Decomposing the Academic Failure–Dropout Relationship: A Longitudinal Analysis

DIANE S. KAPLAN
B. MITCHELL PECK
HOWARD B. KAPLAN
Texas A&M University

ABSTRACT **Data from a 4-wave panel (N = 1,195), tested in the 7th, 8th, and 9th grades and as young adults, were used to estimate a causal model. The model was used to decompose a previously observed relationship between 7th-grade academic failure and later dropout behavior in terms of 5 theoretically informed mediating variables. The academic failure–dropout relationship was partially decomposed by the mediating effects of low motivation, association with deviant peers, and perception of rejection by the students at school. Although perception of rejection by teachers and resistance toward school were, as hypothesized, influenced by earlier negative academic experiences, they had no independent effects on dropping out net of their relationship to *association with deviant peers* or *low motivation*. Implications for current practice and future research are also discussed.**

Poor academic performance is one of the most often cited correlates of and reasons given for dropping out of school (Ekstrom, Goertz, Pollack, & Rock, 1986; Rumberger, 1983). Academic performance as measured by grades (Bachman, 1972; Elliott & Voss, 1974; Jozefowicz, Arbreton, Eccles, Barber, & Colarossi, 1994; Wehlage & Rutter, 1986) generally heads the list of the variables found to be most highly related to subsequent dropout behavior. Not only has poor performance been associated with the initial act of dropping out, it also has been related to high school dropouts' subsequent decisions of whether to return to high school to complete their degrees (Kaufman, 1989).

Rosenberg and Simmons (1971) have suggested that school grades are important to a student's self-esteem because "the grades on one's report card are actually one of the few objective bases for assessing a student's worth" (p. 91). In this view, low grades tend to make a student feel incapable and inadequate. Some students, however, may view grades as being the subjective judgments of their teachers. For these students, low grades may reflect the teacher's personal feelings toward them. In any case, whether grades are perceived as objective measures of ability or subjective measures of teacher affection, one can deduce that receiving poor grades promotes a negative and sometimes devastating effect on a student's self-esteem.

Academic performance could also be considered a primary element of the "unsuccessful school outcomes" component of the frustration–self-esteem type model of dropout behavior described by Finn (1989) in his review of the research on causes of dropout behavior. Academic performance could be considered an element of the "successful performance outcomes" component of the participation–identification type model of dropout behavior, which Finn described in the same research review. In addition to school behavior problems, academic performance is one of the two primary predictors of dropout behavior in an often cited High School and Beyond study (Ekstrom et al., 1986).

Other researchers have reported connections between measures of academic performance in early elementary school and dropout behavior before high school graduation (Barrington & Hendricks, 1989; Ensminger & Slusarcick, 1992). They emphasized the need to examine causes of dropping out before high school because many students drop out before the 10th grade, the grade at which the High School and Beyond study was begun (Ensminger & Slusarcick, 1992). They noted the small number of empirical long-term longitudinal studies of dropouts (Barrington & Hendricks). Those observations are compatible with the suggestion in the growing literature on adolescent development that, because "changing the performance trajectory at the high school level is very difficult" (Entwisle, 1990, p. 215), school performance must be improved at an earlier point in the student's development to improve adolescent achievement.

In a previous study (D. S. Kaplan, Peck, & Kaplan, 1992), we explored the relationship between junior high

Address correspondence to Diane S. Kaplan, Texas A&M University, College of Education, Department of Educational Curriculum and Instruction, College Station, TX 77843-4232.

school academic difficulties and dropping out of high school by specifying and examining the effects of three mediating variables: self-rejection in a school context, absenteeism and truancy, and deviant school behavior. In this earlier work, however, even after those mediating variables were controlled, there remained a significant relationship between poor academic performance in the seventh grade and later dropout behavior. In the present study, this frequently observed relationship between the early school performance of students and their subsequent dropout behavior (Wehlage & Rutter, 1986) was decomposed into direct and indirect effects on psychosocial and behavioral variables that are more proximate direct causes of dropout behavior.

The numerous studies reporting associations between negative academic performance and subsequent dropping out have not considered in any detail the mechanisms through which academic failure affects dropping out of school. In the present study we used panel data to estimate a model in which such mechanisms are specified.

The structural model specified in the current study is theoretically grounded in the existence of the self-esteem motive, according to which people characteristically behave so as to minimize the experience of negative self-attitudes and to maximize the experience of positive self-attitudes (H. B. Kaplan, 1980). We hypothesized that students who experience a loss of self-esteem in the form of poor grades will react in ways that will attenuate their ties to the school, because in their view the school has caused their painful negative self-feelings.

In general, the model may be viewed as fitting the group of school dropout models that Finn (1989) has categorized as the "frustration-self-esteem model" of school withdrawal, a model in which unsuccessful school outcomes lead to reduced self-esteem, which in turn leads to problem behaviors (including negative peer influence), which subsequently lead to unsuccessful school outcomes and a reactivation of the cycle. In the current model, we have provided a more detailed and well-reasoned explanation of why reduced self-esteem may lead to problem behaviors, a broader understanding of the types of problem behaviors that may be exhibited by these students, and a more detailed picture of how the problem behavior can and often does affect school outcomes.

Students desire to feel better about themselves; thus, if they receive low school grades (negative academic experiences), they might engage in a variety of behaviors and adopt attitudes to protect themselves against possible negative feelings. It was the across-time effects of such behaviors and attitudes on one another and on subsequent academic performance, as well as the long-term effects of those behaviors and attitudes on persistence in or withdrawal from school prior to high school graduation, that were examined in the current study. The reactive attitudes and behaviors specified in the model include deflecting blame for failure onto teachers' rejecting attitudes (perceived rejection by teachers) or the rejecting attitudes of other students (perceived rejection by students at school) by telling themselves that their teachers or the other students just don't like them; devaluing the normative school structure by saying that grades are not important (low motivation); rejecting the school, the teachers, and the other students at school by expressing a desire to quit school as soon as possible (resistance toward school); and/or joining forces with other students who are engaged in contranormative behaviors (association with deviant peers) in order to acquire their approval and express rejection of the conventional standards they have failed to meet.

The reciprocal link between these reactive attitudes and behaviors and school performance outcomes, which was an important focus of the present investigation, can be viewed as paralleling the group of school dropout models that Finn (1989) categorized as the participation–identification model of school withdrawal. Finn described this type of school withdrawal model in terms of student "participation in school activities" leading to "successful performance outcomes," which in turn lead to "identification with school" (defined in terms of feelings of belonging and valuing), which subsequently leads back to "participation in school activities" (p. 130).

In the current study, the feeling of being rejected by teachers and fellow students and the expression of the desire to quit school could easily be seen as reflecting a student's sense of belonging or not belonging at school, whereas the student's devaluation of grades and association with other students who adopt contranormative attitudes could be seen as reflecting the valuing/not valuing aspect of identification with school. Through an examination of the interaction among these attitudes and behaviors and their link to academic performance, we attempted to clarify further the school performance–identification–participation connection suggested by Finn (1989). Finn's suggestion (based on the performance–identification–participation connection) that the process of dropping out of school can be viewed as a process of progressive "disengagement from school" (p. 133) was compatible with the current investigation and a previous study of the same students. In these latter studies, researchers demonstrated that poor academic performance and problem behaviors at school led to a decrease in student self-esteem within a school environment; lowered self-esteem, in turn, led to an increased disengagement with school, indicated by absenteeism and skipping classes; and those behaviors, in turn, were significantly related to their later dropout behavior (D. S. Kaplan et al., 1992).

An examination of the research literature on proposed causes of dropping out and other types of adolescent deviant behavior provided support for our estimated model of dropout behavior. This estimation provided the opportunity for us to examine the degree to which five variables measured during junior high school mediated the relationship between junior high school academic performance and dropping out of school before completing high school.

Selected Model Variables

The five variables in the current model have been linked by other researchers with dropout behavior in particular or to the more inclusive concept of deviant behavior. The first, perceived rejection by teachers, which refers to students' feelings of self-derogation within the school environment, was designed to provide a picture of how comfortable the students feel about themselves at school in terms of both their accomplishments and self-efficacy and their ability to form satisfying interpersonal connections with the authority figures at school—their teachers. In one multivariate longitudinal study, junior high school students' perceptions of whether their teachers thought they were doing well (Ensminger & Slusarcick, 1992) were significantly related to the students' subsequent dropout/nondropout behavior. In addition, the potency of the effects of students' perceptions of teachers' attitudes toward or interest in them on subsequent dropout or other deviant behavior has been suggested by the inclusion of this variable as one of three measures of 10th-grade student alienation and rejection associated with subsequent dropout behavior (Wehlage & Rutter, 1986).

Likewise, the variable students' perceptions of teacher rejection was also included as one of three indicators of a global self-rejection construct used in a study of junior high school students that was designed to examine and support a general theory of the genesis of deviant behavior (H. B. Kaplan, Johnson, & Bailey, 1986). The self-rejection construct examined as part of this general theory was more broadly conceived to represent the students' associations of self-derogating attitudes with conventional membership groups in general and was not limited to the association of self-derogating attitudes with the school environment in particular (H. B. Kaplan et al., 1986), which was the focus in the current study.

Previous research on the causes of dropout behavior reveal no specific studies that discussed the effects of resistance toward school (defined as the overt expression of a desire to quit school) and low motivation (conceptualized in terms of the students' readiness to devalue conventional institutions like schools and their readiness to devalue the structures associated with those institutions, such as making good grades). A review of the literature on the causes of deviant behavior, however, revealed the existence of a stage in the genesis of adolescent deviant behavior when adolescents begin to dissociate themselves from the norms of conventional society and begin to devalue those norms. That stage has been described as the latent construct disposition to deviance in a general model of deviant behavior (H. B. Kaplan et al., 1986) that has been estimated for junior high school students. This research on the causes of deviant behavior illustrates the need to account for the acquisition of attitudes of dissociation from the norms of conventional society (in this case, the conventional expectations of the school environment) in a study of dropout behavior (viewed as a particular type of deviant behavior). In our hypothesized model we included two variables to account for those attitudes: resistance toward school, which measured students' desire to remove themselves physically and completely from the school environment, and low motivation, which measured student attitudes that undermine and devalue the norms of the school environment by trivializing the importance of the standards by which students are typically judged in this environment. One question explored in the current investigation was whether those two variables mediate the relationship between academic performance and later dropout/nondropout behavior.

The final two variables hypothesized to mediate the relationship between academic performance and dropout behavior were included to reflect the students' relationships with their peers, including both their interactions with peers at school (perceived rejection by students at school) and the question of whether they interact with students who break rules and get into trouble (association with deviant peers). The perceived rejection by students at school measure was designed once again to tap the degree to which students feel accepted or rejected at school. There has been, however, little consideration of such a variable in the literature on dropout behavior or on adolescent peer groups and peer culture. Although researchers have acknowledged that "an acceptable peer group can be a highly adaptive context for negotiating adolescence" (Brown, 1990, p. 185), they have also admitted that the processes involved in peer group formation are not clearly understood.

On the other hand, there is support in the research literature for a strong significant effect of the association with deviant peers on subsequent deviant behavior independent of previous deviant behavior (Kaplan, Johnson, & Bailey, 1987). Also, Finn (1989, p. 121), in his review of the literature on causes of dropout behavior, asserted that it is "well documented that dropouts as well as delinquents associate with friends with like behavior," and this association has been confirmed in studies of delinquent adolescents (Elliott & Voss, 1974). A description of the mechanisms by which association with deviant peers may facilitate future deviant behavior has included providing adolescents with justifications for their deviance, decreasing their association with representatives of the normative structure—who could under normal circumstances provide informal sanctions against their deviant acts—and providing them with alternative sources of emotional support that continue even when they break the rules, or because they break the rules (Kaplan et al., 1987). Those same types of mechanisms could be operating in the process through which the students' association with deviant peers will ultimately lead to their dropping out of school. Thus, in the present investigation, we hypothesized that students who associate with other students who have adopted contranormative attitudes and behaviors will themselves be more likely to adopt behaviors that will lead to their dropping out of school.

In estimating the model we used junior high students for two reasons. First, junior high is early enough to examine

the development of psychosocial processes and behavioral patterns prior to their becoming rigidly established systems. Second, junior high is late enough to establish a proximate causal connection between those variables and later dropout behavior. The examination of the psychosocial variables related to academic performance during junior high school may be especially important because the research literature on the early adolescent seems to indicate that the transition to middle school or junior high school may have negative consequences for adolescents, who are at a particularly vulnerable stage. Students are being asked to operate in a new atmosphere that they usually find to be less supportive in terms of their interactions with teachers and in which they are often exposed to the disruption of the peer networks that they had established in elementary school (Entwisle, 1990). In fact, Entwisle (p. 220) suggested that "there is a need to study individual students' life trajectories over the adolescent years when students experience various kinds of changes at school and other stressful events."

The longitudinal nature of the data in the current study enabled us to explore the interrelationships among the variables associated with dropout behavior, an exploration suggested by Rumberger (1987) when he said that new research efforts should focus on developing multivariate, longitudinal, and comprehensive models. By examining the variables longitudinally, we can begin to discern a causal pattern of the relationships among variables that are characteristically so interrelated that it is difficult to differentiate the direction and the nature of the relationship.

Theoretical Framework

Our theoretical framework for this study presumed that (a) the self-esteem motive, according to which people characteristically behave so as to minimize the experience of negative self-attitudes and maximize the experience of positive self-attitudes, is a characteristic function of human development; (b) a history of context-specific devaluing experiences that individuals are unable to defend against will lead to their association of that context with their negative self-feelings; and, consequently, (c) such persons will become increasingly inclined to deviate from the normative expectations of the social context or membership group that is perceived to be the source of their negative self-feelings or self-attitudes (Kaplan, 1980).

In the structural model estimated in the current study (see Figure 1), we specified the effects of negative academic experiences at Time 1 (T1) on subsequent feelings of rejection and on the adoption of contranormative behaviors and attitudes at Time 2 (T2) and Time 3 (T3). While controlling for the prior existence of all the psychosocial variables in the model, we hypothesized the following typical sequence of events leading to dropout behavior: (a) poor academic performance; leading to (b) feelings of being rejected at school; leading to (c) a disposition to leave school, a tendency to devalue the school and its grading system, and a search for other sources of self-esteem such as the approval of peers who also have been alienated from the system. We also hypothesized that the adoption of such attitudes and behaviors would lead to continued poor academic performance. Support for this latter hypothesis can be found in the results of a study by Marsh (1990), who examined the causal ordering of academic self-concept and academic achievement in a panel study of high school students; Marsh found that grade averages in Grades 11 and 12 were significantly affected by academic self-concept measured the previous year. Also supporting our hypothesis are the results of a panel study of junior high school students that specified a linkage between self-derogation in a school context and subsequent academic failure that was mediated by a disposition to deviate from conventional expectations (D. S. Kaplan et al., 1994). In summary, then, a cyclical pattern will be set in motion with poor academic performance, leading to feelings of rejection and the adoption of contranormative attitudes and behaviors, leading in turn to continued poor academic performance until the opportunity to leave the perceived source of rejection and failure presents itself and the student drops out of school.

Finally, race, gender, and socioeconomic status (SES)—measured in terms of father's education level—were modeled as exogenous variables that influence negative academic performance, the psychosocial mediating variables, and dropout behavior.

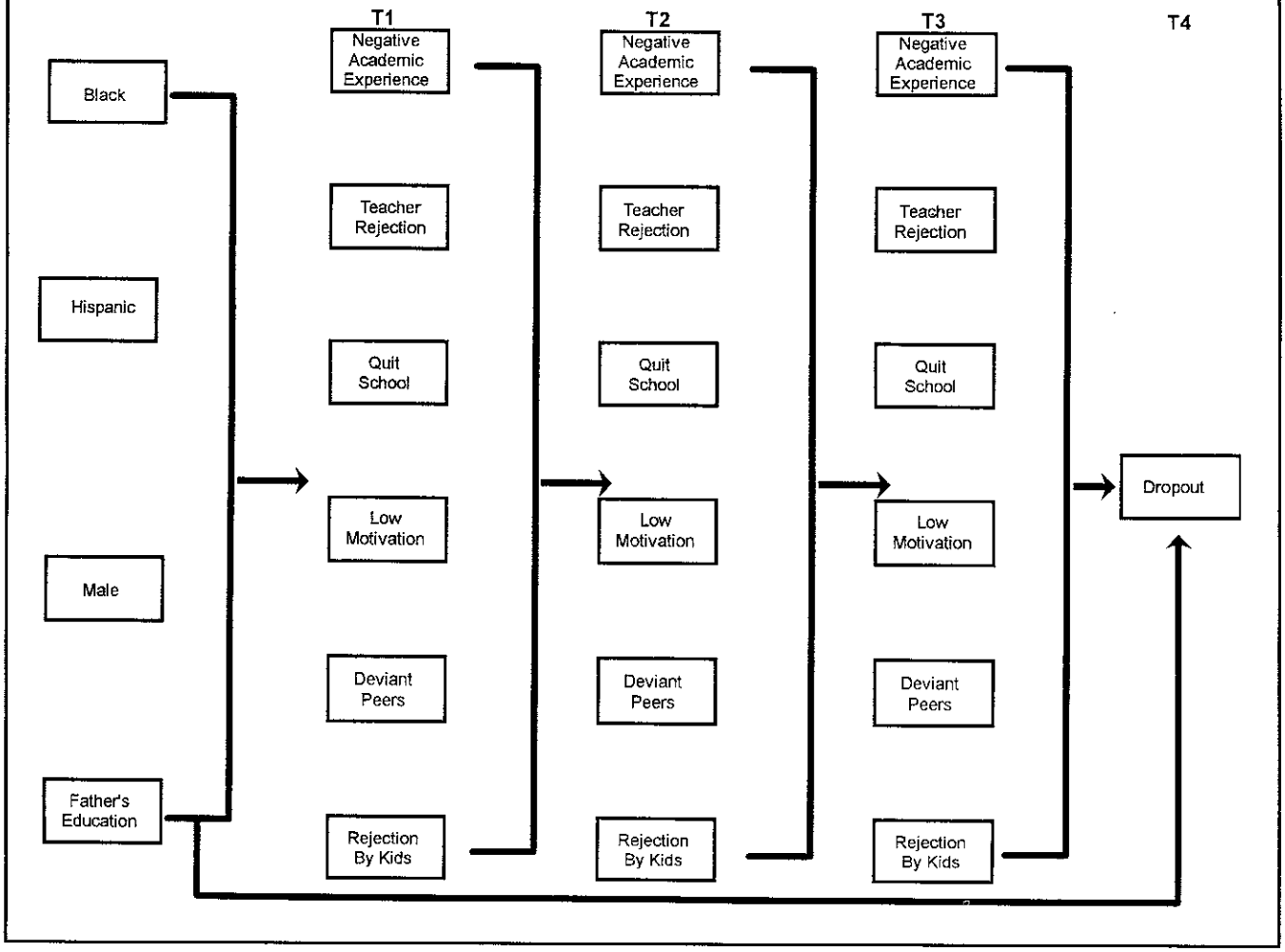
Method

Data Source

The data for this analysis were drawn from a multiwave panel study of all of the seventh-grade students in a random sample of half of the 36 junior high schools of the Houston Independent School District (T1) in 1971. The students were tested in the seventh grade in 1971, in the eighth grade in 1972 (T2), and in the ninth grade in 1973 (T3); the test was a 201-item questionnaire designed to measure psychosocial characteristics, self-reports of deviant behaviors, and sociodemographic characteristics. The questionnaire was administered to the students in class during the spring of each year. Individual home interviews were conducted with these students when they were young adults in the 1980s (T4). The interview involved the administration of an 810-item questionnaire designed to measure psychosocial and sociodemographic characteristics as well as self-reports of life events and responses to life events (including all appropriate items from the earlier questionnaire). For the present analysis, we used only the data relating to the subjects' educational attainment from the Time 4 (T4) interview.

A total of 2,428 students were present for all four administrations. A listwise deletion of missing values for those present at all four administrations reduced the overall sample to 1,195 students, who provided data for all measures used in the present analysis.

Figure 1. Hypothesized Theoretical Model



To address a possible bias caused by participant attrition, we conducted a comparison analysis of the interrelationships among T1 variables for students who continued in the study and for students present at T1 only as part of a previous investigation. The results indicated that

> the overall similarity of measurement parameters and structural relationships between groups is sufficient to accept the hypothesized structure, and any biases in the estimated relationships when using the "present" (i.e., present at T1, T2, & T3) sample appear to be, at worst, conservative and underestimated. (H.B. Kaplan et al., 1986, p. 126)

In addition, two correlation matrices were generated for comparison purposes.[1] One matrix was the correlation matrix of all the variables investigated in the present study for the students in the current sample ($N = 1,195$), based on a listwise deletion of participants who did not provide values for all of the variables being studied. The other matrix was a pairwise correlation matrix that included the correlations for all the participants who provided values for any pair of variables being studied. A comparison of a representative selection of the primary hypothesized relationships among variables in the two matrices indicated that a large majority of the correlations were either not appreciably different from one another or the relationship in the pairwise matrix was appreciably stronger (47 out of 54 correlations compared); in only a small number of the comparisons, the correlation was stronger between the variables in the listwise matrix (7 out of 54 correlations compared). These results indicated that any biases in the present investigation would have worked to underestimate the strength of the relationships demonstrated.

Data Analysis

We estimated the causal model by using the covariance matrix of the measured variables as input to the EQS computer program (Bentler & Wu, 1993). This program provides maximum likelihood estimates of all identified model parameters; it also evaluates the degree to which an overidentified model reproduces the observed variance-covariance matrix in terms of a chi-square goodness-of-fit statistic. The structural relations model represented the

Table 1.—Means, Standard Deviations, and Intercorrelations of Variables in the Theoretical Model

Variable	Black	Mex Am	Male	FaEd	Nacad1	Trej1	Quit1	Lmot1	Dpeers1	St Rej1	Nacad2
Black	1.000										
Mex Am	–0.151	1.000									
Male	–0.050	–0.023	1.000								
FaEd	–0.130	–0.355	–0.014	1.000							
Nacad1	0.029	0.078	0.118	–0.126	1.000						
Trej1	0.024	–0.032	0.086	–0.070	0.333	1.000					
Quit1	0.000	–0.042	0.033	–0.021	0.185	0.191	1.000				
Lmot1	–0.022	–0.049	0.006	0.000	0.121	0.226	0.117	1.000			
Dpeers1	–0.013	–0.038	–0.005	–0.048	0.199	0.301	0.254	0.159	1.000		
St Rej1	–0.009	–0.006	0.070	–0.029	0.149	0.268	0.100	0.035	0.027	1.000	
Nacad2	0.025	0.117	0.155	–0.166	0.478	0.277	0.128	0.108	0.174	0.053	1.000
Trej2	–0.046	0.022	0.140	–0.040	0.216	0.350	0.158	0.102	0.191	0.134	0.383
Quit2	0.026	–0.027	0.036	–0.059	0.151	0.106	0.235	0.054	0.153	0.071	0.186
Lmot2	–0.075	–0.052	0.035	0.009	0.146	0.188	0.083	0.222	0.170	–0.005	0.294
Dpeers2	–0.105	0.022	–0.015	–0.056	0.152	0.258	0.166	0.161	0.420	0.051	0.252
St Rej2	–0.022	0.019	0.076	–0.022	0.130	0.191	0.084	0.008	0.023	0.389	0.168
Nacad3	0.056	0.043	0.134	–0.126	0.400	0.205	0.120	0.055	0.126	0.092	0.484
Trej3	–0.042	0.019	0.123	–0.047	0.204	0.302	0.152	0.120	0.149	0.170	0.317
Quit3	0.027	–0.004	0.032	–0.116	0.158	0.142	0.222	0.052	0.120	0.098	0.171
Lmot3	–0.040	–0.019	–0.006	–0.100	0.133	0.136	0.086	0.174	0.138	0.049	0.185
Dpeers3	0.019	0.098	0.047	–0.094	0.164	0.203	0.163	0.136	0.312	0.076	0.222
St Rej3	–0.026	–0.012	0.120	–0.028	0.113	0.144	0.071	0.042	0.028	0.341	0.127
Drop4	–0.020	0.100	0.067	–0.178	0.169	0.075	0.047	0.100	0.100	0.016	0.223
M	0.224	0.073	0.408	3.320	0.287	0.585	0.131	0.066	0.316	0.710	0.305
S	0.417	0.260	0.492	0.851	0.568	1.009	0.337	0.249	0.722	0.956	0.591

Note. N = 1,195. See Table 2 for meanings of variable abbreviations.

hypothesized causal relationships among the exogenous and endogenous variables as regression coefficients. Direct effects were specified from the exogenous sociodemographic variables to the endogenous T1 variables and the dependent variable at T4 (dropout). Variables at T1 were specified to directly affect only T2 variables. T2 variables were specified to directly affect only T3 variables, and T3 variables were specified to directly affect only the dependent variable at T4 (dropout).[2]

The estimation of the model took into account the categorical nature of the dependent variable. Version 4.02 of the EQS program implements a feature that permits the analysis of models that have categorical and continuous measured variables. It is assumed that categorical variables in the model are categorized versions of variables that are truly continuous. When this assumption is true, the correlations between the underlying variables can be estimated by coefficients known as polychoric and polyserial correlations.[3] For a description of the estimation and implementation of the polychoric and polyserial correlations, see Bentler and Wu (1993) and Lee, Poon, and Bentler (1992).

Measurement Variables

In this study the structural model specified relationships among variables measured at any of four points in time, beginning with T1, T2, and T3 measures of negative academic experiences, perceived rejection by teachers, resistance toward school, low motivation, association with deviant peers, and perceived rejection by other students at school and ending with dropout behavior reported at T4. Each variable was measured by a scale composed of from one to four equally weighted dichotomous statements or questions. The statements and questions used for each scale and the reliability coefficients for each scale are listed in the Appendix.

Negative academic experiences at T1, T2, and T3 was expressed in terms of a two-item scale: One item provided the students' self-report of their grades over the previous 7 years, and the other item provided their self-report of grades since being exposed to the greater demands of the junior high school curriculum.

Perceived rejection by teachers at T1, T2, and T3 was conceptualized as the students' feelings of self-derogation within the school environment. This construct was represented by a four-item scale: Two of the items measured the students' perception of how accomplished their teachers thought they were, and two items measured the students' perception of how well they were liked by their teachers.

Resistance toward school at T1, T2, and T3 was defined as the overt expression of the desire to quit school.

Low motivation at T1, T2, and T3 was measured in terms of the students' readiness to devalue conventional institutions (like schools) and/or their readiness to devalue the

Trej2	Quit2	Lmot2	Dpeers2	St Rej2	Nacad3	Trej3	Quit3	Lmot3	Dpeers3	St Rej3	Drop4
1.000											
0.240	1.000										
0.282	0.172	1.000									
0.315	0.231	0.248	1.000								
0.325	0.134	0.015	0.125	1.000							
0.273	0.188	0.160	0.206	0.174	1.000						
0.429	0.146	0.192	0.230	0.238	0.347	1.000					
0.184	0.400	0.089	0.147	0.132	0.267	0.262	1.000				
0.161	0.188	0.298	0.201	0.101	0.228	0.211	0.173	1.000			
0.270	0.174	0.136	0.464	0.109	0.229	0.323	0.242	0.197	1.000		
0.210	0.072	0.033	0.063	0.496	0.166	0.295	0.193	0.064	0.138	1.000	
0.116	0.063	0.089	0.128	0.095	0.220	0.122	0.120	0.128	0.136	0.007	1.000
0.471	0.187	0.102	0.592	0.605	0.354	0.478	0.178	0.126	0.765	0.543	0.077
0.886	0.390	0.303	0.968	0.933	0.619	0.904	0.383	0.331	1.030	0.888	0.267

structures (making good grades) associated with those institutions. This construct reflected loss of motivation to conform to and motivation to deviate from conventional expectations in the school.

Association with deviant peers at T1, T2, and T3 was conceptualized in terms of a three-item scale that represented the degree to which students reported that their good (or close) friends were engaged in committing deviant acts like smoking marijuana, taking narcotic drugs to get high, and getting into trouble.

Perceived rejection by students at school at T1, T2, and T3 was measured in terms of student responses to a three-item measure that was designed to tap the students' feelings of being rejected at school, in this instance, by peers. The questions on this measure enabled the students to report feelings of being disliked, ignored, and humiliated by their peers.

Dropout behavior at T4 was conceptualized in terms of self-reports of having graduated from high school. The measure of dropout behavior was not administered immediately after the students in the sample should have graduated from high school under normal circumstances, which would have been in the spring of 1976. These measures were administered at least 5 years later. It can be assumed, therefore, that this measure was a more accurate measure of the real high school dropouts, that is, those who did not return within a few years to finish their degree or to obtain a general equivalency degree.

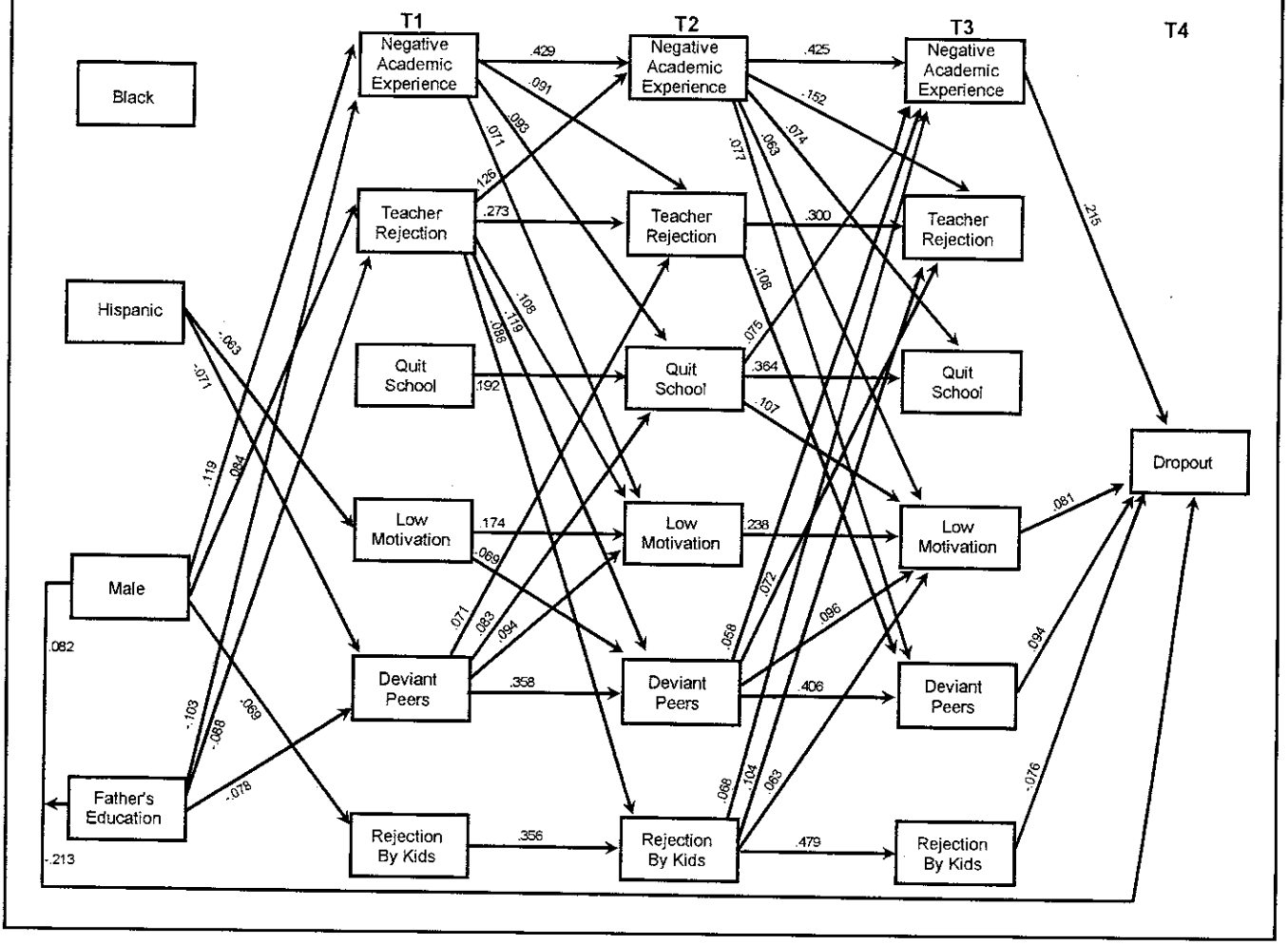
Structural Relations Model

We sought to clarify the relationship between negative academic experiences in junior high school and later dropout behavior by specifying intervening variables that were directly affected by negative academic experiences and that, in turn, may have directly affected dropout behavior. The intervening variables inserted in the model at T2 and T3 included perceived rejection by teachers, resistance toward school, low motivation, association with deviant peers, and perceived rejection by students at school. To more accurately determine the direct effect of negative academic experiences on these intervening variables, we used the same variables as control variables at T1. In addition, to test the models, we controlled the following exogenous variables: ethnicity, gender, and SES, as measured by father's education level.

Results

The means, standard deviations, and intercorrelations of the measurement variables used in the estimation of the causal models are presented in Table 1.[5] The results of the analysis are presented in two sections: (a) an assessment of fit and (b) the estimation of the structural model. We also examined the effects of the exogenous variables on the other variables in the model.

Figure 2. Standardized Structural Coefficients for the Theoretical Model (Significant Paths Only)



Assessment of Fit

The chi-square value for the theoretical model was 380.34 ($df = 96$). The large sample size ensured the high chi-square value. One method for assessing the fit of a model to observed data is the ratio of chi-square to its degrees of freedom (Hayduk, 1987; Wheaton, Muthen, Alwin, & Summers, 1977). In this model, the ratio was 380.34/96 = 3.97. Considering the large sample size (N = 1,195), this value was adequate. The goodness of the assessment of fit was also supported by the high normed fit index (NFI = .93) and nonnormed fit index (NNFI = .85).[6]

Structural Relations Model

Results obtained from an examination of the structural relations model provided support for understanding the relationship between negative academic experiences and later dropout behavior through identification of the psychosocial processes that mediated this relationship. Collectively we expected the mediating variables to account for the relationship between academic performance and dropout behavior. We also expected the mediating variables to be related to each other. However, our examination of the precise relationships among these variables was exploratory.

Causal relations were expressed as regression (beta) coefficients. All significant beta coefficients are presented in Figure 2 on the designated pathways between the variables, and a listing of all the direct, indirect, and total effects of all the independent variables on the T4 dropout dependent variable are presented in Table 2.

The results of particular interest to this study were (a) those that demonstrate (or do not demonstrate) the extent to which the hypothesized variables mediate the previously demonstrated relationship between negative academic experiences and subsequent dropout behavior and (b) those that demonstrate the effects of the proposed mediating variables on subsequent negative academic experiences both between T1 and T2 and between T2 and T3. The second group of results were of interest because they allowed examination of the indirect, as well as the direct, effects of each mediating variable via the other mediating variables.

Table 2.—Direct, Indirect, and Total Effects of Independent Variables in the Model on Dropout at Time 4

Independent variable	Effects		
	Direct	Indirect	Total
Black	–.043	.000	–.043
Mexican American	.039	–.003	.037
Male	.082	.008	.091
Father's education	–.213	–.011	–.225
Negative academic (1)		.055	.055
Teacher rejection (1)		.028	.028
Quit (1)		.015	.015
Low motivation (1)		.010	.010
Deviant peers (1)		.035	.035
Student rejection (1)		–.008	–.008
Negative academic (2)		.107	.107
Teacher rejection (2)		.024	.024
Quit (2)		.047	.047
Low motivation (2)		.014	.014
Deviant peers (2)		.063	.063
Student rejection (2)		–.012	–.012
Negative academic (3)	.215		.215
Teacher rejection (3)	.015		.015
Quit (3)	.049		.049
Low motivation (3)	.081		.081
Deviant peers (3)	.094		.094
Student rejection (3)	–.076		.076

Note. Numbers in parentheses indicate the time at which survey questions were administered: (1) = Grade 7; (2) = Grade 8; (3) = Grade 9; (4) = participants in their early twenties.

The following three mediating variables had direct significant effects on dropout behavior: low motivation (ß = .081), association with deviant peers (ß = .094), and perceived rejection by students at school (ß = –.076). However, when their relationships with earlier negative academic experiences were examined, only low motivation was significantly directly affected by earlier negative academic experiences between both T1 and T2 (ß = .071) and T2 and T3 (ß = .063). Prior negative academic experiences had a significant direct effect on association with deviant peers between T2 and T3 (ß = .077), but not between T1 and T2. On the other hand, perceived rejection by teachers did have a significant effect on association with deviant peers between both T1 and T2 (ß = .119) and T2 and T3 (ß = .108); low motivation also had a significant effect on association with deviant peers between T1 and T2 (ß = .069). In turn, both perceived rejection by teachers and low motivation were directly affected by negative academic experiences between T1 and T2 (ß = .091; ß = .071) and between T2 and T3 (ß = .152; ß = .063).

The third variable that was directly related to dropout behavior, perceived rejection by students at school, was not significantly affected by prior negative academic experiences between T1 and T2 or between T2 and T3. Only perceived rejection by teachers between T1 and T2 (ß = .088) had a significant effect on the variable perceived rejection by students at school even though rejection by students had a significant effect on several variables between T2 and T3, including negative academic experiences (ß = .068), perceived rejection by teachers (ß = .104), and low motivation (ß = .063).

We also examined the results to determine which variables mediated the relationship between early negative academic experiences at T1 and later negative academic experiences at T2 and T3. The only T2 variable that directly mediated the relationship between negative academic experiences at T1 and negative academic experiences at T3 was the expressed desire to leave school (resistance toward school). Thus, the model revealed a significant direct relationship between negative academic experiences at T1 and resistance toward school at T2 (ß = .093) and between resistance toward school at T2 and negative academic experiences at T3 (ß = .075). More complex mediating paths may be inferred by the recognition that negative academic experiences affected perceived rejection by teachers between both points in time (ß = .091; ß = .152); perceived rejection by teachers affected association with deviant peers between both points in time (ß = .119; ß = .108), which, in turn, affected negative academic experiences between T2 and T3 (ß = .058). Perceived rejection by teachers also affected rejection by the kids at school between T1 and T2 (ß = .088), which, in turn, affected negative academic experiences between T2 and T3 (ß = .068).

Although all of the other variables had a direct effect on low motivation either between T1 and T2 or between T2 and T3, the only direct effect of low motivation on any of the other independent variables was its effect on association with deviant peers between T1 and T2 (ß = .069). A consistent result between T1 and T2 and between T2 and T3 was the one-way direct relationship between negative academic experiences and low motivation (ß = .071; ß = .063).

Effects of Exogenous Variables

The significant relationships between the exogenous variables and the endogenous variables are also presented in Figure 1. The often observed relationship between SES (represented by father's education level) and dropout behavior was found in this analysis, which demonstrated direct effects of father's education level on subsequent dropout behavior (ß = –.213) and indirect effects through negative academic experience at T1 (ß = –.103), perceived rejection by teachers at T1 (ß = –.088), and association with deviant peers at T1 (ß = –.078). Once SES was controlled, ethnicity (being Black or Mexican American) was not significantly related to dropout behavior, but being Mexican American was significantly related to both low motivation (ß = –.063) and association with deviant peers (ß = –.071) at T1. Also, being male was significantly positively related to dropout behavior at T4 (ß = .082) and to negative academic experiences (ß = .119),

perceived rejection by teachers (ß = .084), and perceived rejection by students at school (ß = .069) at T1.

Discussion

The analyses provide some clarification and explanation for the often observed relationship between early academic failure and later dropout behavior by specifying selective intervening psychosocial processes. The results indicate that negative academic experiences do have a significant impact on students' self-feelings and feelings of being rejected in the school environment as well as on their attempts to assuage these negative feelings both through their adoption of contranormative attitudes and behaviors and through their association with other students who have adopted similar contranormative stances.

Our results also support the conclusions from other studies of high school dropouts that students who drop out of high school are more likely to report feeling alienated from school life in the years before their dropout behavior than are students who remain in school (Ekstrom et al., 1986). The current study indicates that this pattern of alienation and the adoption of contranormative attitudes and behaviors that lead to dropout behavior can be observed in junior high school students. At the same time, even though significant direct effects of several of the junior high school variables on dropout behavior were observed, the small size of these effects suggest the likelihood that there are more proximal and powerful direct effects on dropout behavior operating during the high school years.

The model presented here indicates both *direct* effects from (a) negative academic experiences, (b) the adoption of attitudes devaluing the importance of the school value system, and (c) association with students who are involved in illegal and disruptive activities and *indirect* effects from (a) academic performance, (b) feelings of rejection in a school context, and (c) adoption of contranormative values and peer associations. Whether the same or a similar set of high school variables used to specify a high school dropout model would yield the same pattern of results supported by more powerful effects remains to be tested.

We observed both cyclical and linear pathways among the variables in the model. We determined that cyclical reciprocal relationships existed between negative academic experience and the desire to quit school, between teacher rejection and association with deviant peers, and between the adoption of attitudes devaluing school grades and association with deviant peers. These findings are consistent with the cyclical models described by Finn (1989) in his review of research on causes of dropout behavior.

At the same time, we observed one significant linear pathway that remained consistent across the model. This was the one-way effect of negative academic experience on the adoption of an attitude devaluing the importance of school grades, which, in turn, had a direct significant effect on dropping out that was not mediated by the other variables. This suggests that students do not do poorly in school because they devalue the importance of grades, but, rather, they begin to devalue the importance of grades because they have done poorly in school. Hence, interventions aimed at encouraging and enabling students to be successful achievers are more likely to improve both their academic performance and their attitudes toward school and toward academic achievement.

The longitudinal nature of the data allowed examination of the trends in the adoption of the contranormative attitudes and associations estimated in the model. An examination of the frequencies of these attitudes and behaviors over the 3 years of junior high school indicated a noteworthy increase (from 6.6 % to 12.55 % between T1 and T3) in the percentage of students reporting that grades were not important and a dramatic increase in the number of students reporting close peer associations who were engaged in contranormative behaviors. In the seventh grade, only 9% of the students (n = 106) reported that close friends performed at least two of three behaviors described in the association with deviant peers measure, whereas by ninth grade, close to 27% of the students (n = 318) reported that their close friends were performing those same types of contranormative behaviors. These results are consistent with Finn's (1989) suggestion that the process of dropping out of school can be understood as a process of progressive disengagement from school (1989, p. 133). Further, although there was a significant increase through the three points in time during junior high school in the number of students' reporting that they were associating with deviant peers, there is a simultaneous decrease in students' reporting a high score (scores of 2 or 3) on perceived rejection by students at school.

We also observed a counterintuitive direct negative effect of perceived rejection by students at school on dropping out of school before high school graduation. Typically, studies of high school students have demonstrated that sophomores who subsequently dropped out of school were less likely to report being popular with other students than were sophomores who stayed in school and graduated (Ekstrom et al., 1986). Entwisle (1990, p. 218), in summarizing results from Pallas's dissertation on the causes of dropout behavior, stated that "youngsters who are rejected by school peers are at higher risk for dropping out later." In the current model, we expected to find that students who feel rejected by other students at school will, like those who feel rejected by teachers, begin to feel more and more alienated from the school environment, and this sense of alienation will eventually lead to their dropping out of school. At first reading, the current results seem to contradict these hypothesized results, but a closer examination of the specified model provides support for an alternative explanation.

Specifically, the significant negative direct relationship that remains between perceived rejection by students and later dropout behavior, after controlling for the effects of the other independent variables, may be viewed as the relationship between students' eventual dropping out and their ear-

lier being rejected by students based on peer values that are contrary to academic or school-related values. The relationship may reflect simultaneously that high-performing students who will eventually graduate often feel disliked by their fellow students and that students who feel they are popular and well liked during junior high school may reflect values that are antithetical to academic achievement and, therefore, to completing schooling. In support of this, researchers have reported a significantly higher incidence of several types of non-academic-based social interactions in high school, including dating and riding around, among those students who ultimately drop out of school than among those who stay in school until graduation (Ekstrom, 1986). Consistent with this finding, Jozefowicz et al. (1994) reported that for male seventh graders, time spent with friends was negatively related to their staying in school through high school graduation.

In the present study, we treated the exogenous variables as controls rather than as theoretically informed variables and, therefore, we have not interpreted them directly. However, the significant relationships observed between SES and negative academic experiences, perceived rejection by teachers, association with deviant peers, and dropout behavior; between being Mexican American and low motivation and association with deviant peers; and between being male and negative academic experiences, perceived rejection by teachers, and dropout behavior suggest that one focus of future research should be on estimating models that specify the linear and moderating influences of gender, race/ethnicity, and SES on the correlates of dropping out. At the very least, these findings suggest the necessity for careful consideration of variables that are not apparently school related for assessing the likelihood of dropping out of school.

Some caution is appropriate in generalizing from the results of this analysis because of the age of (population to have graduated high school in 1976) and localized collection of (limited to students in the Houston Independent School District) the data. However, the composition of the school district at that time reflected the current composition of the city and other cities similar to Houston in population and ethnic composition. Although the population of this study is approximately one generation removed from the cohort of students currently negotiating junior high school (and who we are following as we study the children of the original cohort as they approach graduation/nongraduation from high school), many of the same variables are still suggested in the contemporary literature as causes of students' dropping out of school (Bryk & Thum, 1989; Ekstrom et al., 1986; Kaufman, 1989; Roderick, 1993; Wehlage & Rutter, 1986). Further, our results are essentially compatible with the many informative studies (Ekstrom et al., 1986; Wehlage & Rutter, 1986) based on the High School and Beyond data set derived from students only 6 years older than the students in our data set. Nevertheless, the extent to which cohort effects moderate these relationships remains problematic. As comparable analyses are performed on later cohorts, the timelessness or cohort specificity of the findings will be better established.

The results of this study suggest that one priority in future research should be the investigation of factors affecting negative academic experiences. Logically the first priority for intervention, considering the long-term effects of negative academic experiences, would be to reduce the occurrence and consequences of early academic failure. Intervention in early elementary school to reduce the number of children who fall behind their peers is essential. Perhaps a more flexible curriculum that allows children to progress at their own pace without being penalized by low grades or negative comparisons with their peers would be helpful in reducing negative academic experiences and concomitant self-rejecting feelings and reactive negative school attitudes and behaviors.

The delineation of the variety of peer associations and the questions of how peers come to be associated and how they go about influencing one another have caused researchers to realize that adolescent peer groups and peer cultures are much more complex than was originally assumed (Brown, 1990; Savin-Williams & Berndt, 1990). More refined measurement procedures are necessary to reflect this complexity. Our measures, although acceptable in this exploratory study, must develop into more sophisticated instruments in future research.

Based on the results of the present study, investigators may want to explore further the formation of deviant peer groups and the functions that these groups provide for their members. Frameworks for examining the influences of peers on adolescents, including the school process framework, which typically explores the influences and interactions of best friends, and the school ecology framework, which examines the roles and interactions of students with the more extensive peer community at school (Entwisle, 1990), provide concepts for framing the results of the current study. They also suggest potential research opportunities for exploring the relative importance of types of peer references and associations, as well as the nature of the possible interactions of the effects of these different types of peer associations. We hope that discussions of the model presented here will provide greater opportunities for understanding the processes of student perseverance in and the consequences of deviant peer associations for completing the formal education process.

NOTES

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1. A copy of these correlation matrices is available to interested readers by writing to the first author.

2. Rather than estimate multiple models, we used the cumulative multivariate Lagrange multiplier test (Bentler & Wu, 1993) to test for model misspecification (omission of significant structural paths). The test suggested that only one significant path was omitted (the path from male to T2

perceived rejection by teachers). Because this path was not theoretically informed and no pattern of omitted structural estimates was indicated, we stayed with our original model.

3. Logistic regression or log-linear analysis is a viable alternative for analysis given the dichotomous dependent variable, high school dropout. We used structural equation modeling to permit specification of intervening or mediating variables.

4. For each variable, we scaled the items to form a single indicator rather than using multiple indicators because the individual items were not independent measures but, rather, components of the same theoretical construct. If we had used the items as independent measures in a multiple-indicator model we would have artificially created latent variables when the items were meant to be scaled.

5. All parameter estimates are available from the authors on request.

6. Alternative models were not tested because we estimated a specific theoretical model. In addition, the fit of the present model was acceptable, and the estimation of the Lagrange multiplier test (Bentler & Wu, 1993) revealed no theoretically relevant significant unspecified path. In future research, the current model could be compared with other theoretically informed models.

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APPENDIX
Statements and Questions Used for Each Scale, Along With Their Reliability Coefficients

Measure of Negative Academic Experience

(T1 = .542; *T2* = .581; *T3* = .509)*

Grades Received by the Student (NEGACD)
(2-item scale; score range = 0–2)

During the last 9 weeks, did you get a failing grade in one or more school subject(s)?
Yes = 1; No = 0

Do you usually make good grades (Scored for negative response)
Yes = 0; No = 1

Measure of Perceived Rejection by Teachers

(T1 = .693; *T2* = .695; *T3* = .671)*

Feelings of Self-Derogation Within the School Environment (Trej)
(4-item scale; score range 0–4)

My teachers are usually not very interested in what I say or do.
True = 1; False = 0

By my teachers' standards I am a failure.
True = 1; False = 0

My teachers do not like me very much.

(Appendix continues)

APPENDIX (*continued*)

True = 1; False = 0
My teachers usually put me down.
True = 1; False = 0

Measure of Resistance Toward School (T1, T2, and T3)

Expressed Desire to Quit School (QUIT)
(1-item scale; score range 0–1)

Would you like to quit school as soon as possible?
Yes = 1; No = 0

Measure of Low Motivation (T1, T2, and T3)

Rejection of the Importance of Grades (LMOT)
(1-item scale; score range 0–1)

I think it is important to get good grades.
True = 0; False = 1

Measure of Association With Deviant Peers

(T1 = .686; *T2* = .745; *T3* = .720)*

Having Friends Who Take Drugs and/or Get into Trouble (Dpeers)
(3-item scale; score range 0–3)

Do many of your friends smoke marijuana (grass)?
Yes = 1; No = 0
Do many of your good friends take narcotic drugs to get high?
Yes = 1; No = 0
Most of my close friends are the kinds of kids who get into trouble a lot.
True = 1; False = 0

Measure of Perceived Rejection by the Students at School

(T1 = .636; *T2* = .657; *T3* = .644)*

Perceived Personal Rejection of the Students at School (St-Rej)
(3-item scale; score range 0–3)

More often than not I feel put down by the kids at school.
True = 1; False = 0
The kids at school are usually not very interested in what I say or do.
True = 1; False = 0
Most of the kids at school do not like me very much.
True = 1; False = 0

Measure of Dropout Behavior (T4)

High School Graduation (DROP)
(1-item scale; score range 0–1)

Did you graduate from high school?
Yes = 0; No = 1

*Cronbach alpha reliability estimates are provided for each of the multi-item measures for T1, T2, and T3.