WILLIAM E. McGRATH, DONALD J. SIMON, AND
EVELYN BULLARD

# Ethnocentricity and Cross-Disciplinary Circulation

*Student circulation of books in forty-three major academic disciplines were examined for patterns of disciplinary interdependence. Percentage of books charged out by majors in their own discipline was defined as the ethnocentricity of the major. Percentage of books in a discipline charged out by students majoring in other disciplines was defined as the supportiveness of that discipline. The two concepts have little or no correlation with each other. Graduate students were more ethnocentric than undergraduates. Most disciplines were less supportive at the graduate level. Findings have implications for collection development.*

UNIVERSITY STUDENTS use books in a wide variety of subjects, including those relating not only to their own major, but to other majors as well. For example, physics and chemistry students use books on mathematics, and political science students use books on history and sociology, and so on. Not all such patterns are well known nor are they explicitly built into library policy and procedure.

In a university with sixty or more academic major departments, where it is conceivable that a student majoring in one could use books relating to every other, the number of such relationships becomes horrendous—so many, in fact, that even though librarians and faculty often say that these relationships should be considered in collec-

*William E. McGrath is dean of library services, University of Lowell, Lowell, Massachusetts. Donald J. Simon is director of information systems, and Evelyn Bullard is circulation librarian, University of Southwestern Louisiana, Lafayette. This article is a revision of a paper by William E. McGrath, "Disciplinary Interdependence in University Students' Use of Books," presented at the annual meeting of the American Society for Information Science, 1976, and first published in* Information Politics *(Washington, D.C.: American Society for Information Science, 1976), p.98, microfiche 6.*

tion building, the problem is generally ignored, and solutions are not sought.

This paper seeks to uncover some of these patterns in one university by examining (1) the extent to which students majoring in one subject will use the books of another subject and (2) the extent to which the books in one subject are read by students majoring in other subjects. A composite and economical picture of this disciplinary interdependence as it pertains to student library use has never been painted.

The term *disciplinary interdependence* is used rather than the term *interdisciplinarity*. The first term retains the identity of older established disciplines, such as physics and mathematics, while measuring their dependence on each other, whereas *interdisciplinarity* refers to newer disciplines, such as biochemistry, that have an identity in their own right.

This interdependence should be much broader at the undergraduate level when students have not yet fully specialized and are required to read broadly. At the graduate level, specialization should have narrowed the breadth of dependence while intensifying the depth.

Knowledge of this interdependence should have implications for library operations (circulation control, allocations, acqui-

sitions, etc.), and in terms of political competition for library funds and priorities. It should also be a measurable reflection of course enrollments and assignments.

## THEORETICAL CONTEXT

This research can be placed in the context of Merton's definition of disciplines as (*a*) bodies of knowledge and (*b*) organizations of practitioners.[1] Here, the "bodies of knowledge" are all the subject fields embraced by each academic department in a specific university. "Organizations of practitioners" are groups of students majoring in the fields of those same departments.

The research is also of interest in Kuhnian terms—e.g., differences in textbook use, the research frontier, and paradigm development.[2] Although Kuhn speaks primarily of the scientist and how that person uses books and journals, the scientist's behavior should be reflected by students to the extent they use the same books and journals. Graduate students, i.e., those who are more specialized than undergraduates, presumably do more research than undergraduates. Their use of books, accordingly, should reflect this specialization.

Sherif and Sherif comment that "each discipline needs others in a fundamental and basic sense as a validity check on its own generalizations and theories," and that "man does not arrange his problems along lines drawn by academic disciplines."[3]

Donald T. Campbell expands on this observation in his concept of *enthnocentricity*—the tendency of practitioners to ignore knowledge outside of their own discipline.[4] The tendency, of course, should vary from discipline to discipline. Campbell advocates the ideal situation, what he calls the "fish-scale" model of omniscience—i.e., each discipline overlaps those adjacent to it. He contrasts this fish-scale view with the present situation in which disciplines overlap within clusters, in isolation from other clusters. He proposes the fish-scale approach to graduate training. The study undertaken here offers one approach to measurement of this concept.

As a measure of Merton's bodies of knowledge, the term *supportiveness* is defined here as the extent to which books on the subjects taught in a university department are used by students majoring in other subjects. It might be supposed that the term *basic* could be appropriately used here. However, *basic* usually refers to research by scientists, whereas *supportiveness* is defined in the context of the university curriculum.

## PURPOSE

The purpose of this research is to contribute to the understanding of library use in terms of all majors on the one hand, and all subjects on the other—that is, *who* uses *what* and *what* is used by *whom*. The two phrases are not the same, as will be seen.

Use by an individual person is not examined. Use is aggregated by subject and major, and the identity of individuals is lost, so that we do not know which specific books were used by any specific individual. In other words, the study is sociological rather than psychological in that the group—i.e., the major itself, rather than the person—is the unit of interest. "All subjects" in this paper refers to the subject matter described by the courses listed under each academic department in the *University of Southwestern Louisiana (U.S.L.) Bulletin.* "All majors" refers to departments granting at least a bachelor's degree.

The University of Southwestern Louisiana is accredited by the Southern Association of Schools and Colleges. It awards degrees at the bachelor, master's, and Ph.D. levels, with an enrollment of approximately 11,000 students and a library of nearly 500,000 volumes. It is located in the heart of French Louisiana, which contributes much to the color and tradition of the university. It has advanced research programs in biology, history, English literature, microbiology, mathematics, and computer science.

As usual in circulation studies, use is assumed when a book circulates. For what purpose a book may be used is not considered here. Specific questions considered were:

1. To what extent do graduate and undergraduate students use books on subjects confined to their own major? That is, to what extent is the major ethnocentric?

2. Which subject areas are most supportive in that they are most heavily used by graduate and undergraduate students in

other disciplines, and to what extent? That is, to what extent does the subject matter of a discipline support majors in other disciplines?

3. What differences exist between graduate and undergraduate use? This question can be expressed by four null hypotheses: that (*a*) no correlation exists between graduate and undergraduate ethnocentricity; (*b*) no correlation exists between graduate and undergraduate supportiveness; (*c*) no difference in mean percentages exists between graduate and undergraduate ethnocentricity; and (*d*) no difference in mean percentages exists between graduate and undergraduate supportiveness. We would expect hypotheses (*a*) and (*b*) to be retained and (*c*) and (*d*) to be rejected, supporting the contention that differences exist between the two levels. Furthermore, we would expect the mean percentage for ethnocentricity to be higher at the graduate level and the mean percentage for supportiveness to be lower at the graduate level.

4. What is the difference between ethnocentricity and supportiveness? This question can be expressed by two null hypotheses: that no correlation between the two exists at (*a*) the graduate level and (*b*) the undergraduate level. We would expect these hypotheses to be retained.

### PREVIOUS RESEARCH

Previous research along these lines, sometimes called "dispersion of the literature," has usually been confined to citation studies of scientific journals. Earle and Vickery, for example, counted citations in journals from various disciplines to determine the extent each cited or was cited by other disciplines.[5]

Moore classified scientific journals according to the Dewey classification system, then ranked them according to how much the journals were confined to each subject category and how much they were assigned subjects related to other categories.[6]

Narin, Carpenter, and Berlt studied cross-citing among 275 journals in mathematics, physics, chemistry, biochemistry, and biology and concluded from citation patterns that these sciences were transitively related to each other in that order.[7]

Such studies are abundant. These authors can recall no similar empirical studies that have examined the cross-disciplinary use of monographs by students. Baughman, however, has argued for the study of interrelationships within and among clusters of subject literatures, demands, and disciplines in building library collections.[8]

### METHODS

Student borrowers were classified into forty-three academic major areas. These areas are official academic departments of U.S.L. They are also among the disciplines recognized in the U.S. Office of Education, Higher Education General Information Survey (HEGIS).[9]

Monographs circulated to the students were grouped into the same forty-three academic areas, according to the books' classification numbers, using the method developed by McGrath and Durand.[10] Two computer programs were written to process yearly circulation on U.S.L.'s UNIVAC SPECTRA 70/45.

The first, written in COBOL, processes a tape of book charges compiled from the library's IBM 357 data input system, using a file of student I.D. numbers, majors, and class years. It groups each student into one of the HEGIS categories according to his or her major, and each book's classification number into its proper HEGIS category. For each charge, the student's major and the book's subject area are not necessarily the same. The program separates charges according to whether they are graduate or undergraduate.

The second program in PL/1 arrays and prints the number of book charges into two rectangular, nonsymmetric matrices, one for graduates and one for undergraduates. The columns consist of academic majors (persons) and the rows of academic subjects (bodies of knowledge). Each cell of the matrix contains the number of books charged according to the subject of the row and the major of the column, so that the number of books charged in any subject by any major group is determined.

Four matrices for two years' circulation, 1974/75 and 1975/76, were constructed, two for undergraduates and two for graduates. Two years' data were collected since circulation patterns may change over time. The

matrices are too large to include in this paper. Instead, an excerpt with typical data is shown in table 1.

One test for the validity of subject classification can be made by examining the numbers in the diagonal. Students should ordinarily borrow more books in the subject of their own major than in other subjects. If the data showed otherwise, subject classification of departments should be suspect. Disciplines selected as examples for the matrix in table 1 all have large diagonal cells.

For undergraduate diagonal cells, nineteen of forty-three in 1974/75 were largest and twenty-eight of forty-three in 1975/76. In nearly all cases where the diagonal cells were not the largest, English literature was larger, indicating heavy dependence by all majors. For graduate diagonal cells, seventeen of eighteen in 1974/75 were largest, and sixteen of nineteen in 1975/76. These ratios would suggest substantial validity of classification.

Unit of analysis in this study was the academic major or discipline. Variables were ethnocentricity and cross-disciplinary support (supportiveness). Scores for ethnocentricity were percentages obtained by dividing each diagonal value by the total in its respective column. Scores for supportiveness were percentages obtained by dividing each row total, less its diagonal value, by the row total. Percentages were obtained for all disciplines for both academic years, 1974/75 and 1975/76.

Pearson product-moment correlations were then used to test the similarity of the percentages for the two years. Two-year

correlations for undergraduate ethnocentricity, graduate ethnocentricity, undergraduate supportiveness, and graduate supportiveness were 0.83, 0.85, 0.91, and 0.80 respectively. These correlations were high enough to indicate little change of circulation patterns over two years. All subsequent analysis, therefore, was done on the averages for the two years.

Pearson correlations were also used to test the relationship between the two concepts of ethnocentricity and supportiveness. Spearman rank correlation was used to test shifting of ranks between undergraduate and graduate majors. Student's t-test was used to test the difference between means of undergraduates and graduates.

## RESULTS

### *Ethnocentricity*

Table 2 shows results relating to question 1, the extent that undergraduate students use books on subjects in their own major. Music students, for example, borrowed 924 books about music in 1974/75, but they borrowed a total of 1,278 books on all subjects, or 72.3 percent. Similarly, in 1975/76, they borrowed 71.1 percent in their own field. The average of these two percentages was 71.7.

Majors are ranked according to this average percentage. The higher the percentage, the more ethnocentric the major. That is, students in high ethnocentric disciplines read in their own subject more than they do in other subjects. The lower the percentage, i.e., the less ethnocentric, the more reading they do in subjects other than their own major. Among undergraduates, music

## TABLE 1
CIRCULATION MATRIX OF SUBJECTS AND MAJORS,
GRADUATE STUDENTS, 1975/76, EXCERPT SHOWING FORMAT

| Subjects | Majors | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Biology | Chemistry | Computer Science | Education | French | History | Mathematics | Music | Psychology | Speech |
| Biology | 450 | 3 | 32 | 68 | 1 | 3 | 3 | 0 | 54 | 2 |
| Chemistry | 15 | 102 | 3 | 22 | 0 | 1 | 4 | 0 | 2 | 0 |
| Computer Science | 0 | 0 | 731 | 3 | 0 | 0 | 2 | 0 | 0 | 9 |
| Education | 0 | 0 | 28 | 1,672 | 4 | 5 | 5 | 0 | 11 | 41 |
| French | 0 | 0 | 0 | 96 | 653 | 12 | 2 | 0 | 0 | 0 |
| History | 28 | 5 | 11 | 256 | 45 | 862 | 1 | 0 | 17 | 6 |
| Mathematics | 35 | 3 | 186 | 45 | 0 | 2 | 561 | 0 | 32 | 5 |
| Music | 2 | 8 | 10 | 264 | 1 | 5 | 0 | 166 | 11 | 4 |
| Psychology | 18 | 0 | 2 | 534 | 10 | 11 | 1 | 2 | 483 | 90 |
| Speech | 0 | 0 | 0 | 82 | 0 | 2 | 0 | 0 | 1 | 375 |

## TABLE 2

ETHNOCENTRICITY, UNDERGRADUATE LEVEL:
PERCENT OF BOOKS ON ALL SUBJECTS
CHARGED BY STUDENT MAJORS
IN THEIR OWN MAJOR SUBJECT;
RANK ORDER OF
AVERAGE PERCENT BY MAJOR

| Rank | Student Majors | Two-Year Average Percent |
|---|---|---|
| 1 | Music | 71.7* |
| 2 | English | 44.6 |
| 3 | History | 42.6 |
| 4 | Electrical Engineering | 41.6 |
| 5 | Civil Engineering | 36.8 |
| 6 | Spanish | 34.6 |
| 7 | Architecture | 33.8 |
| 8 | Home Economics | 29.6 |
| 9 | Microbiology | 28.7 |
| 10 | Geology | 25.9 |
| 11 | Petroleum Engineering | 24.5 |
| 12 | Mathematics | 23.3 |
| 13 | Psychology | 23.0 |
| 14 | Fine Arts | 21.8 |
| 15 | Horticulture | 21.2 |
| 16 | Political Science | 21.1 |
| 17 | Speech | 21.0 |
| 18 | Sociology | 20.0 |
| 19 | Philosophy | 19.4 |
| 20 | Computer Science | 18.6 |
| 21 | Applied Arts | 18.3 |
| 22 | French | 17.9 |
| 23 | Chemical Engineering | 17.1 |
| 24 | Mechanical Engineering | 16.7 |
| 25 | Economics | 16.5 |
| 26 | Biology | 15.9 |
| 27 | Physics | 12.9 |
| 28 | Agriculture | 12.8 |
| 29 | Nursing | 11.8 |
| 30 | Industrial Arts | 9.4 |
| 31 | Accounting | 8.7 |
| 32 | Medical Records | 8.4 |
| 33 | Marketing | 8.3 |
| 34 | Special Education | 6.9 |
| 35 | Education | 5.3 |
| 36 | Finance | 5.1 |
| 37 | Chemistry | 5.1 |
| 38 | German | 4.5 |
| 39 | Journalism | 3.3 |
| 40 | Management | 3.2 |
| 41 | Geography | 2.8 |
| 42 | General Business | 1.3 |
| 43 | Vocational Education | 0.0† |

*Most ethnocentric.
†Least ethnocentric.

majors are most ethnocentric; geography, general business, and vocational education majors are least ethnocentric. These results are, of course, for aggregate use. Patterns of individual use may well be different.

Table 3 shows the extent that graduate students charged out books in their own major and their ranks. Here music is again ranked highest in ethnocentricity and management lowest.

*Supportiveness*

Table 4 shows the data relating to question 2: the extent that undergraduate subjects are supportive of major areas other than their own. Taking music again as an example, 70.3 percent of books on music were charged out in the two years by undergraduate nonmusic majors.

The subjects are ranked according to the two-year average percentages of books taken out by nonmajors. A higher percentage indicates less book use in a subject by students majoring in that subject, and more by students majoring in other subjects. That is, the higher the percentage, the more that subject supports other academic subjects. For example, German and vocational education ranked highest in supportiveness with nearly 100 percent of the books in these subjects checked out by other majors. Nursing was least supportive, with 24.7 percent.

Table 5 shows the extent that graduate subjects are supportive of other major areas and their ranks. Here, management was most supportive and computer science the least.

## TABLE 3

ETHNOCENTRICITY, GRADUATE LEVEL:
PERCENT OF BOOKS ON ALL SUBJECTS
CHARGED BY STUDENT MAJORS
IN THEIR OWN MAJOR SUBJECT;
RANK ORDER OF
AVERAGE PERCENT BY MAJOR

| Rank | Student Majors | Two-Year Average Percent |
|---|---|---|
| 1 | Music | 87.4 |
| 2 | Spanish | 85.0 |
| 3 | English | 74.3 |
| 4 | Mathematics | 71.6 |
| 5 | Sociology | 65.3 |
| 6 | French | 64.1 |
| 7 | Psychology | 55.8 |
| 8 | Chemistry | 49.7 |
| 9 | History | 48.2 |
| 10 | Computer Science | 45.7 |
| 11 | Geology | 38.8 |
| 12 | Speech | 36.5 |
| 13 | Home Economics | 32.8 |
| 14 | Microbiology | 32.2 |
| 15 | Physics | 31.0 |
| 16 | Political Science | 25.0 |
| 17 | Geography | 23.7 |
| 18 | Education | 23.3 |
| 19 | Management | 2.2 |

## Undergraduate and Graduate Differences

Results from question 3, the difference between undergraduate and graduate use, are shown in tables 6 and 7. Considerable shifting of ranks from the undergraduate level to the graduate level for both ethnocentricity and supportiveness is apparent, as the correlation coefficients in table 6 show. For example, whereas undergraduate

### TABLE 4

SUPPORTIVENESS, UNDERGRADUATE LEVEL:
PERCENT OF TOTAL BOOKS CHARGED IN EACH
SUBJECT BY NONMAJORS IN THE SUBJECT;
RANK ORDER OF AVERAGE PERCENT

| Rank | Subject | Two-Year Average Percent |
|---|---|---|
| 1 | Vocational Education | 100.0* |
| 2 | German | 99.8 |
| 3 | Geography | 96.0 |
| 4 | Finance | 94.1 |
| 5 | Philosophy | 93.8 |
| 6 | Chemistry | 93.4 |
| 7.5 | General Business | 93.0 |
| 7.5 | History | 93.0 |
| 9 | English | 92.8 |
| 10 | Spanish | 92.6 |
| 11 | Economics | 91.8 |
| 12 | Industrial Arts | 91.6 |
| 13 | French | 90.2 |
| 14 | Physics | 89.5 |
| 15 | Math. & Statistics | 88.9 |
| 16 | Management | 88.0 |
| 17 | Horticulture | 84.7 |
| 18 | Biology | 84.2 |
| 19 | Psychology | 84.1 |
| 20 | Sociology | 83.4 |
| 21 | Home Economics | 81.9 |
| 22 | Applied Arts | 81.6 |
| 23 | Speech | 79.5 |
| 24 | Civil Engineering | 78.7 |
| 25 | Special Education | 78.5 |
| 26 | Agriculture | 76.9 |
| 27 | Fine Arts | 76.1 |
| 28 | Microbiology | 75.2 |
| 29 | Marketing | 74.1 |
| 30 | Journalism | 73.0 |
| 31 | Mechanical Engineering | 71.0 |
| 32 | Music | 70.3 |
| 33 | Political Science | 66.0 |
| 34 | Geology | 64.3 |
| 35 | Chemical Engineering | 59.9 |
| 36 | Computer Science | 54.5 |
| 37 | Medical Records Tech. | 42.5 |
| 38 | Education | 39.1 |
| 39 | Petroleum Engineering | 38.6 |
| 40 | Electrical Engineering | 32.8 |
| 41 | Accounting | 27.2 |
| 42 | Architecture | 26.1 |
| 43 | Nursing | 24.7† |

*Most supportive.
†Least supportive.

### TABLE 5

SUPPORTIVENESS, GRADUATE LEVEL:
PERCENT OF TOTAL BOOKS CHARGED IN EACH
SUBJECT BY NONMAJORS IN THE SUBJECT;
RANK ORDER OF AVERAGE PERCENT

| Rank | Subject | Two-Year Average Percent |
|---|---|---|
| 1 | Management | 98.5* |
| 2 | Home Economics | 97.9 |
| 3 | Physics | 85.0 |
| 4 | Spanish | 82.8 |
| 5 | Chemistry | 78.7 |
| 6 | Music | 76.1 |
| 7 | Psychology | 72.6 |
| 8 | Political Science | 70.9 |
| 9 | Geology | 55.5 |
| 10 | Biology | 55.2 |
| 11 | History | 53.8 |
| 12 | French | 47.0 |
| 13 | Geography | 46.1 |
| 14 | Microbiology | 35.6 |
| 15 | Speech | 34.3 |
| 16 | English | 32.6 |
| 17 | Mathematics | 32.1 |
| 18 | Education | 19.7 |
| 19 | Computer Science | 13.1† |

*Most supportive.
†Least supportive.

biology majors ranked twenty-sixth of forty-three (table 2) in ethnocentricity, graduate biology majors ranked fifth of nineteen (table 3). The shift for ethnocentricity was substantial ($r=0.53$) and considerably greater for supportiveness ($r=0.25$).

Table 7 shows significant differences in the mean percentage levels for both ethnocentricity and supportiveness. The results show the mean percentage for ethnocentricity to be twice as high at the graduate level. The results also show that most disciplines are considerably less supportive at the graduate level.

Hypotheses 3(*a*) and 3(*b*) were thus retained, and 3(*c*) and 3(*d*) were rejected, as expected, supporting the contention that differences exist at the undergraduate and graduate levels.

### TABLE 6

CORRELATION BETWEEN UNDERGRADUATE
AND GRADUATE LEVELS,
SPEARMAN RANK ORDER COEFFICIENTS

| | Correlation Coefficient | Number |
|---|---|---|
| Ethnocentricity | 0.53 | 18 |
| Supportiveness | 0.25 | 18 |

## Ethnocentricity versus Supportiveness

Results for question 4 are shown in table 8. The virtual zero coefficients ($-0.03$, undergraduate, and $-0.05$, graduate) indicate little and probably no relationship between the two concepts. Thus, hypotheses 4(*a*) and 4(*b*) were retained as expected.

### DISCUSSION

Graduate student reading was more ethnocentric than undergraduate, in that graduate students showed a higher percentage of reading in their own subjects. This supports the commonly held belief that graduate reading is more specialized. Interdependence is indeed broader at the undergraduate level. Campbell, of course, asserted that graduate students were too specialized. Measurement of this specialization, as undertaken here, may provide a means for observing this specialization over time. It would be interesting to know whether students will be less or more specialized ten years from now.

It is clear from the low correlation and different percentages that the two concepts—ethnocentricity and supportiveness—are not the same and in fact are very different. One is a characteristic of the persons specializing in a discipline. The other is a characteristic of a discipline's relevance to persons outside of the discipline.

The findings for ethnocentrism may also have relevance in terms of Kuhn's concept of paradigm development of disciplines, sometimes referred to as hard or soft. For example, if students make more use of books in their own major, that major may be farther along the continuum of paradigm development. Inversely, the more reading they do outside of their discipline, the less well developed the paradigm.

This interpretation is cautious, since the patterns shown are not in agreement with

#### TABLE 7

COMPARISON OF UNDERGRADUATE
AND GRADUATE LEVELS.
DIFFERENCE BETWEEN MEAN PERCENTAGES

|  | Undergraduate | Graduate | Difference | Number |
|---|---|---|---|---|
| Ethnocentricity | 23.8 | 47.0 | 23.2* | 19 |
| Supportiveness | 80.2 | 57.2 | 23.0* | 19 |

*Differences significant at 0.01 level for 34*df*.

#### TABLE 8

CORRELATIONS BETWEEN ETHNOCENTRICITY
AND SUPPORTIVENESS.
PEARSON PRODUCT MOMENT COEFFICIENTS

|  | Correlation Coefficient | Number |
|---|---|---|
| Undergraduate | $-0.03$ | 42 |
| Graduate | $-0.05$ | 18 |

studies showing paradigm development. For example, English, showing high ethnocentrism in this study, is not regarded as a high paradigm discipline, in Kuhnian terms. Likewise, geology, showing low ethnocentrism, would not be regarded as a low paradigm discipline. Relationship between ethnocentricity and paradigm development must remain a hypothesis, therefore.

How much the findings for supportiveness reflect theory and how much purely local conditions is very uncertain at this stage. A discipline showing high supportiveness for other disciplines may also be interpreted as having high self-supportiveness. Findings to a large extent must be a function of the local curriculum, distribution of enrollment, and size of collection.

In terms of aggregate use, the findings have obvious implication and interest to campus politics (for both ethnocentrism and supportiveness). In terms of competition for library funds and for building collections relevant to particular subject fields, faculty often argue that their teaching and research range beyond the immediate confines of their own discipline, often implying that this is not true of other areas and that allocations should take this into account. Presumably, this argument holds for student use as well. As these findings show, it is indeed true, and to a measurable degree, that library use, both by major and subjects of books used, ranges beyond the indicated discipline. The measured degree is large for some and small for others and forms a continuum with disciplines all along the scale.

The findings suggest that a better case can perhaps be made for allocation on the basis of total subject usage rather than on total major usage. After all, it is use made of the books in the collection that is of primary interest to collection builders. A third possibility would be to allocate on the basis of use in a major's own subject (the diagonal in

table 1), but this would tend to slight students who are interested in subjects other than their own and to arbitrarily restrict the range of book selection.

Patterns of the kind discussed here, though the findings are merely indicative or tentative and not conclusive, may also be used to help determine other kinds of priorities. On the other hand, it can be argued that existing university priorities—e.g., enrollment quotas, departmental emphases, curriculum completeness—strongly influence what circulates from the library.

Finally, no value judgments concerning ethnocentricity or supportiveness of students and faculty are intended here, nor should any be inferred from either the question or the results. Numerical values for these concepts, of course, are specific to the university studied because of its enrollment distribution and cannot be readily generalized from the data given here. "Acceptable" levels of ethnocentricity and supportiveness—high, low, or otherwise—do not exist and probably should not.

On the other hand, we can hypothesize that the relationship, or rather the differences, between undergraduate and graduate interdependence and the difference between ethnocentricity and supportiveness also hold at other institutions.

## FURTHER RESEARCH

Findings for supportiveness might be more generalizable if the "main effects" of the matrix—i.e., the row and column means—were subtracted from each cell, thus offering a means of comparing one environment to another. This correction may also throw light on the paradigm question. Correlation studies may be done on the relationship between paradigm development and ethnocentricity. A multidimensional scaling of the entire matrix of majors and subjects is being undertaken. This analysis should identify clusters of subjects and clusters of majors and should measure both the degree of dependence of each discipline within a cluster and the distance between clusters. This would provide another test of Campbell's model.

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