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ABSTRACT

Educational and occupational status projections are conceptualized as mobility linked social psychological components of more general status attainment models. Limitations of such submodels are noted and a rationale is offered. Investigating the stability and reciprocal linkage of 2 status projection variables in a subset of a Southern Youth Study, the dynamics of educational and occupational aspirations and expectations in a 3-wave, rural youth panel are analyzed using the Heise 2-variable path analytic technique. The data were collected over a 6 year period (1966-72) from 154 East Texas males who were originally sophomores in high school. Findings include: mean aspiration measures at each of the 3 waves were consistently larger than the expectation measures; prior levels of projections yielded a moderate level of predictions for subsequent measures; cross-lagged effects indicated that occupational decision-making occurred primarily after high school, and that educational decision-making occurred during high school. (Author/KM)

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EDUCATIONAL AND OCCUPATIONAL STATUS PROJECTIONS: STABILITY AND RECIPROCAL LINKAGES[1,2]

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ABSTRACT

Educational and occupational status projections are conceptualized as mobility-linked social psychological components of more general status attainment models. Limitations of such submodels are noted and a rationale for submodeling is offered. The problem addressed is to investigate the stability and reciprocal linkages of two status projection variables in a subset of the Southern Youth Study. More specifically, the dynamics of educational and occupational aspirations and expectations in a three-wave, rural youth panel are analyzed using the Heise two-variable, path analytic technique. Variables utilized include occupational aspirations, occupational expectations, educational aspirations, educational expectations, level of occupational aspiration, and level of educational aspiration. The data were collected from a three-wave panel of East Texas rural youth over a six year period (1966-72) from 154 males who were originally sophomores in high school. The general modeling technique is applied alternately to occupational aspirations and expectations, educational aspirations and expectations, and level of occupational aspiration and level of educational aspiration combined. The major findings of our analysis are as follows: mean aspirational measures at each of the three waves were consistently larger than the expectational measures with the gap between them increasing at each subsequent wave; prior levels of status projections yielded a moderate level of prediction for subsequent measures; between one-half and three-fourths of the variation in the various status projection variables remained unassociated with prior measures of the same variable; cross-lagged effects indicated that occupational decision-making occurred primarily after high school, that educational decision-making was occurring during high school rather than afterward, and that a reciprocal relationship existed between LOA and LEA during high school but that LOA exerted a causal priority over LEA during the post-high school period; and post-high school projections were considerably more stable than projections during high school.

INTRODUCTION

Status attainment research and the associated social psychological concern with status projections for the formation of mobility linked attitudes has advanced considerably during recent years. Although both topics have a long history of sociological interest, the introduction of path analytic techniques along with other causal modeling procedures has both facilitated the integration of much existing knowledge and given impetus to the pursuit of new directions of research. Early studies by Blau and Duncan (1967), Duncan, Featherman, and Duncan (1968), and Elder (1968) have demonstrated not only the utility of path analytic techniques for the analysis of status attainment, but have set the stage both substantively and methodologically for numerous subsequent studies.

The resultant and now widely accepted strategy has been to treat status attainment within a three phase causal model with relatively fixed contextual variables such as parental socioeconomic status and intelligence exerting influences on attainment that are mediated by a set of social psychological variables. Perhaps the most direct and elaborate modeling effort within this general framework was that conducted by Sewell and his colleagues (Sewell, Haller, and Portes, 1969; Sewell, Haller, and Ohlendorf, 1970; Sewell and Hauser, 1972; Haller and Portes, 1973). This model, termed the "Wisconsin model," includes in a single path arrangement the influences of parental socioeconomic status, intelligence, academic performance, significant other influence, occupational aspiration, educational aspiration, and educational attainment upon occupational attainment. Unfortunately, the generality of the Wisconsin model is somewhat problematic because parallel data sets to replicate and extend the analysis are lacking.

Interestingly, a theoretically related and in some cases independent research development has been the modeling, apart from attainment, of mobility linked, social psychological variables such as occupational and educational status projections. Studies by Duncan, Haller, and Portes (1968), Woelfel and Haller (1971), Gordon (1971), Picou et al. (1972), Carter et al. (1972), Cosby and Picou (1973), and Cosby et al. (1973) are among the reports that have recently applied causal modeling to the problem of mobility attitudes. Although many of these studies were apparently conducted for purposes other than status attainment, it is argued here that a fruitful synthesizing perspective would be to view them as components of yet-to-be constructed general attainment models. That is, such studies can be considered as components or sub-models of a hypothetical status attainment model. Of course, this partial modeling approach has certain limitations. Among these are the tendency to prematurely overgeneralize from a submodel and the inherent methodological difficulties in linking and merging submodels into larger systems. However, the rationale for adopting an explicit component-by-component approach is somewhat convincing: (1) to move directly to a complete model of complex system or process logically entails risks of oversimplification and errors of specification and omission; (2) submodeling allows status attainment research to proceed even in the absence of comprehensive and difficult to obtain data sets required for general process models; (3) submodeling encourages the elaboration of components and elements, i.e., in submodeling, single variables can be viewed as complex multivariate phenomena subject to modeling; and (4) component-by-component submodeling has become a proven and standard method for simulation of physical systems.

THE SOUTHERN YOUTH STUDY STRATEGY FOR MODELING STATUS ATTAINMENT

Although the limited research problem addressed in this paper is the construction of some relatively simple submodels (simple from the point of view of general status attainment modeling), a brief discussion of the broader research goals is included to make clear the intended use of the resultant submodels. The submodels reported here were designed for inclusion in a yet-to-be constructed status attainment model utilizing data from the Southern Youth Study. This research project [USDA (CSRS) Regional Project S-81] has available for analysis, standardized data collected in a six-year, three-wave panel of youth from six southern states. The regional study has the potential for ecological and economic analysis as well as for much of the contextual, social psychological, and attainment data included in the Wisconsin model. The strategy of the larger research project has centered around three general assumptions: (1) the "status attainment process" is so complex that component-by-component modeling would prove to be a prudent approach; (2) many aspects of the phenomena which have been treated as single variables in existing models represent an oversimplification of the reality of the process and should instead be treated as dynamic multivariate components subject to submodeling; and (3) the inclusion of ecological and economic influences should improve the generality and efficiency of the resulting model.

THE PROBLEM: SUBMODELING OF THE DYNAMICS OF OCCUPATIONAL AND EDUCATIONAL STATUS PROJECTIONS

This paper does not address the general causal modeling of the status attainment process; rather, it focuses on submodeling, within a path analytic framework, the stability of and relationships between two status projection variables in the Texas subset of the regional panel. More specifically, the dynamics of occupational aspirations and expectations observed in a three-wave, rural youth panel, are analyzed using the two-variable, path analytic technique for panel data developed by Heise (1970). The rationale for selecting this limited aspect of the general status attainment problem is based primarily on the following consideration. If we can assume that these projections were, in fact, highly dynamic (and existing theory and research supports this contention), it would follow that improved knowledge of the dynamics within an explicit modeling framework would appear essential to the construction of more powerful general process models. Put differently, some evidence indicates that status projections demonstrate substantial variation both in the static situation (one-wave designs) with respect to levels of other variables, and in the dynamic situation (multi-wave, repeated measurement designs) with respect to time. This second type of variation has received little attention in current models and, consequently, is poorly understood. Thus, it would follow that modeling taking into account such variation promises gains, however meager, in knowledge of attainment processes.

Numerous theoretical treatments developed both in sociology and other disciplines have viewed occupational projections as highly variable and generally stress the dynamics of the phenomena (e.g., see Ginzberg et al., 1951; Super, 1953; Beilin, 1955; Tiedeman, 1961; Musgrave, 1967; Kuvlesky, 1970). Ginzberg-like explanations of change in status projections that stress a shift from early fantasy (goal-centered) choices of pre-and early adolescence to more realistic (means-centered) choices of late adolescence and early adulthood typify such formulations. Whatever the relative merit of these formulations, there appears to be consistent agreement among these theorists on the dynamic nature of projections.

The organizing construct that allows the conceptual synthesis of the various variables utilized in this research is that of status projections. It is felt that this construct provides a format within which a cluster of restricted orientational variables conveniently fit both conceptually and operationally. The construct is treated as a special case of general status orientations that refer only to a future orientation to statuses. The concept of status orientation, of course, can refer to both past and present, as well as, future status orientations.

Status projection phenomena are differentiated into a status area dimension and a future orientation or projection dimension. Status area refers to the wide range of social statuses that are sociologically meaningful to an individual in any given society. In contemporary American society, youth are generally thought to be socialized and orient d toward several key social statuses. Most evident among these are occupational statuses, educational statuses, marital statuses, procreational statuses, and military statuses. Although this list is not exhaustive, even for American society, it does indicate the types of statuses that are objects of analysis. Generally the statuses selected for analysis are those in a society about which a youth normally must make some decision as he approaches adulthood and that the nature of his decision is thought to have considerable implications for his subsequent behavior.

The projection dimension of the phenomena closely follows the conceptualization proposed by Kuvlesky and Bealer (1966) in their essay on occupational choice. The main departure is that the framework is generalized to education in addition to occupation. Following their lead, two basic components are differentiated both conceptually and empirically--aspirations and expectations. Occupational aspirations are defined as a person's or group's orientation toward an occupational goal. The concept can be further differentiated into three components: (1) a chooser or selector element, (2) a wanting or desiring element, and (3) an occupational goal(s). Occupational expectations, on the other hand, refer to an individual's estimation of the likelihood of attaining an occupational object(s). Like the aspiration concept, three aspects of expectations can also be distinguished: (1) a chooser or selector element, (2) an estimation of probable attainment, and (3) an occupational object(s). The fundamental difference between the concepts is the nature of the orientational component. By definition, the orientational component of an aspiration is essentially positive, a wanting or desire, whereas expectations may be either positive or negative. That is, an individual need not necessarily desire his anticipated or expected occupational attainment. This conceptual treatment, of course, is not new and has been utilized in numerous studies (e.g., Slocum, 1956; Stephenson, 1957; Nunalee & Drabick, 1965; Glick, 1962; Kuvlesky and Ohlendorf, 1968). In addition, the recent annotated bibiliography by Cosby et al., (1973) reviewed over fifty research reports conducted in the South in which this framework was used.

OPERATIONALIZATION OF VARIABLES

(1) Occupational Aspirations (X_1, X_3, X_5: Model I) -- operationalized by assigning Duncan's socioeconomic index scores (1961) to the responses obtained in each of the three waves to the question:

If you were completely free to choose any job, what would you desire most as a lifetime occupation?

(2) Occupational Expectations (X_2, X_4, X_6: Model I) -- determined in a manner similar to that of occupational aspirations by assigning Duncan's socioeconomic scores to the responses obtained in each of the three waves to the question:

Sometimes we are not always able to do what we want most. What kind of job do you really expect to have most of your life?

(3) Educational Aspirations (X_1, X_3, X_5: Model II) -- was operationalized by responses to the following question:

If you could have as much education as you desired, which of the following would you do? (circle only one number):

Six fixed-choice responses accompained this stimulus on the questionnaire, with choices ranging from "quit school now" to "complete additional studies after graduation from a college or university." Assigned numerical values ranged from one to six.

(4) Educational Expectations (X_2, X_4, X_6: Model II) -- determined by fixed choice responses to the following question:

What do you really expect to do about your education? (Circle only one number):

The same fixed responses provided for educational aspirations were again used.

(5) Level of Occupational Aspiration [LOA] (X_1, X_3, X_5: Model III)--a composite variable thought to yield scores, if standardized, that would roughly approximate those obtained with the Haller and Miller Occupational Aspiration Scale (1963). The scores were determined by a simple average of occupational aspirations and occupational expectations expressed in Duncan's SEI scores:

$$LOA = \frac{\text{Occupational Aspiration (SEI)} + \text{Occupational Expectation (SEI)}}{2}$$

(6) Level of Educational Aspiration [LEA] (X_2, X_4, X_6: Model III)--a composite variable thought to approximate the level of educational aspiration scale utilized by Woelfel and Haller (1971). LEA values were obtained by a simple average of educational aspirations and educational expectations.

$$LEA = \frac{\text{Educational Aspiration} + \text{Educational Expectation}}{2}$$

DATA COLLECTION: THE TEXAS PANEL

The data set utilized in this analysis was collected from a three-wave panel of East Texas rural youth over a six year period (1966-1972). The panel consisted of 188 males who had originally (1966) been high school sophomores in three rural East Texas counties. Thirty four respondents were deleted from the modeling because of incomplete projection data. Wave-by-wave data collection procedures were as follows:

(a) Wave I (Spring, 1966). Group-administered questionnaires were given to all tenth-grade high school students present the day of the interview. The high schools selected were in three counties which were classified as 100% rural according to the 1960 census.

(b) Wave II (Spring, 1968). A secon contact was made with the respondents previously interviewed in 1966. The majority of the Wave II data were collected by again using group-administered interview schedules with the items contained in this period worded the same as the previous period. Attempts were also made to contact those respondents who had either mov d from their original counties or who had dropped out of school; personal interviews and/or mailed questionnaires were used with these respondents. Eighty-nine percent of the Wave I panel was interviewed by these combined techniques. Panel attrition was largely attributed to scholastic dropouts--approximately one-half of the Wave II losses were high school drop-outs.

(C) Wave III (Summer-Fall, 1972). The third contact was made in 1972 when the original respondents were four years beyond expected high school completion. The measures for this period were obtained primarily by personal interview. Mailed questionnaires and telephone interviews were used for a minority (15%) of the respondents who were not interviewed by the primary method. Approximately 92% of the Wave II panel were recontacted by all methods. The principal cause of panel attrition appeared to be out-of-state migration and military service.

THE DEVELOPMENT OF THE 3W-2V MODEL: AN APPLICATION OF THE HEISE APPROACH

The general modeling technique applied alternately to (1) occupational aspirations and expectations, (2) edu tional aspirations and expectations and (3) level of occupational aspiration (LOA) and level of educational aspiration (LEA) is an adaptation of the path analytic method developed by Heise (1970) for analysis of panel data. Heise designed a path-analytic method to deal with the consistency and cross-lagged effects in a two-wave, two-variable panel design (2W-2V model). [Note: See Pelz and Lew (1970) for an evaluation of the utility of the Heise model using simulated data; Pelz and Andrews (1964) for a discussion of the closely related method of cross-lagged correlations; and Duncan (1972) for an extension of the 2W-2V model to include unmeasured factors.] The main departure in our modeling from that presented by Heise is a simple extension of the technique from a two-wave, two-variable (2W-2V) model to a three-wave, two-variable (3W-2V) model.

Closely following the approach developed by Heise, our models treat the same variable observed at each wave as hypothetically different variables. [For a graphic representation of the general approach see Figure I]. Thus, X-odd variables (X_1, X_3, X_5) refer to a single variable, either occupational aspirations, educational aspirations, or level of occupational aspiration (LOA) depending on the model and X-even variables (X_2, X_4, X_6) to occupational expectations, educational expectations, or level of educational aspiration (LEA) again depending on the model [examine Figure II for a clarification of variable specifications]. Using this arrangement, each of the 3W-2V models resulted in a model with six hypothetical variables. It was obvious (and in this case theoretically desirable) that all possible paths in a six variable submodel could not be computed (See Heise, 1969; Heise, 1970). Fortunately, however, the introduction of a set of assumptions, discussed in some detail by Heise, which are isomorphic with the notion of causation in time-ordered data, allowed a theoretically agreeable solution. First, the assumption of temporal asymmetry of effects was made so that later states of a variable could not influence earlier states. Thus, it was assumed that occupational aspiration levels in Wave III (1972) did not effect levels of the variables in either Wave II (1968) or Wave I (1966) and that levels in Wave II (1968) did not effect levels in Wave I (1966). The application of this assumption eliminated the following twelve paths: ($X_6 \rightarrow X_{1,2,3,4}$; $X_5 \rightarrow X_{1,2,3,4}$; $X_4 \rightarrow X_{1,2}$; and $X_3 \rightarrow X_{1,2}$). Second, it was assumed that effects did not occur instantaneously but rather after some finite time period. Therefore, it was assumed that aspirations and expectations measured in the same wave did not effect each other but instead that effects were cross-lagged across waves. The generalization of this assumption resulted in the deletion of six additional paths ($X_1 \rightarrow X_2$; $X_2 \rightarrow X_1$; $X_3 \rightarrow X_4$; $X_4 \rightarrow X_3$; $X_5 \rightarrow X_6$; and $X_6 \rightarrow X_5$). Third, since the study was designed to analyze the wave-by-wave consistency and cross-lagged effects, the four paths that skip Wave II ($X_1 \rightarrow X_{5,6}$ and $X_2 \rightarrow X_{5,6}$) were also deleted.

The application of the aforementioned set of assumptions and the related deletion of paths resulted in the three-wave, two-variable model which appears as Figure I. The paths in this model lead to two types of interpretation. First, one set of paths are interpreted as estimates of the consistency or stability of each type variable between waves. For example, paths from X-odd to X-odd variables for Model I are estimates of the consistency or stability of occupational aspirations and paths from X-even to X-even variables in this same model are estimates of the consistency or stability of occupational expectations. Second, the paths from X-odd to X-even variables and X-even to X-odd variables are interpreted as estimates of the cross-lagged effects of one type of paired variable on the other. Again in Model I, the paths from aspirations to expectations (X-odd to X-even) and from expectations to aspirations (X-even to X-odd) are estimates of various cross-lagged effects between occupational aspirations and expectations. These interpretations of estimates agree with the Heise model (1970) and with the earlier work on cross-lagged correlations by Pelz and Andrews (1964).

ANALYSIS OF MODEL I: DYNAMICS OF OCCUPATIONAL STATUS PROJECTIONS

(1) Mean and standard deviation values for Model I are reported in Table 1. Inconsistent directions of aggregate change were observed for occupational projections. The largest mean values for both aspirations ($\bar{X}_3 = 55.45$) and expectations ($\bar{X}_4 = 48.38$) were obtained in the intermediate or Wave II data. Thus, there was not a consistent trend toward an increase or decrease in either type projection within the temporal range of our data. There was, however, a tendency for the difference between aspiration and expectation means at each wave to increase over time (i.e., Wave I: $\bar{X}_1 - \bar{X}_2 = 5.69$; Wave II: $\bar{X}_3 - \bar{X}_4 = 7.07$; and Wave III: $\bar{X}_5 - \bar{X}_6 = 9.89$). These changes represent an increase in average difference of 24 percent between Wave I and Wave II and a larger increase of 40 percent between Wave II and Wave III. Thus, two patterns in the aggregate data were discernible. The youth had generally higher level aspirations and expectations during their senior year, and the difference between aspirations and expectations increased over time with the largest increases occurring after high school. Although these patterns obviously suggest certain developmental interpretations, such explanation should

be made with caution since these values (1) were obtained from a restricted panel, and (2) were based on aggregate rather than individual measures.

(2) The matrix of zero-order correlations between the six variables for Model I are reported in Table 2. All correlations in the matrix were found to be statistically significant at a probability level less than .01. Three rather clear patterns among the correlation coefficients were discerned. First, the correlations between occupational aspirations and expectations measured at the same wave (r_{12} = .65, r_{34} = .62, and r_{56} = .55) were found to be the largest coefficients in the matrix. These correlations were viewed as an indication of the relatedness and overlap of the two types of occupational projections at the same point in time. Second, correlations between variables in Waves I and II (r_{13} = .45, r_{14} = .42, r_{23} = .38, and r_{24} = .50) and correlations between variables in Waves II and III (r_{35} = .46, r_{36} = .43, r_{45} = .44, and r_{46} = .50) were larger than the corresponding correlations between variables in Waves I and III (r_{15} = .23, r_{16} = .31, r_{25} = .29, and r_{26} = .32). Thus, there appeared to be a time-linked pattern for the degree of correlation between projections to diminish when the time lag between measurements increased. Third, consistency correlations (correlations between aspirations and aspirations or between expectations and expectations) were generally larger than cross-lagged correlations (correlations between aspirations and expectations). That is, correlations between <u>like</u> variables were generally larger than correlations between <u>related</u> variables.

(3) The diagram for the three-wave, two-variable submodel applied to the total male panel is presented as Model I. Each path coefficient in the model was found to be greater than .10 and all but two were at least twice their standard error and, thus, were considered to have sufficient magnitude to indicate effect. As in the analysis of correlations, several patterns emerged. First, and perhaps the most apparent of these, was the similarity in the multiple correlation coefficients associated with both aspirations and expectations observed in Waves II and III ($R_{3\cdot12}$ = .47, $R_{4\cdot12}$ = .52, $R_{5\cdot34}$ = .50, and $R_{6\cdot34}$ = .52). These figures indicated that approximately one-fourth of the variation in each projection measure could be accounted for by levels of the variables at the just-prior wave ($R^2_{3\cdot12}$ = .22, $R^2_{4\cdot12}$ = .27, $R^2_{5\cdot34}$ = .25, and $R^2_{6\cdot34}$ = .28). Second, the consistency paths (p_{31}, p_{42}, p_{53}, and p_{64}) were all larger than the cross-lagged paths (p_{32}, p_{41}, p_{54}, and p_{63}). The magnitude of the consistency paths at the various waves suggests that (1) both aspirations and expectations were moderately stable within the range of the data and (2) that occupational expectations had become slightly more stable than aspirations between Waves II and III (p_{64} = .34 whereas p_{53} = .30). Third, an examination of the cross-lagged paths revealed mixed effects. Both cross-lagged coefficients between Waves I and II were similar and were the smallest ones in the model—both were less than twice their standard error. Between Waves II and III the effects from expectations to aspirations were stronger than from aspirations to expectations (p_{54} = .26 and p_{63} = .19). That is, although both types of projections exerted cross-lagged influences, the data suggested a priority of

expectations between these two waves.

ANALYSIS OF MODEL II: DYNAMICS OF EDUCATIONAL PROJECTIONS

(1) The mean and standard deviation values for both educational aspirations and expectations at each of the three-waves are reported in Table 3. The educational aspiration mean was 4.38 at the sophomore year, decreased slightly by the senior year ($\bar{X}_3$ = 4.33), and then increased to the largest value four years after high school ($\bar{X}_5$ = 5.01). To assist in interpreting these values, it should be pointed out that a value of 4 would indicate a response "to graduate from a junior college" and a value of 5 would indicate a response "to graduate from a four year college or university." Thus, there was a tendency for the aggregate to aspire to higher educational goals (to graduate from a four year college or university) by Wave III. This change suggests that the panel was placing an increased value on educational attainment. The mean values for educational expectations, however, followed a much different pattern in that they changed very little ($\bar{X}_2$ = 4.12, $\bar{X}_4$ = 3.94, and $\bar{X}_6$ = 4.02). Also, there was a consistent wave-by-wave pattern for the differences between aspirations and expectations to widen ($\bar{X}_1 - \bar{X}_2$ = .26, $\bar{X}_3 - \bar{X}_4$ = .39, and $\bar{X}_5 - \bar{X}_6$ = .99). The percentage change in these mean differences between Waves I and II was 50 percent and 154 percent between Waves II and III. It was interesting to note that these changes were similar to patterns in differences between occupational aspirations and expectations means reported in Table 1.

(2) The zero-order correlations between educational aspirations

and expectations measured at each of the three waves are presented in Table 4. All correlations in the matrix were found to be of sufficient magnitude to indicate statistical significance at a probability level less than .0001. The correlations between educational aspirations and expectations measured at the same wave were among the larger coefficients ($r_{12} = .74$, $r_{34} = .75$, and $r_{56} = .54$). When we used the coefficient of determination as the criterion of comparison ($r^2_{12} = .55$, $r^2_{34} = .56$, and $r^2_{56} = .29$) it was found that the shared variation between aspirations and expectations at Waves I and II was approximately twice that observed for Wave III. This was considered further evidence of age-linked divergence of educational aspirations and expectations. The consistency and cross-lagged correlations between Wave I and Wave III were generally of less magnitude than the other correlations in the matrix ($r_{15} = .33$, $r_{16} = .38$, $r_{25} = .44$, and $r_{26} = .44$). The wave-by-wave, consistency and cross-lagged correlations were mixed and of moderate magnitude (ranging between .42 to .62).

(3) The 3W-2V path diagram for the dynamics of educational aspirations and expectations appears as Model II. Multiple correlation coefficients for aspirations and expectations were as follows: $R_{3\cdot12} = .56$, $R_{4\cdot12} = .64$, $R_{5\cdot34} = .51$, and $R_{6\cdot34} = .54$. Thus, the associated explained variation at each point in the model was $R^2_{3\cdot12} = .31$, $R^2_{4\cdot12} = .41$, $R^2_{5\cdot34} = .26$, and $R^2_{6\cdot34} = .29$. Each of the consistency paths was found to be of significant magnitude to indicate effect ($p_{31} = .31$, $p_{42} = .46$, $p_{53} = .43$, and $p_{64} = .41$). As had been the case with the occupational status projection model (Model I), an examination of the cross-lagged paths between educational aspirations and expectations did not reveal a consistent pattern. All the coefficients

were .10 or greater but two were less than twice their standard error. Between Waves I and II, the path from educational expectations to educational aspirations (p_{32} = .29) was larger than the path from educational aspirations to educational expectations (p_{41} = .22). However, between Waves II and III, both cross-lagged paths were less than twice their standard error and, thus, were considered to be of insufficient magnitude to have an effect.

ANALYSIS OF MODEL III: DYNAMICS OF LOA AND LEA

(1) Mean and standard deviation values for Model III are reported in Table 5. Since LOA is the average of occupational aspirations and expectations (see Table 1), LOA also increased somewhat in Wave II and decreased slightly in Wave III ($\bar{X}_1$ = 46.59, $\bar{X}_3$ = 51.92, and $\bar{X}_5$ = 48.02). Similarly, LEA means are comparable to those for educational aspirations and expectations (see Table 3) with a slight decrease at Wave II and a larger increase at Wave III ($\bar{X}_2$ = 4.25, $\bar{X}_4$ = 4.14, and $\bar{X}_6$ = 4.51). These means summarize the overall pattern of the aggregate data in that LOA was highest during the senior year and LEA was highest four years later. Thus, the LOA trend peaked during high school and declined later while the reverse occurred for LEA.

(2) The matrix of zero-order correlations for Model III is reported in Table 6. All correlations in the matrix were found to be statistically significant at a probability level of .0001. Patterns of relationships among these correlations were mixed compared to the previous matrixes. The largest coefficient in the matrix was between LOA and LEA in Wave II (r_{34} = .65) but the comparable one for Wave I was the lowest (r_{12} = .35)

and the coefficient for Wave III was of intermediate magnitude ($r_{56} = .53$). Correlations between variables in Waves I and II ($r_{13} = .54$, $r_{14} = .44$, $r_{23} = .41$, and $r_{24} = .64$) and between Waves II and III ($r_{35} = .58$, $r_{36} = .54$, $r_{45} = .44$, and $r_{46} = .58$) were all higher than the corresponding coefficients between Waves I and III ($r_{15} = .38$, $r_{16} = .41$, $r_{25} = .36$, and $r_{26} = .48$). This indicated that the time-linked pattern for the degree of correlation between LOA and LEA diminished with greater time lag between measurements. With two exceptions ($r_{15} = .36$ and $r_{16} = .41$), the correlations between like variables were larger than between unlike ones. This indicated that the correlations between like variables were generally stronger than correlations between related variables.

(3) The path diagram for the dynamics of LOA and LEA is presented as Model III. Multiple correlation coefficients associated with LOA and LEA in Waves II and III were somewhat higher than for occupational aspirations and expectations ($R_{3\cdot21} = .59$, $R_{4\cdot21} = .67$, $R_{5\cdot34} = .58$, and $R_{6\cdot34} = .62$). This indicated that one-third or more of the variance in LOA and LEA was accounted for by the variables in the prior wave ($R^2_{3\cdot21} = .34$, $R^2_{4\cdot21} = .45$, $R^2_{5\cdot34} = .34$, and $R^2_{6\cdot34} = .39$). The consistency paths ($p_{31} = .45$, $p_{42} = .55$, $p_{53} = .50$, and $p_{64} = .40$) were all larger than the cross-lagged paths ($p_{32} = .25$, $p_{41} = .24$, $p_{54} = .12$, and $p_{63} = .28$). All of the paths except a cross-lagged one (p_{54}) were at least twice their standard error. This suggests that LOA and LEA were moderately stable with LEA more stable between Waves I and II and LOA more stable between Waves II and III.

The cross-lagged paths between Waves I and II ($p_{32} = .25$ and $p_{41} = .24$) were both of sufficient magnitude to indicate effect. This suggested that in the earlier stage (high school period) LOA and LEA exerted approximately equal reciprocal effects. However, during the post-high school period, a different pattern emerged. The cross-lagged path between LEA and LOA (p_{54} = .12) for this period had greatly diminished and was considered to be of insufficient magnitude to indicate effect. The other cross-lagged path from LOA to LEA (p_{64} = .28) remained of sufficient size to indicate effect. Tentatively, the relationship between LOA and LEA during high school appeared to be reciprocal whereas in the post-high school period LOA appeared to have a causal priority over LEA.

HIGH SCHOOL VERSUS POST HIGH SCHOOL STABILITY IN PROJECTIONS

An interesting and potentially significant problem that can be addressed in multi-wave, repeated measurement panel designs is differential rates of stability expressed as a function of time. Stated substantively in terms of the present research, such designs allow the researcher to ascertain whether the stability of the various measures of status projections became more or less stable as the panel moved from the high school to post-high school periods. This could be estimated roughly by inspecting the relative magnitude of the corresponding stability paths if the lags between waves were identical. However, in variable lag designs such as ours, the analysis becomes somewhat complicated in that the stability paths across waves are not directly comparable.

One obvious solution to this problem of variable lags is the application of the principles of elementary differential calculus to the appropriate equations. That is, the first derivative ($\frac{dy}{dt}$) of stability (y) expressed as a function of time (t) results in a measure of the rate of change in stability. Therefore, if we take the first derivative of the appropriate function $y = f(t)$ for the high school period and compare it with the first derivative of the corresponding function for the post-high school period, a direct comparison of stability can be achieved regardless of lags. Unfortunately, this assumes that the required stability equations have been determined and can be applied readily to the data set. Since this information was unknown for the stability of status projections, experimenting with likely functions became a task of this research.

Intuitively, linear, exponential, and logistic functions seemed to represent reasonable options. The linear form was selected as a point of departure since it involved the option with the least and simplest assumptions. A linear solution can be approached as follows. Logically, we can assume that stability (y) equals one when time (t) equals zero, i.e., there could be no instability without an incremental change in time. In addition, we have obtained a measure of stability (the stability path) at a given time for each period. Therefore, the linear solution can be achieved since we have two known points by applying the slope formula ($m = y_2 - y_1 / x_2 - x_1$). Using these procedures, stability equations were derived for each status projection variable during the high school and post-high school periods. The first derivatives were taken for each equation and interpreted as the rate of change in stability.

The stability paths and the corresponding rates of change in stability for each measured status projection variable are presented in Table 7. When the stability paths for the high school period were compared with the corresponding post-high school paths, the resulting pattern of stability paths was mixed, i.e., some paired paths were larger for the high school periods while others were larger in the post-high school period.

As we have already indicated, the comparison of these paths for the given periods may not lead to a straight-forward interpretation as a result of different lags.

Based on analysis of the rates of change ($\frac{dy}{dt}$), the previously discussed caution in interpreting stability paths proved to be prudent in that a clear pattern was revealed which had been concealed in the stability paths. In each rate of change in stability comparison, post-high school status projections were found to be considerably more stable than the comparable high school projections. That is, the rates ($\frac{dy}{dt}$) were of smaller negative value for post-high school measures than for high school measures, indicating greater resistance to changes in these attitudes after high school. Based on the ratio of the high school to the post-high school rates, the stability of the latter appeared to be approximately one and one half to two and one half times greater than the former. It should be noted that these conclusions were based on a linear function of the relationship between stability of status projections and time, when in fact, the form of these relationships has not been adequately established. We feel that the use of either exponentials or logistic functions would not alter the central finding of increasing stability; however, the use of such functions would definitely effect the magnitude between the rates of stability.

DISCUSSION AND IMPLICATIONS

The problem addressed in this research was the submodeling of selected components of the general status attainment process. More specifically, modeling the stability of and the relationships between several measures of occupational and educational status projections were developed as components for a yet-to-be constructed status attainment model. The submodeling was centrally concerned with the dynamics of educational and occupational aspirations stated in terms of the Wisconsin model. This delimited approach was based on the rationale that "the status attainment process" is so complex that component-by-component submodeling would prove a sound research strategy. It was felt that the treatment of occupational and educational aspirations as simple one-time variables in current models oversimplifies their effect in the process and that instead, viewing these phenomena as dynamic multivariate components subject to submodeling should further elaborate the understanding of status attainment processes. Before discussing the implications of the submodels, a brief outline of several "findings" would be useful.

(1) Mean aspirations measures (both occupational and educational projections) at each of the three waves were found to be consistently larger than the corresponding expectational measures. Furthermore, the gap between aspirational and expectational means became larger at each subsequent wave. This strongly supports the treatment of aspirational and expectational phenomena in a developmental framework and suggests that divergence of the two types of projections may take on greater significance relatively late in the status attainment process.

(2) From the statistical perspective of simple prediction, prior levels of status projections were found to yield a moderate level of prediction of subsequent measures. For example, coefficients of determination (R^2) obtained at the senior contact (Wave II) in Model

III for LOA and LEA were .35 and .46, respectively. That is, 35 percent of the variation in senior year LOA and 46 percent of the variation in senior year LEA could be associated with sophomore levels of LOA and LEA. Interestingly, these coefficients were approximately the same magnitude as the coefficients of determination in the Wisconsin model for farm and village youth. The coefficients obtained with the Wisconsin farm subsample were .32 and .34 for LOA and LEA, respectively, and .40 for LOA and .43 for LEA with the Wisconsin village subsample. Admittedly, these coefficients were not directly comparable since the Wisconsin estimates are based on the effect of significant other influence and academic performance on LOA and LEA observed in a single wave, whereas estimates in this study were based on effects of prior levels of LOA and LEA on subsequent levels of the same variables in a multi-wave, panel design. Nevertheless, it does suggest that approximately the same degree of prediction of LOA and LEA can be achieved from knowledge of prior levels of the variables as from current knowledge of causal networks.

(3) Coefficients of nondetermination ($1-R^2$) for the various status projection variables measured at Waves II and III in the three models were found to range from a high of .78 to a low of .54. This indicated that about one-half to three-fourths of the variation remained unassociated with the prior measures of the same variables. This suggests an interesting problem. By inference, the amount of variation (considering direct effects) that remained "unexplained" would be some function of measurement error and unknown intervening influences. If we were to assume for the moment

that measurement errors were negligible, we would conclude from our models that the major source of influence on senior measures of these variables occurred during the high school period and that pre-sophomore influences played a relatively minor role. Of course, the assumption of minimal measurement error would be unfounded without additional information. This argument, however, not only points to the usual concern for measurement error to improve the precision of estimates, it also suggests a possible line of analysis heretofore not addressed in status attainment modeling. That is, an analysis of measurement error could lead to an understanding of the point of intervention of unknown influences into the process.

(4) An analysis of the cross-lagged effects of aspirations and expectations for occupational projections (Model I) indicated a lack of either a one-way or reciprocal effect of aspirations and expectations during high school. However, both cross-lagged effects were observed in the post-high school period indicating a possible reciprocal relationship. If we assume that interpenetration of aspiration and expectation for occupations are indicative of decision-making, as some maintain then it would follow that such behavior was occurring after high school. A comparable analysis of aspiration and expectation for educational projections (Model II) produced similar findings with the exception that educational decision-making seemed to be occurring during high school rather than in the post-high school period. These two findings, taken together, may point to critical development periods for measuring occupational and educational projections.

(5) An analysis of the cross-lagged effects of LOA and LEA resulted in the finding that during high school both paths were judged to have effect indicating a possible reciprocal relationship. Woelfel and Haller (1971) had hypothesized such a relationship and in their modeling with one wave data initiated such an analysis. When we compared the cross-lagged paths in our post-high school data, a different relationship was observed. In this case, there appeared to be a causal priority of LOA over LEA. When our two findings were taken together, it was apparent that the problem is not only the form of the LOA-LEA relationship but also the period in which the measurements are taken. That is, it can be argued that the LOA-LEA relationship is reciprocal during high school and changes into a one-way relationship after high school with an emergence of a causal priority of LOA over LEA.

(6) Perhaps the most consistent finding was that post-high school projections were considerably more stable than projections observed during high school. This observation held for occupational aspirations and expectations; educational aspirations and expectations; and LOA and LEA. That is, the rates of change in status projections had decreased after high school and were "crystalizing" as Ginzberg _et al._, (1951) had theorized for this period.

The preceding exercise in submodeling has led us to several "findings" which we feel may lead to further elaboration and reformulation of current status attainment models. The general impression gained from our experience in working with these 3W-2V status projection models was that the dynamics and interrelationship evidenced by LOA-LEA phenomena are so complex that one-wave treatments of such variables may result in both an oversimplification of the role they play and an underestimation of their influence on actual status attainment. This, of course, is suggestive of a strategy of including multi-wave repeated measurement projection data in status attainment models. Although intuitively appealing, the utility of this argument remains problematic until such data are combined with measures of attainment in the same model. The submodeling conducted in this research does, however, provide information from which to speculate on the nature of such a restructured model.

First, it appears that the aspirational-expectational distinction, heretofore, unconsidered in status attainment models may have utility in the explanation and that the significance of the distinction may occur relatively late (post-high school) in the process. It should be recalled that aggregate aspirational and expectational measures for both occupational and educational projections became consistently more divergent over the range of our data. Second, it appears that the critical period for analysis of LEA type phenomena would be during the high school period, whereas, the critical period for the analysis of LOA phenomena may occur after high school. Third, it appears that the effects between LOA and LEA should be included in status attainment models with the researcher being aware of a possible shift from reciprocal influences between LOA and LEA during high school to a one-way priority of LOA over LEA after high school. It is hypothesized that the incorporation of these components in a general status attainment model would lead to further explanation of the role of occupational and educational projections in attainment processes.

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FIGURE I. GENERALIZED THREE-WAVE, TWO-VARIABLE MODEL
(3W-2V MODEL)

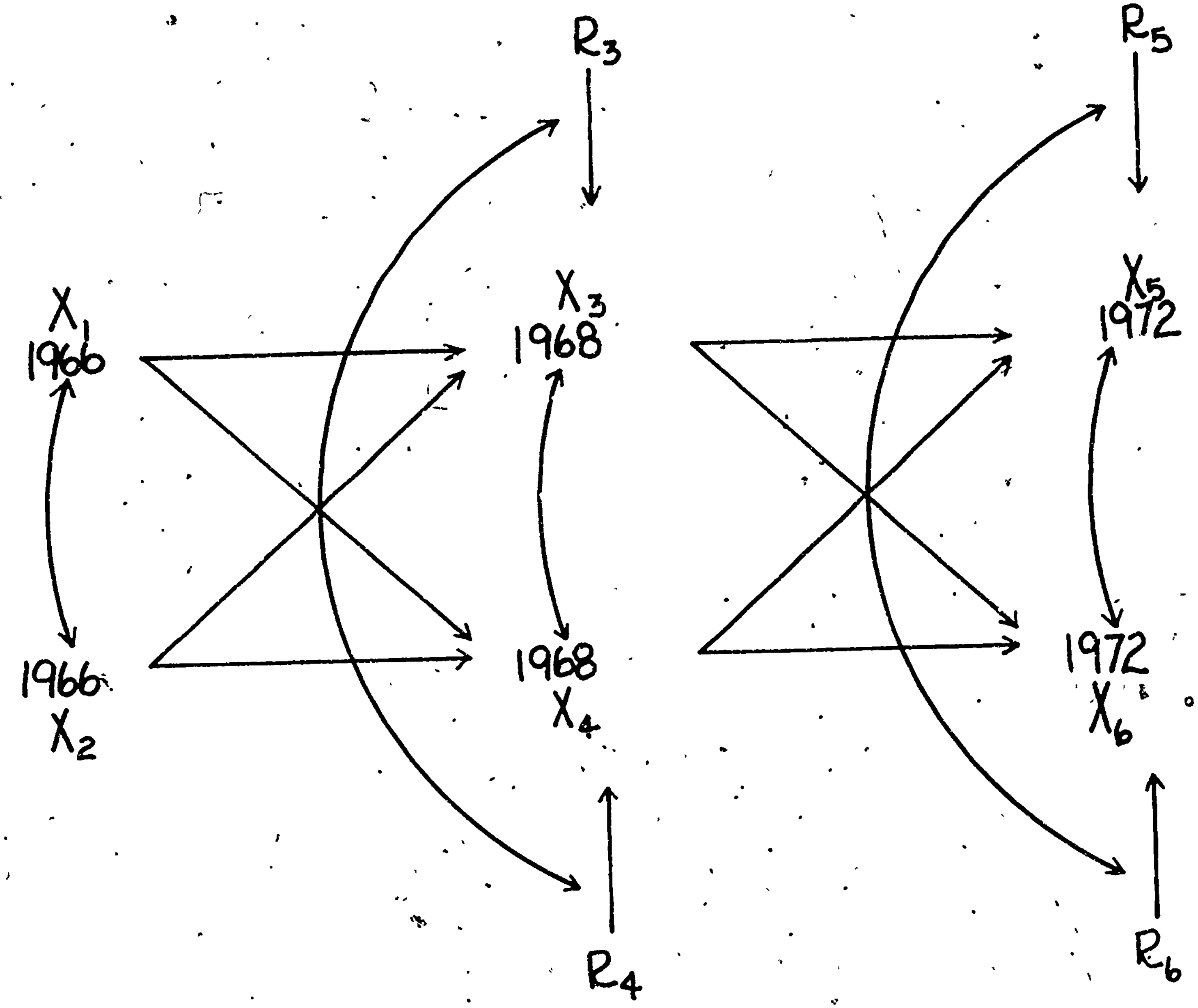


FIGURE II. VARIABLE SPECIFICATIONS FOR EACH OF THE THREE MODELS

MODEL	WAVE I (1966)	WAVE II (1968)	WAVE III (1972)
MODEL I			
Occupational Aspirations	X_1	X_3	X_5
Occupational Expectations	X_2	X_4	X_6
MODEL II			
Educational Aspirations	X_1	X_3	X_5
Educational Expectations	X_2	X_4	X_6
MODEL III			
Level of Occupational Aspiration	X_1	X_3	X_5
Level of Educational Aspiration	X_2	X_4	X_6

TABLE 1. Means and Standard Deviations For Occupational Aspirations and Expectations Across Three Waves (Model I)

Status Projection	Wave I Sophomores (1966)	Wave II Seniors (1968)	Wave III Seniors +4 (1972)
Occupational Aspirations	$\bar{X}_1 = 49.44$	$\bar{X}_3 = 55.45$	$\bar{X}_5 = 52.97$
	SD = 25.60	SD = 26.07	SD = 25.73
Occupational Expectations	$\bar{X}_2 = 43.75$	$\bar{X}_4 = 48.38$	$\bar{X}_6 = 43.08$
	SD = 26.36	SD = 26.70	SD = 25.46

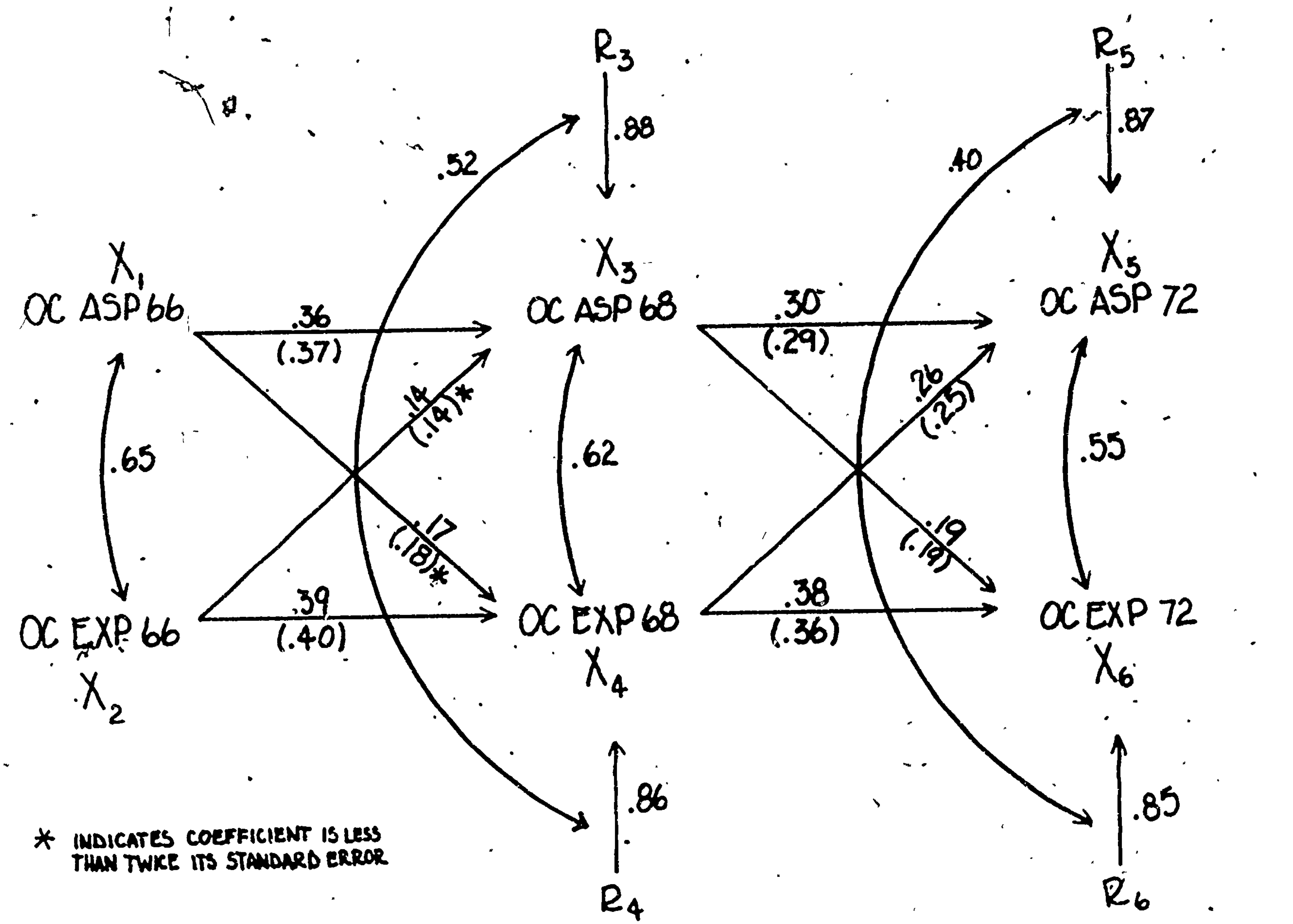
N=154

TABLE 2. Correlation Matrix Between Occupational Aspirations and Expectations With Associated Probability Levels (Under Ho: Rho = 0)

	OC ASP 1966 X_1	OC EXP 1966 X_2	OC ASP 1968 X_3	OC EXP 1968 X_4	OC ASP 1972 X_5	OC EXP 1972 X_6
OC ASP 1966 X_1	—	.65 (.0001)	.46 (.0001)	.42 (.0001)	.23 (.0048)	.31 (.0002)
OC EXP 1966 X_2		—	.38 (.0001)	.50 (.0001)	.29 (.0005)	.32 (.0002)
OC ASP 1968 X_3			—	.62 (.0001)	.46 (.0001)	.43 (.0001)
OC EXP 1968 X_4				—	.44 (.0001)	.50 (.0001)
OC ASP 1972 X_5					—	.55 (.0001)
OC EXP 1972 X_6						—

N=154

MODEL I. MODEL OF THE DYNAMICS OF OCCPATIONAL STATUS PROJECTION



* INDICATES COEFFICIENT IS LESS THAN TWICE ITS STANDARD ERROR

TABLE 3. Means and Standard Deviations For Educational Aspirations and Expectations Across Three Waves (Model II)

Status Projection	Wave I Sophomores (1966)	Wave II Seniors (1968)	Wave III Seniors +4 (1972)
Educational	$\bar{X}_1 = 4.38$	$\bar{X}_3 = 4.33$	$\bar{X}_5 = 5.01$
Aspirations	SD = 1.45	SD = 1.46	SD = 1.28
Educational	$\bar{X}_2 = 4.12$	$\bar{X}_4 = 3.94$	$\bar{X}_6 = 4.02$
Expectations	SD = 1.39	SD = 1.37	SD = 1.44

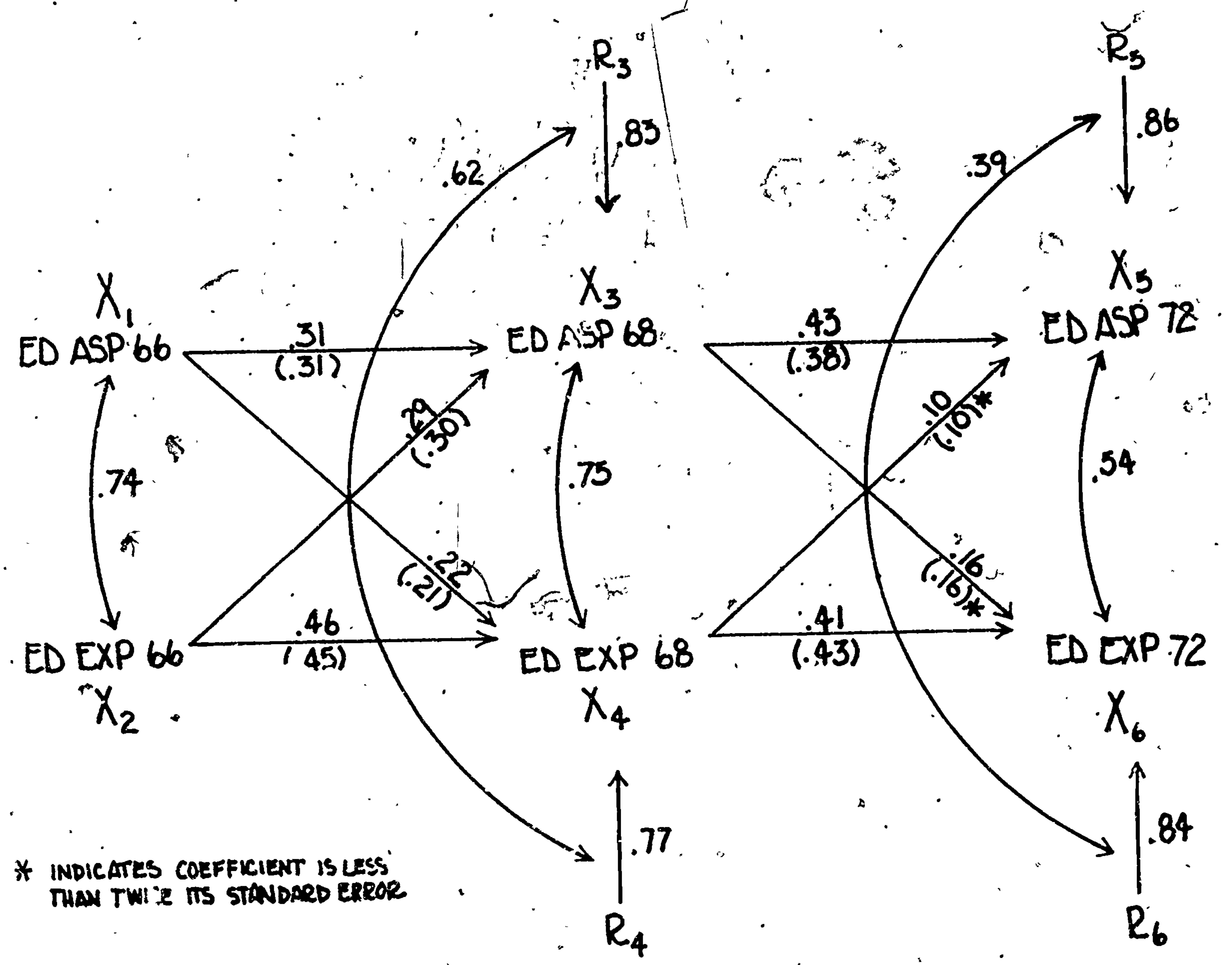
N=154

TABLE 4. Correlation Matrix Between Educational Aspirations and Expectations With Associated Probability Levels (Under Ho: Rho = 0)

	ED ASP 1966 X_1	ED EXP 1966 X_2	ED ASP 1968 X_3	ED EXP 1968 X_4	ED ASP 1972 X_5	ED EXP 1972 X_6
ED ASP 1966 X_1	——	.74 (.0001)	.52 (.0001)	.56 (.0001)	.33 (.0001)	.38 (.0001)
ED EXP 1966 X_2		——	.52 (.0001)	.62 (.0001)	.44 (.0001)	.44 (.0001)
ED ASP 1968 X_3			——	.75 (.0001)	.50 (.0001)	.46 (.0001)
ED EXP 1968 X_4				——	.42 (.0001)	.52 (.0001)
ED ASP 1972 X_5					——	.54 (.0001)
ED EXP 1972 X_6						——

N=154

MODEL II. MODEL OF THE DYNAMICS OF EDUCATIONAL STATUS PROJECTION



* INDICATES COEFFICIENT IS LESS THAN TWICE ITS STANDARD ERROR

TABLE 5. Means and Standard Deviations For Level of Occupational Aspirations (LOA) and Level of Educational Aspirations (LEA) Across Three Waves (Model III)

Status Projection	Wave I Sophomores (1966)	Wave II Seniors (1968)	Wave III Seniors +4 (1972)
LOA	$\bar{X}_1 = 46.59$	$\bar{X}_3 = 51.92$	$\bar{X}_5 = 48.02$
	SD = 23.58	SD = 23.73	SD = 22.56
LEA	$\bar{X}_2 = 4.25$	$\bar{X}_4 = 4.14$	$\bar{X}_6 = 4.51$
	SD = 1.32	SD = 1.32	SD = 1.19

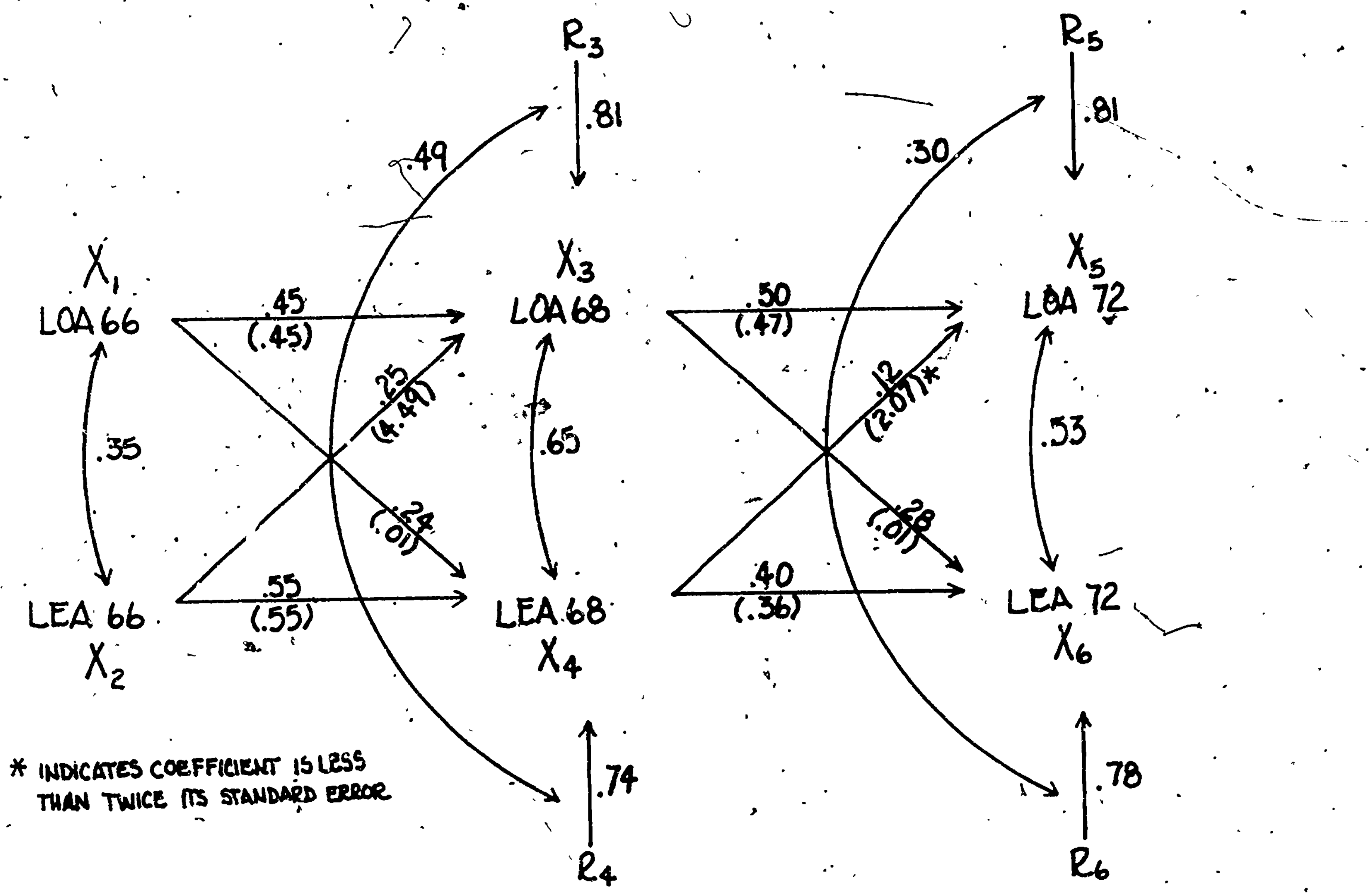
N=154

TABLE 6. Correlation Matrix Between Level of Occupational Aspirations (LOA) and Level of Educational Aspirations (LEA) With Associated Probability Levels (Under Ho: Rho = 0)

	LOA 1966 X_1	LEA 1966 X_2	LOA 1968 X_3	LEA 1968 X_4	LOA 1972 X_5	LEA 1972 X_6
LOA 1966 X_1	—	.35 (.0001)	.54 (.0001)	.44 (.0001)	.36 (.0001)	.41 (.0001)
LEA 1966 X_2		—	.41 (.0001)	[illegible] (.0001)	.36 (.0001)	.48 (.0001)
LOA 1968 X_3			—	.65 (.0001)	.58 (.0001)	.54 (.0001)
LEA 1968 X_4				—	.44 (.0001)	.58 (.0001)
LOA 1972 X_5					—	.53 (.0001)
LEA 1972 X_6						—

N=154

MODEL III. MODEL OF THE DYNAMICS OF LEVEL OF OCCUPATIONAL ASPIRATION AND LEVEL OF EDUCATIONAL ASPIRATION



* INDICATES COEFFICIENT IS LESS THAN TWICE ITS STANDARD ERROR

TABLE 7. Stability Paths and Corresponding Rates of Change in Stability Between High School and Post-High School Periods (Linear Form)

Model	Status Projection	Stability Paths (P_{ij}) HS Period (Wave I-II	Stability Paths (P_{ij}) Post HS Period (Wave II-III)	Rates of Change in Stability ($\frac{dy}{dt}$) HS Period (Wave I-II)	Rates of Change in Stability ($\frac{dy}{dt}$) Post HS Period (Wave II-III)	$\frac{\frac{dy}{dt} HS}{\frac{dy}{dt} Post HS}$
Model I	Occupational Aspirations	.36	.30	-.32	-.18	1.82
	Occupational Expectations	.39	.38	-.31	-.16	1.96
Model II	Educational Aspirations	.31	.43	-.35	-.14	2.41
	Educational Expectations	.46	.41	-.27	-.15	1.84
Model III	LOA	.45	.50	-.28	-.13	2.20
	LEA	.55	.40	-.23	-.15	1.50