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Controlling for such factors as precollege cognitive ability and academic motivation, ethnicity, gender, exposure to college, work responsibilities, and the pattern of courses taken, students reporting that the first-year instruction they received was well organized and prepared tended to demonstrate greater general cognitive development than their peers who reported receiving less organized and prepared instruction. Implications for student affairs are discussed.

INTRODUCTION

In a recent presidential address to the American College Personnel Association (ACPA), Schroeder (1994) pointed out that it is clearly time for student affairs administrators to recognize their contributions to student learning and focus more of their professional effort and expertise in this area. They should regard themselves as educators whose primary responsibility is to promote student learning and personal development. Schroeder's call for student affairs professionals to commit more of their effort and expertise to student learning is quite consistent with the theme of the ACPA's (1994): *The Student Learning Imperative: Implications for Student Affairs (SLI)*. The *SLI*, developed and endorsed by a group of higher education scholars and leaders that included the ACPA president and the executive director of the National Association of Student Personnel Administrators, places student affairs at the center of postsecondary

education's primary mission of facilitating student learning and intellectual growth. As noted in the *SLI*, student affairs divisions should include experts on teaching and learning, and student affairs policies and practices should be based on the research on student learning, as well as institution-specific assessment.

The *SLI* authors clearly encourage the use of knowledge about teaching and learning in the development of student affairs programs. In this regard, however, two points remain problematic. First, as Kuh, Bean, Bradley, and Coomes (1986) noted, student affairs journals publish very little research on student learning or the teaching-learning process. Consequently, with some notable exceptions (e.g., Baxter, Magolda, 1992; Kuh, Schuh, Whitt, & Associates, 1991), an adequate knowledge base may not be readily available in the professional literature of the student affairs field. Second, the knowledge base itself has limitations. In their review of the literature on college impact, Pascarella and Terenzini (1991) pointed out that there is still much to learn about collegiate teaching and learning.

The results of a study designed to contribute to the student affairs knowledge base on the teaching-learning process are reported in this paper. The findings have implications for how student affairs programs and services might be presented in ways that promote student learning.

LITERATURE REVIEW

A substantial number of researchers have

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addressed the relationships between different dimensions of teacher behavior and student learning (e.g., Benton, 1982; Cashin, 1988; Centra, 1977, 1979, 1989; Cohen, 1980, 1981, 1987; Costin, Greenough, & Menges, 1971; d'Appolonia & Abrami, 1988; d'Appolonia, Abrami, & Rosenfield, 1993; Feldman, 1989, 1990, 1994; Marsh, 1984, 1986, 1987; Marsh & Dunkin, 1992; Marsh, Fleiner, & Thomas, 1975; Mintzes, 1982; Murray, 1980, 1985, 1991; Sullivan, 1985; Sullivan & Skanes, 1974). Fortunately, there have been a number of useful reviews and summaries of this research (e.g., Cashin, 1988; Cohen, 1981, 1987; Feldman 1989, 1994; Marsh, 1987). What is clear from these syntheses of research is that student ratings or descriptions of teaching behavior are multidimensional and that the different dimensions vary substantially in the strength of their relationship with course achievement. For example, Cohen (1981, 1987) concluded that there were eight general dimensions of student ratings of teacher behavior or instruction: skill, rapport, structure, difficulty, interaction, feedback, evaluation, and interest motivation. Feldman (1989, 1994), however, suggested that there may be as many as 28.

Despite different perspectives on the dimensionality of teacher behaviors, there appears to be a marked agreement among most studies with respect to those dimensions most strongly linked with student achievement. Two dimensions consistently stand out: (a) teacher organization and preparation (e.g., "Class time is used well," "Presentation of material is well organized") and (b) teacher instructional skill and clarity (e.g., "The teacher gives clear explanations," "The teacher makes good use of examples and illustrations to get across difficult points"). Hereafter, these two dimensions will be referred to as *teacher organization/preparation* and *teacher skill/clarity*. In Cohen's (1981) meta-analysis, the teacher skill/clarity dimension had an average correlation of .50 with course subject matter achievement, whereas the organization/preparation dimension had an average correlation of .47 with achievement. The next highest correlation between a teacher behavior dimension and student achievement was only .31.

Similarly, in a more recent and extensive meta-analysis, Feldman (1989, 1994) also showed that, of all the teacher behavior dimensions considered, teacher skill/clarity and teacher organization/preparation had the highest correlations with student achievement, .56 and .57 respectively. What is perhaps most interesting about such consistent findings is that several of the constituent skills involved in these two teacher behavior dimensions (e.g., structuring and organizing class time efficiently, effectively using examples, learning to present material clearly) may themselves be learnable (Dalgaard, 1982; Land, 1979, 1981; Land & Smith, 1979, 1981; Pascarella & Terenzini, 1991; Smith, 1982).

Although researchers can now be reasonably confident about the substantial and consistent links between teacher organization/preparation and teacher skill/clarity, on the one hand, and student achievement, on the other, knowledge of these links is essentially limited to the relationship between these two dimensions of teacher behavior and knowledge acquisition in specific courses. Almost nothing is known about the extent to which teacher organization/preparation and teacher skill/clarity may influence more general and broad-based measures of student cognitive development than those tapped by course-level achievement tests. Equally little is known about the degree to which these two dimensions of teacher behavior manifest their influence in a broader context than an individual course. Specifically, do the extent of teacher preparation/organization and the extent of teacher skill/clarity in a student's overall academic experience influence general cognitive outcomes during college?

Finally, inquiry about the relationship between teacher behaviors and student achievement has been focused almost exclusively on general effects. That is, researchers have assumed that the learning enhancements of teacher organization/preparation and teacher skill/clarity are similar in magnitude for all students. However, the effects of these two dimensions of teacher behavior on student learning may be conditional rather than general. That is, they may vary in their influence on achievement for students with different background or other

characteristics (e.g., gender, ethnicity, age, precollege academic preparation or motivation).

In the current study these issues were addressed through a longitudinal investigation of student first-year cognitive development in 18 colleges and universities around the country. The study involved two specific purposes. First, the net effects of teacher organization/preparation and teacher skill/clarity on students' first-year development in reading comprehension, mathematics, critical thinking, and composite cognitive development were assessed, using standardized instruments specifically designed to assess general cognitive skills acquired in the first 2 years of college. Second, the extent to which the cognitive effects of teacher organization/preparation and teacher skill/clarity differ in magnitude for students with different background and other characteristics was examined.

METHOD

Institutional Sample

The sample was selected from incoming first-year students at 18 four-year colleges and universities located in 15 different states throughout the country. Institutions were selected from the National Center on Educational Statistics IPEDS database to represent differences in colleges and universities nationwide on a variety of characteristics, including institutional type and control (e.g., private and public research universities, private liberal arts colleges, public and private comprehensive universities), size, location, commuter versus residential, and the ethnic distribution of the undergraduate student body. In aggregate, the student population of those 18 schools approximated the national population of undergraduates in four-year institutions by ethnicity and gender.

Student Sample and Instruments

The individuals in the overall sample were 2,416 first-year students who participated in the National Study of Student Learning (NSSL), a large longitudinal investigation of the factors that influence learning and cognitive development in college. The research was sponsored by the

federally funded National Center on Post-secondary Teaching, Learning, and Assessment (NCPTLA). The initial sample was, as far as possible, selected randomly from the incoming first-year class at each participating institution. The students in the sample were informed that they would be participating in a national longitudinal study of student learning and that they would receive a stipend for their participation. They were also informed that the information they provided would be kept confidential and would never become part of their institutional record.

An initial data collection was conducted in the Fall of 1992 and lasted approximately 3 hours, and students were paid a stipend of \$25 by the NCPTLA. Students were reminded that the information they provided would be kept in the strictest confidence and that they were expected only to give an honest effort on tests and a candid response to all questionnaire items. The data collected included a precollege survey that gathered information on the students' demographic characteristics and background, aspirations, and expectations of college, plus a series of items assessing their orientations toward learning. The participants also completed Form 88A of the Collegiate Assessment of Academic Proficiency (CAAP), which was developed by the American College Testing Program (ACT) specifically to assess selected general cognitive skills that students typically acquired in the first 2 years of college (ACT, 1990). The total CAAP consists of five 40-minute, multiple-choice test modules, three of which—reading comprehension, mathematics, and critical thinking—were administered during the first data collection.

The CAAP reading comprehension test comprises 36 items that assess reading comprehension as a product of skill in inferring, reasoning, and generalizing. The test consists of four prose passages, of about 900 words each, that are designed to be representative of the level and kinds of writing students commonly encounter in college curricula. The passages were drawn from topics in fiction, the humanities, the social sciences, and the natural sciences. The KR-20, internal consistency reliabilities for the reading comprehension test ranged between .84

TABLE 1
Composition of Two Teacher Behavior Scales

SCALE/ ITEM	ITEM-TOTAL SCALE CORRELATION	ALPHA RELIABILITY
<i>TEACHER ORGANIZATION AND PREPARATION</i>		.874
Presentation of material is well organized	.711	
Instructors are well prepared for class	.766	
Class time is used effectively	.678	
Course goals and requirements are clearly explained	.712	
Instructors have good command of what they are teaching	.652	
<i>TEACHER INSTRUCTIONAL SKILL AND CLARITY</i>		.863
Instructors give clear explanations	.683	
Instructors make good use of examples to get across difficult points	.707	
Instructors effectively review and summarize the material	.698	
Instructors interpret abstract ideas and theories clearly	.745	
Instructors answer my questions in a way that helps me understand the material	.579	

and .86. The mathematics test consists of 35 items designed to measure a student's ability to solve mathematical problems typical of many postsecondary curricula. The emphasis is on quantitative reasoning rather than formula memorization. The content areas tested include pre-, elementary, intermediate, and advanced algebra; coordinate geometry; trigonometry; and introductory calculus. The KR-20 reliability coefficients for the mathematics test ranged between .79 and .81. The critical thinking test is a 32-item instrument that measures a student's ability to clarify, analyze, evaluate, and extend arguments. The test consists of four passages that are designed to be representative of the kinds of issues typical of a postsecondary curriculum. A passage typically contains a series of sub-arguments that support a more general conclusion. Each passage contains one or more arguments and involves a variety of formats, including case studies, debates, dialogues, overlapping positions, statistical arguments,

experimental results, or editorials. Each passage is accompanied by a set of multiple choice items. The KR-20 reliability coefficients for the critical thinking test ranged from .81 to .82 (ACT, 1990). In pilot testing of various instruments for use in the NSSL on a sample of 30 college students, the critical thinking test of the CAAP was found to correlate .75 with the total score on the Watson-Glaser Critical Thinking Appraisal (Pascarella, Bohr, Nora, & Terenzini, 1995).

Each of the 18 institutions was given a target sample size relative in magnitude to the respective size of the first-year class at that institution. The overall target sample for the Fall 1992 data collection at the 18 institutions was 3,910. The overall obtained sample size, (i.e., those students actually tested) for the Fall 1992 data collection was 3331, or a response rate of 85.19%.

A follow-up testing of the sample took place in the Spring of 1993. This data collection required about 3 1/2 hours, and students were paid a second stipend of \$35 for their partici-

pation by the NCPTLA. Collected during the follow-up testing were Form 88B of the CAAP reading comprehension, mathematics, and critical thinking modules, as well as questionnaire instruments designed to measure an extensive range of students' experiences during the first year of college. Embedded in the questionnaire were 45 items about the kinds of teaching that students had received. The introduction for these items was as follows:

We would like to get your views on the overall nature of the teaching you received during the past year. We want to know, in general, how your teachers taught and what you did in class. Please circle the number on the scale below that indicates how often you have experienced the following in your coursework as a whole.

The possible student responses to each item were adapted from the *College Student Experiences Questionnaire* (PACE, 1984, 1987, 1990). The responses were 1 = *never*, 2 = *occasionally*, 3 = *often*, or 4 = *very often*. Thus, perceptions of instruction received referred to the students' overall or total first-year academic experience, not to any specific course or instructor.

In this part of the questionnaire two scales were developed a priori to tap teacher organization/preparation and teacher skill/clarity. In developing the scales, the researchers were guided by the constituent items that appeared in previous research (e.g., Cohen, 1981, 1987; Feldman 1989, 1994) to load on these particular dimensions of teaching behavior. The exact wording of the items constituting each scale, the correlation between each item and the total scale, and the alpha (internal consistency) reliabilities for the scales are shown in Table 1.

Of the original sample of 3,331 students who participated in the Fall 1992 data collection, 2,416 participated in the Spring 1993 data collection, for a follow-up response rate of 72.53%. Given the high response rates at both testings, it was not particularly surprising that the sample was reasonably representative of the population from which it was drawn. However, to adjust for potential response bias by gender, ethnicity, and institution, a sample weighting

algorithm was developed. Specifically, within each of the individual institutions participants in the follow-up data collection were weighted up to the institution's first-year population by gender (male or female) and ethnicity (White, Black, Hispanic, other). Thus, for example, if an institution had 100 Black men in its first-year class and 25 Black men in the sample, each Black male in the sample was given a sample weight of 4.00. An analogous weight was computed for participants falling within each Gender \times Ethnicity cell within each institution. The effect of applying sample weights in this manner was to adjust not only for response bias by gender and ethnicity, but also for response bias by institution. The final weighted sample was 45% male and 55% female; was 59% White, 16% Hispanic, 14% Black, 7% Asian and 4% Other; and had a median age of 18 years.

Analytical Model

The independent variables of interest in the study were the teacher organization and preparation scale and the teacher instructional skill and clarity scale. The dependent variables were Spring 1993 scores on the CAAP reading comprehension, mathematics, and critical thinking tests, plus a measure of freshman-year composite cognitive development that combined all three tests. The composite cognitive development measure was constructed in two steps. First, each of the three CAAP tests (i.e., reading comprehension, mathematics, and critical thinking) was standardized to put each on the same metric. Subsequently, the composite cognitive development score was computed by summing across standardized scores. The alpha (internal consistency) reliability for the composite cognitive development measure was .83.

Because of the extraneous factors that might influence both how students perceive the teaching they receive in college and their cognitive growth during the first year of college, simple correlations are likely to yield a spuriously inflated estimate of the impact of specific teaching behaviors on students' first-year cognitive development (e.g., Feldman, 1994; Pascarella, 1985; Pascarella & Terenzini, 1991). Conse-

quently, in the current study a number of potentially important confounding variables were also included in the analytic model. In selecting those salient confounding variables, the researchers were guided by the existing body of evidence on the factors independently influencing learning and cognitive development during college (e.g., Astin, 1968, 1977, 1993; Astin & Panos, 1969; Kuh, 1993; Pascarella, 1985; Pascarella & Terenzini, 1991). The individual-level confounding variables incorporated in the analytical model were the following:

1. Individual precollege (Fall 1992) CAAP reading comprehension, mathematics, critical thinking, and composite cognitive development scores (each employed in prediction of the appropriate end-of-first-year [i.e., Spring 1993] CAAP reading comprehension, mathematics, critical thinking, and composite cognitive development score).
2. Precollege (Fall 1992) academic motivation: an 8-item, Likert-type scale (5 = *strongly agree* to 1 = *strongly disagree*) with an internal consistency reliability of .65. The scale items were developed specifically for the NSSL and were based on existing research about academic motivation (e.g., Ball, 1977). Among the constituent items were the following: "I am willing to work hard in a course to learn the material, even if it won't lead to a higher grade," "When I do well on a test it is usually because I was well prepared, not because the test was easy," "In high school I frequently did more reading in a class than was required simply because it interested me," and "In high school I frequently talked to my teachers outside of class about ideas presented during class."
3. Gender: coded: 2 = *female*, 1 = *male*.
4. Ethnicity: coded: 2 = *non-white*, 1 = *white*.
5. Age
6. Number of credit hours taken: total number of credit hours each student expected to complete during the first year of college (taken from the follow-up questionnaire).

7. Number of hours worked: total number of hours a student worked per week both on- and off-campus (taken from the follow-up questionnaire).

8-12. Number of courses taken during the first year of college in five different areas: natural sciences (e.g., biology, chemistry, engineering, geology, physics); arts and humanities (e.g., art history, composition, English literature, foreign languages, philosophy, classics); social sciences (e.g., economics, psychology, history, sociology, political science, social work); mathematics (e.g., algebra, calculus, statistics, computer science, geometry, matrix algebra); and technical or preprofessional (e.g., business, education, physical education, nursing, physical therapy, drafting). Respondents were given 61 different courses across the five broad areas to select from, and they were asked to indicate how many of each of the 61 courses they had taken during their first year of college (coded from 0 to 5). This information was taken from the follow-up questionnaire. Because substantial evidence exists to suggest that instructors in different disciplines have different pedagogical approaches (e.g., Cashin, 1990; Cashin & Sixbury, 1993), it was anticipated that this set of variables would act as a reasonable control for student exposure to different teaching styles.

Because the existing body of evidence also suggests that the academic preparation of an institution's student body can influence the nature of instruction received (e.g., Braxton & Nordvall, 1985; Pascarella & Terenzini, 1991), an estimate of student academic preparation was taken into account as an institutional-level confounding variable. This was operationalized as:

13. The the average precollege (Fall 1992) CAAP reading comprehension, mathematics, critical thinking, or composite cognitive development score for the sample of first-year students at each of the 18 institutions. Each individual student in the

sample was given the mean of his or her institution on all three CAAP tests, plus the composite, and each of the institutional mean estimates was employed in analysis of the appropriate end-of-first year (Spring 1993) individual-level reading comprehension, mathematics, critical thinking, or composite cognitive development score.

In the first stage in the analysis the researchers sought to estimate the net impact of teacher organization/preparation and teacher skill/clarity on the four first-year cognitive outcomes, controlling for the potential confounding influences delineated earlier. Thus, using ordinary least squares, each of the four end-of-first year cognitive outcomes (i.e., Spring 1993 reading comprehension, mathematics, critical thinking, and composite cognitive development scores) was regressed on all of the 13 potentially confounding influences plus the teacher organization/preparation and the teacher skill/clarity scales.

The second stage of the analyses involved testing for the presence of conditional effects (Pedhazur, 1982). A series of cross-product terms was computed between teacher organization/preparation and teacher skill/clarity, on the one hand, and each of the 13 other variables in the model. These were then added to the regression model employed in the first stage of the analyses (i.e., the main-effects model). The addition of the sets of cross-products was done separately for each of the teacher behavior scales. A statistically significant increase in explained variance (R^2) attributable to the set of cross-product terms (over and above the main-effects model) indicated that the net effects of teacher organization/preparation and teacher skill/clarity varied in magnitude for students at different levels on the other variables in the prediction model. Tests for conditional effects were also conducted to determine whether the cognitive effects of teacher organization/preparation varied at different levels of teacher skill/clarity, and vice versa.

Complete data for the different analyses conducted in the study were available for 2,302 of the 2,416 students who participated in the

follow-up testing. Based on the weighted sample, these 2,302 participants represented a population of 24,503 first-year students at the 18 four-year colleges and universities. The weighted sample ($N = 24,503$), adjusted to the actual sample size ($N = 2,302$) to obtain correct standard errors, was used in all analyses. Because of the large (unweighted) sample size, the critical alpha level was set at .01.

RESULTS AND DISCUSSION

Table 2 contains a summary of the regression analysis results for end-of-first-year reading comprehension, mathematics, critical thinking, and composite cognitive development scores. (The means, standard deviations, and inter-correlations among all variables in the analyses are available from the first author on request.) As indicated in the table, when controls for such factors as individual student precollege cognitive level and academic motivation, the average cognitive level of the incoming first-year class at the institution attended, the student demographic characteristics, the extent of enrollment and work responsibilities, the number of courses taken in five discipline areas, and teacher skill/clarity were present, the teacher organization and preparation scale had significant and positive, though modest, effects on all four cognitive outcomes. Put another way, students who reported that the instruction they received during the first year of college was well organized and prepared (e.g., "Presentation of material is well organized," "Class time is used effectively," and "Course goals and requirements are clearly explained") tended to demonstrate greater general cognitive development than their peers who reported receiving less well organized and prepared instruction. Controlling for the same confounding influences, plus teacher organization/preparation, the teacher skill and clarity scale had only trivial and nonsignificant effects on the four end-of-first-year cognitive measures.

In the second stage of the analyses the addition of the cross-products of the two teacher behavior scales and all other variables in the model were consistently associated with small and nonsignificant increases in the variance

TABLE 2
Regression Analysis Summaries

PREDICTOR	READING COMPREHENSION	MATHEMATICS	CRITICAL THINKING	COMPOSITE COGNITIVE DEVELOPMENT
Individual Precollege Reading Comprehension, Mathematics, Critical Thinking, or Composite Cognitive Development Scores	.604** (.609)	.643** (.664)	.719** (.666)	.264** (.787)
Average Precollege Reading Comprehension, Mathematics, Critical Thinking, or Composite Cognitive Development Scores for First-Year Students at Each Institution	.250** (.118)	.234** (.139)	.149** (.067)	.019** (.066)
Precollege Academic Motivation	-.134 (-.013)	.105 (.013)	.191 (.018)	.009 (.006)
Female	.357 (.032)	-.525** (-.059)	.183 (.016)	.013 (.007)
Non-White	-1.125** (-.099)	-.435* (-.048)	-.673** (-.057)	-.074* (-.043)
Age	.030 (.026)	-.036* (-.039)	.034 (.029)	.002 (.009)
Number of Credit Hours Taken	.254** (.064)	.091 (.029)	.322** (.078)	.029* (.048)
Number of Hours Worked	.000 (.000)	-.048 (-.030)	-.029 (-.015)	-.003 (-.011)
Number of Courses Taken in the Natural Sciences or Engineering	.049 (.013)	.129** (.043)	.094 (.025)	.007 (.012)
Number of Courses Taken in the Arts and Humanities	.041 (.018)	-.052 (-.029)	.082 (.035)	.001 (.002)
Number of Courses Taken in the Social Sciences	.097 (.034)	-.108** (-.048)	.104 (.035)	.002 (.002)
Number of Courses Taken in Mathematics	.005 (.001)	.374** (.104)	.123 (.026)	.031** (.046)
Number of Courses Taken in Technical/Professional Areas	-.252** (-.063)	-.114* (-.035)	-.322* (-.077)	-.028** (-.046)
Teacher Organization and Preparation	.800** (.075)	.404* (.047)	.657* (.060)	.089** (.055)
Teacher Instructional Skill and Clarity	-.127 (-.012)	-.091 (-.011)	-.328 (-.031)	-.021 (-.014)
R^2	.585**	.702**	.615**	.777**

Note. Top number is the metric or unstandardized coefficient; number in parentheses is the standardized (beta) coefficient.

* $p < .01$. ** $p < .001$.

explained in each of the four cognitive outcomes. The average R^2 increase associated with the addition of each set of cross-product terms to the main-effects equation was .0036 (.36%), and the largest R^2 increase was less than half of one percent. Similarly, the addition of the cross-product of Teacher Organization/Preparation \times Teacher Skill/Clarity to the main-effects equation was associated with a nonsignificant increase in the explained variance of all four cognitive outcomes. Such findings suggest that the net cognitive impacts of teacher organization/preparation and teacher skill/clarity are general rather than conditional. That is, the net impacts of these two teacher behavior dimensions shown in Table 2 tend to be similar in magnitude, irrespective of variations in a student's precollege cognitive level or academic motivation, age, ethnicity, gender, work responsibilities, extent of enrollment, the discipline emphasis of coursework taken, and the estimated average cognitive proficiency of the incoming class at the institution attended. Similarly, the positive cognitive impacts of teacher organization and preparation appeared to be similar in magnitude, irrespective of the extent to which teacher skill and clarity characterized the overall instruction received during the first year of college.

The findings of the study have at least two implications for the body of evidence pertaining to the validity and usefulness of student evaluations or perceptions of teaching. First, they suggest that the positive link between teacher organization/preparation and specific course achievement may extend to the impact of a student's total first-year instructional experience on more broad-based, general cognitive proficiencies. The dependent measures in this investigation were general cognitive skills such as reading comprehension and critical thinking that may have only weak links to specific course content (Pascarella & Terenzini, 1991). Moreover, even when controls were made for the number of mathematics, engineering, and natural sciences courses taken, level of teacher organization and preparation in overall instruction received during the first year of college also had positive net impacts on standardized mathematics proficiency. Thus, not only does teacher prepara-

tion and organization play a major role in students' specific course achievement, but its presence in the overall curricular experience also appears to have positive implications for students' general cognitive development during the first year of college.

Second, and perhaps most important from a policy standpoint, many of the constituent elements of teacher organization and preparation would appear to be learnable by college faculty. For example, some of the items in the teacher organization and preparation scale employed in the study were: "Presentation of material is well organized," "Class time is used effectively," and "Course goals and requirements are clearly explained." Such elements of teacher behavior can themselves be learned through purposeful teaching improvement efforts at the department, college, or institutional level (Weimer, 1990).

Three additional issues associated with the study findings are worthy of mention: (a) the modest size of the net effects uncovered, (b) the potential causal mechanisms underlying the findings, and (c) the failure of teacher skill/clarity to have a significant influence on any first-year cognitive outcomes. Researchers examining teacher evaluations and course achievement have suggested an average correlation of about .50 between teacher organization/preparation and student achievement in any particular course. The current study's results suggest a net positive impact of teacher organization/preparation in the total curricular experience on general measures of cognitive development that is substantially smaller in magnitude. This is perhaps not overly surprising, for two reasons. First, research on teacher behaviors and course achievement links teacher behaviors in specific courses to achievement in that course. Moreover, as McKeachie (1987) pointed out, the course-level achievement tests used in most existing research emphasize definitions and recall of facts rather than higher-level comprehension, problem solving, and critical thinking. In the current study the researchers attempted to link teacher behaviors on a much broader scale—the overall teaching received in the first year of college—to general measures of cognitive functioning that may have only marginal relationships with the factual

knowledge conveyed in specific courses. Second, previous researchers had typically reported only the simple, or zero-order, correlations between teacher behaviors and course achievement. Few, if any, attempts had been made to estimate the magnitude of the link between teacher behaviors and course achievement while statistically controlling for potentially confounding influences. In the current study efforts were made to control for an array of potentially confounding influences. This probably also contributed to the substantially more modest magnitude of the net effects reported here.

Second, as Feldman (1994) suggested, the psychological and social psychological mechanisms underlying the link between teacher behaviors and student learning may be particularly complex, and not as simple or obvious as may be presumed. Indeed, the specific "mechanisms underlying the link between teacher organization and student achievement have yet to be specifically and fully determined" (Feldman, 1994, p. 15). Perry (1991), has hypothesized one psychological mechanism that may account for the link.

Instructor organization . . . involves teaching activities intended to structure material into units more readily accessible for students' long-term memory. An outline for the lecture provides encoding schemata and advanced organizers which enable students to incorporate new, incoming material into existing structures. Presenting linkages between content topics serves to increase the cognitive integration of the new material and to make it more meaningful, both of which should facilitate retrieval. (p. 26)

Perry's (1991) hypothesis clearly applies most directly to the link between teacher organization/preparation and specific course content mastery. Yet, it may also have significant indirect implications for the learning of higher-order cognitive skills. By facilitating the efficient acquisition of factual knowledge and definitions, teacher organization and preparation may allow for greater instructional emphasis on more general and higher-order cognitive skills.

Similarly, a growing body of evidence suggests that sound content knowledge is a necessary foundation for higher-order and creative intellectual performance (e.g., Rabinowitz & Glaser, 1985). To the extent that teacher organization/preparation facilitates efficient acquisition of factual content knowledge, it may also be providing a more effective foundation from which students can progress toward complex and general cognitive capabilities. Of course, this is only a tentative hypothesis, and the causal mechanisms underlying the link between teacher organization/preparation and the development of general cognitive skills during college remains a fruitful area for further inquiry.

Finally, the failure of teacher skill/clarity to influence general cognitive development positively is inconsistent with research on the influence of that teacher behavior on course-level achievement. Although it is difficult to identify the specific reason for this inconsistency, two tentative explanations come to mind. First, teacher skill/clarity may have a proximal impact on student learning that is primarily exerted at the course level. In contrast, teacher organization/preparation may have a more pervasive influence on both course-level achievement and non-course-specific cognitive development because it establishes a supportive instructional context that enhances learning. Second, it may be that for general cognitive development the impact of a teacher is not so much in the skill and clarity of his or her presentation of content as in the establishing of an organizational context or framework that facilitates students' acquisition of complex and general cognitive skills.

Additional Analyses

Although this study focused on those two dimensions of teacher behavior shown in previous research to have the strongest links with course-level achievement tests, it could well be that the impacts of various behaviors shift in magnitude when the outcomes are higher-level cognitive skills (as in this investigation). To test for this possibility, the researchers conducted an additional set of analyses. From the set of items on the follow-up questionnaire that asked about the kinds of teaching received during the first

year of college the researchers constructed four additional scales: *Teacher Support* (e.g., "Instructors give assignments that help in learning the course material," "Instructors are available for consultation outside of class"); *Effective Questioning Techniques* (e.g., "Instructors ask challenging questions in class," "Instructors' questions in class ask me to argue for or against a particular point of view"); *Feedback* (e.g., "Instructors keep me informed of my level of performance," "Instructors check to see if I have learned well before going on to new material"); and *Use of Educational Technology* (e.g., "Instructors use electronic technologies [e.g., computers, video, audio, film, CD-ROM] to present course content," "Courses require me to learn how to use computers or word processors"). The standardized regression coefficients between these four teacher behavior scales and the four end-of-first-year outcomes were then computed, while the 13 potential confounding variables identified in the main analyses were controlled for statistically.

In all cases the regression coefficients for these other teacher behaviors tended to be nonsignificant and smaller in magnitude than those found for the teacher organization/preparation scale. Thus, at least in the current sample, support exists for the conclusion that teacher organization/preparation is a more salient influence than other dimensions of teacher behavior even when the outcome is general cognitive skills rather than course-level achievement tests.

POLICY IMPLICATIONS

The findings of the study also have at least two policy implications for student affairs. The first stems from the profession's concern with student learning and cognitive development. If, as argued in the *SLI*, student affairs programs need to place greater focus on their role in student learning, then evidence identifying instructional practices that promote students' general cognitive growth becomes important professional knowledge. Furthermore, in some institutions student affairs professionals with appropriate training may be significantly involved in instructional develop-

ment efforts designed to facilitate student learning. The findings of this investigation suggest that major elements of one of the instructional dimensions shown to facilitate students' general cognitive growth during the first year of college may need to be focal points of such efforts.

Second, the findings also have potential implications for the educative aspects of student affairs programming itself. A significant part of such programming may involve the student affairs staff member as a teacher. To the extent that teaching or instruction is part of one's professional role, the greatest developmental impact on students may occur when program content is presented in a manner intended to help the learner organize, link, and integrate factual material and concepts. What constitutes effective classroom teaching practices may also constitute effective student affairs programming.

LIMITATIONS

This investigation has several limitations that one should keep in mind when interpreting the findings. First, although the overall sample is multi-institutional and consists of a broad range of four-year institutions from around the country, the fact that the analyses were limited to a sample of 18 four-year colleges means that the results cannot necessarily be generalized to all four-year institutions in the United States. Similarly, although attempts were made in the initial sampling design and subsequent sample weighting to make the sample as representative as possible at each institution, the time commitment and work required of each student participant undoubtedly led to some self-selection. Those who were willing to participate in the study and those who declined the invitation to participate in the study might have responded differently. Weighed against this, however, is the fact that no significant conditional effects involving such factors as age, precollege academic aptitude and academic motivation, credit hours taken, work responsibilities, or course-taking patterns were found. Thus, even if the sample had some bias on these factors, it did not appear to influence the study results appreciably. Third, although

several different measures of cognitive development in college (reading comprehension, mathematics, and critical thinking) were examined, these are certainly not the only dimensions along which students develop intellectually during the college years. Alternative conceptualizations or approaches to the assessment of cognitive development might have produced findings different from those yielded by this investigation. Finally, this study involved a tracing of cognitive growth over only the first year of college, and the reported results might not hold for subsequent years in college.

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