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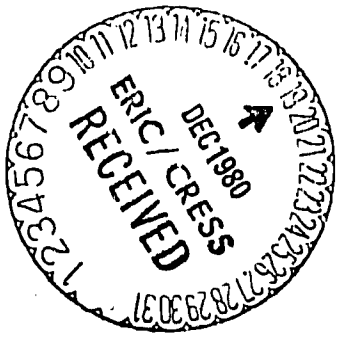
ABSTRACT

Using two panel studies which collectively covered the preadolescent-to-young adulthood period in the life cycle, the study focused on the issues of level of aspiration formation, stability, and race-sex subgroup invariance. The panel studies collected data from youths from (1) rural areas with towns of 2,500 or less and urban areas with cities of 40,000 or more characterized by school drop-out, unemployment, and poverty; and (2) counties with a more rural population, characterized by higher proportions of black residents and lower socioeconomic levels. The analysis utilized an unobserved construct approach via confirmatory factor analytic models. Findings indicated that socioeconomic background has a continuing, and at times increasing, influence on level of educational (LEA) and occupational (LOA) aspirations. The increasing stability of both LEA and LOA (described through the process of "crystallization") indicated that, while students from low grade school to early high school will change and thus be susceptible to attempts at raising career awareness through career education programs, a delay until the sophomore year or later might substantially lower such a program's chances of success. In terms of subgroup invariance, most of the structural departures from invariance examined were interpretable in light of other pertinent research reports. No strong evidence was found for differential race-sex subgroup reliability in "idealistic" and "realistic" indicators of the level of aspiration construct. (Author/CM)

STABILITY AND CHANGE IN EDUCATIONAL AND OCCUPATIONAL ASPIRATIONS: LONGITUDINAL ANALYSES FROM PREADOLESCENCE TO YOUNG ADULTHOOD



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STABILITY AND CHANGE IN EDUCATIONAL AND OCCUPATIONAL ASPIRATIONS: LONGITUDINAL ANALYSES FROM PREADOLESCENCE TO YOUNG ADULTHOOD

A B S T R A C T

The stability of the level of educational and occupational aspirations are examined using two panel studies which collectively cover the preadolescent-to-young adulthood period in the life cycle. Focusing on issues of level of aspiration formation, stability, and race - sex subgroup invariance, the analysis utilizes an unobserved construct approach via confirmatory factor analytic models. The findings indicate that socioeconomic background has a continuing, and at times increasing, influence on level of educational (LEA) and occupational (LOA) aspirations. The increasing stability of both LEA and LOA over the life cycle is described through the well-known process of "crystallization". In terms of subgroup invariance, most of the structural departures from invariance that were examined are interpretable in light of other pertinent research reports. No strong evidence is found for differential race - sex subgroup reliability in "idealistic" and "realistic" indicators of the level of aspiration construct. The implications of these empirical results for policy programs in career education are discussed.

STABILITY AND CHANGE IN EDUCATIONAL AND OCCUPATIONAL ASPIRATIONS: LONGITUDINAL ANALYSES FROM PREADOLESCNECE TO YOUNG ADULTHOOD

The study of levels of aspiration that individuals have for completed schooling and adult occupational status attainment has truly been industrious. Bibliographies which have ambitiously attempted to keep track of this growing literature have rapidly become dated (e.g., Kuvlesky and Reynolds, 1970a, b; Cosby *et al.*, 1974). Independent of such career decisions being of interest in and of themselves, the importance of these continuing efforts by researchers is the central role of aspirations in theories of the status attainment process. For instance, educational aspirations during adolescence have a well-known direct effect on subsequently completed schooling as do occupational aspirations for status attainment in the job market (Haller and Portes, 1973; Haller *et al.*, 1974; Featherman and Carter, 1976; Picou and Howard, 1978; Rehberg and Rosenthal, 1978; Otto and Haller, 1979).

Despite the voluminous literature, and perhaps due to the diverse theoretical approaches (see Falk, 1975), several important matters remain relatively uninformed by explicit empirical research. These include issues of (1) *formation* (period in the life cycle when aspirations become formulated); (2) *stability* (relative change over a given portion of the life cycle); and (3) *subgroup invariance* (degree to which formation, reliability of measures, and construct stability operate similarly across subpopulations; e.g., sex and race subgroups).

Past research has documented a number of important variables that contribute to the formation of educational and occupational

aspirations but a central one is socioeconomic background. Aspirations during the senior year of high school are said to largely mediate parental SES effects on early attainments (Otto and Haller, 1979), yet a key issue is do earlier goals play a more important intervening role than later ones? Shea (1976: 499-500) reports on an unpublished study:

> "Rehberg and Hotchkiss. . . , unencumbered by the limitations of a one-shot measure of educational goals, were able to investigate earlier and later measures, and thereby assess the importance attached to senior-year aspirations . . . their finding that *freshman year rather than senior year educational goals represent the critical mediating variable in the process* is a major refinement . . ." (emphasis his).

Thus, although it is known that parental SES influences status aspirations during high school but not as much is known about the formative and continuing "socialization" effects of socioeconomic background on such goal orientations.

The stability of educational and occupational aspirations has relevance for both theory development and policy programs in "career education". For instance, if policy intervention programs are focused on earlier age groups (e.g., elementary school students) with the aim of clarifying sex-role and ethnic stereotypes (Leifer and Lesser, 1976), then the stability of these aspirations should inform specific program objectives for greater effectiveness. Furthermore, from a more purely theoretical interest, if significant changes occur continually over a

brief intertemporal period then this begs the question of how are these attitudes actually transferred into attainments? Since some evidence indicates that the aspirations of junior high school students are only vaguely related to eventual adult attainments (Kerckhoff, 1974), in contrast to those at the end of high school, their particular stability during high school has added theoretical significance (see Williams, 1972; Rehberg and Rosenthal, 1978). However, even with the previous level of research,

> "a study that estimates stability and reliability of direct, object-specific measures (or one that approaches having time-series ovservations over, say, the junior high and high school period) has yet to be reported . . ." (Spenner and Featherman, 1978: 383-4).

There is a considerable literature on sex - race profiles of educational and occupational aspirations (Kuvlesky and Reynolds, 1970a, b; Berman and Haug, 1975; Marini, 1978). Moving beyond descriptive profiling approaches, other research has addressed more complex theoretical issues underlying the *process* of subgroup invariance. This literature readily suggests that there are distinctive sex-role and ethnic "social psychologies" at work in the status aspiration phenomenon. Thus, on the basis of previous empirical work, such attitudinal dynamics as temporal formation and stability have no *a priori* basis for being highly similar among males *vs.* females or whites *vs.* blacks. Moreover, the effects of some antecedents on aspirations have been shown to differ by sex - race subgroup (Hout and Morgan, 1975; Marini and Greenberger, 1978a, b; see Howell and Frese, 1979 for an interpretation). Finally, aside from aspiration dynamics *per se*, there is the question

of invariance in the measurement properties of any given operationalization of an aspiration construct (e.g., Hallen *et al.*, 1974; Hotchkiss *et al.*, 1979).

This paper reports on an attempt to bring longitudinal information to bear on several of these issues. Using panel data from two separate studies, we piece together empirical evidence on the formation, stability, and sex - race subgroup invariance of both educational and occupational aspirations. The two panel studies collectively cover the preadolescent-to-young adulthood portion of the life cycle. The long-term effects of socioeconomic background on these levels of aspiration are also examined.

Using a confirmatory factor analytic approach, the analysis is organized as follows. For reasons of clarity, levels of educational and occupational aspirations are presented separately. For each aspiration construct, the two-wave (preadolescent-to-adolescent) and three-wave (adolescent-to-young adulthood) panel data are presented in that order, following a synthetic chronological sequence. Within each of these two panel studies, the sex - race invariance of the confirmatory factor models is systematically explored. Using multiple indicators of an (unobserved) aspiration construct also provides estimates of the long-term reliability of conventional (observed) measures of these concepts. At the same time, all structural estimates of formation and stability are made within the context of simultaneous assessments of the reliability of the observed indicators.

We are thus able to assess the "early" (preadolescent) formation of aspirations with regard to their stability and change into adolescence

where these decisions are normatively salient to adult achievements (Spenner and Featherman, 1978). The intervening role of "prior" aspirations between socioeconomic background and late-adolescent aspirations is analyzed in a much broader temporal scope than previously reported (see Shea, 1976). These formation and stability dynamics are further assessed in a more focused "short-run" framework using the three-wave panel, covering the sophomore-year, senior-year, and four-years post-high school periods. Insight into the stability of schooling and work attitudes in the immediate post-high school years as provided in this part of the analysis is necessary to more fully understand the adolescent-to-adulthood transition (see Spaeth, 1977; Bachman *et al.*, 1978).

METHODS

Data Sources

Southern Occupational Goals Study (SOGS) Panel. The SOGS panel consists of a sample of fifth and sixth grade students and mothers contacted in 1969 in six states in the South (Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia).[1] A total of 1,202 students in 20 schools were interviewed in classrooms using pretested instruments. Mothers of students were independently interviewed in their homes (or other locations as necessary). Schools were purposively selected so that county socioeconomic composition reflected areas characterized by unemployment, school drop-out, and poverty, as well as a stratification of rural areas containing towns of 2,500 or less and urban areas with cities of 40,000 or more as designated by the 1960 Census. All schools were officially desegregated at the time of the study. To meet sampling quotas in each state, actual school choice corresponded to the selection of approximately one-out-of-three schools that met selection criteria. The original investigators estimate that the population of families in the South with similar characteristics totaled approximately 200,000. See Butler (1973) or Powell and Covington (1974) for additional details on sample design and data collection procedures.

In 1975, researchers returned to the original schools in a follow-up effort. School officials were contacted to locate students still in area schools, and to procure addresses for those who had moved. For students thought to have dropped-out of school (determined by teachers, school officials, or peers), peers were consulted for current

addresses. Students, now predominately juniors and seniors, were interviewed in school, while "dropouts" (18%) were contacted at home. A total of 945 (78.6%) of the original sample were recontacted; of these, 28 percent are white males, 29 percent white females, 23 percent black males and 20 percent black females.

Southern Youth Study (SYS) Panel. The SYS is a three-wave panel whose initial baseline of sophomores (in 1965) were recontacted as seniors (1968) and again four years later, after most had completed high school.[2] The student population of sophomores in Alabama, Georgia, South Carolina, and Texas (N = 7,010) was administered questionnaires in group settings during regular school hours. Similar procedures were used in the senior-year contact which covered approximately 75 schools. Although the selection of areas was of a non-probability design, the SYS panel reflects youth coming from counties with a more rural population, characterized by higher proportions of black residents and lower socioeconomic levels. In addition, most of the schools in the sample had small class enrollments (less than 75 students).[3]

For the early adulthood follow-up in 1972, a sample (n = 1,500) of the original respondents, stratified by race (50:50) and sex (60:40, male-female) was recontacted using field, mail, and telephone survey methods. In the four states, 851 (or 85% of the follow-up sample) were reinterviewed, consisting of 35% white males, 22% white females, 24% black males, and 19% black females. The SYS panel is described in greater detail elsewhere (see Thomas, 1978; Howell, 1980; Picou *et al.*,

forthcoming).

Measurement

Observed indicators are used in measurement models (see below) to specify the unobserved constructs socioeconomic status (SES), level of educational aspiration (LEA), and level of occupational aspiration (LOA). Each observed variable is described below, with measurement differences between the two panels noted where important. All education measures are coded into the years of schooling metric while occupations are scaled in the SEI.

Socioeconomic background (ξ_1) is reflected by major income earner's or *breadwinner's, occupation* (BOCC), father's education (FED), and *mother's education* (MED). For the SOGS panel, this information was obtained in the mother's baseline interview while parallel data in the SYS panel came from the (sophomore) students themselves.

Level of aspiration (η_1), either educational or occupational, is comprised of two observable dimensions: an "idealistic" (or *aspiration*) and a "realistic" (or *expectation*) item (see Kuvlesky and Bealer, 1966; Haller *et al.*, 1974). For level of educational aspiration (LEA), this consists of the number of years of schooling the student would *like* (aspiration) and *expects* (expectation) to attain.[4] For level of occupational aspiration (LOA), this involves similar items for the occupations the student would *like* and *expects* to enter.[5]

This operationalization varies with those theorists who conceptualize sharp distinctions between "aspired-to" and "expected" components of educational or occupational decisions (e.g., Kuvlesky and Bealer, 1966;

Rehberg, 1967; Kerckhoff, 1976). However, an explicit measurement model relating "aspirations" and "expectations" to one theoretic construct shows that both dimensions are relevant in a similar model (Marini and Greenberger, 1978a, b) and other exploratory evidence suggests that one factor "saturates both" (Haller *et al.*, 1974; Hotchkiss *et al.*, 1979). We test the presence of unique "idealistic" and "realistic" dimensions over time using data from both panels covering varying portions of the life cycle.

Analysis

The techniques of analysis conform to a structural equations approach to confirmatory factor analysis (CFA) models developed by Jöreskog and associates (Jöreskog, 1970; Jöreskog and Sörbom, 1977, 1978) where the relationships among observed indicants are simultaneously estimated along with the relations between unobserved constructs. In longitudinal research, a crucial issue is the separation of "true" change from that determined by measurement error, and recent examples have shown the utility of this method (Wheaton *et al.*, 1977; Kohn and Schooler, 1978). The advantages of the CFA model in panel designs are several (Wheaton *et al.*, 1977: 93) and in the present case we utilize model estimates of both random and nonrandom measurement error to test theoretical issues against observed data (see Jöreskog and Sörbom, 1977). More elaborate treatments of CFA models are available elsewhere (see references above and Burt, 1973; Long, 1976 among others).

Two latent variable models are specified, one for the two-wave SOGS panel and another for the three-wave SYS panel (shown in Figures 1

and 2, respectively). They are identical except for the additional measurement period in Figure 2.

The *measurement model* consists of the observed "aspiration" (A69 , A75 in Figure 1; A66, A68, A72 in Figure 2) and "expectation" (E69, E75 in Figure 1; E66, E68, E72 in Figure 2) items being determined by an endogenous common unobserved construct (η_i = level of educational aspiration [LEA] or level of occupational aspiration [LOA] construct) plus an error term (ε_i). Socioeconomic background (ξ_1 = SES) is an exogenous unobserved construct underlying parental statuses (FED, MED, BOCC), the latter of which also have measurement error terms (δ_i). So that the "same" construct is measured over time, a constraint is placed on the unstandardized regressions of the observed measures on the level of aspiration constructs (i.e., factor loadings) for them to be equal at each time period for each indicator (see Wheaton *et al.*, 1977). For example, in Figure 1: $\lambda_1=\lambda_3$ and $\lambda_2=\lambda_4$ where λ_5, λ_6, λ_7 are free. These loadings (λ_i) indicate the relationship between the unit of measurement for the observed variable and that of the unobserved construct and when standardized are interpretable as "validity" coefficients (Werts, Linn and Jöreskog, 1974).

The *structural equations model* follows traditional path analysis conventions. The level of aspiration construct at time-one is dependent upon SES (estimated by γ_1). This same construct, at the subsequent interval, is determined by its own previous value (β_1) and SES (γ_2). In the SYS three-wave panel (Figure 2), this sequence is repeated. The endogenous constructs have their corresponding error terms (ζ_i).

(Figure 1 Here)

(Figure 2 Here)

Several models are presented, each with an unstandardized and standardized solution. All estimates are performed on the sample variance-covariance (S) matrix since the longitudinal relationship of the level-of-aspiration construct is of interest and, as such, the model(s) should not be "scale-free" as would be the case in analyzing the observed correlation (R) matrix (Jöreskog and Sörbom, 1977; Werts, Linn and Jöreskog, 1971). To provide standardized estimates, the unstandardized solution is transformed so that construct variances are equal to 1.0, analogous to the traditional calculation of standardized regression coefficients (Blalock, 1972). In the measurement portion of the model, where observed measures are regressed on underlying constructs, a similar transformation is performed so that measured variances (e.g., s^2) are set to unity. Following the arguments of others (Werts, Linn and Jöreskog, 1971; Wheaton *et al.*, 1977), only the variances of the SES construct (ζ_1) and the level of aspiration construct at time-one (η_1) are fixed at 1.0 whereas the other(s) are allowed to vary freely. The scale for η_1 (and η_2) is fixed by the constraint of equal unstandardized loadings for the "aspirations" and "expectations" items. In addition, although these raw loadings are constrained to equality, the standardized values which are dependent upon measurement errors and true score vairances will vary intertemporally.

Model I allows for random or uncorrelated errors of measurement

only (i.e., π_{ij} are not estimated; thus, θ_ε is diagonal). In analyzing data from panel designs with repeated measures of multiple indicators, item-specific factors may be related intertemporally, independent of their commonly determining construct (Jöreskog and Sörbom, 1977). Model II allows for an analysis of unique "aspiration" and "expectation" components that may covary over time and partly tests the efficacy of a common factor measurement specification. For the SYS panel, Model III allows for *both* temporally adjacent and non-adjacent covariance terms over the three waves (see Figure 2). The general model "fit" to the observed data, and alternative specifications, are assessed with the χ^2 goodness-of-fit statistic, along with the per-degree of freedom ratio χ^2/df (Jöreskog, 1970; see also Wheaton *et al.*, 1977).

In order to investigate race - sex subgroup invariance in these models, simultaneous subgroup ($g = 4$) analyses were performed (Jöreskog, 1971; McGaw and Jöreskog, 1971; Jöreskog and Sörbom, 1978). The strategy was to first test for a common covariance matrix (i.e., $\Sigma_1=\Sigma_2=\Sigma_3=\Sigma_4$; see Specht and Warren, 1975). Since they were not identical, the specific models generating them could not be assumed identical (Jöreskog, 1971; Alwin and Jackson, 1979). Second, using both random (Model I) and nonrandom (Model II) error specifications, tests for common subgroup measurement models ($\Lambda_1=\Lambda_2=\Lambda_3=\Lambda_4$) and structural models ($\Gamma_1=\Gamma_2=\Gamma_3=\Gamma_4$ or $\beta_1=\beta_2=\beta_3=\beta_4$, both separately and jointly) were performed. The χ^2 test statistic is defined as before, comparing the hypothesis that the model (including all constraints) holds within each subgroup against the alternative that all of the covariance matrices are unconstrained positive definite (Jöreskog and Sörbom, 1978). In "nested"

models where constraints are changed but the variables remain the same, the test statistic equals the difference between the two chi-squares at a degree of freedom equal to the difference in degrees of freedom for the two models being compared (Jöreskog, 1971: 420). The descriptive fit ratio, χ^2/df, is also used to compare results across models (Wheaton *et al.*, 1977: 99).

F I N D I N G S

The results are presented, first, for level of educational aspirations (LEA) and, second, for level of occupational aspirations (LOA). So as to more fully appreciate the chronological sequence of the two panel designs, within each type of aspiration construct, the various model estimates are presented for (a) the preadolescence-to-adolescence sample (SOGS), and then (b) the adolescence-to-young adulthood (SYS) sample.

I. Level of Educational Aspirations

A. SOGS Panel: Preadolescence-to-Adolescence

Although reification of the LEA construct should be avoided (i.e., falsely confirming its existence because it has been "measured"), if separate "idealistic" and "realistic" indicators are of a common domain then it appears that both aspirations and expectations constitute proximal measures of this construct. Inspecting the maximum-likelihood estimates shown in Table 1 for Model I (random measurement error), however, there is a higher validity for educational *expectations* ($\lambda_2^* = .776$) than aspirations ($\lambda_1^* = .628$) during preadolescence. These standardized "loadings" do not appreciably change in value or in their relationship to one another six years later. The LEA construct itself does change in terms of its variance, increasing 24% relative to its earlier (and arbitrary) metric.

(Table 1 Here)

The question of stability in educational decision-making is an often-broached topic in the literature (Shea, 1976) and these results tend to corroborate the speculation of significant change in educational aspirations. The stability parameter (β_1) shows this overall rate of change from the mid-elementary to late-secondary schooling period, after the removal of whatever spurious SES effects there may be. The standardized coefficient is small ($\beta_1^* = .302$). Thus, substantial changes in level of educational aspirations do occur over this portion of the student career.[6]

What factors contribute to this change? The impact of socio-economic background on the early formation of LEA is moderate ($\gamma_1^* = .361$) but, more importantly, continues to have an equally powerful direct effect on LEA ($\gamma_2 = .356$). "Early" educational aspiration levels, then, do not fully mediate the effects of socioeconomic background on later decisions. In fact, the total effect of SES on LEA increases over the six-year period (from .361 to .465). This suggests that the educational goals held as mid-elementary schoolers cannot serve as more important SES-mediators for educational attainment than these "later" ones since most of the total SES effect (76%) on LEA75 is direct.[7]

By strictest terms, the observed data do not fit the proposed model since the chi-square statistic rejects the null hypothesis of a perfectly reproduced variance-covariance matrix (see Table 1). However, the ratio of χ^2/df is quite reasonable (32.79/12 = 2.7) by conventional standards.

While a postulated common factor is specified as part of the LEA

measurement model, it would not be surprising to discover that there is something "unique" to the idealistic and realistic items that covaries over time. To acknowledge this possibility, Model II includes separate covariance terms for these indicators (π_{ij}).

Under this specification, two essential features of the estimates are important. One, expectations are more valid indicants of LEA than aspirations. Two, the fit of the model is improved to the point that this model cannot be rejected on statistical grounds alone ($\chi^2 = 14.61$, 10 df, $p = .147$).

The correlated errors affect the stability of the LEA construct and the magnitudes of the SES effects very little. Nevertheless, the values of these error covariances themselves are of interest. For the aspirations item, a nominal positive correlation ($\pi^*_{13} = .181$) exists over the six-year interim that is unrelated to the common domain LEA. A surprisingly strong negative correlation ($\pi^*_{24} = -.822$) appears between the error terms associated with the expectations item. Apparently, given a "ceiling effect" interpretation to this negative error covariance (Siegel and Hodge, 1968: 35-6), a strong "expectancy decline" occurs among youth during this period. This decline is such that those with higher early educational expectations sharply reduce them by the end of high school.[8]

While these estimates are a reasonable fit between model and data, the question of to what degree is there invariance across

race and sex subpopulations is explored next. Following Jöreskog's hypothesis-testing framework (see Jöreskog, 1971; also Alwin and Jackson, 1979), sequential examinations of subgroup differences in the covariance matrix, measurement model (in terms of the factor pattern), and various portions of the structural relations (β_i, γ_i) are presented. These results are summarized for both random (Model I) and specific nonrandom (Model II) error (see Table 2).

The hypothesis of equality of the covariance matrices is handily rejected ($p<.000$). This offers potential for the specific forms of invariance-departure of interest here to be detected. As a rule, however, few of these equality tests can be adduced to be substantial.

In terms of an invariant factor pattern, suggesting differential reliability of observed indicators, the measurement model cannot be rigorously rejected ($p=.070$) for either the random or nonrandom error models. Examining the stability of the LEA construct, we find that the β_1 estimates do seem to vary across subgroups. While this *group* of coefficients is marginally different ($p=.056$), inspecting the pattern matrix shows that black stability is higher than that for whites (see Howell, 1979: Table 6.10).[9] Socioeconomic background effects on educational aspirations are conventionally reported to be greater for both females and whites versus their respective counterparts (Marini, 1978), but the invariance of this *group* of SES effects (γ_i) cannot be statistically rejected ($p=.110$). The pattern of these effects, though, does exhibit tendencies in the expected direction by race (i.e., $\gamma_w > \gamma_b$). These are nominal in size and interpreted as the result of the SOGS sample design (see Howell and Frese, 1979). Thus, the general

conclusion is that departures from race-sex invariance in models pertaining to the LEA construct from preadolescence-to-adolescence are small, at best.

(Table 2 Here)

B. SYS Panel: Adolescence-to-Young Adulthood

A shorter-term examination of the LEA construct, spanning the sophomore, senior, and four-year post-high school periods, is facilitated by a similar model estimated on data from the three-wave SYS panel (see Table 3). This coverage of the student career includes a time of supposed transition and change (see Bachman *et al.*, 1978) and so our theoretical expectations would be for some noteworthy dynamics in career decision-making.

Comparable to the random error model for SOGS data (Model I), educational expectations are slightly more valid measures of the LEA construct than aspirations. Unlike the above findings, the absolute values of these validity coefficients increasingly decline through this life cycle period. For example, while sophomore expectations are reasonably reliable ($\lambda_2^{*2} = .611$), this figure recedes to an abysmally low level in early adulthood ($\lambda_2^{*2} = .324$). Examining the variance of the latent LEA construct perhaps suggests why this might occur. With the common variance decreasing over time (and the unique variance correspondingly increasing), the two indicants of the LEA construct have less and less "in common". Thus, the LEA construct becomes relatively less variable, with aspiration and expectation components more differentiated in

terms of what variance they do share.

From sophomore to senior years, level of educational aspirations are remarkably stable (β_1^* = .727) yet leave room for some "sorting" to occur (see Cicourel and Kitsuse, 1963; Rehberg and Rosenthal, 1978). In the years immediately following high school, LEA is also more prone to stability than change (β_2^* = .727). One inference is that while LEA changes a great deal from the mid-elementary grades to the sophomore year of high school, it is much more "crystallized" from this point well into young adulthood.

(Table 3 Here)

Confirming the SOGS results (with the acknowledgement that they reflect a different temporal life cycle period), socioeconomic background continues to nominally direct the level of schooling preferred, even with relatively recent educational decisions taken into consideration. Actually, the total SES effects on LEA at the end of high school in the SOGS and SYS panels are quite similar (SOGS = .465, SYS = .479) but more is mediated by prior LEA(s) in the SYS data due to the shorter measurement interval. The net SES effects are moderate during the sophomore year (γ_1^* = .325) and monotonically decline to a nominal level (γ_3^* = .187). Thus, even during a much briefer measurement period, prior aspirations do not exhaust the continuing socialization of educational decisions to reflect socioeconomic background.

The ratio of χ^2/df for this random error model is within tolerable bounds (91.1/24 = 3.8) but, by statistical standards, can be rejected as

not fitting the observed data ($p<.001$).

Allowing temporally-adjacent errors to correlate (Model II) does reduce this statistic ($\chi^2_I - \chi^2_{II} = 16.74$, 4 df, $p<.01$), indicating a significant improvement to the model but not necessarily a better fit ratio. The small positive error term correlations make only subtle impressions on the other substantive parameters. LEA indicants have somewhat higher validities under this modification. The stabilities (β^*_i) decrease slightly while SES effects (γ^*_i) increase by a similar amount.

In Model II, temporally adjacent and non-adjacent error terms are allowed to covary but with little effect on other parameters. Generally, the validities of the aspiration and expectation items equalize. However, neither the stabilities of the LEA construct, SES effects, or overall model fit are influenced appreciably. The error term covariances, especially those for the expectation items, do hint at a common inter-temporal dimension that is separate from the LEA construct. Since the non-adjacent error term covariances are small (i.e., Π_{15}, Π_{26}) relative to their adjacent counterparts, the item-specific covariance seems to be a continuing expectancy factor that is different from the domain common to both "idealistic" and "realistic" components.

In the SYS panel, covariance matrices significantly vary by subgroup (see Table 4). If the measurement model (factor pattern) is tested, the hypothesis of invariance is indeed rejected ($p<.000$). Since the primary purpose of this particular test is to assess equal subgroup reliability in the "idealistic" and "realistic" indicators of the unobserved LEA construct, this rejection may be important. Observing the

Λ_y matrix (the factor pattern for the educational "aspirations" and "expectations" indicants) apart from the Λ_x matrix (loadings for SES indicants) suggests a small subgroup distinction in the former (λ_1-λ_6) but a substantial difference in the latter (λ_7-λ_9). Principally, household head's occupational status (BOCC) has a lower reliability for blacks than whites. This is theoretically understandable in light of the known lower occupational returns for years of schooling among blacks than among whites (Duncan, 1968).[10] On the other hand, only marginal differences in reliabilities for the LEA construct appear. It seems, then, that the substantive departures from an invariant factor pattern occur in the measurement model of the SES, rather than the LEA, construct.[11]

(Table 4 Here)

Equality in structural relations can also be rejected as shown in Table 4. Basically, the LEA construct stabilities vary significantly by race ($\beta_{1,2_W} < \beta_{1,2_b}$). Nonrandom error does not alter this finding (Table 4: Model II). Sex and race departures from an invariant set of background "socialization" effects are also present ($p=.000$). Essentially, SES effects are larger for females than males with whites simultaneously obtaining greater effects than blacks.[12]

We conclude that: (1) level of educational aspiration (LEA) is more stable for whites than blacks, irregardless of sex, during the adolescent-to-young adult period, and (2) SES effects are slightly greater for females than males, within each race, and greater for whites than blacks.

II. Level of Occupational Aspirations

A. SOGS Panel: Preadolescence-to-Adolescence

Although the same cautionary remarks on reification for level of educational aspiration (LEA) pertain to the level of occupational aspiration (LOA) construct, the Model I estimates reveal that during preadolescence both "idealistic" and "realistic" indicators obtain proximal validity for measuring a common domain (see Table 5). Perhaps this means that during the fifth and sixth grade, occupational expectations are just as "fantasy-oriented" as aspirations. However, this interpretation is beyond the confines of these data to resolve. What is apparent is that these validities are equal to the corresponding LEA indicants (i.e., $\lambda_{69} \simeq .7 - .8$) during the early formation of the LOA construct. Moreover, they remain fairly reliable well into adolescence ($\lambda_{75} \simeq .7 - .8$).

The preadolescent-to-adolescent stability of LOA approximates that for level of educational aspirations and is small ($\beta_1^* = .295$). Departing from the LEA results, however, are the SES effects on LOA which are initially smaller ($\gamma_1^* = .152$) and increase markedly over time ($\gamma_2^* = .256$). The total effect of SES on adolescent LOA ($\gamma_{TE}^* = .239$), nonetheless, is only 51% of the same SES effect on LEA ($\gamma_{TE}^* = .465$). The important finding is that "early" LOA does not substantially mediate the impact of socioeconomic background on "later" career decisions.

(Table 5 Here)

Paralleling the relative intertemporal variance of LEA, the LOA

construct's variance shrinks by 20% during the six years. Perhaps the same interpretation that was advanced for LEA holds here as well but the (standardized) validity coefficients for the LOA indicants do not fall substantively below their previous values as for LEA. So, this interpretation does not appear to be fully supported for the LOA construct in the SOGS panel.

The fit of the LOA random error model appears to be quite good. With a $\chi^2 = 20.45$ and 12 df, the probability of rejecting the model equals .059. The fit ratio χ^2/df is 1.7, highly acceptable by most standards.

Even though this model should not be rejected on statistical grounds, the nonrandom error model was estimated to assess changes in the other parameters (see Table 5, Model II). Actually, while the overall fit is improved even more ($\chi^2_I - \chi^2_{II} = 9.67$, 2 df, $p=.01$), the more important effects of relaxing this assumption are that it parallels the findings for the LEA construct. With item-specific intertemporal error covariances, the validities of the occupational expectations items marginally improve at a corresponding expense of the aspirations indicators. The structural coefficients are not affected much, although 8% of the LOA stability (β_I^*) is proven spurious in light of this form of nonrandom measurement error. Unlike the LEA indicators, there is no intertemporal item-specific dimension present among the error terms. For occupational expectations, the insignificant correlation is negative ($\Pi^*_{24} = -.066$) while the nontrivial correlation for the aspirations errors is a small positive one ($\Pi^*_{13} = .139$).

As in previous tests, the initial assessment of invariance

successfully rejected the null hypothesis of equal covariance matrices ($p = .000$). While this test does show that covariance structures applied to these data are unlikely to be invariant, the specific forms investigated in this study do not appear to be among them (see Table 6).

(Table 6 Here)

The measurement model factor pattern does exhibit some tendency toward substantive departures - - - such as systematically lower validity coefficients in the occupational "aspirations" item for females (Howell, 1979: Table 6.11) - - - yet the overall pattern matrix appears invariant within sampling error ($p = .130$). Moreover, while LOA stability varies by race ($\beta_b > \beta_w$) somewhat, socioeconomic effects do not, and the *set* of structural coefficients are not unequal across subgroups ($p = .879$). Relaxing the random error assumption among "aspiration" and "expectation" items (Model II) does not alter these invariance tests. Other specific forms of race-sex invariance, such as unequal error variance (e.g., Alwin and Jackson, 1979), may account for significant differences in the covariance matrix.

B. SYS Panel: Adolescence-to-Young Adulthood

Similar to the results for LEA, the (standardized) validity coefficients for both occupational aspirations and expectations markedly and systematically decline in the three-wave SYS panel. Presented under Model I in Table 7, the LISREL results suggest that both "idealistic" and "realistic" indicators become poor referents of a general LOA construct in young adulthood. Given these low reliabilities, there

is little difference in the *relative* validity of either observed indicator in the senior year or young adulthood waves.

Level of occupational aspiration is remarkably stable between the sophomore and senior years of secondary schooling ($\beta_1^* = .927$), meaning that there is very little change in the status of career-specific decisions *during* high school. There is, almost predictably, considerably lower stability in the immediate post-high school period. These results are not incompatible with the findings of Bachman and colleagues using a single-indicator, repeated measurements approach on data from a national sample of young men (1978: 292; also see Heise, 1969).

(Table 7 Here)

Socioeconomic background impacts moderately on sophomore LOA ($\gamma_1^* = .384$), then recedes in its direct effects during the next two measurement intervals ($\gamma_2^* = .200$, $\gamma_3^* = .236$). As consistently observed in these two data sets and for LEA, prior levels of occupational aspiration do not mediate all SES effects on subsequent LOAs. In the SYS panel, the total SES effect at the only comparable measurement period (senior year in high school) is stronger ($\gamma_{TE}^* = .556$) than the coefficient in the SOGS data ($\gamma_{TE}^* = .339$). While sample composition may account for this difference it would seem to be a specious conclusion in light of the relative equality of total SES effects on the LEA construct. Thus, given some slight inconsistencies between data sources, the effects of SES on the formation of LOA are minimal but increase to a significant level during the secondary schooling period and remain until well into young adulthood. Earlier LOAs, moreover, do not transmit all of the substantive

SES effects on later LOAs which means that socioeconomic background has a continuing socializing influence on career (status) decision-making.

Nonrandom error (Model II) does present a slight improvement in overall fit ($\chi^2_I - \chi^2_{II} = 31.2$, 4 df, $p<.001$) but any firm conclusion may be a case of "over-fitting by chance" ($\chi^2_{II}/df_{II} = 4.5$; see Jöreskog, 1971). Adjacent intertemporal error term correlations reduce occupational "aspiration" validity while improving validity for the "expectations" component. These correlations themselves are nonsignificant for expectation errors but an item-specific trait does appear among the aspiration terms. Particularly in the sophomore - senior period ($\pi^*_{13} = .247$), a unique intertemporal "idealistic" dimension is one potential interpretation of this nonrandom error model. Otherwise, the structural coefficients representing LOA stability are reduced by 11% in the sophomore to senior period but hardly at all in the senior to post-high school interval (3%). SES effects are also marginally changed.

Adding non-adjacent error term correlations to these estimates (see Model III, Table 7) makes very small differences in either the measurement or structural portions of the model. Small positive covariances among the error terms of LOA indicators do emerge, although resulting in no better fit of the model or change in their respective reliabilities. Even the changes in the stability parameters are at modest levels (4% and 7%, respectively for β^*_1 and β^*_2).

After rejecting the hypothesis of equality in the covariance matrices ($p = .000$), the assessment of invariance yields the following conclusion. While measurement model (factor pattern) and SES effects

do indeed appear to depart significantly from invariance, these differences may be roughly allocated to (1) race differences in SES indicator reliability, especially household head's occupational status, (2) subtle sex variations in LOA indicate reliability, (3) sex differences in LOA stability, and (4) nominal race differences in socioeconomic effects on the LOA construct through the temporal scope of the SYS panel. After rejection of the relevant null hypotheses (see Table 8), these conclusions are based on inspection of the various model estimates within each race-sex subgroup (not shown).

SUMMARY AND CONCLUSIONS

In using data from two separate but complementary panel studies which collectively cover much of the student career, we sought to contribute empirical evidence to three areas of status aspiration research that have gone relatively uninformed in the literature. The use of similar latent variable models, each examining the stability of level-of-aspiration purged of its dependence on socioeconomic background, places the results in a framework that facilitates inferences about the status aspiration phenomenon during the relevant portions of the life cycle.

Regarding the *formation* of educational (LEA) and occupational (LOA) aspirations, socioeconomic background has varying degrees of influence during preadolescence. Socioeconomic origin effects on early level of educational aspiration are moderate (γ^{*}=.3 - .4) and much smaller (γ^{*}=.15) on level of occupational aspiration. For both educational and occupational aspiration levels, socioeconomic background has a continuing, and in the case of LOA, increasing, influence over the student career. These effects are thus not manifested in a "one-shot" manner (see Shea, 1976). Even with prior levels of aspiration controlled, as recently as two years previous, socioeconomic background continues to direct the aspiration-formation process. These SES effects should be considered total effects (Alwin and Hauser, 1975) relative to other research findings which result from a more complete specification of the aspiration process. In conclusion, although the dynamics underlying the basis for socioeconomic origins to continually

act as a reference for status aspirations remains unspecified (but see Kerckhoff, 1972), the present findings do document such a continual influence.

In terms of the *stability* of levels of aspiration as students progress from grade school to young adulthood, the most feasible conceptual metaphor to describe these results is the well-known process of "crystallization" (Ginzberg *et al.*, 1952; see also Cosby, 1974; Howell *et al.*, 1977). The six year preadolescent-to-late adolescent stabilities for both educational and occupational aspiration levels are only moderate ($\beta^{*} \cong .3$). However, during the two year sophomore-to-senior and four year senior-to-young adult periods, levels of aspiration are remarkably more stable ($\beta^{*} \cong .6 - .9$). While educational and occupational aspiration levels are quite prone to change from the mid-elementary grades to the sophomore year of high school, they become much more "crystallized" from the tenth-grade onward.[13]

With regard to policy programs aimed at "career education" for students, and their (as yet) limited success (Leifer and Lesser, 1976), these estimates of level of aspiration stability should be informative. If our inferences about the "crystallization" of schooling and work status decisions are temporally correct, then their low grade school-to-early high school stability suggests that they will indeed change and, hence, be susceptible to attempts at raising "career awareness" (see Leifer and Lesser's recommendations, 1976). On the contrary, however, a delay until the sophomore year of high school (or later) would appear to substantially lower such a program's chances of success, *ceteris paribus*.

It also appears that LOA is more stable than LEA during high school but this pattern reverses in the immediate post-high school period where, perhaps, schooling patterns become more fixed and occupational considerations are of more immediate concern (Picou and Howard, 1978).

How *invariant* these general patterns are across race - sex subgroups was also considered. While all of the covariance matrices tested appear to be significantly different across the four subgroups, most of the structural departures from invariance that we examined are not incompatible with other relevant research findings. Some evidence, stronger in the SYS panel, indicates more powerful SES effects on levels of aspiration for whites than blacks and for females than males within each race. In the stability of the latent "level of aspiration" construct, inconsistent patterns occur with regard to subgroup invariance. Blacks have marginally more stable levels of educational aspiration than whites during the preadolescent-to-adolescent period but this reverses in the adolescent-to-young adult transition. Males tend to have more stable levels of occupational aspiration during this later period than females. In sum, more evidence about departures from invariance obtains in the adolescent-to-young adult (SYS panel) than in the preadolescent-to-adolescent (SOGS panel) period. A further explication of these subgroup dynamics should be given attention in future research.

Turning to concluding issues of measurement, both "aspiration" and "expectation" indicators are reasonable proxies for level of

aspiration except in young adulthood where youth begin to markedly differentiate between "idealistic" and "realistic" components. This distinction begins to occur between the sophomore and senior years of high school. Such results places critiques from either conflicting conceptual school (e.g., Kuvlesky and Bealer, 1966; Rehberg, 1967; Kerckhoff, 1976) in a life cycle perspective; that is, such comments must include a reference to the stage of "crystallization" as part of a measurement rationale. In general, "aspirations" and "expectations" are about equally reliable indicators of level of aspiration with some edge going to expectations, especially under nonrandom measurement error specifications. A common factor appears to be a reasonable measurement specification for levels of educational or occupational aspiration up to, and perhaps including, adolescence (see Marini and Greenberger, 1978a, b; Haller *et al.*, 1974). However, some small, idiosyncratic item-specific (or "unique") covariation does appear, suggesting that weak intertemporal "idealistic" or "realistic" dimensions are present over this part of the life cycle.

No strong evidence appears for differential race - sex subgroup reliability in the level of aspiration construct. Rather, it appears that LEA or LOA is more invariant than the traditionally aggregated construct, socioeconomic status (SES). Principally among black - white comparisons, SES indicants are not invariant across subgroups (i.e., father's and mother's education, household head's occupational status). This is interpreted in light of the known lower occupational returns from education among blacks relative to whites and not as an artifact of the data. There is also some nominal indication that level of

occupational aspiration items, especially "aspirations", are not as reliable for females as for males (see Hotchkiss *et al.*, 1979 for a discussion of sex differences in measurement).

The extent to which these findings would be obtained in a nationally-representative sample is not known. Thus, we encourage the reader to maintain caution in generalizing them to other populations without adequate replication. In fact, even though these two panel studies compare favorably with regional figures and with each other (Mohan, 1977), it is entirely possible that the same results would not be obtained on a single panel of youth covering the same (collective) life cycle period.

As a recent paper in this area of research suggests (Hotchkiss *et al.*, 1979), there is a need for a research program on status aspiration measurement. It is hoped that this research makes a contribution to that initial trend.

N O T E S

1. The SOGS panel is the descriptor for data obtained by USDA-CSRS Project S-63, "Influences on Occupational Goals of Young People in Three Southern Subcultures."
2. The SYS panel is one phase of USDA-SEA/CR Project S-114, "Defining and Achieving Life Goals: A Process of Human Resource Development."
3. Comparisons of the sociodemographics of SYS counties with regional and national figures can be found in Mohan (1977), Thomas (1978), and Picou *et al.*, forthcoming, among others, who conclude that these qualifications comprise the essential deviations from regional data.
4. In SOGS, the aspiration item was "If you had your choice, how far would you really *like* to go in school?", followed by the expectations item "How far do you think you *really will* go in school?". In SYS, the aspiration item was "If you could have as much education as you desired and were completely free to choose, which of the following would you do?", followed by the expectations item "What do you really expect to do about your education?".
5. In SOGS, the occupational aspiration read "If you could choose any job you wanted, what kind of job would you really *like* to have in the future?", followed by the expectations item "What kind of job do you think you think you *really will* have in the future?". SYS panel items were, respectively: "If you were completely free to choose any job, what would you desire most as a lifetime job?" and "Sometimes were are not always able to do what we want most. What kind of job do you really expect to have most of your life?".

N O T E S
(cont.)

6. A more rigorous approach to change in level-of-aspiration over time is the use of differential calculus to evaluate the rate of change per year (e.g., Cosby and Ohlendorf, 1973). However, this more elaborate technique is more informative for comparing either uneven lag periods or results obtained from variable lag designs such as in the present case. We return to this approach in such a comparison between the SOGS and SYS panels (see note 13).

7. This assumes that there would be no direct effect of LEA69 on educational attainment independent of LEA75 (e.g., see Heise, 1970).

8. This "expectancy decline", however, is obtained relative to a common LEA construct and should not be interpreted to mean that educational expectations are inversely correlated intertemporally.

9. Specifically, $\beta_{1_{bm}} > \beta_{1_{bf}} > \beta_{1_{wm}} > \beta_{1_{wf}}$ with $\beta_{1_{bm}} = 0.610$ and $\beta_{1_{wf}} = 0.026$. The extremely small coefficient for white females in the preadolescent-to-adolescent period is striking in comparison to their race ($\beta_{1_{wm}} = 0.169$) or sex ($\beta_1 = 0.398$) peers.

10. Since SES is comprised of the commonality of socioeconomic status indicators, the lower intercorrelations for these three indicants among blacks, especially involving BOCC, produce lower "validity" coefficients.

11. We disaggregated the SES construct into three (perfectly reliable) single indicator constructs to further examine unique status effects

N O T E S
(cont.)

and the fit of the model using the SYS panel. In the LOA model, BOCC exerted larger direct effects ($\gamma^*_{1,2,3}$ = .269, .101, .233, respectively) than did FED or MED. In the LEA model, BOCC ($\gamma^*_{1,2,3}$ = .134, .216, .032, respectively), and to a lesser degree FED ($\gamma^*_{1,2,3}$ = .147, .060, .081, respectively), obtained significant direct effects on the aspiration construct. The fit of the model improves statistically for both LEA (to χ^2 = 61.6, 18 df; compare with Model I, Table 3) and LOA (to χ^2 = 67.8, 18 df; compare with Model I, Table 7). However, when put on a per-degree of freedom basis, only the LOA model is substantially improved (from χ^2/df = 5.0 to 3.8). This essentially reflects the significant direct effects of BOCC on LOA reported above.

12. $\gamma_{1wf} > \gamma_{1bf} > \gamma_{1wm} > \gamma_{1bm}$; $\gamma_{2wf} > \gamma_{2bf} > \gamma_{2wm} > \gamma_{2bm}$; except: $\gamma_{3bf} > \gamma_{3wf} > \gamma_{3wm} > \gamma_{3bm}$

13. Returning to the issue of the rate of level-of-aspiration change per unit of time (see note 6), using differential calculus we computed per-year rates of change in a linear form for LEA and LOA (following Cosby *et al.*, 1974). The results tend to confirm our (and Cosby *et al.*'s) interpretation of increasing stability in levels of aspiration. The first derivatives for the rate of change per year ($dy/dt = bx$; see also Coleman, 1968) in LEA and LOA are as follows:

N O T E S
(cont.)

LEA: SOGS (69→75) = -.116
SYS (66→68) = -.137; (68→72) = -.068

LOA: SOGS (69→75) = -.118
SYS (66→68) = -.037; (68→72) = -.085

These rates of change (per year) are generally indicative of increasing stability in LEA, given some "slippage" between the SOGS and SYS panels (i.e., -.116 and -.137). This synthetic extrapolation for LOA suggests that stability is greater in the sophomore-to-senior years relative to that from the mid-elementary grades to the end of high school and during the immediate post-high school period (i.e., -.118, -.037, -.085). Such a trend is not inconsistent with our interpretation of the relative stabilities of LEA and LOA in the high school *vs.* post-high school periods. These estimates should be taken with caution, however, as the assumptions underlying them (e.g., linear form, etc.) are not investigated.

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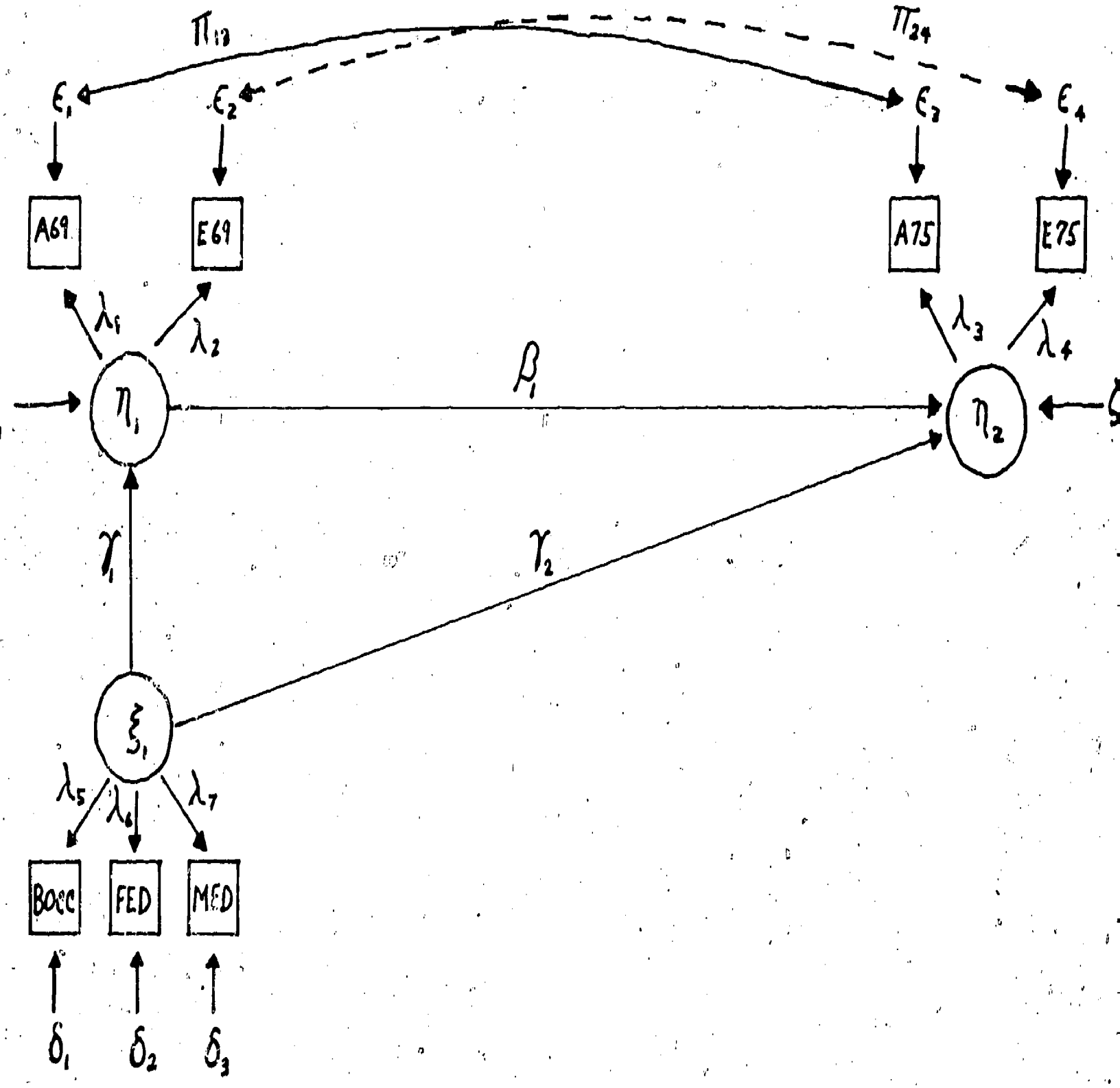

Figure 1. Two-Wave Panel Model: Preadolescent-to-Adolescent Period

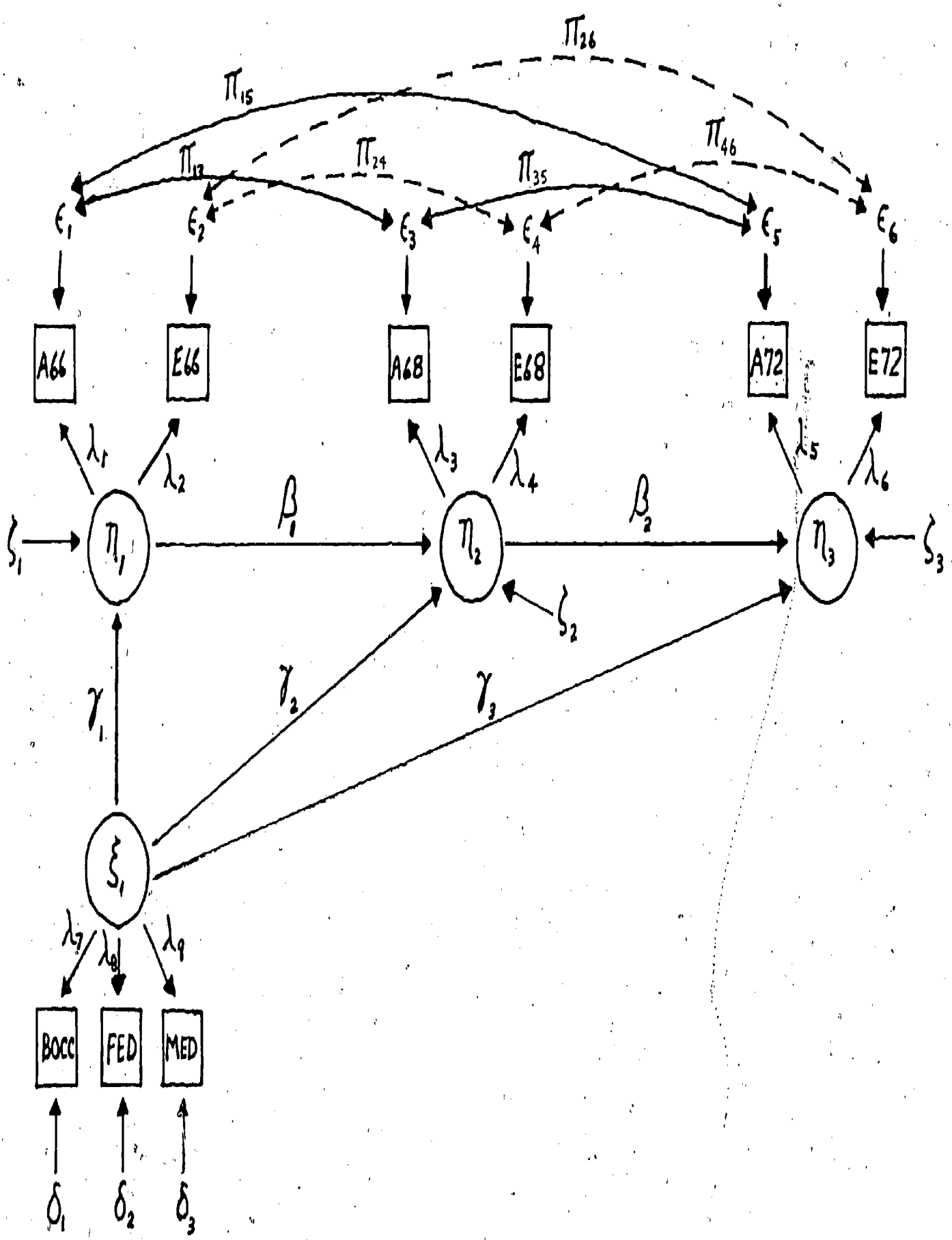

Figure 2. Three-Wave Panel Model: Adolescent-to-Young Adult Period

Table 1. Parameter Estimates for Models Involving Level of Educational Aspiration Construct: Preadolescence-to-Adolescence

	Model I		Model II	
Parameter	U	S	U	S
λ_1	1.311[a]	.628	1.180[a]	.565
λ_2	1.609[b]	.776	1.831[b]	.883
λ_3	1.311[a]	.638	1.180[a]	.569
λ_4	1.609[b]	.744	1.831[b]	.838
λ_5	6.322	.394	6.355	.396
λ_6	1.988	.638	1.991	.639
λ_7	1.930	.644	1.924	.642
β_1	.336	.302	.348	.316
γ_1	.361	.361	.336	.336
γ_2	.396	.356	.368	.334
V(SES)	1.000[f]	1.000	1.000[f]	1.000
V(LEA69)	1.000[f]	1.000	1.000[f]	1.000
V(LEA75)	1.240	1.000	1.214	1.000
π_{13}	---	---	.528	.181
π_{24}	---	---	-.450	-.822
σ_{ε_1}	1.535	.778	1.667	.825
σ_{ε_2}	1.186	.631	.772	.469
σ_{ε_3}	1.582	.770	1.752	.823
σ_{ε_4}	1.254	.668	.709	.546
σ_{δ_1}	14.746	.919	14.731	.918
σ_{δ_2}	2.397	.770	2.395	.769
σ_{δ_3}	2.289	.765	2.295	.766
χ^2	32.79		14.61	
df	12		10	
prob.	.001		.147	

f = fixed parameter
a, b = parameters constrained equal
u = unstandardized solution
s = standardized solution

Table 2. Summary of Analyses Pertaining to Race-Sex Subgroup Invariance in Level of Educational Aspiration Model: Preadolescence-to-Adolescence

I. Random Error (Model I)

Hypothesis:	No. of Parameters	χ^2	df	χ^2/df	p
H_{Σ_i}	28	355.9	84	4.2	.000
H_{Λ_i}	49	80.2	63	1.3	.070
H_{β_i}	61	68.0	51	1.3	.056
H_{γ_i}	58	67.0	54	1.2	.110
H_{β_i, γ_i}	55	73.5	57	1.3	.070

II. Nonrandom Error: Adjacent Inter-temporal Terms (Model II)

Hypothesis:

H_{Λ_i}	57	58.9	55	1.1	.333
H_{β_i}	69	42.7	43	1.0	.485
H_{γ_i}	66	43.7	46	1.0	.570
H_{β_i, γ_i}	63	46.9	49	1.0	.560

Table 3. Parameter Estimates for Models Involving Level of Educational Aspiration Construct: Adolescence-to-Young Adulthood

Parameter	Model I		Model II		Model III	
	U	S	U	S	U	S
λ_1	1.710[a]	.732	1.729[a]	.791	1.774[a]	.811
λ_2	1.805[b]	.870	1.796[b]	.866	1.738[b]	.838
λ_3	1.710[a]	.579	1.729[a]	.592	1.774[a]	.610
λ_4	1.805[b]	.699	1.796[b]	.704	1.738[b]	.684
λ_5	1.710[a]	.539	1.729[a]	.552	1.774[a]	.570
λ_6	1.805[b]	.569	1.796[b]	.574	1.738[b]	.558
λ_7	8.206	.366	8.217	.367	8.247	.368
λ_8	2.202	.657	2.198	.656	2.194	.655
λ_9	1.621	.557	1.620	.557	1.621	.557
β_1	.544	.727	.522	.689	.519	.683
β_2	.691	.727	.676	.711	.674	.707
γ_1	.325	.325	.329	.329	.335	.335
γ_2	.182	.243	.188	.248	.192	.253
γ_3	.133	.187	.140	.194	.139	.192
V(SES)	1.000[f]	1.000	1.000[f]	1.000	1.000[f]	1.000
V(LEA66)	1.000[f]	1.000	1.000[f]	1.000	1.000[f]	1.000
V(LEA68)	.560	1.000	.574	1.000	.578	1.000
V(LEA72)	.506	1.000	.519	1.000	.525	1.000
π_{13}	---	---	.228	.141	.112*	.078
π_{15}	---	---	---	---	-.070*	-.044
π_{24}	---	---	.088*	.127	.212*	.240
π_{26}	---	---	---	---	.153*	.118
π_{35}	---	---	-.062*	-.031	-.184*	-.101
π_{46}	---	---	.108*	.110	.248*	.210
σ_{ε_1}	1.212	.623	1.197	.612	1.114	.585
σ_{ε_2}	0.863	.493	0.878	.500	0.986	.546
σ_{ε_3}	1.370	.815	1.351	.806	1.285	.792
σ_{ε_4}	0.756	.715	0.790	.710	0.894	.729
σ_{ε_5}	1.510	.842	1.477	.834	1.414	.822
σ_{ε_6}	1.204	.822	1.242	.819	1.318	.830
σ_{δ_1}	20.835	.931	20.831	.930	20.819	.930
σ_{δ_2}	2.525	.754	2.528	.755	2.532	.756
σ_{δ_3}	2.414	.831	2.415	.831	2.414	.831
χ^2	91.1		74.4		72.6	
df	24		20		18	
p	.000		.000		.000	

f = fixed parameter
a, b = parameters constrained equal
u = unstandardized solution
s = standardized solution

*coefficient is less than twice its standardized error

Table 4. Summary of Analyses Pertaining to Race-Sex Subgroup Invariance in Level of Educational Aspiration Model: Adolescence-to-Young Adulthood

I. Random Error (Model I)

Hypothesis:	No. of Parameters	χ^2	df	χ^2/df	p
H_{Σ_i}	45	619.9	68	9.1	.000
H_{Λ_i}	69	210.6	111	1.9	.000
H_{β_i}	78	191.3	102	1.9	.000
H_{γ_i}	75	204.1	105	1.9	.000
H_{β_i, γ_i}	69	225.0	111	2.0	.000

II. Nonrandom Error: Adjacent Inter-temporal Terms (Model II)

Hypothesis:					
H_{Λ_i}	85	178.9	95	1.9	.000
H_{β_i}	94	162.4	86	1.9	.000
H_{γ_i}	91	176.9	89	2.0	.000
H_{β_i, γ_i}	85	197.0	95	2.1	.000

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Table 5: Parameter Estimates for Models Involving Level of Occupational Aspiration Construct: Preadolescence-to-Adolescence

	Model I		Model II	
Parameter	U	S	U	S
λ_1	17.718[a]	.722	16.592[a]	.676
λ_2	19.757[b]	.785	21.177[b]	.841
λ_3	17.718[a]	.687	16.592[a]	.648
λ_4	19.757[b]	.792	21.177[b]	.854
λ_5	6.472	.403	6.459	.403
λ_6	2.080	.668	2.082	.669
λ_7	1.834	.612	1.833	.612
β_1	.264	.295	.245	.272
γ_1	.152	.152	.147	.147
γ_2	.263	.294	.258	.287
V(SES)	1.000[f]	1.000	1.000[f]	1.000
V(LOA69)	1.000[f]	1.000	1.000[f]	1.000
V(LOA75)	.799	1.000	.809	1.000
Π_{13}	---	---	40.665	.139
Π_{24}	---	---	-7.319	-.066
σ_{ε_1}	16.630	.692	17.849	.737
σ_{ε_2}	15.458	.620	13.375	.541
σ_{ε_3}	15.276	.726	16.434	.762
σ_{ε_4}	10.966	.611	8.238	.520
σ_{δ_1}	14.680	.915	14.686	.915
σ_{δ_2}	2.318	.744	2.316	.744
σ_{δ_3}	2.368	.791	2.368	.791
χ^2	20.45		10.78	
df	12		10	
prob.	.059		.375	

f = fixed parameter
a, b = parameters constrained equal
u = unstandardized solution
s = standardized solution

Table 6. Summary of Analyses Pertaining to Race-Sex Subgroup Invariance in Level of Occupational Aspiration Model: Preadolescence-to-Adolescence

I. Random Error (Model I)

Hypothesis:	No. of Parameters	χ^2	df	χ^2/df	p
H_{Σ_i}	28	436.0	84	5.2	.000
H_{Λ_i}	49	75.8	63	1.2	.130
H_{β_i}	61	41.3	51	0.8	.831
H_{γ_i}	58	42.5	54	0.8	.871
H_{β_i, γ_i}	55	44.8	57	0.8	.879

II. Nonrandom Error: Adjacent Inter-temporal Terms (Model II)

Hypothesis:					
H_{Λ_i}	57	66.0	55	1.2	.148
H_{β_i}	69	32.0	43	0.7	.891
H_{γ_i}	66	33.5	46	0.7	.916
H_{β_i, γ_i}	63	35.5	49	0.7	.927

Table 7. Parameter Estimates for Models Involving Level of Occupational Aspiration Construct: Adolescence-to-Young Adulthood

Parameter	Model I		Model II		Model III	
	U	S	U	S	U	S
λ_1	17.614[a]	.708	16.720[a]	.672	17.520[a]	.704
λ_2	20.426[b]	.303	21.365[b]	.860	20.574[b]	.309
λ_3	17.614[a]	.522	16.720[a]	.518	17.520[a]	.552
λ_4	20.426[b]	.543	21.365[b]	.610	10.574[b]	.582
λ_5	17.614[a]	.472	16.720[a]	.462	17.520[a]	.493
λ_6	20.426[b]	.489	21.865[b]	.540	20.574[b]	.517
λ_7	9.145	.408	9.301	.415	9.202	.411
λ_8	2.084	.623	2.071	.619	2.079	.621
λ_9	1.602	.551	1.584	.545	1.594	.548
β_1	.620	.927	.577	.824	.571	.803
β_2	.580	.659	.551	.636	.534	.615
γ_1	.384	.384	.364	.364	.381	.381
γ_2	.134	.200	.149	.213	.153	.216
γ_3	.139	.236	.163	.269	.165	.267
V(SES)	1.000[f]	1.000	1.000[f]	1.000	1.000[f]	1.000
V(LOA66)	1.000[f]	1.000	1.000[f]	1.000	1.000[f]	1.000
V(LOA68)	.447	1.000	.490	1.000	.506	1.000
V(LOA72)	.346	1.000	.368	1.000	.381	1.000
Π_{13}	---	---	66.139	.247	45.989	.196
Π_{15}	---	---	---	---	5.172*	.020
Π_{24}	---	---	-13.679*	-.098	21.690*	.113
Π_{26}	---	---	---	---	42.230	.195
Π_{35}	---	---	37.546	.142	24.039*	.101
Π_{46}	---	---	-7.827*	-.039	25.044*	.103
σ_{ε_1}	15.617	.706	17.018	.741	15.910	.710
σ_{ε_2}	13.517	.596	10.661	.510	13.054	.588
σ_{ε_3}	14.661	.853	15.720	.855	14.738	.834
σ_{ε_4}	14.858	.840	13.079	.792	14.651	.813
σ_{ε_5}	16.157	.882	16.861	.887	16.171	.870
σ_{ε_6}	16.599	.872	15.364	.842	16.618	.856
σ_{δ_1}	20.441	.913	20.369	.910	20.415	.912
σ_{δ_2}	2.618	.782	2.628	.785	2.622	.784
σ_{ε_3}	2.427	.835	2.439	.838	2.432	.836
χ^2	120.5		89.3		82.0	
df	24		20		18	
p	.000		.000		.000	

f = fixed parameter
a, b = parameters constrained equal
u = unstandardized solution
s = standardized solution

*coefficient is less than twice its standard error

Table 8. Summary of Analyses Pertaining to Race-Sex Subgroup Invariance in Level of Occupational Aspiration Model: Adolescence-to-Young Adulthood

I. Random Error (Model I)

Hypothesis:	No. of Parameters	χ^2	df	χ^2/df	p
H_{Σ_i}	45	784.0	68	11.5	.000
H_{Λ_i}	69	218.4	111	2.0	.000
H_{β_i}	78	194.7	102	1.9	.000
H_{γ_i}	75	195.8	105	1.9	.000
H_{β_i, γ_i}	69	211.7	111	1.9	.000

II. Nonrandom Error: Adjacent Inter-temporal Terms (Model II)

Hypothesis:

H_{Λ_i}	85	171.9	95	1.8	.000
H_{β_i}	94	143.9	86	1.7	.000
H_{γ_i}	91	150.6	89	1.7	.000
H_{β_i, γ_i}	85	161.2	95	1.7	.000