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AUTHOR Springer, Leonard; And Others
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ABSTRACT

This study examined the relative importance of curricular, classroom, and out-of-class experiences on learning related attitudes and values of freshman college students after taking into account certain precollege characteristics of new students, including initial levels of interest in learning. Specifically, the study looked at students' formal instructional experiences and classroom-related contacts with faculty members and their out-of-class experiences with faculty, peers, and the formal co-curriculum. The 210 students were given the Collegiate Assessment of Academic Proficiency and Likert-type attitude tests in the autumn and spring of their first year. Analysis showed that both students' class-related experiences and their out-of-class experiences made statistically significant and unique contributions to the explanation of variations in learning orientation above and beyond students' precollege traits and their experiences in other areas of college life. A modest joint effect was also observed. This study supports the theory that effects of college on student learning are holistic, that learning is shaped both by students' formal, classroom experiences and by their out-of-class experiences. The data also suggest that administrators, faculty members, and student peers all have important roles in shaping the interests students have in learning. (Contains 24 references.) (GLR)

INFLUENCES ON COLLEGE STUDENTS' ORIENTATIONS TOWARD LEARNING FOR SELF-UNDERSTANDING

by

Leonard Springer
Research Assistant
National Center on Postsecondary Teaching,
Learning, and Assessment
The Pennsylvania State University
403 South Allen Street, Suite 104
University Park, PA 16801-5202
BITNET: LXS20@PSUVM
INTERNET: LXS20@PSUVM.PSU.EDU

Patrick T. Terenzini
Professor, Senior Scientist, and Associate Director
National Center on Postsecondary Teaching,
Learning, and Assessment
The Pennsylvania State University

Ernest T. Pascarella
Professor and Director
National Study of Student Learning
National Center on Postsecondary Teaching,
Learning, and Assessment
University of Illinois at Chicago

Amaury Nora
Associate Professor and Senior Research Associate
National Study of Student Learning
National Center on Postsecondary Teaching,
Learning, and Assessment
University of Illinois at Chicago

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INFLUENCES ON COLLEGE STUDENTS' ORIENTATIONS TOWARD LEARNING FOR SELF-UNDERSTANDING

Historically, American colleges and universities have had a broad educational mission that encompasses more than intellectual development. Pascarella and Terenzini (1991) note that this "broader mission has defined education to include increased self-understanding" among other outcomes (p. 162). In 1852, Cardinal Newman (in Chickering, 1981) proposed that college provides "the repose of a mind which lives in itself, while it lives in the world" (p. 2). Both understanding oneself and understanding others remain important educational outcomes. The Socratic imperative to "Know thyself" continues to represent an educational outcome of intrinsic value to many American college students. Terenzini and colleagues (in press) note that a substantial number of students consider learning about oneself the "real learning" during college. Enabling "learning for self-understanding" remains an explicit or implicit part of the educational mission of most American colleges and universities.

A great deal of research has been done on college student learning, though no known studies address influences on students' orientations toward learning for self-understanding. Pascarella and Terenzini (1991), in their review of the past twenty years of research on the effects of college on students, use two broad

categories to synthesize the available literature on within-college influences on student learning. The first deals with "the acquisition of subject matter knowledge and academic (usually verbal and quantitative) skills" (p. 114). The second contains studies on the development of students' higher-order cognitive skills (e.g., communication, formal reasoning, critical thinking, postformal reasoning) and intellectual growth. Pascarella and Terenzini note that research on many educational outcomes, such as personal development, lags substantially behind assessment of vocational preparation and other utilitarian functions of a college education.

Studies of college influences on student learning have also been limited by how analysts conceptualize research questions. In their research on students' intellectual orientations, Terenzini, Springer, Pascarella, and Nora (1993) report that the studies they reviewed are highly atomistic in their conception and design. The role of the curriculum or course-taking patterns, for example, are analyzed separately from the influences of instructional approaches and classroom climate, and these academic sources of influences on learning are examined as if they were unrelated to students' out-of-class experiences. Supporting a number of long-held theories (e.g., Chickering, 1969; Heath, 1968; Sanford, 1962) the researchers provide evidence that college's effects on student learning are holistic, that learning is shaped both separately and jointly by formal classroom experiences and out-of-class experiences, and suggest that future research take greater account

of the multiple and interrelated sources of influence on any educational outcome.

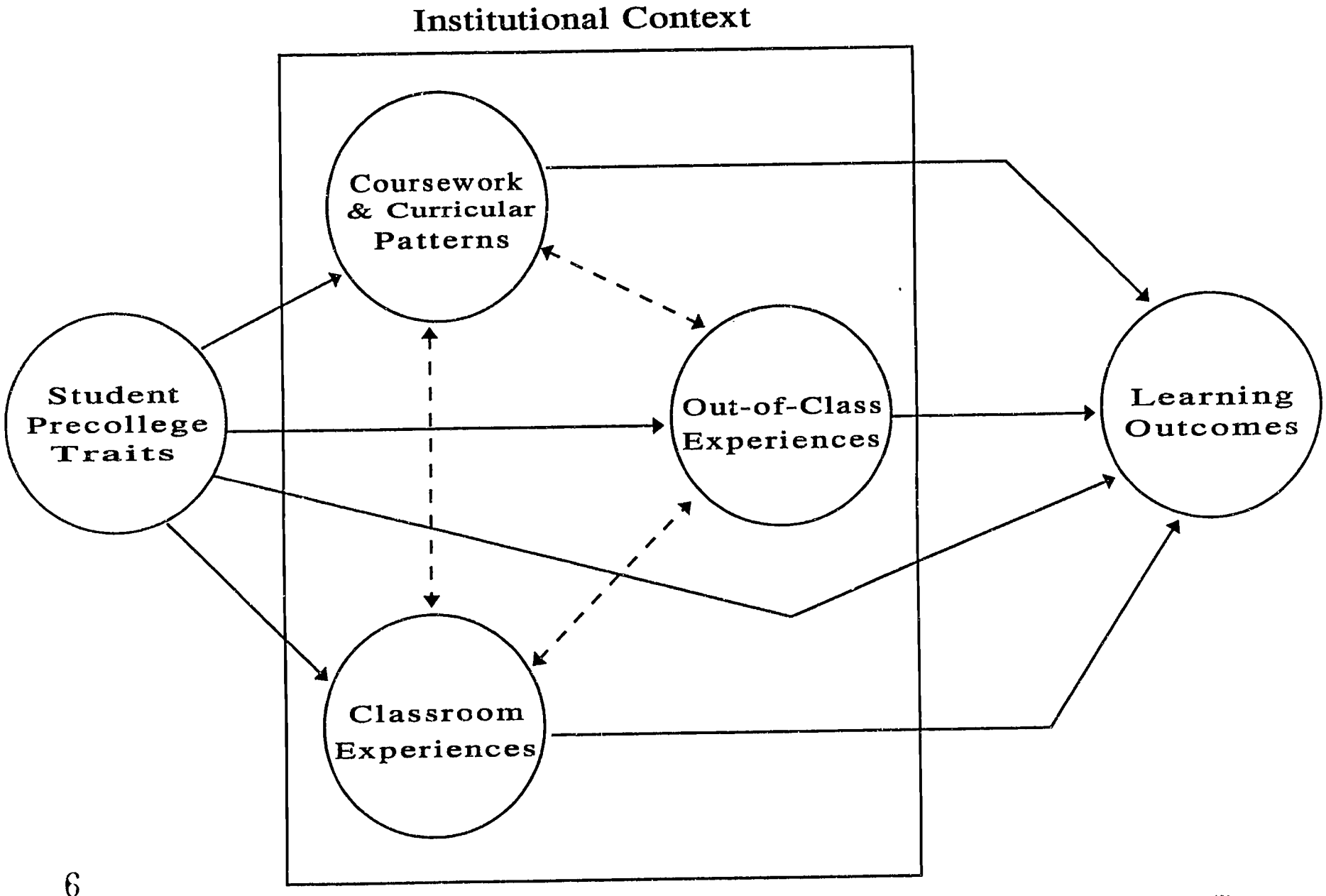
This study examines the relative importance of three, theoretically interrelated sets of variables on changes in students' orientations toward learning for self-understanding: students' curricular experiences, their formal instructional experiences and classroom-related contacts with faculty members, and their out-of-class experiences with faculty, peers, and the formal co-curriculum. The study's purpose is two-fold: (1) to learn which college experiences influence students' orientations toward learning for self-understanding and (2) to evaluate the relative importance of the three areas of influence.

METHODS

Conceptual Frame

The basic conceptual model for this study (see Figure 1) is longitudinal and draws upon many of the elements of recent conceptualizations of college impact (e.g., Astin, 1984, 1985; Pascaralla, 1985; Tinto, 1974, 1987; Weidman, 1989). The model hypothesizes six sets of constructs defining a causal sequence that begins when students come to college with a wide array of educationally-relevant background characteristics and experiences. These precollege characteristics and experiences influence not only the outcomes of college directly, but also students' course-taking patterns, formal classroom experiences, and out-of-class experiences during college, which, in turn, also shape educational outcomes. The interplay between and among these sets of

Figure 1. A General Conceptual Model of College Influence on Student Learning



influences on learning takes place within a particular institutional context (e.g., organizational characteristics, structures, and policies). This study seeks to estimate the relative importance of students' curricular, classroom, and out-of-class experiences on learning-related attitudes and values after taking into account certain of the precollege characteristics of new students, including initial levels of interest in learning. (Because this is a single-institution study, however, the institutional context is constant for all students and, thus, cannot be a factor in differential change in students' orientations toward learning for self-understanding.)

Design, Sample, and Data Collection

The study employed a one-year panel study design. Data were collected as part of a pilot study for a large, national, longitudinal investigation of the factors that influence learning, cognitive development, attitudes or orientations toward learning and persistence in college. The population for the study was the approximately 4,500 students enrolled for six or more academic credit hours during their first semester (Fall, 1991) at a large, urban, Research I university in the midwest serving an undergraduate population of primarily commuters. Students were recruited by mail and from those who attended a precollege orientation. They were advised that they would participate in a national longitudinal study and would receive a stipend for their involvement. Students were also assured that the information they provided would be kept confidential. The Fall, 1991 data

collection required about four hours, and students were paid $35. Students who participated in the Spring follow-up received a second stipend of $35 for three and one-half hours of testing.

Of the approximately 1,150 new students who volunteered for the initial, precollege data collection, 600 were randomly selected to participate (the small initial sample size relative to the population reflects budgetary constraints on the pilot study). Of the 600 students selected to participate, 327 (54.5%) actually did so, with 210 of those (64.2%) also participating in the subsequent data collection in the Spring of 1992 (the end of the students' first year). This sample of 210 students was reasonably representative of the institution's population of new students, although there was some potential bias. Though trends were not statistically significant, students in the sample had somewhat higher academic achievements and were somewhat more likely to be non-minority students than the population from which they were drawn.

Variables

Fall, 1991 data were collected using two instruments. The first was Form 88B of the Collegiate Assessment of Academic Proficiency (CAAP), a five-module instrument developed by the American College Testing Program to measure student skills in reading comprehension, mathematics, writing, science reasoning, and critical thinking. The second instrument was specifically designed for this study and gathered information on student demographic and background characteristics. Incorporated in this

precollege survey were a series of Likert-type items designed to tap students' attitudes toward learning. The Spring, 1992 follow-up instrument included Form 88A of the CAAP, Pace's (1984) College Student Experience Questionnaire (CSEQ) to measure students' experiences in college, and a specially-designed follow-up survey assessing aspects of students' first-year experiences not covered by the CSEQ. This latter instrument contained the same series of Likert-type items tapping students' attitudes toward learning completed by students in the Fall of 1991.

Following the conceptual frame for this study, one dependent variable and four sets of independent variables (precollege characteristics, courses, class-related experiences, and out-of-class experiences) were developed. The dependent measure was students' scores on the end-of-first-year learning for self-understanding scale, one of several scales developed from the 50 Likert-type items (scaled 5 = strongly agree and 1 = strongly disagree). Development of the scale items was guided by such measures as the intellectual disposition scales of the Omnibus Personality Inventory (Heist & Yonge, 1968), the concepts of intellectual autonomy or internal attribution for academic success (e.g., Phares, 1973, 1976; Rotter, 1966, 1975; Wolfle & Robertshaw, 1982), and various taxonomies of educational objectives (e.g., Bloom, 1956; Braxton & Nordvall, 1985). Students' responses to these items on the end-of-first-year survey were subjected to a series of principal component factor analyses with both varimax and oblique rotations. The analyses yielded

five meaningful factors from which factor scale scores (the sum of each student's scores on the component items divided by the number of items) were developed using those items that loaded .40 or higher on a factor. Items loading at or above .40 on two or more factors were excluded. The "Learning for Self-Understanding" scale (Cronbach's Alpha = .75) contains items that tap preferences for clarifying one's self-concept and values in general, by reading, through college, and through faculty instruction. Table 1 reports the component items and factor loadings.

The first set of independent variables consisted of students' precollege characteristics, treated as control variables in this study. That set included parents' combined formal education and total family income, and students' race/ethnicity, gender, degree aspirations, and precollege scores on the CAAP mathematics and reading comprehension modules (adopted to reflect students' basic academic aptitude and achievement levels). The internal consistency reliability (KR-20) coefficients for these two CAAP modules are .81 and .84, respectively (American College Testing Program, 1989). The operational forms of all these control variables are given in Table 2. Examination of the distributions of the categorical variables (race/ethnicity, gender, and highest degree planned) indicated that the limited skewness present was unlikely to bias regression parameter estimates.

As explained in greater detail below, because of the large number of independent variables relative to the sample size, the results of this study are based largely on "reduced-model"

Table 1

Item Factor Loadings for Learning for Self-Understanding Scale
(Scale Alpha = .75)

Item	Loading[a]
I prefer courses in which the material helps me understand something about myself.	.71
I prefer reading things that are relevant to my personal experience.	.58
I consider the best professors to be those who can tie things learned in class to things that are important to me in my personal life.	.56
For me, one of the most important benefits of a college education is a better understanding of myself and my values.	.55
Developing a clearer sense of who I am is very important to me.	.51

[a]No item loaded above .40 on any other scale.

Table 2

Independent Variables in Learning for Self-Understanding Model

Category/Variable
Precollege
Parents' Education: Sum of mother's and father's education on a 9-point scale, where 1 = grammar school or less and 9 = professional degree.
Total Family Income: 14-point scale, where 1 = less than $6,000 and 14 = $150,000 or more.
Race: 0 = nonwhite, 1 = white.
Sex: 0 = female, 1 = male.
Highest Degree Planned: 4-point scale, where 1 = associate's degree (A.A. or equivalent) and 4 = doctoral degree (Ph.D., Ed.D., M.D., D.O., D.D.S., or D.V.M.).
CAAP Mathematics Score: From ACT's CAAP Mathematics module; mean = 60, SD = 5. Internal consistency reliability (KR-20) for Form B = .81 (American College Testing Program, 1989).
CAAP Reading Score: From ACT's CAAP Reading module; mean = 60, SD = 5. Internal consistency reliability (KR-20) for Form B = .84 (American College Testing Program, 1989).
Curriculum
No variables survived priliminary analyses
Class-Related Experiences
Instructor Effectiveness in Social Science: Single-item rating on a 5-point scale reflecting instructor's overall teaching effectiveness in the first course in social science taken at this college, where 1 = very poor and 5 = excellent.
Experiences with Faculty: 10-item CSEQ "Experiences with Faculty" scale reflecting students' experiences with faculty (e.g., "Talked with a faculty member" and "Asked your instructor for comments and criticisms about your work"). Scored on a 4-point scale, where 1 = never and 4 = very often. Alpha = .82.

Table 2 (Continued)

Independent Variables in Learning for Self-Understanding Model

Category/Variable	
Out-of-Class Experiences	
Hrs./Wk. Socializing with Friends:	Single-item rating on a 7-point scale, where 1 = 0 hrs./wk. and 7 = more than 20 hrs./wk.
Personal Experiences:	10-item CSEQ "Personal Experiences" scale reflecting students' interpersonal relationships (e.g., "Asked a friend to tell you what he/she really though about you" and "Talked with a counselor or other specialist about problems of a personal nature"). Scored on a 4-point scale, where 1 = never and 4 = very often. Alpha = .84.
Art, Music, Theater:	12-item CSEQ "Art, Music, Theater" scale reflecting students' experiences in the arts (e.g., "Talked about art [painting, sculpture, architecture, artists, etc.] with other students at the college" and "Talked about music [classical, popular, musicians, etc.] with other students at the college"). Scored on a 4-point scale, where 1 = never and 4 = very often. Alpha = .84.

Note. All Alphas are for this sample of students.

regressions containing only those independent variables that preliminary analyses indicated were related to the dependent measure. Thus, not all variables used in the preliminary analyses were retained for the final analyses. Table 2 also lists the variables (including item/scale contents and metrics) in each of the three areas of influence (the curriculum, students' classroom experiences and instruction-related contacts with faculty members, and their out-of-class experiences) that were retained for "reduced-model" regressions on the "Learning for Self-Understanding" scale. Table 3 lists variables that were included in the preliminary analyses but not retained for the final analyses.

Analytical Procedures

The conceptual model underlying this study (see Figure 1) specifies reciprocal relations among the three college experience variable sets. The analyses reported below were not intended to test those reciprocal relations, but rather to estimate the unique and joint contributions of students' academic and out-of-class experiences to changes in students' orientations to learning. Thus, hierarchical regression, rather than causal modeling, techniques were adopted.

Data analysis proceeded in two stages. In order to avoid inflated estimates of the proportion of the variance explained due to the large number of independent variables relative to the sample size, the first stage consisted of a series of ordinary least-squares (OLS) regressions to identify those variables within

Table 3

Independent Variables Dropped from Reduced Model

Category/Variable
Curriculum
Number of college courses taken in:
technical or preprofessional
composition or writing
science
social science
mathematics
arts and humanities
Class-Related Experiences
Hours studying
Relationship with faculty
Number of textbooks or assigned books read
Number of essay exams taken
Number of term papers or other written reports
Instructor effectiveness in science
Instructor effectiveness in mathematics
Instructor effectiveness in arts and humanities
CSEQ Scales:
Experiences in Writing
Library Experiences
Course Learning
Science

Table 3 (Continued)

Independent Variables Dropped from Reduced Model

Category/Variable
Out-of-Class Experiences
Hours talking with teachers outside of class
Hours worked on-campus
Hours worked off-campus
Hours in student clubs or organizations
Number of non-assigned books read
Relationship with students
CSEQ scales:
Athletic and Recreation Facilities
Student Union
Campus Residence
Topics of Conversation
Clubs and Organizations
Student Acquaintances

each college experience set (curriculum, class-related, and out-of-class experiences) that were statistically significant predictors of each outcome measure after controlling for students' precollege characteristics, but not controlling for students' precollege learning orientation or other college experience variables. These variables were left uncontrolled to avoid masking (through collinearity among the predictor variables) the possible influence of college experience variables that might be of theoretical or practical interest in their own right. Any college influence variable related to the dependent measure at $p < .05$ was retained.

The second stage of analysis used OLS regression to estimate, for the dependent measure, the unique and joint proportion of the variance explained by each of the three (now reduced) college experience variable sets. To estimate the unique variance attributable to each category of variables, each of the three sets of college influence measures was entered into the regression after precollege characteristics and the other two college experience sets had been entered. The change in the value of the R^2 accompanying the entry of the last set reflects the magnitude of that variable set's unique (or net) influence on learning orientation above and beyond that attributable to students' precollege characteristics and all other college experience variables.

Estimates of the proportion of the total variance shared by the three college experience variable sets were derived arithmetically, not by the entry of a set of statistical (cross-

product) interaction terms. Shared variance estimates were calculated by subtracting from the overall R^2 the sum of (a) the variance due to the precollege characteristics, and (b) the unique (R^2-Change) variance associated with each of the three college experience variable sets. Such an analytical approach produces conservative estimates of the influence of each set of experience variables in that any variance these experience variables share with students' background characteristics are attributed to the precollege characteristics set.

Students' precollege learning orientation could be expected to be the single-most powerful predictor of their learning orientation at the end of the first year. Under such conditions, the probability was high that the influence of other predictor variables of theoretical or practical interest might be masked due to collinearity among the independent variables. Consequently, two "reduced-model" regressions (i.e., containing only those variables identified in the first stage of analyses) were run for the end-of-first-year learning for self-understanding scale, the first (the "In" model) with precollege level on "learning for self-understanding" controlled (i.e., included in the set of precollege characteristics), the second (the "Out" model) with precollege level left uncontrolled.

The two reduced models produce upper- and lower-bound estimates of the influence of each variable set. Inclusion of students' precollege learning orientation score (the "In" model) probably underestimates college's influence on the dependent

variable, while exclusion of the score (the "Out" model) probably overestimates college's effects.

College experiences might affect men and women or white and minority students differently. To assess whether each experience had a differential effect on the development of students' orientations toward learning for self-understanding by gender and ethnicity, a series of interaction terms were entered into both "In" and "Out" model regressions (after the variables representing students' precollege characteristics and college experiences). Interactions were operationalized with two-item cross-products of each college influence variable retained for the reduced-model regressions with the gender variable, then the race/ethnicity variable.

RESULTS

Table 4 summarizes the results of the two reduced-model regressions estimating the unique and shared variance for the learning for self-understanding scale. Overall, the models explained 28.4 percent and 47.7 percent of the total variance in students' orientations toward learning for self-understanding (depending on whether precollege orientation level was excluded or included). When precollege orientation level was excluded from the model (the "Out" model), background characteristics accounted for less than 5 percent (a statistically non-significant amount) of the variance in year-end orientation. With precollege orientation level included (the "In" model), the variance

Table 4

Partitioning of Variance Results for Reduced-Model Regression on Learning for Self-Understanding Scale

Variable Set	Learning for Self-Understanding	
	Out[a]	In[b]
Variance due to Precollege Characteristics	.045	.374***
Unique[c] Variance due to:		
Curriculum	.000	.000
Class-Related Experiences	.051***	.000
Out-of-Class Experiences	.178***	.103***
Total Shared Variance[d]	.010	.000
Total Variance Explained	.284***	.477***

[a]Precollege score on dependent variable excluded from model.
[b]Precollege score on dependent variable included in model.
[c]Controlling for precollege variables and other college experience variable sets.
[d]Shared among the three college experience variable sets. The statistical significance of these estimates cannot be determined.

*p < .05. **p < .01. ***p < .001.

attributable to precollege characteristics (as one would expect) jumped to 37.4 percent.

Table 4 also indicates that, of the total variance explained by the "Out" model (28.4 percent), students' out-of-class experiences uniquely account for nearly two-thirds (17.8 percent), about three and one-half times as much as that explained by students' class-related experiences (5.1 percent). The unique variance attributable to class-related experiences, while relatively small, was nonetheless statistically significant ($p < .01$). When students' precollege level of orientation toward learning for self-understanding is taken into account (the "In" model), the influence of class-related experiences disappears.

Also noteworthy is the fact that, for the "Out" model, 1 percent of the total variance (i.e., a little more than 3.5 percent of the total variance explained) is shared among the college experience variable sets. The shared variance is an estimate of the joint, simultaneous influence of all college experience variables above and beyond the variance attributable to students' precollege characteristics and the unique contributions of each college experience variable set.

The estimate of shared variance might reflect "reality," that is, the extent to which students' academic and non-academic experiences in fact jointly influence learning, or they might be statistical artifacts, reflecting multicollinearity (the intercorrelations) among the independent variables. To shed light on this issue, a formal analysis of the degree of collinearity in

the model was carried out using the collinearity diagnostics available in SAS (SAS Institute, 1989). The results of this analysis indicated little or no collinearity among the predictor variables. Thus, the evidence suggests that the estimate of shared variance, indeed, reflects the joint effects of the college experience and not multicollinearity among the predictor variables.

Table 5 reports the standardized multiple regression coefficients (beta weights) reflecting the relative contributions of each component variable to the explanation of variance in the dependent measure. As can be seen in the table, two class-related experiences and three out-of-class experiences relate significantly and positively to students' year-end orientations toward learning for self-understanding (in either the "In" or "Out" models).

In the "Out" regression, among class-related experiences, students' evaluations of their social science instructor's effectiveness and the CSEQ "Experiences with Faculty" scale are associated with development of a greater orientation toward learning for self-understanding. The CSEQ "Experiences with Faculty" scale reflects the extent to which students talk with faculty members, ask for course-related information, visit informally with faculty members after class, discuss ideas for a term paper or class project with an instructor, ask an instructor for comments and criticisms of their work, meet a faculty member

Table 5

Beta Weights at Final Step[a] for Reduced-Model Regression on Learning for Self-Understanding Scale

Variable	Learning for Self-Understanding	
	Out[b]	In[c]
Precollege		
Parents' Education (Sum)	-.16*	-.09
Total Family Income	-.04	-.08
Race	-.10	-.04
Sex	.09	.11*
Highest Degree Planned	-.10	-.08
CAAP Mathematics Score	.11	.08
CAAP Reading Score	.04	.02
Dependent Measure		.52***
Class-Related Experiences		
Instr. Effect. in Soc. Science	.19**	
CSEQ Faculty Experiences Scale	.14*	
Out-of-Class Experiences		
Hrs./Wk. Socializing with Friends	.20**	.14*
CSEQ Scales:		
Personal Experiences	.31***	.19**
Art, Music, Theater		.16**

Note. The absence of a beta weight for a variable indicates that the measure was not included in the model.

[a]All variables with a tabled beta weight were included in model.
[b]Precollege score on dependent variable excluded from model.
[c]Precollege score on dependent variable included in model.

*p < .05. **p < .01. ***p < .001.

for coffee or a soft drink, or work with a faculty member on a research project.

Also in the "Out" regression, among out-of-class experiences, the number of hours per week students spent socializing with friends and the CSEQ "Personal Experiences" scale are associated with gains in the dependent measure. The nature of students' socializing is unclear from the data. The CSEQ "Personal Experiences" scale, the most influential among all experiences assessed during this study, reflects such activities as seeking out a friend to help with a personal problem, electing a course that deals with understanding personal and social behavior, reading articles or books about personal adjustment and personality development, and talking with a counselor or other specialist about problems of a personal nature.

In the "In" regression, no class-related experiences related significantly to the dependent measure. Both out-of-class experiences that were significant in the "Out" model (the number of hours per week students spent socializing with friends and their personal experiences) were also significant in the "In" model. Personal experiences again proved most influential. In addition, students' experiences with art, music, and theater, though not significant in the "Out" model, were positively and significantly associated with development of greater year-end orientations toward learning for self-understanding in the "In" model. This CSEQ scale reflects the extent of students' involvement in talking about art, music, or theater with other

students; going to art galleries or exhibits, plays, or concerts; reading or discussing art, music, or theater critics' opinions, and participating in some artistic, theatrical, or musical activity.

The addition of the interaction terms in the models indicated that the effects of college experiences were not the same for all kinds of students. More specifically, the number hours per week spent socializing with friends was more influential in development of orientations toward learning for self-understanding among women than among men ($p < .01$ in the "In" model and $p < .05$ in the "Out" model). The significance of the interaction in both models suggests that the effect of socializing with friends was indeed greater among women than among men. No other gender differences and no differences in ethnicity were apparent.

Limitations

This study is limited in several respects. First, the data come from a relatively small sample of students, at a single institution, who are probably not representative of any national population. While these students may well be representative of first-year students at similar commuter institutions, only a small number lived in university-controlled housing and, thus, the nature and impact of their college experiences may not be representative of those of students at residential institutions.

Second, the study examines changes over only one year. It seems quite possible (even probable) that greater, cumulative changes may occur later in students' college careers. This study,

however, cannot address the magnitude of change over a longer period nor whether the same college influences may be consistently salient in subsequent college years.

Third, "learning for self-understanding" is a complex construct that the dependent measure in this study might only begin to reflect.

Fourth, the measures of students' curricular experiences (the number of courses taken in each of six general disciplinary categories) probably does not adequately reflect the effects of those courses (or of any patterns among them) on changes in students' orientations toward learning.

Finally, the measure of instructor effectiveness is based entirely on students' perceptions of instructional competence. The additional inclusion of peer evaluations might enhance the validity of the construct.

DISCUSSION AND CONCLUSIONS

The findings of this study are consistent with a number of other studies indicating that what happens to students after they matriculate has a substantially greater influence on what and how they learn than do the attributes they bring with them to college (see Pascarella & Terenzini, 1991). Measures of a variety of students' college experiences variables explained 10 to 24 percent of the total variance above and beyond that attributable to students' precollege characteristics (depending upon whether students' initial learning orientation was taken into account). Both were statistically significant increments. The number of

courses students had taken in each of six general disciplinary categories (used as a measure of curricular effects), however, appeared to be unrelated to students' orientation toward learning for self-understanding net of their precollege characteristics and other college experiences. This finding may be artifactual, however, due more to the relatively imprecise measurement of curricular effects (i.e., number of courses taken instead of, say, patterns of coursework). It may also be that curricular effects are cumulative over time and not manifest until later in students' college careers.

More interesting and important is the finding that both students' class-related experiences and their out-of-class experiences made statistically significant and unique contributions to the explanation of variations in learning orientation above and beyond students' precollege traits and their experiences in other areas of college life (when students' initial learning orientation was not taken into account). Students' class-related experiences uniquely explained up to 5 percent of the total variance, while students' out-of-class experiences uniquely explained 10 to 18 percent of the total, over and above variance attributable to their precollege characteristics and experiences and other their experiences during college. Morover, not only do students' class-related and out-of-class experiences exert simultaneous and unique effects on students' orientation toward learning for self-understanding, but the evidence suggests that the two variable sets might also exert a modest joint effect.

Together, the two sets explained up to 1 percent of the variance not attributable uniquely to any other college experience or to students' precollege characteristics or experiences.

The presence of an apparent joint effect, due to a combination of academic and non-academic experiences, is consistent with a similar, but larger, joint effect reported by Terenzini, Springer, Pascarella, and Nora (1993). In that study, the joint effect of students' class-related and out-of-class experiences explained between 2 and 12 percent of the variance in students' intellectual orientations over and above the variance explained uniquely by either set of experiences.

Identification of both unique and possibly joint effects of students' class-related and out-of-class experiences is both theoretically and practically important. Pascarella and Terenzini (1991) note that

> Most theoretical models of development in no way guarantee that any single experience will be an important determinant of change for all students. A majority of important changes that occur during college are probably the cumulative result of a set of interrelated experiences sustained over an extended period of time (p. 610).

They conceded, however, that there was no empirical evidence to support this belief. Their study suggests that such holistic influences are more than theoretical.

With respect to theories of how students change during college, or of how college affects those changes, Terenzini, Springer, Pascarella, and Nora (1993) reported the first evidence of both unique and joint effects of class-related and out-of-class

experiences on students' orientations to learning. This study offers further evidence supporting the long-held theory that college's effects on student learning are holistic, that learning is shaped both by their formal, classroom experiences and by their out-of-class experiences. Given the present findings, it would appear that future research on college's effects on students must be more comprehensive in both conception and design, taking into greater account the multiple and interrelated sources of influence on any given educational outcome. Unless that is done, the magnitudes of the overall college effect will be underestimated and the relative importance of various general and specific dimensions of the college experience will remain unclear.

From a practical point of view, these findings suggest the importance of a more comprehensive perspective in educational program planning and development and closer collaboration among academic and student affairs divisions in the delivery of educational programs and services. Given the desire of educators at most institutions to intervene in their students' lives in ways that maximize desired educational outcomes, faculty and administrators must take into account not only the most promising and proximate interventions, but also a wide range of student experiences--in and out of the classroom--that can mediate the extent to which any particular goal is achieved. What students learn in the classroom is not untouched by what happens to them outside of class, and vice-versa.

The evidence in this study further suggests that students' academic and non-academic experiences both separately and jointly shape student learning. Terenzini, Springer, Pascarella, and Nora (1993) found that students' interest in academic learning appeared to be primarily a function of three kinds of experiences, two class-related and one out-of-class experience. Students' classroom experiences (e.g., participating in class discussions, trying to see how different ideas fit together, doing a paper or project requiring the integration of ideas from different sources) were the most powerful predictors of academic interest levels. Time spent studying was also positively related to gains in academic interest levels, but the amount of time students spent socializing was negatively related to this outcome.

In this study, time spent socializing with friends was positively related to gains in orientations toward learning for self-understanding. Students' out-of-class experiences were most significantly related to gains, with their personal experiences (e.g., seeking out a friend to help with a personal problem, reading articles or books about personal adjustment and personality development, and talking with a counselor or other specialist about problems of a personal nature) the most powerful predictor of development of orientations toward learning for self-understanding.

Three experiences (two class-related and one out-of-class-related) that Terenzini, Springer, Pascarella, and Nora (1993) identified as significantly and positively related to the

intrinsic value students find in learning also appeared significantly and positively related to gains in their orientations toward learning for self-understanding. These were students' evaluations of their social science instructor's effectiveness, their experiences with faculty members (e.g., in- and after-class interactions, seeking criticism of one's work, working with faculty on a research project), and their experiences in art, music, and theater (e.g., talking about art, music, or theater with other students; going to art galleries or exhibits, plays, or concerts; participating in some artistic, theatrical, or musical activity). The evidence suggests that these experiences positively shape both students' intellectual orientations (or intellectual curiosity) and their orientations toward learning for self-understanding.

These results are consistent with previous evidence that faculty members have an important influence on student change in virtually all areas (see Pascarella & Terenzini, 1991). The studies also suggest that programs, facilities, and opportunities for experiencing art, music, and theater can benefit students in a number of ways. Though, ultimately, the impact of college on students depends on their seeking out the people, programs, facilities, opportunities, and experiences that contribute to learning, educators can facilitate learning by providing opportunities for such beneficial activities.

This study also indicates that the same experiences might have different effects on the same outcome for different groups of

students. Time spent socializing with friends was more positively related to gains in orientations toward learning for self-understanding for women than for men. The findings are consistent with much of the literature on gender-related differences in learning during college (Belenky, Clinchy, Goldberger, & Tarule, 1986; Baxter Magolda, 1992) indicating that women generally value connectedness or social relationships in their learning experiences to a greater extent than men.

The evidence in the two studies further suggests that administrators, faculty members, and student peers each have important roles in shaping the interests students have in learning. Though socializing with friends might negatively affect students' interest in academic learning (perhaps because it reduces the time available for studying and the positive benefits associated with that activity), socializing might positively affect students' interest in learning for self-understanding, particularly among women. Further studies might clarify the nature and content of students' socializing that relates to development of their interests in or orientations toward learning for self-understanding.

Finally, this study suggests that future research should examine the interconnected (both positive and negative) relationships of a number of in- and out-of-class experiences on various instructional and academic goals in analyzing college's effects on students. With more holistic conceptual frameworks and designs, researchers can better assess the magnitudes of the

overall college effect and the relative importance of various general and specific dimensions of the college experience. Similarly, faculty members and administrators are likely to benefit from considering the interconnections of academic and non-academic activities as they plan and develop educational programs intended to enhance student learning. A more comprehensive perspective in educational program planning and development and closer collaboration among academic and student affairs divisions in the delivery of educational programs and services is likely to enhance students' learning during college.

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