motherhood as positive predictors for the dropout rate of the community. The degree of urbanization of a community has also been shown to be positively related to dropout rate (Marsh, 1991).

Although environmental factors (characteristics of schools, families, and communities) are shown to be related to students’ dropping out, the most direct and immediate effects on the dropout decision are associated with students’ personal attributes. Environmental factors, after all, affect students’ decisions through students’ perceptions of the environment. Therefore, it is no surprise to find that, by far, the largest set of predicting variables for dropout scrutinized by researchers is student characteristics. Researchers have investigated a great variety of demographic, psychological, and behavioral variables to understand why students drop out of high school.

Among the demographic variables examined, individuals with ethnic minority backgrounds, low SES, and English as a second language have shown consistently higher dropout rates (Ekstrom, Goertz, Pollack, & Rock, 1986; Kaplan et al., 1997; McNeal, 1995; Rumberger, 1983, 1987). For example, there is a dramatic difference in the dropout rate between different ethnic groups. African American, Hispanic, and Native American students have a much higher risk of dropping out than their Anglo and Asian counterparts. Although the dropout rate was 9.1% for the nation and 8.8% for White students, the rates were 11.2% for African American students and 21% for Hispanic students (U.S. Census Bureau, 1999). The rate for Native Americans was even higher than that of the two other minority groups—as high as 90% in some areas (Steinberg, 1982).

These individual characteristics and some aforementioned family demographic characteristics, such as family structure, poverty, and student native language, constitute what researchers call “social address” variables (Bronfenbrenner, 1986). Although the social address variables are very useful to depict a profile of dropout
students, it doesn’t help much toward understanding and solving the problem of dropping out. First, as indicated by researchers, these variables “reveal very little about the underlying processes that influence ... dropout behavior” (Rumberger, 1995, p. 585). For example, researchers found that, after controlling for other factors, ethnicity had little, if any, effect on the likelihood of dropping out of high school (White & Kaufman, 1997). Second, even if we know that these variables are related to dropout, it is difficult, if not impossible, to conduct interventions at the social address variable level to influence students’ decisions to drop out of school. Finally, and perhaps most important, the meaning of findings of this type is easily misconstrued. Findings regarding social address variables are sometimes used to imply that there are irrevocable intellectual advantages or disadvantages associated with such structural factors as SES, ethnicity, and family composition. Thus, most researchers, although acknowledging the importance of social address variables, have focused their efforts on behavioral and psychological attributes of dropout students, such as their academic performance and perceptions of teachers, schools, peers, and themselves. We also focused our study on these variables, and we turn our discussion to them next.

Poor academic performance is one of the most often cited behavioral variables related to dropping out (Astone & McLanahan, 1991; Barrington & Hendricks, 1989; Ekstrom et al., 1986; Ensminger & Slusarcick, 1992; Fettler, 1989; Jordan et al., 1996; Kaplan et al., 1997; Marsh, 1991; Morris, Ehren, & Lenz, 1991; Roderick, 1994; Rumberger, 1995; Simner & Barnes, 1991; Wehlage & Rutter, 1986). Rumberger (1995), using information from the National Educational Longitudinal Study of 1988 (NELS:88), conducted a comprehensive investigation of the effects of personal, family, and school variables on dropouts. He found that, after controlling many demographic, family, and school variables in a logistic regression model, students’ academic performance, measured by their course grades and standardized test scores, was still a significant predictor of dropping out. An increase in grades or test scores significantly reduced the possibility of dropping out. Other researchers (e.g., Simner & Barnes, 1991) found that even the academic performance of students in their early school career was negatively related to high-school dropouts. They reported that low reading and arithmetic scores in first grade predicted a high probability of dropping out before high-school graduation.

Low motivation is another important psychological factor predictive of dropouts. Adapting Deci and Ryan’s (1987) cognitive emergence theory, Vallerand and Fortier (1997) proposed a motivational model to explain dropout behavior. As Deci and Ryan postulated that feelings of competence and self-determination were two fundamental components of intrinsic motivation, Vallerand and Fortier contended that if school administrators, teachers, and parents were supportive of students’ autonomy, the students would feel competent in school activities and self-determinant in school-related affairs. The perceived autonomy and competence on the part of students would further develop into self-determined school
motivation. Students with high self-determined school motivation would have a strong intention to stay in school and complete their high school education, whereas students with low self-determined school motivation would be at a high risk of dropping out. This motivational model was tested with structural equation modeling and supported by data collected from a group of more than 4,000 high-school students. Other researchers (Astone & McLanahan, 1991; Kaplan et al., 1997) have reported similar findings: Students were losing their motivation for school work before dropping out. Kao and Tienda (1998) found that among students with various ethnic backgrounds, those with the lowest aspiration for their own education had the highest dropout rate.

If dropping out is characterized by a lack of academic success and low motivation for school work, it is not surprising to find that dropout students also have low self-esteem and an external locus of control. Learned helplessness theorists (Abramson, Seligman, & Teasdale, 1978; Kuhl, 1981) contended that after experiencing a sufficient amount of noncontingency between effort and outcome (i.e., repeated failures), students tended to perceive themselves as pawns in an environment where they were controlled by external forces and developed the learned helplessness syndrome. Students with learned helplessness abandon their effort in sequential learning tasks, even in tasks they never failed before, which leads to deficits in performance, motivation, and emotion. Attribution theorists (Abramson et al., 1978; Weiner, 1986) further demonstrated that attributing failures to stable and global factors, such as lack of ability, led to chronic and universal learned helplessness that could be severely harmful to students' cognition, motivation, and self-esteem. With this line of reasoning, Finn (1989), based on his review of dropout literature, depicted dropping out as a "failure—frustration—low self-esteem" process. The model has been supported by research findings. Calabrese and Poe (1990) found that junior high and high-school students who felt powerless in schools were at a great risk of dropping out. Wood, Hillman, and Sawilowsky (1996) conducted a study to investigate self-esteem and locus of control of African American students. Comparisons between students at risk of dropping out and dropout students who lived in shelters or were homeless showed the students who strayed away from school and home had greater external locus of control and lower self-esteem. Vallerand and Fortier (1997) also reported that the stronger the students' perception of autonomy in school and at home, which could be conceptually seen as an internal locus of control, the more likely the students completed high school.

Researchers who investigated dropouts from a sociological perspective believe that dropping out is a gradual process. Dropping out initially begins with students deviating from the social norm of school behavior, followed by ceasing their participation in school activities, failing to identify with school values, alienating themselves from the school community, and finally disconnecting from the school community (Finn, 1989; Kaplan et al., 1997; McNeal, 1995). Supportive evidence for the sociological model is ample. For example, Tinto
(1987) found that a high level of integration in a school community was associated with a decreased likelihood of students' dropping out of high school. Kaplan et al. found that students who felt rejected by their teachers and peers and who were viewed by other students as deviant were at a high risk of dropping out. Calabrese and Poe (1990) found that students who were isolated from peers in schools were likely to drop out. McNeal also found that participation in school activities, especially team sports, reduced the probability of dropping out. Rumberger (1995) found that the negative attitudes students held toward their teachers and peers were predictive for dropping out.

Dropout students' alienation from the school community is also manifested in their negative perception of school. Reyes and Jason (1993) assessed the school satisfaction of students with a high or low risk of dropping out who were matched in age and academic performance. The researchers found that the low-risk students were more satisfied with school than the high-risk students. Rumberger (1987) found that Hispanic male students chose disliking school as the reason for dropping out more often than they did economic reasons (desire to work, financial difficulties, and home responsibilities) and personal reasons (marriage). Using a national database, Jordan et al. (1996) reported that negative perceptions of schools, including disliking school and the feeling of not belonging in school, were the most frequently cited reasons for dropout students, regardless of students' ethnicity and gender.

In summary, the research on dropping out has painted a rather gloomy picture of dropout students: failing in school work, having low motivation, feeling inferior to other students, losing control over their environment, being isolated from teachers and peers, and feeling indifferent or resentful toward the school community. This dismal picture of dropping out has been verified by self-reported information from dropout students. In the National Education Longitudinal Study of 1988 (NELS:88), dropout students were asked to list reasons for their dropout decision. The most commonly identified reasons, among 21 reasons listed in the questionnaire, were as follows: attitude toward school ("I didn't like school" chosen by 50.3% and 42.1% of dropout students in 2 follow-up waves, respectively), poor school performance ("I was failing school" chosen by 43.8% and 42.5% in the 2 follow-ups, respectively), and the relationship with teachers ("I couldn't get along with teachers" chosen by 34.6% and 25.7% in the 2 follow-ups, respectively; National Center of Educational Statistics [NCES], 1995).

The majority of findings on personal factors of dropout students in the aforementioned studies were based on cross-sectional comparisons between dropouts and graduates. Recently, researchers have also used longitudinal research to show that students' decisions to drop out of school were not made overnight, and that the deterioration of dropout students in academic performance and perceptions of school and self is a gradual and continuous process. For example, Kaplan et al. (1997) followed a panel of more than 1,000 students from 7th grade to 12th grade
and showed a chain of negative changes happening to the students who eventually dropped out: Academic failure in 7th grade was followed by the students’ low motivation, association with deviant peers, and perception of rejection by the students at school, which led to dropping out. Kasen, Cohen, and Brook (1998) and Mahoney (2000) conducted longitudinal studies to reveal the deterioration in students’ school engagement (e.g., academic performance and extracurricular activity participation) and perception of school (e.g., educational aspiration and academic atmosphere of the school) that happened during the years before the students manifested antisocial behaviors and dropped out from school. Manlove (1998) and Upchurch (1993) were interested in the relation between female students’ school experiences, teenage pregnancy, and dropping out. Using a national longitudinal database, they showed a common progression of events that lead to female students dropping out from school, including a weakening of their engagement with school, getting pregnant or becoming teen mothers, and ending up with a great likelihood of dropping out.

Although the longitudinal studies helped us to see the developmental pattern of dropout students, they usually were focused on one or a few personal variables or aspects of dropping out. Information that comprehensively depicts longitudinal changes in personal variables related to dropping out is needed. Theoretically, the information is needed to enrich our understanding of the developmental pattern and process of dropping out. Practically, the information will help practitioners to identify the most critical time in the dropping out process to intervene and provide at-risk students with help when they need it most.

In this study, we conducted a longitudinal investigation of a group of dropout students to examine changes in their personal attributes over a 4-year period as students progressed from 8th grade to 12th grade. The personal attributes examined in the investigation included the following:

1. Academic performance.
3. Effort expenditure in school work.
4. Participation in school activities.
5. Relationship with teachers.
6. Relationship with peers.
7. Perception of school.
8. Self-esteem.
9. Locus of control.

We included these variables in our investigation because (a) the literature review showed that these attributes were related to dropping out, and (b) it is possible for researchers and educators to design interventions that revolve around these personal attributes to prevent students from dropping out.
Data and Sample

Data used in this study came from the National Educational Longitudinal Study of 1988 (NELS:88) conducted by the National Center of Educational Statistics (NCES). To create a representative sample, the NCES selected 1,100 schools (public and private) and surveyed 25 eighth graders in each of the selected schools. The total sample had approximately 25,000 students. The selected students were surveyed four times between 1988 through 1994. The base-year (BY) survey was conducted in 1988 when the students were in eighth grade. The first follow-up (F1) survey was conducted in 1990 when the cohort of students were in 10th grade. The second follow-up (F2) survey was conducted in 1992 when the cohort was supposed to graduate from high school. Finally, a third follow-up (F3) survey was conducted 2 years after high-school graduation in 1994. In addition to the students' perspectives, parents, teachers, and school administrators were also included in the surveys. However, in this study, only students' data from the first three waves of data collection (BY, F1, and F2) were examined. Although survey instruments used for administrators, teachers, and parents also contained information on students' personal attributes, we decided not to use these sources of information because (a) students' perceptions of the school and themselves have the most direct influence on dropping out; and (b) administrators, teachers, and parents were not surveyed in all waves so their data did not meet the needs of the longitudinal analysis we conducted.

Because this study was designed to investigate the developmental pattern of dropout students, only dropouts were chosen for the analysis. Two NELS:88 variables were used to select the sample: F2FIDOST, which indicated students' dropout status in 10th grade, and F2RTROUT, which indicated the students' dropout status in 12th grade. Using these two variables, we selected students who stayed in school in 10th grade but dropped out before the completion of high school in 12th grade. Therefore, students included in the analysis provided data in three waves of data collection (BY, F1, and F2 surveys). Although NCES also surveyed students who dropped out before the F1, the instruments used for the dropout group were very simple and brief, and therefore did not contain the information needed for this study. This selection process produced a sample of 1,327 high-school dropouts. With the consideration of the appropriate NELS:88 sampling weight, the sample represented a total of 226,696 students in the population, 7.6% of the population of 2,970,835 students covered in NELS:88.

Not counting students with missing values on some demographic variables, the sample contained 591 (53.5%) males and 513 (46.5%) females. Among them were 673 White not Hispanic (61.6%), 196 Hispanic (17.9%), 172 Black not Hispanic (15.7%), 27 Asian and Pacific Islanders (2.5%), and 25 American Indians or Alaska
Natives (2.3%). The average age of the group was 14.68 years when the data were collected in 1988, in eighth grade. The vast majority of the dropout students (95.6%, N = 1,042) were not limited in English proficiency. About 70% of their parents (73.3% and 73.4% for fathers and mothers, respectively) had high school or less than a high school education. More than 90% (91.7%) of the students were from families whose annual incomes were lower than $50,000. In a composite index of SES based on father’s education, mother’s education, father’s occupation, mother’s occupation, and family income, the dropout students’ mean in eighth grade was -0.58, which is more than half of the standard deviation below the population mean (M = 0.07, SD = 0.81). Regarding the schools they were from, 44.0% of them were from the south, 24.2% from the north central region, 20.3% from the west, and 11.5% from the northwest. About half of the students (49.4%) were from schools with less than 20% minority students, and 42.4% of them were from schools where more than 30% of students were eligible for free lunch in the schools.

Variables

Based on the literature review we conducted, we chose to longitudinally analyze dropout students’ personal attributes that were related to dropping out, which included academic performance, relationships with teachers, relationships with peers, perceptions of school, participation in school activities, motivation for school work, effort expended in school work, self-esteem, and locus of control. To create these variables, items contained in the BY, F1, and F2 survey questionnaires were carefully reviewed and selected through a 4-step procedure.

First, items that we judged to have good face validity for measuring a given variable were selected as potential candidates for items indexing the variable. Second, we aligned scoring systems of the selected items to make interpretations of the scores consistent. Scoring of some items needed to be reversed so that for all items low values were designated to undesirable perceptions or behaviors and high values were designated to desirable perceptions and behaviors. Third, the selected items had different response scales. Some had a dichotomous scale of “yes” and “no,” whereas others used 3-, 4-, or 5-point Likert scales. To make items weight equally when being combined, all item scores were standardized to z scores with a mean of 0 and a standard deviation of 1. Finally, to counteract the effect of the two-stage stratified and clustered sampling procedure used in NELS:88, a panel weight variable (F2PNLWT), which was created for analyses using items selected from the three waves of data collection, was applied to the z scores. It is worth noting that, because the z scores were calculated and weighted for the entire student population in NELS:88 before the sample of dropout students was chosen, the mean value of 0 of the selected item indicated an estimate of the national average for the student population in the United States at the time of measurement.
Before composing variables with the selected items, items clustered under a given variable were scrutinized for psychometric merits with statistical and conceptual considerations. Correlation coefficients among the items of a variable were examined. Items that were correlated weakly with other items within a variable were evaluated. Unless the items carried important information to the construct that the variable was supposed to measure, the item was deleted. For each variable, a factor analysis was conducted to examine the factor loading of items on the latent construct. With few exceptions, retained items had factor loadings exceeding .20. Based on the conceptual and statistical scrutiny, a total of 271 items in the NELS:88 database were selected to create 26 variables. The variables of academic performance, relationships with teachers, perceptions of school, participation in school activities, motivation for school work, effort expended in school work, self-esteem, and locus of control were repeatedly measured in BY, F1, and F2; and relationships with peers was measured only in BY and F1. All constructed variables had a satisfactory level of reliability as measured by Cronbach's alpha (Mα = .79, range from .61–.92). Table 1 lists the names, descriptions, sample items, number of items, and the reliability coefficients of the variables created for this study. A listing of all items used to create the 26 variables was too long to be included in this article and is available on request from the first author.

Overview of Data Analysis

Previous research has shown inconsistent gender effects on dropout; therefore, participants' gender was integrated into the analysis to investigate whether gender moderated longitudinal changes in the personal attributes. Every personal attribute variable was measured at three different times (BY, F1, and F2), except relationship with peers, which was measured only in the BY and the F1. Each of the personal attribute variables was submitted to a 2-way analysis of variance (ANOVA) procedure as the dependent variable with a within-subject independent variable of time (BY, F1, and F2) and a between-subject independent variable of gender. As suggested by NCES to adjust for the design effect (i.e., an inflated probability of significance caused by the NELS:88 sampling), the test statistics (F values) obtained from the 2-way ANOVA were divided by a Panel Sample Average Design Effect of 2.843 obtained from the NELS: 88 User Guide (NCES, 1994, p. 78). F values reported next are the adjusted values, and the significance of the tests was evaluated at the .001, .01, and .05 levels. If the time effect was significant, the Newman-Keuls approach was used for the post hoc comparisons between BY and F1, F1 and F2, and BY and F2. The test results were adjusted again for the design effect by dividing the statistics (Q values) by 1.666, also obtained from the NELS: 88 User Guide. An alpha of 0.05 was chosen for all post hoc comparisons.

Although a sample of 1,327 dropout students was identified with the two dropout status variables, not every student was included in the following analysis. If a
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Sample Item</th>
<th>No. of Items and Reliability</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>BY</td>
</tr>
<tr>
<td>Academic performance</td>
<td>Scores of standardized tests in reading, mathematics, sciences, and social studies</td>
<td></td>
<td>4 items, .91</td>
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<tr>
<td>Relationship with teachers</td>
<td>Relationship between dropout students and teachers</td>
<td>“Students get along with their teachers.”</td>
<td>16 items, .73</td>
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<tr>
<td>Relationship with peers</td>
<td>How dropout students was perceived by their peers</td>
<td>“Students in class see respondent as popular.”</td>
<td>3 items, .66</td>
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<tr>
<td>Perception of school</td>
<td>Perception of school spirit, discipline, instruction, and school safety</td>
<td>“I don’t feel safe at this school.”</td>
<td>17 items, .84</td>
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<tr>
<td>Motivation in school work</td>
<td>Interest in learning activities and school works</td>
<td>“How many times did you cut/skip classes.”</td>
<td>15 items, .75</td>
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### TABLE 1 (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Sample Item</th>
<th>No. of Items and Reliability</th>
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<tr>
<td>Effort in school work</td>
<td>Time expenditure on doing school works</td>
<td>&quot;Time spent on homework out of school.&quot;</td>
<td>5 items, .85</td>
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<td>Participation in school activities</td>
<td>Participation in school extracurricular activities</td>
<td>&quot;Participated in school varsity sports.&quot;</td>
<td>19 items, .77</td>
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<td>Self-esteem</td>
<td>Dropout students' perception of themselves</td>
<td>&quot;I am a person of worth, equal of others.&quot;</td>
<td>7 items, .79</td>
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<td>Locus of control</td>
<td>View of accountability of events that happen to students</td>
<td>&quot;I don't have enough control over my life.&quot;</td>
<td>6 items, .68</td>
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*Note.* BY = base-year; F1 = first follow-up; F2 = second follow-up.
student stayed in school in 10th grade but left before the student survey was administered in 12th grade, he or she could not provide any information in F2 for the longitudinal comparisons. Due to the missing data of these students and missing values on some items we used to compose the dependent variables, the number of respondents included in ANOVA analyses varied.

RESULTS

Descriptive statistics, including means and standard deviations of the dependent variables, are organized by the independent variables of time and gender and presented in Table 2. Results of the ANOVA on the individual dependent variables are presented and discussed next.

Academic Performance

The ANOVA on academic performance produced a significant time effect, \( F(2, 882) = 18.21, \eta^2 = 0.11, p < .001 \). The gender effect and the interaction effect between time and gender were not significant. Post hoc comparisons indicated that the differences in academic performance between BY and F1, F1 and F2, and BY and F2 were all significant. As shown in Table 2, dropout students’ academic performance declined from .48 standard deviation below the national average in the eighth grade to .59 standard deviation below the national average in the 10th grade, and further declined to .68 standard deviation below the national average in the 12th grade.

Relationships With Teachers

The ANOVA on the relationship with teachers also yielded a significant time effect, \( F(2, 634) = 5.78, \eta^2 = 0.08, p < .01 \). The gender effect and the interaction effect were not significant. Comparisons showed that the differences between BY and F1, F1 and F2, and BY and F2 were significant. Dropout students’ relationships with their teachers were not worse than the national average when they were in 8th grade (\( M = -0.02 \)) but became significantly negative in 10th grade (\( M = -0.18 \)), and kept deteriorating when they were in 12th grade (\( M = -0.33 \)).

Perception of School

The analysis showed that dropout students’ perceptions of school changed significantly from the 8th grade through the 10th grade to the 12th grade, \( F(2, 622) = 6.53, \eta^2 = 0.02, p < .01 \). The gender and interaction effects were not significant. Comparisons indicated that the differences in the perception of school between the
<table>
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<td>Academic performance</td>
<td>Male (232)</td>
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<td>0.73</td>
<td>-0.57</td>
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<td>-0.55</td>
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<td></td>
<td>Female (211)</td>
<td>-0.50</td>
<td>0.66</td>
<td>-0.61</td>
<td>0.69</td>
<td>-0.74</td>
<td>0.65</td>
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<td>0.59</td>
<td>-0.08</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Motivation in school work</td>
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<td>Female (132)</td>
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<tr>
<td>Effort in school work</td>
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<tr>
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<td>0.80</td>
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<td>Participation in school activities</td>
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<td>Total (274)</td>
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<td>0.46</td>
<td>-0.05</td>
<td>0.47</td>
<td>-0.24</td>
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<tr>
<td>Self-Concept</td>
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<td>0.94</td>
<td>-0.08</td>
<td>0.97</td>
<td>-0.05</td>
<td>0.95</td>
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<td></td>
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<tr>
<td></td>
<td>Total (745)</td>
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<td>1.02</td>
<td>-0.24</td>
<td>1.03</td>
<td>-0.20</td>
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<tr>
<td>Locus of control</td>
<td>Male (370)</td>
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<td>1.05</td>
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<td>1.03</td>
<td>-0.31</td>
<td>0.97</td>
<td>-0.32</td>
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<tr>
<td></td>
<td>Female (374)</td>
<td>-0.44</td>
<td>1.00</td>
<td>-0.40</td>
<td>1.00</td>
<td>-0.36</td>
<td>1.07</td>
<td>-0.40</td>
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<td>Total (744)</td>
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<td>-0.39</td>
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</table>

Note. BY = base-year; F1 = first follow-up; F2 = second follow-up.
8th and 10th grades and between the 8th and 12th grades were significant. The difference between the 10th and 12th grades was not significant. Students' perceptions about school worsened from a national average level ($M = -0.09$) in 8th grade to below national average ($M = -0.16$) in 10th grade and remained at a similar level in the 12th grade ($M = -0.20$).

Motivation for School Work

A significant time effect showed that students' motivation in school work declined during the high school years, $F(2, 598) = 8.96$, $\eta^2 = 0.14$, $p < .01$. The gender and interaction effects were not significant. Comparisons showed the decline in motivation between the 8th grade ($M = -0.06$) and the 10th grade ($M = -0.25$) and between the 8th grade and the 12th grade ($M = -0.38$) was significant, whereas the change between the 10th grade to the 12th grade was not significant.

Participation in School Activities

The ANOVA on participation in school activity showed a significant time effect, $F(2, 544) = 6.05$, $\eta^2 = 0.06$, $p < .01$. The gender and interaction effects were not significant. Comparisons showed dropout students' involvements in school activities in 8th grade ($M = -0.05$) and 10th grade ($M = -0.05$) were about the same at the national average level but significantly decreased between 10th and 12th grade ($M = -.24$).

Other Personal Factors

At a descriptive level, changes that happened in the variables of relationship with peers, effort in school work, self-esteem, and locus of control during the 4-year period between 8th grade and 12th grade were basically in the same pattern as observed in other variables; that is, starting at the national average level in the eighth grade then continuing a downward trend. However, the differences were not statistically significant. The interaction effect was not significant for these variables either. Table 3 summarizes the results of comparisons of the personal attributes between the three waves.

The Gender Effect on the Dependent Variables

The only significant gender differences were found for self-esteem, $F(1, 743) = 15.51$, $\eta^2 = 0.06$, $p < .01$, and relationship with peers, $F(1, 859) = 3.79$, $\eta^2 = 0.01$, $p < .05$. Male dropout students held more positive perceptions about themselves ($M = -.04$) than the female dropout students ($M = -.42$). Male dropout students also
TABLE 3
Post Hoc Comparisons in Personal Attributes of Dropout Students
Between the Base-Year, First Follow-Up, and Second Follow-up

<table>
<thead>
<tr>
<th>Variable</th>
<th>BY and F1</th>
<th>F1 and F2</th>
<th>BY and F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic performance</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Relationship with teachers</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Relationship with peers</td>
<td>ns</td>
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<tr>
<td>Perception of school</td>
<td></td>
<td>*</td>
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<tr>
<td>Motivation in school work</td>
<td>*</td>
<td>ns</td>
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<tr>
<td>Effort in school work</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Participation in school activities</td>
<td>ns</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Self-concept</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Locus of control</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

Note. BY = base-year; F1 = first follow-up; F2 = second follow-up.
*p < .05.

had better relationships with peers \(M = -0.05\) than female dropout students \(M = -0.16\).

DISCUSSION

This study investigated change in dropout students’ personal variables from the eighth grade through the 12th grade. We examined longitudinal change on a wide variety of variables including students’ academic performance, perceptions of school, relationships with teachers and peers, motivation and effort expenditure in school work, participation in school activities, locus of control, and self-concept. A consistent and interesting finding was that the dropout students scored at the national average of these variables when they were in eighth grade when the study started. As shown in Table 2, with the exception of academic performance, which was already more than a half standard deviation below the national average, other attributes of the dropout students were at or not much below the national average. However, when the same variables were measured in 10th grade, deterioration had occurred in several variables. At the 10th-grade measurement, the dropout students’ academic performance, relationships with teachers, perceptions of school, and motivation for school work had all declined significantly. Further deterioration was evident at the 12th-grade assessment. Specifically, their academic performance, relationships with teachers, and perceptions of school continued falling until they dropped out of the school. Another significant change in the last 2 years of high school was that the dropout students became increasingly alienated from school activities.

The developmental pattern of the personal attributes of the dropout students observed in this study was consistent with findings of previous research on dropout.
We observed that dropout students' perceptions of school, teachers, and school-related work deteriorated between the 8th grade and the 10th grade and continued to decline after the 10th grade until they dropped out. For some reason, they kept their involvement in extracurricular activities even though they didn't perceive the school and teachers so positively. However, they finally lost their interest in school activities in the last 2 years of high school. Seeing a school as a community, the study showed how dropout students were becoming disinterested and disengaged in the values, norms, and activities of the school community. Although we have theories to help us understand various aspects of dropout students' lives, it seems that a theory that comprehensively explains the process of alienation from the school community that dropout students experience is needed. Such a theory will provide us with a dynamic perspective from which to examine the interaction of dropout students with other members of the community (e.g., teachers, peers, and school administrators) as well as their involvement in community activities (e.g., academic and nonacademic events in school). Such a theory will also integrate educators' and researchers' intervention efforts into a holistic approach to helping at-risk students overcome the various barriers they experience in school.

We think there are three issues in the study that are worth special attention and discussion. They are transition to high school, academic intervention, and the psychological construction of dropout students. We discuss each of these in turn next.

Transition to High School

We think the most important finding in this study is the general decline in the personal attributes of the dropout students when they transition to high school. Although developmental research has focused on the transition to junior high (see Eccles et al., 1993; MacIver, Reuman, & Main, 1995; Roderick, 1994; Roderick & Camburn, 1999) and the transition to college (see Brooks & DuBois, 1995; Larose & Boivin, 1998), our research suggests that the transition to high school represents a time of stress and vulnerability as well.

Perhaps some of the difficulties in studying this transition are the heterogeneity in size and initial grade of high schools in the United States, which depend on school districts or geographic location. Schiller (1999) illustrated the complexity of studying the transition to high school by showing that the academic achievement of students in high schools was related to how students were promoted into high schools. For example, her research suggested that students who were performing poorly in eighth grade would perform better if they moved to a high school that contained fewer of their eighth-grade classmates.

Despite difficulties, we are encouragingly seeing an increasing research interest in the transition to high school. Perhaps this is due to well-publicized violent incidents in our high schools that may have served as a danger signal to educators and researchers. Although the impetus for this research is unclear, the research find-
ings are consistent with ours. Isakson and Jarvis (1999), in a small-scale longitudinal study, found evidence of academic decline after the transition to high school. The researchers believed the decline was associated with high school students’ autonomy and the lack of integration into the school. Reyes, Gillock, Kobus, and Sanchez (2000) also showed significant declines in perceived school support after the transition to high school in a sample of minority youth.

Although research has yet to study the high-school transition extensively, developmental theorists have certainly acknowledged the importance of this transition. During the transition period, students are cognitively moving more firmly into Piaget’s formal operational stage where the abilities of abstract thinking, hypothesis testing, and hypothetical–deductive reasoning emerge. These abilities are necessary to compete and succeed in the challenging academic curriculum in high schools. Developmental theorists have also described the prototypical social tasks of the period. According to Erikson (1980), students at this age are struggling with issues of identity. Although many students are exploring and evaluating career options and different academic challenges, those who are having difficulties with high school academics may be forced into what Marcia (1987) termed identity diffusion. Individuals who are classified as identity diffuse tend to have lower self-esteem and difficulties in relationships with others (Marcia, 1987) and do not make commitments to any educational and professional direction or personal standards of behavior (Archer & Waterman, 1990). These characteristics of individuals with identity diffusion parallel the personal attributes we observed in dropout students in our study.

Taken together, the dramatic changes in the cognitive and social spheres of the adolescents’ lives may sharply change students’ perceptions of themselves and the new school environment. For dropout students who have a history of academic failure, the academic and social obstacles they experience at the beginning of high-school education could increase or accelerate the deterioration process that eventually leads to dropping out. In line with these theoretical assertions, Newman, Lohman, Newman, Myers, and Smith (2000) recently reported that students described the changes associated with high school as including new academic challenges, a more complex environment to negotiate, new social demands and pressures, and qualitatively different interactions with teachers. We are planning to compare personal attributes of dropouts and graduates to show that a successful transition from junior high to high school is the key for retaining students in high school through graduation.

Although for many students the dramatic psychological changes of adolescence are well under way by the time they enter high school, adolescents are most vulnerable if they are experiencing such changes within a nonsupportive context. Our results, and a growing body of research from other sources, suggest that the school environments in which dropout students exist are perceived as nonsupportive. Coupled with poor academic performance, the perceived nonsupportive environ-
ment is most detrimental to dropout students. Educators, including teachers and school administrators, must create friendly and supportive school environments and pay close attention to students' needs during the transition. Through this, they may be able to reduce the probability of students' dropping out.

Academic Intervention

Consistent with the findings of previous research, our findings suggest that the earliest potential indicator of dropout status is poor academic achievement, which starts before eighth grade and then generalizes to other aspects of the students' school experiences. The dropout students in this study were on average two thirds of the standard deviation below the national average by eighth grade, but our analysis could not reveal how long the students had been performing poorly in school. Evidence suggests that the transition to junior high is stressful for many students (Eccles et al., 1993). It is during this time that we start to see students disengage from academic pursuits and show poorer achievement. Because dropout students have already experienced lower academic success in eighth grade, intensive intervention in the early grades of junior high is imperative, and research shows that the earlier the intervention, the more fruitful the efforts (Ramey & Ramey, 1998; Slavin, Karweit, & Madden, 1989). The early intervention will not only help students academically but may also help solve their problems in other areas, such as those investigated in this report. Reciprocally, the improvement in these other areas may also have the effect of improving academic achievement.

As researchers have indicated that students who are at risk of academic failure are a diverse group with diverse set of problems and needs, there is probably no single strategy that will address all their problems (Finn, 1991; Janosz, LeBlanc, Boulerice, & Tremblay, 2000). In addition to early intervention, there are other strategies that schools can apply to rescue at-risk students from dropping out. For example, research has shown that dropouts and at-risk students usually possess and use less effective study skills in their learning (Battin-Pearson et al., 2000; Steinberg, Blinde, & Chan, 1984). Research has also shown that effective training programs designed to enhance learning skills and strategies benefit students, especially students with low-academic performance (Brown & Palincsar, 1987; Hattie, Biggs, & Purdie, 1996; Mastropieri & Scruggs, 1989; Palincsar & Brown, 1984). One possible solution to help students with low-academic achievement is to provide them with programs or courses teaching learning skills and strategies.

Schools can also help students with low-academic achievement by creating a supportive atmosphere in schools and classrooms. Due to their history of academic failure and scant support for academic achievement at home, students at risk need more than the usual assistance to succeed. Teachers may create a supportive atmosphere in their classrooms by adapting instruction to the students' current skills and knowledge, increasing one-on-one teacher-student interaction, using relatively structured
tasks and assignments, and developing mastery of one task or skill before moving to a new one (Garibaldi, 1993; Ormrod, 2003). These instructional practices will develop a sense of a learning community where teachers and students share a common goal and are mutually supportive of everyone's achieving the goal.

Families and communities that at-risk students are from are another valuable resource in our effort to help these students. Although these students' families and communities are characterized by educational and financial disadvantages, researchers found that soliciting parental and communal cooperation and involvement with school programs was an effective way of facilitating students' academic success (Garibaldi, 1993; Legters, Balfanz, Jordan, & McPartland, 2002; Slavin et al., 1989).

Psychological Construction of Dropout Students

Also consistent with the findings of previous research (Finn, 1991; Rumberger, 1995), we found that dropout students tended to have low self-esteem. As a group, their perception of themselves, measured by the variable of self-esteem in this study, was approximately a quarter of the standard deviation below the national average: Means were $-0.25$, $-0.24$, and $-0.20$ when the variable was measured at the 8th, 10th, and 12th grade, respectively. Interestingly, we did not observe gradual deterioration in students' perceptions of themselves as we observed their perceptions of their school environment. Male dropout students' self-esteem was maintained at a national average level across the three waves of data collection ($M = -0.01, -0.08, \text{and } -0.05$ at the 8th, 10th, and 12th grade, respectively). Female dropouts' self-concept was two thirds or a half of the standard deviation below the national average ($M = -.50, -.39, \text{and } -.35$ for the three waves, respectively), but no significant decrease was observed during the period of the 4 years.

One possible explanation is that the items used to measure self-esteem and locus of control in NELS:88 were not task or context specific and failed to detect the changes in the variables. For example, the dropout students might not suffer from low self-esteem in general, yet it is likely that their academic self-esteem was low. Our concern over the measurement specificity on self-referred constructs echoes a similar one in the self-efficacy literature that emphasizes the importance of examining domain-specific conceptions rather than domain-general ones when understanding people's perceptions of self (Harter, 1999; Pajares & Miller, 1995). Until the measurement issue is addressed, the importance of self-esteem and locus of control in the dropout process remains an open question.

It is worth noting that dropout students in this study tended to have an external locus of control to begin with ($M = -0.28$ and $-0.44$ for eighth grade male and female students, respectively) and maintained external locus of control in their accountability belief throughout high school ($M = -0.31$ and $-0.36$ for 12th grade male and female students, respectively). Believing that events happening in their lives are con-
trolled by external factors might be the reason for the dropout students’ failures to respond constructively to adversities in their school careers. It could also be the reason that dropout students felt that they were treated unfairly in school, and that their needs and effort in school work were ignored by their teachers.

When working to create a supportive external school environment for students, educators should also attempt to create a supportive internal environment for them. Several “attribution retraining” programs (Luzzo, Funk, & Strang, 1996; Menec et al., 1994; Perry & Penner, 1990) have been effective for changing students’ accountability beliefs from external to internal. If the attribution retraining programs are applied to at-risk and dropout students to convince them that they have control over what is happening in their lives, they may have a better chance at overcoming obstacles and barriers to completing their high school education.

REFERENCES


