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ABSTRACT

Two studies are described which capitalize on the strengths of the instructional development process for research purposes. Typically, developed courses have carefully-designed learning environment specifications, replicable instructional treatments, and well-proven achievement measures. A battery of questionnaires and rating scales concerning interests, activities, and attitudes including a locus of control scale were administered to college freshmen in eight courses. The full-time academic advisors of those students were administered an Advisor's Judgment Questionnaire to record their assessment of the students. A multiple correlation was computed for the prediction of course grades for 152 students using eight variables, which included the Scholastic Aptitude Test (SAT), previous grade point average (GPA), and advisor judgment. The multiple correlation, without SAT or GPA, was only slightly lower using seven predictor variables. It was inferred that part of the valid variance in advisor judgment was gained in face-to-face meetings. Some recommendations for attending to additional information when advising students were made; it was suggested that the student's use of time and motivation for alternatives are also predictors of academic success. (Author/CTM)

A MULTIVARIATE ANALYSIS OF ACADEMIC ADVISING:

Case Study of Research in an Instructional Development Setting

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ABSTRACT

Two studies are described which capitalize on the strengths of the instructional development process for research purposes. In three (study I) and five (study II) developed courses, students were administered a battery of tests of individual differences. Simultaneously, the full-time academic advisors of those students were administered an Advisor's Judgment Questionnaire to record their assessment of the students. Multiple linear regression showed that: (1) presumably due to the reduced error variance in achievement measures of developed courses, a multiple R of .74 could be obtained using 8 variables (study II), when predicting final grade in course; (2) advisor's judgment accounted for variance independent of the commonly-used SAT and GPA (3% in study I, 7% in study II); (3) this independent variance may have been drawn from information gained in face-to-face meetings (study II); (4) some recommendations for attending to additional information when advising students were tentatively made.

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The instructional developer--if he can get his nose away from the grindstone long enough--is likely to find himself in a position which provides some unique opportunities for research which will advance the state of his art. Typically, developed courses have carefully-designed learning environment specifications, replicable instructional treatments, and well-proven achievement measures. These three things help create an unusually fruitful environment for research. Since treatments are well specified and replicable, many of the variations in instruction typical of a classroom setting are eliminated; thus, the task of interpreting findings concerning treatments is facilitated. Similarly, since achievement measures are commonly of higher reliability than in the typical course, the error commonly found in such measures may be expected to be reduced. Reduced error gives the investigator an improved chance of finding effects of substantial magnitude.

While these things make the developed course more attractive than the usual field setting for research, there are some additional characteristics of developed courses which make them more attractive than laboratory settings, for many purposes. For example, usually there is no difficulty in designing treatments which run over long periods of time--e.g., an entire unit, semester, or academic year. In addition, obtaining large n's necessary for correlational investigation is usually not a problem; thus, we are free to use designs other than the traditional ANOVA-based factorial approach. Finally, the motivation of subjects is likely to be much more realistic than in a laboratory setting; consequently, effects are likely to be somewhat larger than in the laboratory.

Where development has been practiced for some time, it is likely that a number of courses in a variety of subjects will have been developed. In the case of the Division of Development and Special Projects (DDSP) at Indiana University, many of these courses serve the same population: college freshmen seeking introductory-level instruction. If learner characteristics are measured for students taking these courses, then, it

becomes possible to start looking for interactions. Students with a certain profile of characteristics are likely to do well in one developed course, while students with another profile are likely to do well in an alternative course. Again, it should be emphasized that the characteristics of developed courses improve the likelihood of productive research on such comparisons.

Ultimately, of course, it is possible to exploit such a setting to investigate aptitude-by-treatment interactions (ATI). The conscientious developer may be able to formulate particular instructional strategies for different types of students, based on his empirical findings. However, there is another way--short of redesigning courses--in which such findings are potentially of use.

The process of deciding which courses to take constitutes a great, continuous, intuitive, ATI experiment. Students have feelings--based on experience--about which kinds of courses they are likely to do best in. They try to make selections accordingly. The process of academic advising (by faculty and staff) is intended to facilitate such selections. Generally, the advice given to students (at least, the portion not based on official policies) is intuitive. Appropriate research by the developer, using developed courses, can provide some empirical based for such recommendations. Thus, it may ultimately be possible to identify the components of such intuitive feelings about the probable success of a given student in a given course, and perhaps to provide recommendations for improving upon intuition.

The studies described here represent such a program of research. Our objectives were: (1) to identify what types of information the full-time academic advisors at Indiana University used in making their judgments about students, and (2) to make suggestions for attending to additional information which might be of use in improving the judgments

of the advisee's probable success in a given course. As this research continues, it may be possible to apply decision theory to the advising process. However, the current studies represent no more than a preliminary step in that direction.

To capitalize on the advantages of developed courses (described above), we included in the study a selection of introductory-level courses which were the produce of a development effort by the faculty member, working alone or in conjunction with DDSP.

To tap the advisor's judgments about students, we developed, piloted, and revised a self-report questionnaire which enabled the advisors to record their judgments of a student in a quantifiable form.

The learner variables measured were drawn from a questionnaire developed by Misanchuk (1976). While the variables are drawn from Atkinson's (1974) model, the implications of the study for the model will not be discussed here. The variables are summarized in Table I.

Study I

During the Spring, 1975 semester, Misanchuk (1975) administered the Atkinson instruments to all students attending the general lecture session of each of five introductory courses at Indiana University originally selected for the study. For students completing the questionnaire, standard demographic data were gathered from University records. Then, those students in the sample who were advised by the University's full-time academic advisors were selected, and the Advisor's Judgment Questionnaire administered to each student's advisor. While completing the questionnaire, advisors were provided with the standard university record file for each of their advisees.

The number of students selected in this way was large enough for analysis in three courses: the first and second semesters of an introductory Chemistry lab course (31 and 53 students respectively), and

an introductory Economics course (22 students). Advisors completed 106 questionnaires out of 124 possible. Complete data were compiled for 80 of the students.

In spite of the limitations of sampling technique, comparison of population parameters with sample characteristics indicated that the sample was approximately representative of most students advised by full-time academic advisors at I.U. All were freshmen, most second semester, most were recent high school graduates, and mean SAT math and verbal scores were close to population means. Because of the small n, it was not possible to perform meaningful regression analyses on the individual courses, so the three courses were taken together. Before analysis, all independent variables (except SAT) were recomputed using the Z transformation. To conserve the greatest amount of information, pairwise deletion of missing data was used throughout.

The advisor's judgment was measured using a questionnaire containing nine items. The questionnaire was developed on the basis of debriefings following simulated interviews between advisors and a role-playing surrogate for an advisee. The items on the questionnaire were highly intercorrelated, and consequently, appeared to be tapping some general approval factor on the part of advisors. In stepwise multiple linear regression, two questions accounted for more than 2% of variance independent of other measures. These were, "do you think the student will be intimidated by the large size of the class?" and, "In your opinion, does the student feel this course is important to him?."

A similar pattern of intercorrelation appeared with the Atkinson variables. While very few of the coefficients exceeded .40, the matrix does suggest that the student variable questionnaire tapped some general factor. A high intercorrelation with the ability measures of SAT and

GPA suggest some commonality with a general ability factor.

Regression analysis clarifies this pattern (Table 3). As might be expected, the generalized achievement measures (SATOT and GPA) accounted for by far the most variance in final grade: 38%. Next came two learner variables from the Atkinson model, FEARFAIL and MOTALTAR, which with INCENTIV account for an additional 9% of variance in final grade. The two previously mentioned advisor questions CLASSLG and CRSIMP account for an additional 3% of variance.

There is some reason to believe that FEARFAIL (fear of failure) is acting as a moderator variable. The correlation with the criterion variable is zero, but the correlation with SATOT is relatively high (r= .38). It comes into the regression equation 4th, but accounts for variance only if SATOT is entered first. With some partial correlation analyses, the relationships of figure 1 emerged.

While the small n and crudeness of instrumentation preclude any strong conclusions from these data, the overall pattern of results in the study seems to suggest reason for further investigation. The performance of SAT and GPA in accounting for approximately 38% of variance in final grade is consistent with typical experience with I.U.'s freshman class (B.E.S.T., 1973). However, the ability of the learner variables to account for an additional 9% of variance, and advisor variables to account for an additional 3% of variance, suggest that a promising line of investigation had been found. Consequently, a replication with improved instrumentation was justified.

While this study was considered preliminary, its results were reported to the academic advising staff. Findings were considered too tentative to permit specific recommendations, but the very heavy dependence on SAT and GPA by advisors was noted. The advisors, therefore, had some reason to attend to additional factors more closely for the second study,

and they also made a number of suggestions for revision of the Advisors Judgment Questionnaire. From these suggestions emerged the questionnaire which was used in the second study (see Appendix A).

Study II

Courses selected for the second study were introductory courses in Chemistry, European History, Macroeconomics, Human Geography, and Finite Mathematics. The learner variable questionnaire (Appendix B) was administered in class to all students in attendance. All questionnaires were administered between the 9th and 13th week of the Spring, 1976 semester at Indiana University. Except in Chemistry, completion of the questionnaire was voluntary. Students were instructed that the questionnaire was part of the overall evaluation effort for the course; that anonymity was assured; and that frank answers would be most valuable. In all administrations except math only a few students present refused to complete the questionnaire. In Geography and History, poor attendance at the administration sessions led to a follow-up by mail for those who had not responded.

After the end of the semester, for each student enrolled in each course, GPA, SAT scores, final grade, and background data were obtained from university records.

Simultaneously, before midterm grades became available, students were identified who were in the selected courses, who also were advised by full-time academic advisors. Those advisors were then asked to complete one revised Advisors Judgment Questionnaire for each of their advisees who were in the sample. In this way, complete data from advisors, students, and university records were obtained for 152 cases. All the variables were transformed to Z scores. The Human Geography course presented a special problem. Since it is taught on the mastery model, the range of final grades is restricted. However, raw point values

for final grade exhibit a distribution much closer to the traditional norm-referenced letter grade distribution. Consequently, the Z transformation of final point grade was substituted for final letter grade in that course.

Questionnaire Reliabilities

Scale reliabilities for the learner variables are reported in Table 1. In general, scale reliabilities are adequate to permit some tentative conclusions, but additional steps of refinement and retesting will be required before the questionnaire can be of general use.

For the Advisors Judgment Questionnaire, reliability was assessed using an inter-rater reliability procedure. For a random sample of 71 cases*, academic advisors deemed to be experienced judges reviewed the files of the students involved and completed questionnaires for each student, on the basis of files alone, with no interviews. Where their own advisees had been sampled, advisors completed no questionnaire. For each of the items on the questionnaire, reliability information was computed (Table 4). Again, reliabilities are not high enough to permit substantial theoretical analysis of questionnaire results, but the generally high intercorrelations of the items suggest some overall approval factor, as in Study I.

Results

Analysis was accomplished using SPSS 6.5, subprogram REGRESSION. The correlation matrix (Table 5) shows a few patterns of interest. First, the generally high intercorrelations of the advisors judgment questions, as in study I, is apparent. As previously noted, this suggests some general approval factor operating. The other principle cluster of

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*In the interim between selection of the sample and completion of the inter-rater reliability procedure, records for some students became unavailable to the advisors. Conseguently, a few cases were lost from the random sample.

intercorrelations is between the subscales of the learner variable questionnaire. While correlations are generally only moderate, it appears that the TIMEWRK scale shows moderate intercorrelations with most of the other scales in the instrument. TIMEWRK also shows intercorrelations with three of the items in the Advisors Judgment Questionnaire.

As shown in Table 6, stepwise multiple regression demonstrated that a multiple R of .74 could be obtained using 8 variables. As might be expected, GPA is by far the dominant variable in the equation, but interestingly, even with this variable in the equation the advisor's prediction of final grade (PRGRADE) still accounted for nearly 7% of independent variance. The prominance of one of the course variables, COURSE3, is a result of the effects coding scheme used; that variable contrasted the mastery-model Geography course with the other courses in the study.

Since multiple regression is extremely sensitive to the sequence in which variables enter the equation, it is convenient to check for sequence effects by forcing variables into an equation in stepwise mode but with their sequence of entry reversed. When this was done for the equation of Table 6, the substantial overlap of GPA with the other variables in the equation became apparent. In particular, the importance of the two time variables is clearly demonstrated. Also, the increased prominance of the advisors' judgment of math ability (MATH) is notable.

Since the swamping effect of SAT and GPA, the general ability variables, was so pronounced, a second stepwise regression run was performed with these variables excluded from the equation. Surprisingly, the multiple R suffered very little (Table 7). The strength of the advisors' prediction of final grade is even more apparent, as is the exceptional behavior of the course variable contrasting the mastery course from the others. Again, the time variables retain their importance.

A reverse stepwise run reveals substantial overlap between the math question, the prediction of final grade, and the COURSE3 variable. Comparing these results with those for the first run it seems likely that MATH is acting as a surrogate for the general ability variables.

Partial correlation runs yielded the results shown in figure 2. Compared with the results for study I, the share of independent variance accounted for by advisors judgment has increased. With GPA and SAT in the equation, two advisors judgment variables (PRGRADE and TIMEORG) accounted for nearly 8% of variance, compared with 3% in study I. With GPA and SAT not in the equation, advisors judgments independently accounted for 24% variance in final grade. The relationship of advisors judgment, the learner variables, and GPA is illustrated in figure 3. While there is substantial overlap between advisor variables and GPA, some independence does exist.

By contrast, the independent contribution of the learner variables in the presence of GPA has gone down. While in study I the learner variables account for an additional 9% of variance in final grade, in study II their independent contribution (rendered only by TIMEWRK) was less than 2%. However, with GPA and SAT not in the equation, the learner variables accounted for 14% of the variance in final grade (figure 2). The overlap between advisors judgment and the learner variables is 14%.

To further clarify the nature of advisors judgments, a control was designed. An expert academic advisor was asked to complete Advisors Judgment Questionnaires for 42 students from the original sample, based only on these students' files. The correlations between the expert judgments and advisor's judgments are recorded in Table 8. With the exception of the questions on reading, math, and previous college performance, correlations are quite small. In addition, a stepwise multiple regression run substituting the expert judgments for the original

advisor variable judgments, with order forced to be the same as the original, demonstrated a somewhat weaker multiple R for the expert judge (Table 7). Consequently, it seems reasonable to conclude that advisors in study II appeared able to render judgments using information from face to face contact in a way not duplicated by access to files alone.

Conclusions

There are at least three findings of interest from the study. First, it appears that use of developed courses in the study did in fact substantially reduce the amount of error variance in the final grade. This is the most probable reason for the dramatically higher multiple R's in both studies I and II, compared to the typical performance of SAT and GPA. While SAT and GPA predicted final grade in both studies with strengths typical of these variables, the ability of additional measures to account for additional independent variance is most interesting, since additional variance is normally lost in noise.

Second, the independent contribution of advisor's judgment appears to be substantial. In study II, the advisor's prediction of final grade accounted for 7% of variance independent of the prediction from GPA. This single question, operating alone, seems to lend credence to advisors judgment as a predictor. The control performed in study II suggests that information in advisor's judgment comes, at least in part, from face-to-face contact. However, the modest reliabilities of questionnaire items prevent conclusions on what factors the advisors attend to.

Third, the study provides some tentative recommendations for improving the advising process. The prominance of the two time variables (TIMEWRK and TIMEORG) suggest that how a student uses his time may substantially modify the prediction of success drawn from his general

abilities. Additionally, Study I recorded that the Motivation for Alternatives subscale and the Incentives and opportunities subscale of the learner variable questionnaire accounted for variance independent of SAT and GPA. These results were confirmed for Study II only if the learner variables were regressed against final grade, without the presence of the advisors judgment variables (Table 10). The motivation for alternatives variable is closely related to the time variables, since it attempts to tap the presence of attractive alternatives to spending time studying. By contrast, the Incentives and Opportunities subscale may relate to specific rewards for success in a particular course; consequently, attending to it may be of use in some cases. While these recommendations must be taken as only tentative at this time, it should be possible to strengthen and expand them after further research with improved instrumentation.

Finally, the substantial increase in the predictive power of advisor's judgment between Studies I and II may result as much from the effect of Study I as from the improved questionnaire of Study II. It is possible that reporting Study I, with no specific recommendations, to advisors, constituted an intervention which increased the advisor's sensitivity to information other than SAT and GPA.

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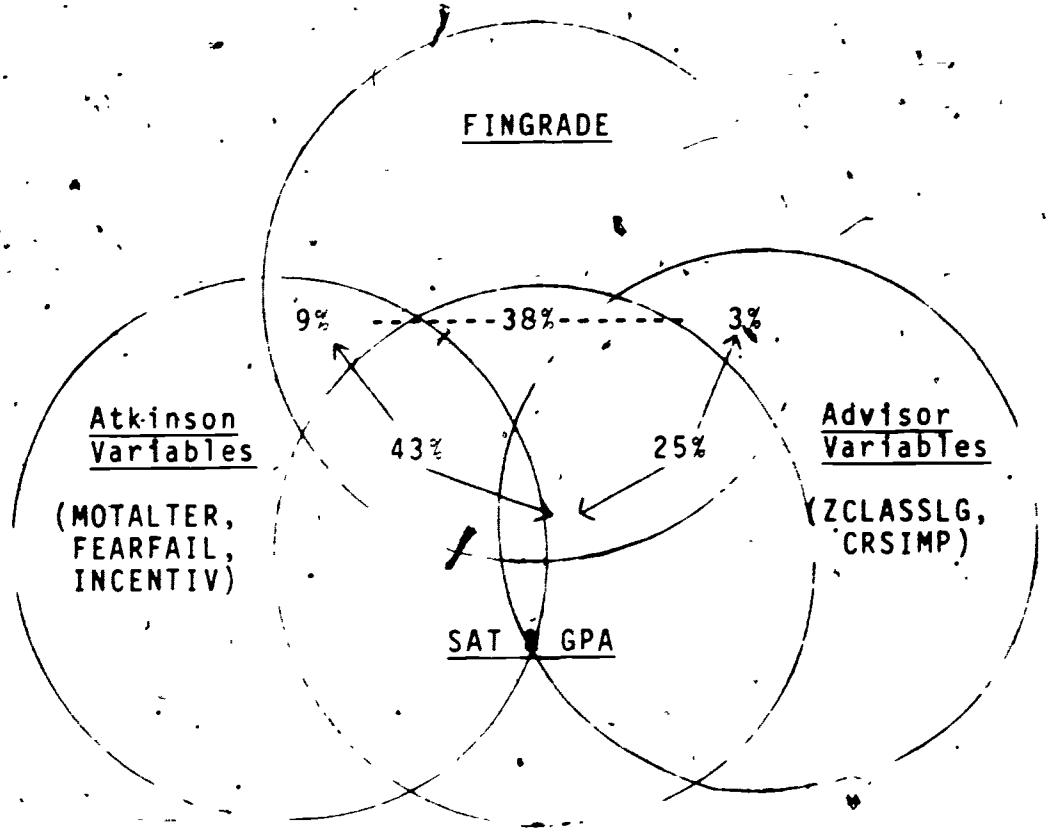

Figure I: Relationships of the Variables (Study I)

All percentages shown are percentages of the variance in FINGRADE

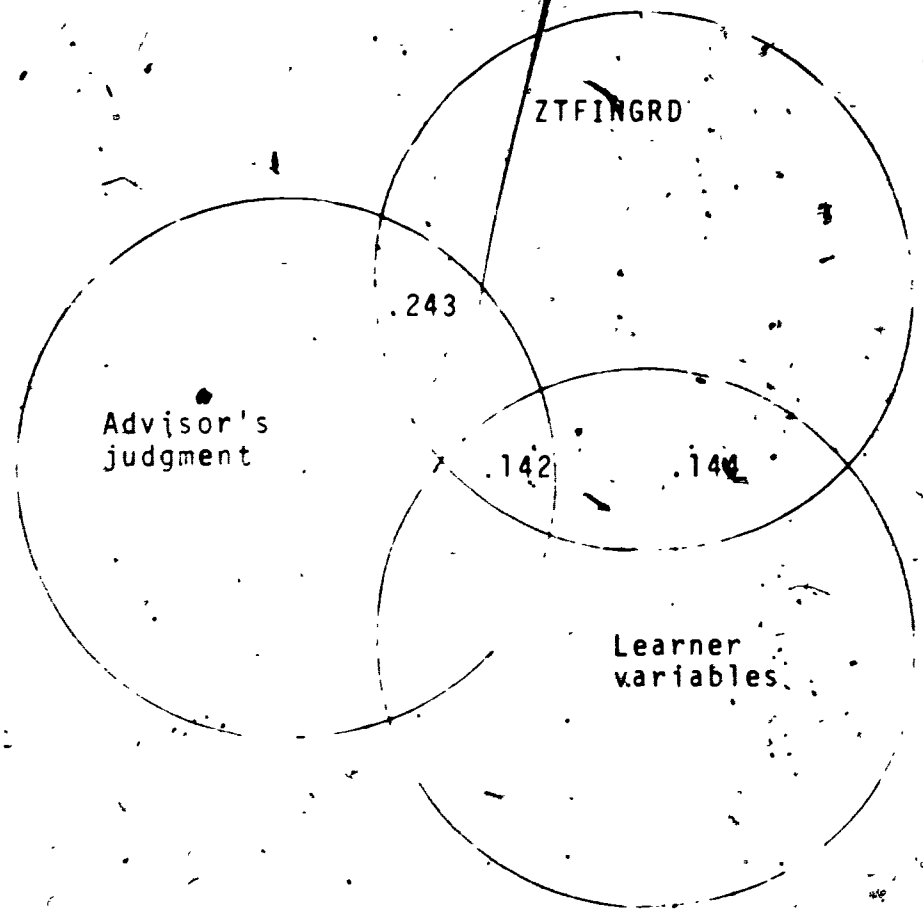

Figure 2: Relationships with dependent variables (study II).

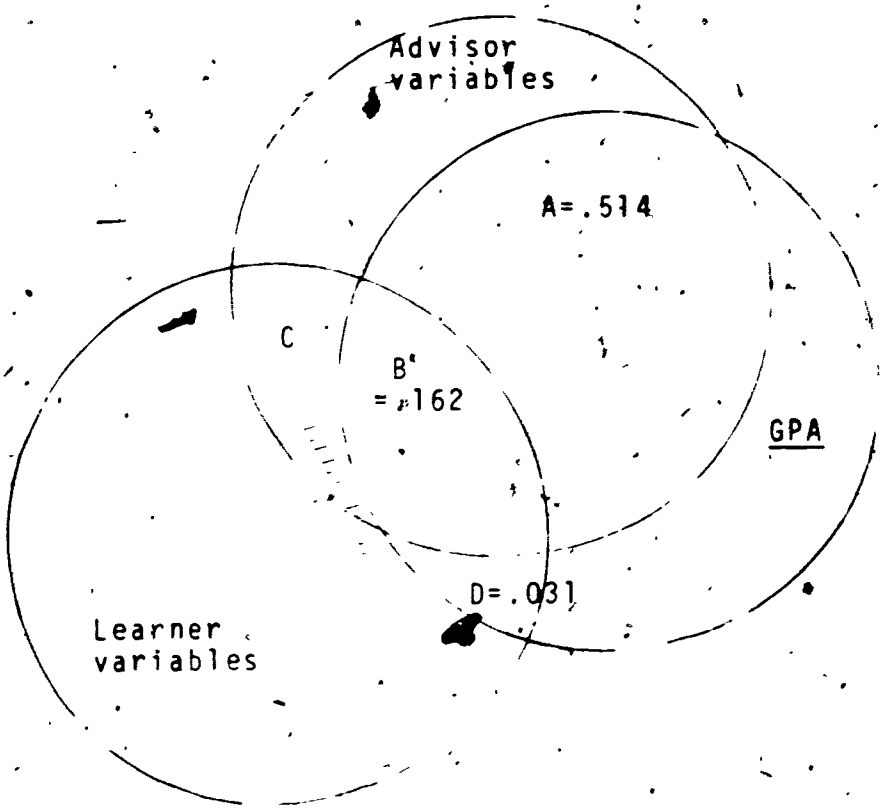

Figure 3: Partial correlations with GPA (study II).

APPENDIX A: ADVISOR'S JUDGMENT QUESTIONNAIRE (Study II)

Student Name _____ SSN _____ Advisor Code _____

Course for which this questionnaire is to be completed: _____

The answers to these questions should be based on your interpretation of all information you have about the student.

1. Does there appear to be a link between the student's studies and his/her career goals?

/	/	/	/	/	_____
no relationship		some relationship		strong relationship	unable to answer

2. Is the student likely to learn in a variety of instructional situations (e.g., large or small classes, lecture or discussion, structured, or unstructured, etc.)?

/	/	/	/	/	_____
probably not		moderately likely		more than most of his classmates	unable to answer

3. Rate the student's proficiency in math.

/	/	/	/	/	_____
well below his class		average		well above his class	unable to answer

4. Rate the student's proficiency in reading.

/	/	/	/	/	_____
well below his class		average		well above his class	unable to answer

5. Rate the student's past academic performance in college.

/	/	/	/	/	_____
well below average		average		well above average	unable to answer

6. Predict the student's final grade in this course.

/	/	/	/	/	_____
F	D	C	B	A	student will withdraw from this course.

The following items are intended to elicit your considered judgment of the student, based on your advising experience. Even if your judgment is at variance with what the student has actually said, please report your judgment.

7. How effectively do you feel the student organizes his time?

very ineffectively	about like his class-mates	very effectively	unable to answer

8. Is the student self-directed?

less than his/her peers	average	much more than most	unable to answer

9. Does the student have other interests which compete for his studying time?

fewer than his/her classmates	about the same as most of his/her classmates	more than most	unable to answer

10. Does the student's social and academic adaptation to the campus influence his/her academic performance?

substantially hinders	no effect	substantially helps	unable to answer

11. If the student is challenged by the course, is he/she likely to:

give up	continue working the same way	try harder	unable to answer

APPENDIX B:

SCALES IN THE INSTRUMENT

LEVEL OF PERFORMANCE WHILE AT WORK SCALE

R 20. I work hard most of the time.

23. Often I'm just not in the mood for work and then I don't do it.

R 26. I prefer to begin working on assignments as early as possible so that I don't have last-minute pressure.

36. In high school I worked just hard enough to pass my courses.

R 37. I stick to an assignment until it's done, even if I don't like it.

43. I pick the grades I think I can get, and then I work just hard enough to get them.

R 50. When I sit down to work, I can disregard distractions and work efficiently

INCENTIVES AND OPPORTUNITIES SCALE

R 24. Getting good grades in this course is important to me.

R 28. Failing this course would have an adverse effect on my career plans.

29. The content of this course will not be very helpful in my future career.

R 32. Getting a passing grade in this course is important to my future.

R 33. Getting a poor grade in this course would lower my feeling of self-worth.

MOTIVATION FOR ALTERNATIVES SCALE

R 30. I take part in more sports activities than my classmates do.

R 35. My day-to-day routine is so crowded with activities that I don't have time to study.

R 42. I frequently do other things when I need to be studying.

R 46. I take part in more social activities than my classmates do.

R 49. I have more hobbies than my classmates do.

51. My studying takes up most of my free time.

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R 49. I have more hobbies than my classmates do.

51. My studying takes up most of my free time.

TIME SPENT AT WORK SCALE

16. In the average day, I spend about ___ hours studying (outside class time).

18. In an average week, I spend about ___ hours studying (outside class time).

41. My classmates attend classes more regularly than I do.

44. My friends spend more time doing school work than I do.

R 45. Going to classes regularly helps me keep up with my work.

R 52. I spend more time studying than my classmates do.

CAREER-ORIENTED DAYDREAMING SCALE

17. On the average, I think about my future career about ___ times per day.

21. I rarely think about what it would be like to make a unique accomplishment in life.

R 38. I often think about what I will be doing in my future career.

R 39. I often think about what it would be like to be successful in my future life.

R 40. I often think that I will make a unique accomplishment in life.

47. I rarely think about being the best in my future occupation.

EDUCATION-ORIENTED VALUES SCALE

19. The level of education I intend to eventually attain is a:

R 22. I consider good academic grades to be a sign of real achievement.

R 25. I believe that getting good grades in college will significantly benefit my future life and career.

27. Getting good grades in college is not important to me.

31. I am less concerned with doing a job well than most of my classmates are.

R 34. Getting ahead in the world is important to me.

R 48. I believe that succeeding at whatever one undertakes is very important.

53. a. Children get into trouble because their parents punish them too much.
D b. The trouble with children nowadays is that their parents are too easy with them. 53. ___

54. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries. 54. ___

55. a. Heredity plays the major role in determining one's personality.
D b. It is one's experiences in life which determine what they're like. 55. ___

56. a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
b. Getting a good job depends mainly on being at the right place at the right time. 56. ___

57. a. There are certain people who are just no good.
D b. There is some good in everybody. 57. ___

58. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin. 58. ___

59. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
R b. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it. 59. ___

60. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
R b. By taking an active part in political and social affairs the people can control world events. 60. ___

61. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There is really no such thing as "luck." 61. ___
R

62. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes. 62. ___
D

63. a. It is hard to know whether or not a person really likes you.
R b. How many friends you have depends upon how nice a person you are. 63. ___

64. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life. 64. ___

Social Security Number_____ Name_____
(please print)

INSTRUCTIONS:

We are aware that students differ in the way they react to tests and examinations, and we want to collect data about your reactions to tests.

There are no 'catch' questions in this questionnaire, however, please read each question and each scale carefully to ensure that you are correctly describing your feelings or attitudes. The value of this questionnaire will depend in large measure on how frank you are in stating your opinions, feelings, and attitudes. Needless to say, your answers will be treated in the strictest confidence, and will not in any way influence your performance in this course.

There is no time limit. PLEASE ANSWER EVERY QUESTION.

PART I

In order to have you all answer the questions using a common frame of reference, we are posing the questions in relation to a test almost all of you have taken at one time or another--the group intelligence (or ability) test. By group intelligence tests we refer to tests which are administered to several individuals at a time. These tests contain different types of items and are usually pencil-and-paper tests with answers requiring either fill-ins or choices of several possible answers. Scores on these tests are given with reference to the standing of the individual within the group tested or within specific age and educational norms. The Scholastic Aptitude Tests (SAT) which you have probably taken represent this type of test. Please try to remember how you usually reacted toward this type of test and how you felt while taking them.

For each question there is a line or scale on the ends of which are statements of opposing feelings or attitudes. In the middle of the line you will find either the word 'Midpoint' or a phrase, both of which are intended to reflect a feeling or attitude which is in-between the statements of opposing feelings described above. You are required to put a mark (X) on that point on the line which you think best indicates the strength of your feeling or attitude about the particular question. The midpoint is only for your guidance. Do not hesitate to put a mark on any point on the line as long as that mark reflects the strength of your feeling or attitude.

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

1. How valuable do you think group intelligence tests are in determining a person's ability?

Very valuable	Valuable in some respects and valueless in others	Valueless

2. Do you think that group intelligence tests should be used more widely than at present to classify students?

Should be used less	Should be used as at present	Should be used more widely

3. Would you be willing to stake your continuance in college on the outcome of a group intelligence test which has previously predicted success in a highly reliable fashion?

Very willing.	Uncertain	Not willing

4. If you know that you are going to take a group intelligence test, how do you feel beforehand?

Feel very unconfident	Midpoint	Feel very confident

5. After you have taken a group intelligence test, how confident do you feel that you have done your best?

Feel very unconfident.	Midpoint	Feel very confident

6. When you are taking a group intelligence test, to what extent do your emotional feelings interfere with or lower your performance?

Do not interfere at all	Midpoint	Interfere a great deal

7. Before taking a group intelligence test, to what extent are you aware of an "uneasy" feeling?

Am very much aware of it	Midpoint	Am not aware of it at all

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

8. While taking a group intelligence test to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

9. Before taking a group intelligence test to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

10. While taking a group intelligence test to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

11. Before taking a group intelligence test to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

12. While taking a group intelligence test to what extent do you perspire?

Perspire not at all	Midpoint	Perspire a lot

13. Before taking a group intelligence test to what extent do you perspire?

Perspire not at all	Midpoint	Perspire a lot

14. In comparison with other students, how often do you think of ways of avoiding a group intelligence test?

Less often than other students	As often as other students	More often than other students

15. To what extent do you feel that your performance on the college entrance tests was affected by your emotional feelings at the time?

Affected a great deal	Midpoint	Not affected at all

PART II

This part of the questionnaire is designed to sample your attitudes toward school, grades, your future career, and the importance to you of this course.

Please answer all questions. No questions are duplicated, although some may sound similar. There are no trick questions, so you need not be concerned with trying to match your response on one question to your response on another question. It is best to record the response that first comes to mind after reading the question.

Record your responses by choosing the letter that corresponds to your response, and writing that letter in the space provided on the right margin of the page.

16. In the average day, I spend about _____ hours studying (outside class time).

    A. 1 or less
    B. 2
    C. 3
    D. 4
    E. 5 or more

    16. _____

17. On the average, I think about my future career about _____ times per day.

    A. 0
    B. 1 or 2
    C. 3 or 4
    D. 5 or 6
    E. 7 or more

    17. _____

18. In an average week, I spend about _____ hours studying (outside class time).

    A. 5 or less
    B. 6 - 10
    C. 11 - 15
    D. 16 - 20
    E. 21 or more

    18. _____

19. The level of education I intend to eventually attain is a:

    A. bachelor's degree (or equivalent)
    B. master's degree (or equivalent)
    C. professional degree (medical doctor, dentist, lawyer, etc.)
    D. doctorate (or equivalent)

    19. _____

PLEASE CONTINUE TO THE NEXT PAGE...

Answer the following questions using this key:

A. true of me
B. somewhat true of me
C. neutral
D. somewhat untrue of me
E. untrue of me

20.	I work hard most of the time.	20. ___
21.	I rarely think about what it would be like to make a unique accomplishment in life.	21. ___
22.	I consider good academic grades to be a sign of real achievement.	22. ___
23.	Often I'm just not in the mood for work and then I don't do it.	23. ___
24.	Getting good grades in this course is important to me.	24. ___
25.	I believe that getting good grades in college will significantly benefit my future life and career.	25. ___
26.	I prefer to begin working on assignments as early as possible so that I don't have last-minute pressure.	26. ___
27.	Getting good grades in college is not important to me.	27. ___
28.	Failing this course would have an adverse affect on my career plans.	28. ___
29.	The content of this course will not be very helpful in my future career.	29. ___
30.	I take part in more sports activities than my classmates do.	30. ___
31.	I am less concerned with doing a job well than most of my classmates are.	31. ___
32.	Getting a passing grade in this course is important to my future.	32. ___
33.	Getting a poor grade in this course would lower my feeling of self-worth.	33. ___
34.	Getting ahead in the world is important to me.	34. ___
35.	My day-to-day routine is so crowded with activities that I don't have time to study.	35. ___
36.	In high school I worked just hard enough to pass my courses.	36. ___

Answer the following questions using this key:

A. true of me
B. somewhat true of me
C. neutral
D. somewhat true of me
E. untrue of me

37. I stick to an assignment until it's done, even if I don't like it. 37. ___

38. I often think about what I will be doing in my future career. 38. ___

39. I often think about what it would be like to be successful in my future life. 39. ___

40. I often think that I will make a unique accomplishment in life. 40. ___

41. My classmates attend classes more regularly than I do. 41. ___

42. I frequently do other things when I need to be studying. 42. ___

43. I pick the grades I think I can get, and then I work just hard enough to get them. 43. ___

44. My friends spend more time doing school work than I do. 44. ___

45. Going to classes regularly helps me keep up with my work. 45. ___

46. I take part in more social activities than my classmates do. 46. ___

47. I rarely thing about being the best in my future occupation. 47. ___

48. I believe that succeeding at whatever one undertakes is very important. 48. ___

49. I have more hobbies than my classmates do. 49. ___

50. When I sit down to work, I can disregard distractions and work efficiently. 50. ___

51. My studying takes up most of my free time. 51. ___

52. I spend more time studying than my classmates do. 52. ___

PART III

The items below are designed to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives letered a or b. Please select the one statement from each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously there are no right or wrong answers.

Record your choice by writing the letter a or b in the space to the right of each item. Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

53. a. Children get into trouble because their parents punish them too much.
    b. The trouble with children nowadays is that their parents are too easy with them. 53. ___

54. a. In the long run people get the respect they deserve in this world.
    b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries. 54. ___

55. a. Heredity plays the major role in determining one's personality.
    b. It is one's experiences in life which determine what they're like. 55. ___

56. a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being at the right place at the right time. 56. ___

57. a. There are certain people who are just no good.
    b. There is some good in everybody. 57. ___

58. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin. 58. ___

59. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. betting people to do the right thing depends upon ability; luck has little or nothing to do with it. 59. ___

60. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
    b. By taking an active part in political and social affairs the people can control world events. 60. ___

61. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck." 61. ___

62. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes. 62. ___

63. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends upon how nice a person you are. 63. ___

64. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life. 64. ___

Table 1: Learner Variables in the Study

Variable	Variable Name	Definition	Cronbach's ALPHA (Study II)
Fear of failure	FRFAIL	fear that the individual will fail in his/her academic work.	.85
Time spent at work	TIMEWRK	self-reported study time in a typical week.	.81
Career-oriented daydreaming	DAYDRM	a hypothesized measure of achieving tendency.	.77
Education-oriented values	VALUES	self-report of values generally associated with considering education important, e.g., education leads to self improvement, self esteem, better job, etc.	.67
Level of performance while at work	LEVPERF	self-report of how hard the student works while studying	.62
Incentives and opportunities	INCENTV	incentives for achievement in a particular course included in the study	.59
Motivation for alternatives	MOTALTR	a measure of activities which might distract from studying	.63
Locus of control	LOCUS	internality-externality	.62
Sex	SEX	taken as a possible background variable moderating others	--
Total SAT	SATOT	sum of SAT verbal and math scores	--
Grade point average	GPA	first semester college grade point average	--

NOTES:

1. Fear of failure was measured by the test anxiety questionnaire (Mandler and Sarason, 1952).
2. Locus of control was measured by a subset of the Rotter scale (1954) which had previously been found to correlate well with the entire scale.
3. To code the five courses selected for study II into the regression equation, four course variables were used.

Table 2: Correlation coefficients for variables accounting for 1% of variance or more in fingrade (study I).

	FINGRADE	GPA	SATOT	FEARFAIL	MOTALTER	INCENTIV	ZCRSIMP	ZCONSIST	ZCLASSLG
GPA	.57								
SATOT	.38	.27							
FEARFAIL	.00	.13	.38						
MOTALTER	-.14	.04	.21	-.02					
INCENTIV	.18	.11	.22	-.32	-.02				
ZCRSIMP	.27	.26	.04	.03	-.07	.10			
ZCONSIST	.40	.46	.35	.14	.08	.07	.31		
ZCLASSLG	-.32	-.27	-.21	-.07	-.10	-.02	-.03	-.35	
ZPARAPR	.27	.26	.34	.19	-.01	.08	.30	.31	-.08

Table 3: Stepwise and reverse order stepwise regressions with final grade as dependent variable (study I).

		Stepwise		Reverse Order	
	R	R^2	R^2 Change	R^2	R^2 Change
GPA (grade point average)	.57	.33	.33	.51	.10
SATOT (total SAT)	.62	.38	.05	.51	.20
MOTALTER (motivation for alternatives)	.65	.43	.05	.21	.03
FEARFAIL (fear of failure)	.68	.47	.04	.21	.00
ZCLASSLG (is student intimidated by large classes)	.70	.49	.02	.19	.06
ZCRSIMP (is course important to student?)	.71	.50	.01	.13	.10
INCENTIV (incentive for education)	.72 ($P < .001$)	.51	.01	.03	.03

Table 4: Inter-rater reliability for advisors judgment questionnaire items.

Question	Variable Name	Study II Cronbach's ALPHA
Does there appear to be a link between the students studies and his/her career goals?	GOALINK	.541
Is the student likely to learn in variety of instructional situations?	STUFLEX	.547
Rate the student's proficiency in math.	MATH	.643
Rate the student's proficiency in reading.	READING	.720
Rate the student's past academic performance in college.	COLPERF	.658
Predict the student's final grade in this course.	PRGRADE	.623
How effectively do you feel the student organizes his/her time.	TIMEORG	.542
Is the student self-directed.	SELFDIR	.396
Does the student have other interests which compete for his studying time.	OTHINT	.436
Does the student's social and academic adaptation to the campus influence his/her academic performance.	ADAPT	.442
If the student is challenged by the course, is he/she likely to give up or try harder.	CHLNGE	.479

Table 5: Correlation coefficients above ± .20 (study II).

	COURSE1	COURSE2	COURSE3	COURSE4	ZDAYDRM	ZFRFAIL	ZLOCUS	ZTIMEWRK	ZVAL-UES	ZLEVPERF	ZINCENTV	ZMOTALTR	ZTFIN-GRD	ZFIN-GRD	ZSAT-OTC
COURSE2	.596														
COURSE3	.514	.535													
COURSE4	.572	.587	.502												
ZLOCUS				-.252											
ZTIMEWRK	-.341														
ZVALUES					.241		-.284	.501							
ZLEVPERF							-.209	.471	.262						
ZINCENTV	-.214						-.232	.341	.513	.266					
ZMOTALTR	.203					.222		-.570	-.298	-.367	-.245				
ZTFINGRD	-.234		-.421	-.288				.306		.206	.254				
ZSATOT			-.207										.261	.219	
ZGPA									.204				.545	.582	.306
ZGOALINK			-.286									-.219	.315	.267	.269
ZSTUFLEX			-.234										.432	.374	.334
ZMATH													.461	.413	.471
ZREADING													.387	.355	.366
ZCOLPERF			-.201					.269	.237				.499	.518	.323
ZPRGRADE								.253					.513	.512	.237
ZTIMEORG								.223	-.203				.468	.466	.221
ZSELFDIR													.392	.376	
ZADAPT									.206					.202	
ZCHLNGE									.230				.424	.414	.249

Table 5: (Continued)

	ZGPA	ZGOALINK	ZSTUFLEX	ZMATH	ZREADING	ZCOLPERF	ZPRGRADE	ZTIMEORG	ZSELFDIR	ZADAPT
ZGOALINK	.275									
ZSTUFLEX	.448	.380								
ZMATH	.407	.242	.508							
ZREADING	.419		.538	.597						
ZCOLPERF	.794	.313	.483	.493	.512					
ZPRGRADE	.622	.232	.517	.499	.428	.583				
ZTIMEORG	.494	.351	.452	.400	.403	.521	.542			
ZSELFDIR	.438	.393	.407	.341	.347	.476	.493	.640		
ZADAPT	.333			.221		.290		.399	.368	
ZCHLNGE	.513	.307	.387	.372	.371	.581	.478	.560	.552	.351

Table 6: Stepwise linear multiple regression, all variables, study II (N=152).

ALL VARIABLES

N= 152

	STEPWISE, FORWARD			STEPWISE, REVERSE		
Variable	R	R^2 Cum	R^2 Chng	R	R^2 Cum	R^2 Chng
ZGPA	.545	.298	.298	.741	.549	.020
COURSE3	.635	.404	.105	.727	.529	.070
ZPRGRADE	.686	.471	.067	.677	.459	.029
ZMATH	.703	.494	.023	.655	.430	.103
ZTIMEWRK	.714	.510	.016	.571	.326	.032
ZTIMEORG	.723	.522	.011	.542	.294	.203
COURSE4	.731	.534	.011	.300	.090	.035
COURSE1	.741	.549	.015	.234	.054	.054

Table 7: Stepwise linear multiple regression, all variables except SAT and GPA, study II.

ALL VARIABLES EXC. SAT & GPA

	STEPWISE			STEPWISE, REVERSE		
Variable	R	R^2 Cum	R^2 Chng	R	R^2 Cum	R^2 Chng
ZPRGRADE	.513	.263	.263	.727	.529	.035
COURSE3	.654	.428	.164	.703	.494	.064
ZTIMEORG	.679	.461	.033	.655	.430	.063
ZMATH	.694	.482	.021	.605	.366	.208
ZTIMEWRK	.709	.503	.020	.397	.158	.067
COURSE4	.717	.514	.011	.300	.090	.035
COURSE1	.727	.529	.015	.234	.054	.054

Table 8: Control: Correlations of advisor's judgments with expert judge for each question (study II).

Variable	r	r^2	(n=42)
ZGOALINK	.287	.082	
ZSTUFLEX	.245	.060	
ZMATH	.339§	.114	
ZREADING	.412*	.169	
ZCOLPERF	.426*	.182	
ZPRGRADE	.172	.029	
ZTIMEORG	.274	.075	
ZSELFDIR	.081	.006	
ZOTHINT	.110	.012	
ZADAPT	.073	.005	
ZCHLNGE	.196	.038	

§ Signif. at $\alpha \leq .10$

* Signif. at $\alpha < .05$

Table 9: Stepwise multiple linear regression, advisor's judgment and control (study II).

ADVJ VARIABLES ONLY

(N= 42)

Control(Forced Same Order)

Variable	R	R^2 Cum	R^2 Chng	Variable	R	R^2 Cum	R^2 Chng
ZPRGRADE	.513	.263	.263		.252	.063	.063
ZCOLPERF	.569	.324	.060		.406	.164	.101
ZMATH	.595	.354	.029		.441	.194	.029
ZTIMEORG	.611	.374	.020		.506	.256	.061
ZGOALINK	.621	.385	.011		.507	.257	.001

Table 10: Stepwise multiple linear regression, learner variables only (study II).

ATKINSON VARIABLES & COURSE ONLY

Variable	R	R^2 Cum	R^2 Chng
COURSE3	.421	.177	.177
ZTIMEWRK	.496	.246	.068
ZMOTALTR	.513	.264	.017
ZDAYDRM	.525	.275	.011
ZINCENTV	.534	.286	.010