

widely recognized, inquiry into its descriptive nature and exact effects has been limited. Suggestions for future research are offered.

The observation instrument Peer Approval-Disapproval (PAD) provided an in situ account of the natural frequencies and rates of social reinforcement among school-age children. A PAD record contained descriptions of approval and disapproval behaviors emitted to and received from peers in first, third and fifth-grade classrooms. Trained observers recorded the classroom behavior of 253 children over three separate three-minute sessions, with an overall reliability index of .92.

During seatwork periods in the classroom, peer social reinforcement was characterized by (a) a persistent rate of behavior that accompanied the work behavior, and (b) approval rates that were two times higher than disapproval rates. Post hoc analyses revealed that PAD rates (a) did not vary by grade level but (b) did vary by classroom activity. There was a positive correlation between the number of approvals given and the number of approvals received by an individual child ($r_1 = .48$). Peer approval rates received by an individual child during work periods were higher than teacher approval rates (Loehfelz 1974; White et al., 1973) received during instructional periods. Peer disapproval rates were lower than teacher disapproval rates in grades three and five.

The socialization process provided an explanation for the positive content and persistent nature of peer social reinforcement. In the classroom, children as social reinforcers may be shaping the academic and/or social behavior of their peers more effectively than the classroom teacher. Based on these findings suggestions for the future use of PAD were discussed.

A CAUSAL ANALYSIS OF EXPECTANCIES AND VALUES CONCERNING MATHEMATICS

Order No. 8106139

FUTTERMAN, ROBERT, PH.D. *The University of Michigan*, 1980. 169pp. Chairperson: Jacquelynne Eccles Parsons

The sex differences consistently found on mathematics achievement tests have long been noted by psychologists and educators. These sex differences have major consequences for both the individual and society. The most plausible explanation of this phenomenon is that sex-related achievement differences are a consequence of the sex differences in the number of mathematics courses taken in high school. A review of the literature supports the view that participation in mathematics courses is a function of student attitudes toward mathematics. This study examines the determinants of these attitudes through the use of causal modeling techniques.

Two components of attitudes are distinguished which correspond, respectively, to the concepts of expectancy and value. Expectancies refer to an individual's subjective probability judgments. Values refer to an individual's feelings, emotions, or affective reactions to an object or entity. Expectancies and values are believed to have multiple determinants. An individual's task-specific beliefs are thought to be the most important determinants of expectancies and values for that task. Task beliefs are seen as having two components; beliefs about one's own ability regarding the task (self-concept of ability) and one's beliefs about task demands or characteristics (perceptions of task characteristics). One variable thought to influence both task-specific beliefs and expectancies is causal attributions about achievement outcomes. Causal attributions are cognitions about the perceived causes of behavior, specifically, achievement successes and failures. This research develops a causal model of relations among expectancies, values, and their determinants based on a theoretical framework offered by Parsons et al. (in press).

The sample of students participating in this study consisted of 339 students from grades 5 through 11 inclusive. All students were currently enrolled in mathematics courses. These students were administered a questionnaire designed to assess those variables which the theory suggests as predictors of students' behaviors. The primary measurement technique was the semantic differential scale. Measures of students' attributions for success and failure situations employed a forced ranking procedure. Complete data were available for 247 students.

Causal relations among variables were examined by a computer for the analysis of linear structural relations using the method of maximum likelihood (LISREL IV; Joreskog and Sorbom, 1978). A statistically acceptable model of the attitudinal process was developed ($\chi^2 = 82.9356$, 65 df, $p = .0661$) and estimates of the parameters of the model were obtained.

Theory-testing procedures indicate that: (a) attributions to ability play an important causal role in the attitudinal process, directly affecting self-concept of ability and the value of mathematics, (b) self-concept of ability is a cause rather than an effect of expectancies and perceptions of task characteristics, (c) perceptions of task characteristics determine

expectancies, (d) expectancies and values are causally independent, and (e) sex directly affects attributions to ability, self-concept of ability, expectancies, and values. Results are discussed and implications for educational practice are drawn.

LINGUISTIC FACTORS IN PERCEIVED TRAIT CO-OCCURRENCES

Order No. 8105006

GARA, MICHAEL ANTHONY, PH.D. *Rutgers University The State U. of New Jersey (New Brunswick)*, 1980. 53pp. Director: Professor Seymour Rosenberg

In this study, measures of intertrait similarity were obtained from each of three independent data bases: (1) trait descriptions of persons known to subjects; (2) ratings of the same traits in terms of similarity-in-meaning; (3) descriptions of the same traits in terms of their perceived features. Feature descriptions of the trait adjectives were obtained in both a free-response manner (Study I) and in a recognition-type task (Study II), where the features extracted in Study I were presented to subjects in checklist form. Based on recent theoretical work concerning linguistic synonymy, the measure of intertrait similarity devised for the feature description data, essentially a measure of the features common to each trait pair, was viewed as a measure of the linguistic synonymy of each trait pair. In both Study I and Study II, the pattern of correlations among the three measures of intertrait similarity indicated that the high correspondence between the measure based on personality trait descriptions and the measure based on similarity in meaning ratings, could not be accounted for by the measure of linguistic synonymy, i.e. the measure of common features. This high correspondence, also observed in previous investigations, was explained by the idea that ratings of meaning similarity, like personality ratings, reflect the various beliefs of the rater about the co-occurrences of traits (the rater's implicit personality theory) as well as the linguistic synonymy of those traits. Previous investigators, who relied on ratings of meaning similarity as a measure of linguistic synonymy, had concluded that personality trait ratings reflect solely linguistic synonymy. These conclusions are placed into serious question by the results of this study. It was also shown in this study that the correspondence of the trait structure based on personality trait ratings and that based on meaning similarity is less when intimate persons are described than when non-intimate persons are described. The conclusions of earlier investigations are reconsidered in light of this result.

SOCIAL CLIMATE, INVOLVEMENT, AND SATISFACTION IN URBAN BLOCK ORGANIZATIONS

Order No. 8105426

GIAMARTINO, GARY A., PH.D. *George Peabody College for Teachers of Vanderbilt University*, 1979. 60pp. Major Professor: J. R. Newbrough

This study was an attempt to understand the dynamics of involvement and satisfaction in neighborhood organizations by examining the relationship between these variables and the social climates of organizations. Moos (1976) maintained that perceived social climate was a mediating variable which could accentuate or mitigate the effects of other organizational factors on individuals. According to this perspective, the social climates of organizations could be modified to increase or decrease such factors as involvement or satisfaction in organizations.

The purpose of this study was to assess the social climates of neighborhood organizations and the relationship of different kinds of organizational environments to members' satisfaction and involvement in the organizations. The general hypothesis was that differences in neighborhood organization social climates would be systematically related to involvement and satisfaction in the organizations.

Seventeen block organizations in a neighborhood in Nashville, Tennessee were studied. Data were derived from a larger study of participation in block organizations. Members of the organization completed the Group Environment Scale (GES) Short Form and a battery of items indicating their satisfaction with the organization and their level of involvement in the organization.

The 17 organizations differed along 8 of the 10 GES social climate dimensions indicating that there were differences in perceived social climate between the groups. Correlations between GES dimensions and satisfaction items indicated that organizations with more satisfied members, members who enjoyed their affiliation with the organization, and who thought their organizations were getting stronger were high on the dimensions of Cohesiveness, Leader Support, Task Orientation, Order and Organizations, and Leader Control. Similar patterns of relationship were shown with the involvement items although there were fewer statistically significant relationships. The general hypothesis, thus, was partially supported.

CAUSAL ANALYSIS OF EXPECTANCIES
AND VALUES CONCERNING MATHEMATICS

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Early in their careers, social scientists learn that correlation is not causation. For instance, two variables which covary may be implausibly causally related--e.g., shoe size and intelligence. Cook & Campbell (1979) have described several necessary-but-not-sufficient criteria which can be used to aid the scientist in making causal inference. These criteria include: 1) covariation of variables (variables in a presumed cause-effect relation must be related), 2) temporal precedence of cause over effect (to establish causality, an effect cannot precede the variable presumed to cause it), and 3) the need to use 'control variables' to rule out rival hypotheses. This criterion is advanced in recognition of the fact that fallacious inferences can be made about possible cause-effect relations. The notion of spurious correlation, for example, describes the case where covariation between two variables, say mortality rates and length of time married, is due to their joint dependence on a third variable--in this case, age.

In the randomized experiment, the researcher can manipulate events so as to meet these criteria for the inference of causality. The experimenter controls the covariation of independent variables and their temporal sequence, and attempts to rule out rival hypotheses by eliminating confounding variables through the design of the study. Random assignment of subjects to conditions insures the equivalence of treatment and control groups prior to the experimental manipulation. Experiments tend to have high internal validity--that is, the validity or 'truth' of statements about causality is maximized by their use.

While randomized experiments may be highly desirable in terms of internal validity, non-randomized field studies are often undertaken

linear model. As in OLS regression, errors in equations are assumed to be uncorrelated with each other. Treatment groups are assumed to have equal variance and all variables are assumed to be measured without error. When these assumptions are met, then path analysis leads to efficient and unbiased estimates of causal parameters.

Equally or more important, path analysis requires theoretical assumptions to be met. Specifically, the researcher must determine the sequence of OLS regressions in an a priori fashion. If achievement, for example, is thought to be determined by attitude, then achievement must be regressed on attitude and not vice-versa. The important assumption to be met is the assumption that the model tested is specified correctly. Specification error refers to the degree to which the mathematical representation of the theory diverges from reality--that is, how inaccurate the theory is. The greater specification error, the more biased are the estimates of the causal effects. Researchers often use the statistical convention of $p \leq .05$ to make decisions about meaningful paths.

The Expectancy/Value Model of mathematics attitudes and choice behavior which we have offered (Parsons, Futterman, Goff, Kaczala & Meece, Note 1) specifies the manner in which causes and effects in this domain are presumed to operate. Thus, this model was used to determine the sequence of path regressions. The construct of attributions about achievement outcomes occupies a central role in our model, but how is the importance of attributions to be assessed? One solution would be to enter into the regression equation each of the 18 attributional explanations for success and failure which students were required to rank in importance. This data analysis assumes simple additivity of

(variance-accounted-for) are compared for each dependent variable in each of these models. The researcher must then make a judgment about the size and/or meaningfulness of any differences in R^2 values.

Separate ATTPAT variables and ATTPAT dummy variables were created for each year of the two-year study, and separate path analyses were performed for each year of the study. This allowed two tests of our model. The results of the path analyses are shown in Figures 1 and 2. The lines in these figures represent path regression coefficients statistically significant at the $p < .05$ level. Path regression coefficients in both figures are the estimates of causal parameters when ATTPAT is included in the model. Paths to and from ATTPAT are not drawn, since it is not possible to determine correct standard errors for the decomposed variable. Several variables included in the path analysis at year one have been deleted from the year two path analysis. Including these variables would have drastically reduced the number of subjects available for path analysis.

Insert Figures 1 & 2

One's perceptions of significant others' judgments about self were found to be important causal variables in both years of the study. For instance, perceptions of others' judgment about self's ability had a significant impact on current expectancies, task difficulty judgments, and perception of one's current performance (which here included self-concept of ability). Judgments of the effort of math for self were a significant cause of judgments about the utility, importance, and worth of mathematics. Sex of child had a consistent effect on utility and on future expectancies as well. One interesting discrepancy is in the

The essential notion of CLPC is that the correlation of a cause measured at time 1 with its lagged effect should be greater than the correlation of an effect measured at time 1 with its cause measured at time 2. The difference between the values of these cross-lagged correlations is tested, and causality is inferred if this difference reaches statistical significance. There are several theoretical assumptions to be satisfied. These assumptions are known as stationarity and synchronicity (for a full discussion of this technique, see Kenny, 1975). The null hypothesis of CLPC assumes common-factoredness--that is, covariation observed between variables is due to their dependence upon a third variable.

Kenny's PANAL program was used to compute these analyses. Attitude scales included in this analysis were those scales on which there were sufficient data both years of the study. Only subjects with non-missing data on all these scales were included because of the suggestion that this procedure increases the stability of the observed correlation (N=255).

CLPC examines all pairs of input variables for cross-lagged differences. Current practice holds that uncorrected correlations not be used in CLPC. The pattern of significant cross-lagged differences can be schematically represented in the form of a path diagram (Figure 3). Examining this diagram, one sees that perceptions of the future difficulty of math and the perceptions of its worth seem to cause expectancies, interest, utility of math, and self-concept of ability.

of attributions were entered into the regression equations, perhaps results would differ considerably. However, the relative paucity of variance accounted for by the ATTPAT variable indicates that notions about the functions of attribution patterns may need to be seriously revised. This revision should result in more explicit specification of hypotheses, models, and predictions about the causal role of attributions, particularly with regard to the direction and magnitude of effects. For instance, are attributions a cause or an effect of attitudes? Should they impact on expectancies or on values; or perceptions of self vs perceptions of others vs perceptions of tasks; or on future orientations rather than assessment of current state? We intend to address ourselves to these questions in the future.

Reference Notes

1. Parsons, J., Futterman, R., Goff, S.B., Kaczala, C.M., and Meece, J. Expectancies, values, and academic choices: Origins and change. In J.T. Spence (Ed.), Assessing achievement. San Francisco: W.H. Freeman, in press.

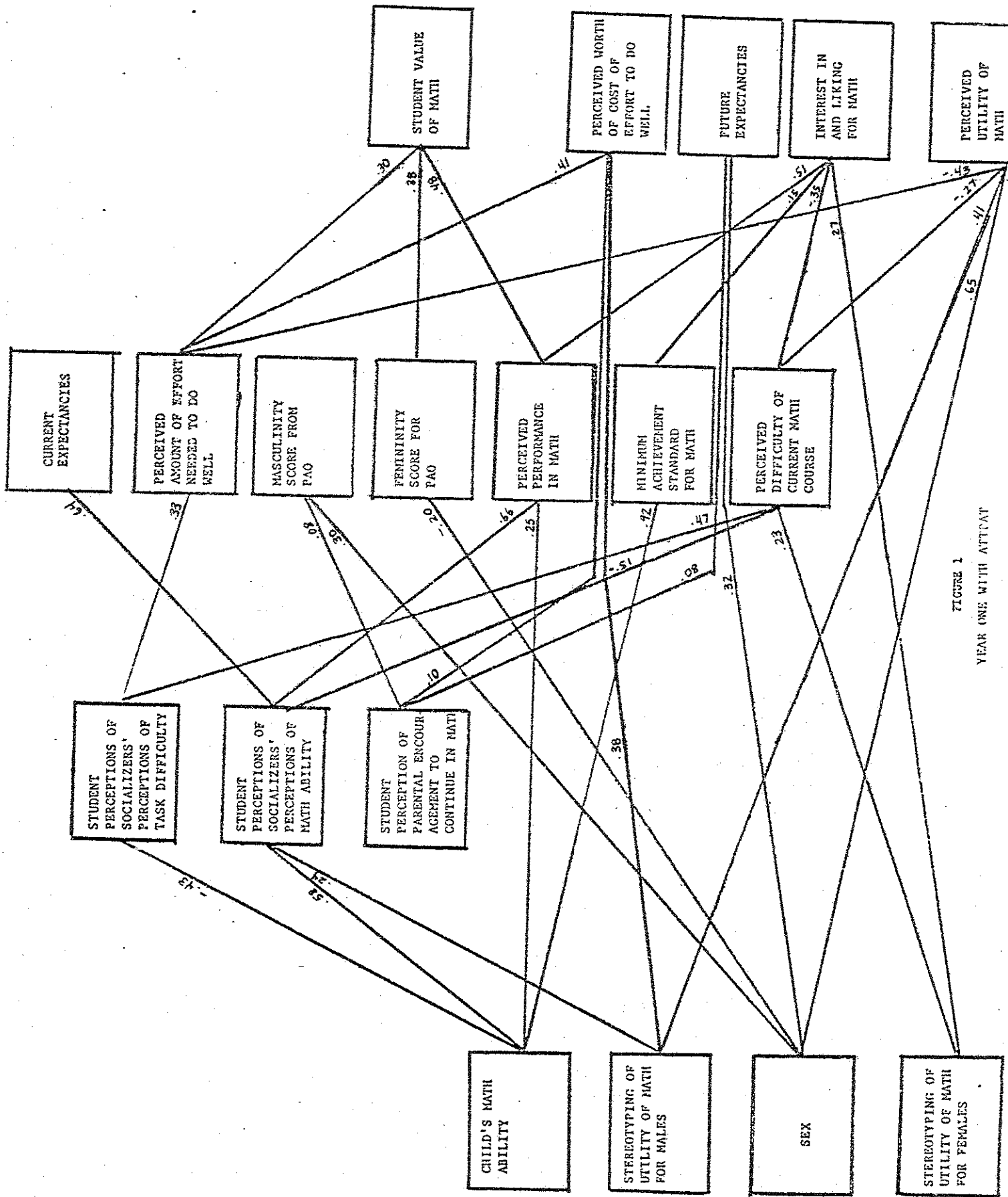


FIGURE 1
YEAR ONE WITH ATTAY

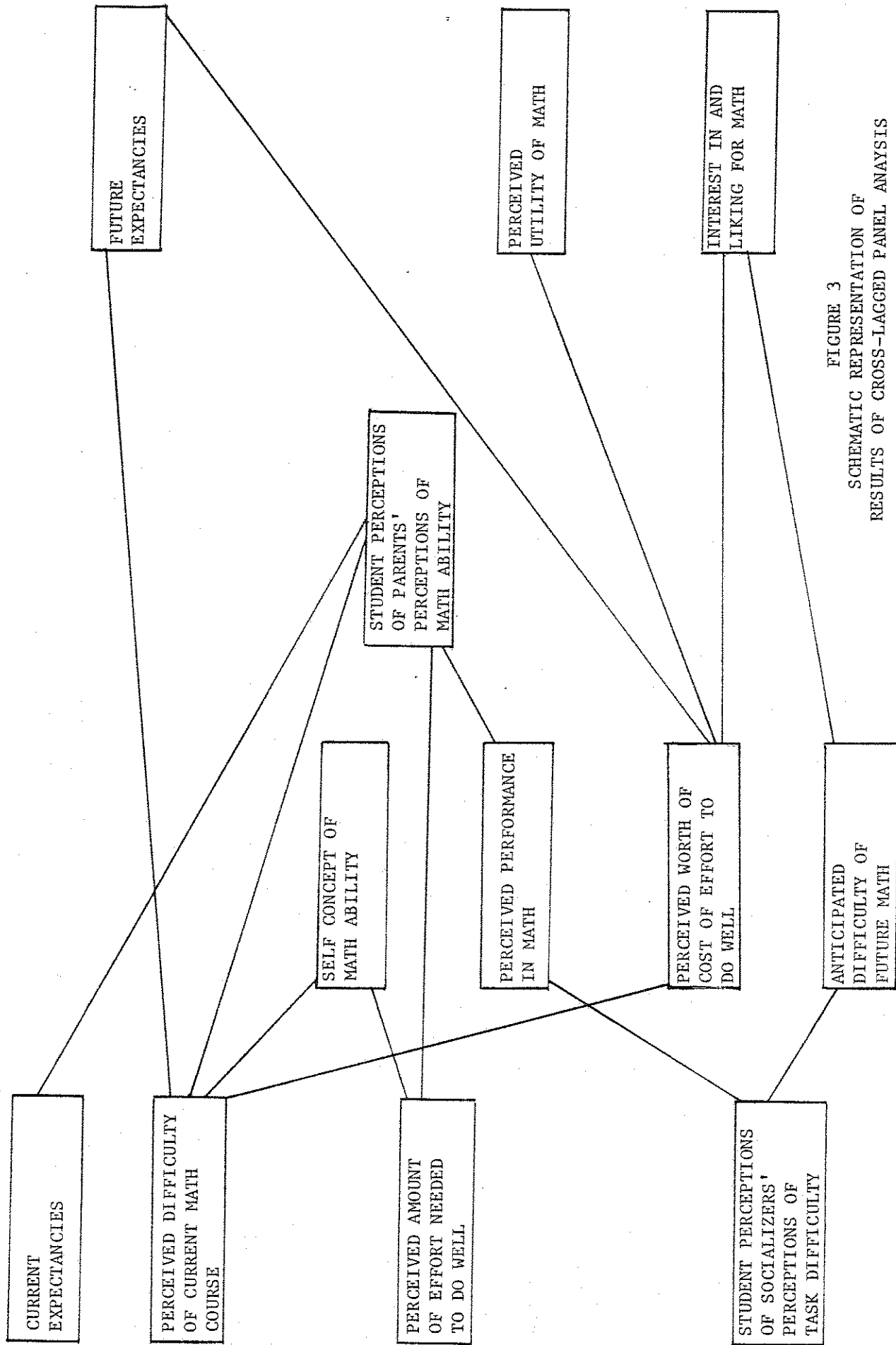


FIGURE 3
 SCHEMATIC REPRESENTATION OF
 RESULTS OF CROSS-LAGGED PANEL ANALYSIS

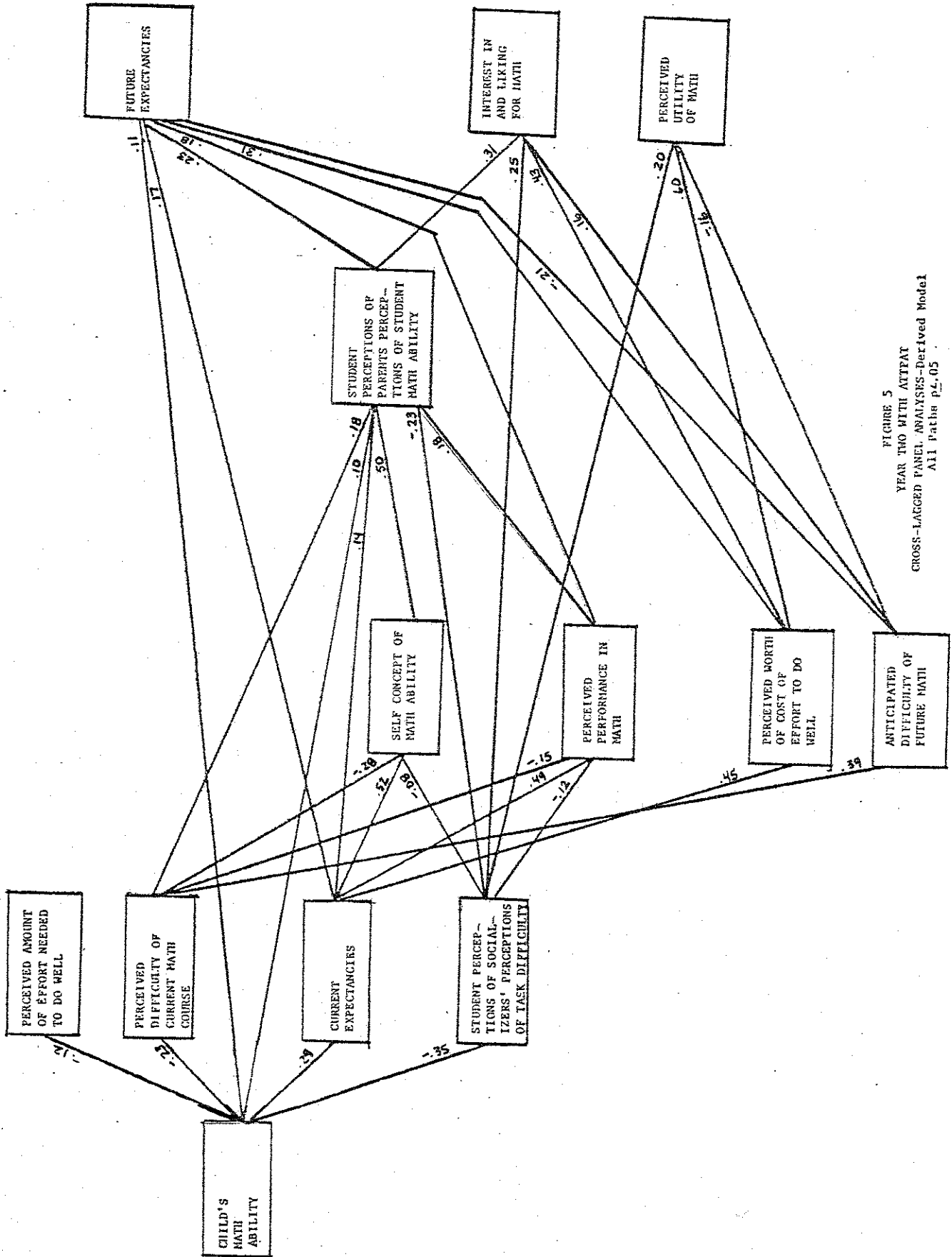


FIGURE 5
 YEAR TWO MATH ATTIT
 CROSS-LAGGED PANEL ANALYSES-Derived Model
 All Paths $p < .05$