

DOCUMENT RESUME

ED 033 668

HF 001 193

AUTHOR Face, C. Robert
TITLE The Measurement of College Environments.
INSTITUTION California Univ., Los Angeles. Center for
the Study of Evaluation.
Spons Agency Office of Education (DHEW), Washington,
D.C. Bureau of Research.
Bureau No ED-6-1646
Pub Date 68
Note 23p.; Reprinted from Organizational
Climate: Explorations of a Concept. Renato
Tagiuri and George H. Litwin (Editors),
Boston: Graduate School of Business
Administration, Harvard University, 1968.

EDRS Price MF-\$0.25 HC-\$1.25
Descriptors Behavior, Controlled Environment,
*Environment, Environmental Criteria,
*Environmental Research, *Higher
Education, *Institutional Environment,
*Measurement, Methodology, Research

Abstract

In characterizing college and university environments, there have been 4 general approaches to measurement: "environmental press," individual characterization, demographic characteristics, and individual behavior. Despite different means of measurement, there are some general similarities in the results that indicate that college environments may be characterized by their degree of intellectualism, humanism and estheticism, vocationalism or pragmatism, and sense of community. Analyses of studies suggest certain tentative conclusions. First, certain types of institutions--denominational, junior colleges, state universities, etc.--tend to have quite similar profiles. Secondly, many pieces of the college environment fit together in ways that do not correspond to common organizational categories. For instance, the degree of success of independent study programs may depend upon the amount of responsibility that students are given in non-academic areas. Further studies of college environments need to explore additional dimensions and directions. There are different contents of inquiry and methods of approach for such studies. This type of inquiry may be labelled the study of "climates"--namely, the particular combination of causes associated with a specific result. (DS)

BR-6-1646
PA-24
DE/BR

ED033668

THE MEASUREMENT OF
COLLEGE ENVIRONMENTS

By
C. Robert Pace

Reprint #1

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION
POSITION OR POLICY.



HE001 193

UCLA
Graduate School of Education
Los Angeles, California



Marvin C. Alkin
Director

UCLA Graduate School of Education

The **CENTER FOR THE STUDY OF EVALUATION (CSE)** is one of nine centers for educational research and development, sponsored by the United States Department of Health, Education, and Welfare, Office of Education. Established at UCLA in June, 1966, CSE is devoted exclusively to finding new theories and methods of analyzing educational systems and programs and gauging their effects.

The Center serves its unique function with an interdisciplinary staff whose specialties combine for a broad, versatile approach to the complex problems of evaluation. Study projects are conducted in three major program areas: Evaluation of Instructional Programs, Evaluation of Educational Systems, and Evaluation Methodology and Services.

ED033668

THE MEASUREMENT OF COLLEGE
ENVIRONMENTS*

C. Robert Pace

* Reprinted from *Organizational Climate: Explorations of a Concept*. Renato Tagiuri and George H. Litwin (Editors), Boston: Graduate School of Business Administration, Harvard University, 1968.

C. Robert Pace

is Professor of Higher Education at the University of California, Los Angeles. Previously he was Instructor at the University of Minnesota, Director of the Evaluation Center, Syracuse University, and Chairman of the Department of Psychology, Syracuse University. He also served the Navy Department as Head of the Research Unit, Bureau of Naval Personnel, and the Commission on Teacher Education, American Council on Education, as Research Associate. He holds the BA degree from De Pauw University and the MA and PhD degrees from the University of Minnesota.

Dr. Pace is a pioneer in the studies of college environments. His publications include How to Get into College (with F. Bowles and J. Stone, E. P. Dutton, 1968); Analyses of a National Sample of College Environments (U.S. Office of Education, Project No. 5-0764, 1967); and Evaluation in Teacher Education (with M. E. Troyer, American Council on Education, 1944).

The Measurement of College Environments

Although many psychologists have long been engaged in the study of individual differences, it is only recently that a few psychologists have turned their attention to the study of institutional differences. Perhaps this is because institutions have been regarded as in the domain of sociology; but in so far as human behavior exists in and is influenced by social contexts, the study of such contexts interacts naturally with the study of behavior. In the psychologist's vocabulary, institutions or organizations can be seen as complex "stimuli." In the educational researcher's vocabulary, institutions can be seen as complex "treatments." In either case, whether as stimuli or as treatments, there is an assumed relationship between stimulus and response, or between treatment and outcome or attainment.

Colleges and universities are the type of institutions with which the present chapter is concerned. In studying them, researchers have more commonly used the word "environment" than the word "organization" in describing the focus of their research. Perhaps this reflects a view that colleges are a special class of organizations, differing both in purpose and in structure from military, entrepreneurial, bureaucratic, and other organizations; and a consequent desire to avoid associations which many people might make with the word organization — such as authority, supervision, span of control, efficiency, productivity. Whatever the reasons may be, most of the research described in this chapter has not been guided by any specific or dominant interest in these aspects of organizational structure or purpose. This is not to say that such an interest would be inappropriate; it is merely to say that so far

it has not been prominent. Up to now, the research interest in the college environment has been directed primarily to exploring new ways of viewing and measuring the atmosphere, the style of life, or the general institutional context, within which student learning, growth, and development take place. In this rather global type of inquiry, organizational structure, policies, procedures, etc., are aspects of the total environment.

The perspective from which the college environment has been viewed, the measures used in viewing it, and the conclusions reached about it can be seen as related to the questions that have been asked. What image do people have of the environment? Who lives in the environment? What demographic features does the environment possess? How do people behave in the environment? *

METHODS AND MEASURES

The first systematic and objective measuring instrument for characterizing college environments, the College Characteristics Index, CCI (Pace and Stern, 1958) was stimulated by Henry Murray's need-press theory and by a practical interest in expanding the information which might usefully be considered in college admissions studies.

When students enroll in college they are presumably entering a new environment — presenting an assortment of expectations and activities, pressures and rewards, facilities and people, to which they must make adaptive responses. These characteristic demands and features as perceived by the students are called the environmental press. In Murray's theory,

* The following two sections of this paper, headed "Methods and Measures," and "Major Dimensions of Environment," are taken from an article, "College Environments," which I wrote in September 1966 for inclusion in the Fourth Edition of the *Encyclopedia of Educational Research*, being edited by Robert Ebel and Victor Noll. Since the Encyclopedia will not be ready for publication until 1969, the editors have given me permission to reproduce these portions of the article at this time.

environmental presses are viewed as counterparts to personality needs, and performance in the environment is seen as a function of the congruence between need and press. The concept of environmental press determined the type of items composed for the CCI, items which could be regarded as environmental counterparts to a set of 30 personality needs included in the Stern Activities Index, or AI. For example, a personality need for "order" would presumably find reward in an orderly environment in which, let us say, students had assigned seats in class and had regular tests, and in which the objectives of courses were clear and specific. Or, a personality need for "affiliation" would presumably find support and satisfaction in an environment where friendships were easily formed, professors were interested in students' problems, and a strong sense of belonging and group loyalty was evident. Although there was no explicit guide line for determining the content of items, an effort was made to include a great variety of events, conditions, and practices which might be found on different college campuses and which would have meaning and importance for students and educators.

The strategy followed by Stern (1960) in analyzing and interpreting the results obtained from the CCI has been to use the responses of individuals as the unit of analysis: that is, responses of students from different schools are put into a common matrix and are undifferentiated as to which school any given student's reply refers. This produces a set of factors which characterize students' perceptions of environments in general. Among the labels given to these factors in a recent report (Stern, 1965) are: vocational climate, intellectual climate, aspiration level, student dignity, self-expression, group life, and social form.

The combination of need and press, represented by the intended parallelism between AI and CCI, has not been empirically demonstrated as fully as had been hoped. Except

for one large joint factor which concerns intellectual needs and the intellectuality of environments, each instrument produces its own unique set of factors (Saunders, 1962). In a further illustration of this (Stern, 1962), need-press scales classified under three major groupings — intellectual orientation, social relationships, and emotional expression — indicated that in the first group one-third of the scales were not parallel, and in the other two groups two-thirds of the scales were not parallel.

In Pace's strategy (1960) for analyzing the CCI, which uses the institutional mean scores rather than the scores of individuals as the unit of analysis, and in the development of other instruments for describing the college environment using the collective perceptions of students as the basis for measurement, the need-press model has not been followed. For example, in the College Characteristic Analysis (Pace, 1964) items were written and selected to fit a specifically developed outline of educational content. There were three major categories: first, administrative sources of press, referring to rules and regulations, general features, and facilities; second, academic or faculty sources of press, referring to characteristics of faculty members, courses and curricula, and instructional practices and demands; and third, student sources of press, referring to student characteristics, informal activities and interests, and extracurricular programs.

Another instrument, College & University Environment Scales, or CUES (Pace, 1963) is now being widely used. In its present form it consists of half of the CCI items, selected to measure most sharply the major dimensions along which a normative group of 50 college environments differed. The scoring and interpretation of CUES follow the rationale of public opinion polling. If students agree, by a consensus of two to one or greater, that a statement is true about their college, then that statement is scored or counted as characteristic of the college. The institutional score is determined

by the number of statements that are characteristic of its environment. The scales are labeled Scholarship, Awareness, Community, Propriety, and Practicality.

Other examples of the image or collective perception approach to describing environments are the college press scales developed by Thistlethwaite (1959). These scales are divided into two groups — faculty press scales and student press scales. Thistlethwaite's purpose was to identify items and item combinations which were related to a criterion index — namely, the institutions' productivity of future doctorates in the natural sciences, and in the arts, humanities, and social sciences. The type of item used was similar to those in the CCI. The purpose, however, was not to describe the general environment, but rather those aspects of the environment that are related to scholarly productivity. Scales similar to some of Thistlethwaite's were also used in a study of the Carnegie Tech environment (Kirk, 1965).

A different way of characterizing environments is to characterize the type of people who live in them. Striking differences between institutions in the mean scores of entering freshmen on the American Council on Education Psychological Examination were reported by Darley (1962). The Cornell values study (Goldsen and others, 1960) revealed large differences between the student bodies at eleven universities in educational values, with 80% of the students at one school indicating that vocational training was their main goal compared with only 30% of the students at another school. Even within the restricted range of medical schools, Gee and Glazer (1958) found large differences not only in aptitude but also in value orientation as measured by the Allport-Vernon-Lindzey Study of Values. McConnell and Heist (1962) cite an example of two liberal arts colleges whose entering classes were alike in scholastic aptitude but distinctly different in many of the traits measured by the Omnibus Personality Inventory. The implication of these

studies is that the atmosphere of a college may largely be determined by the types of students who enroll in it.

The Environmental Assessment Technique, or EAT (Astin and Holland, 1961), is based on this proposition. EAT assumes that the college environment or atmosphere is a product of its size, the average intelligence of students, and the personal characteristics of the students. Holland's Vocational Preference Inventory classified occupations into six categories related to personality characteristics: realistic, intellectual, social, conventional, enterprising, and artistic. A person's vocational choice is really a kind of personality test, since there are typical personality differences between occupational categories. Extending this empirically validated proposition to college students, who are not yet in occupations, requires only that one regard the student's major field of study as a forerunner of his later occupation. Then, by classifying major academic fields into the same six types that occupations have been classified, and noting what proportions of students at a given college are majoring in these subjects, one can characterize the environment as being predominantly enterprising, conventional, artistic, etc., as the case may be. The virtue of this approach is that one can get all the necessary information from public sources. Astin (1965a) demonstrated this by publishing standard scores on each of the eight EAT variables for all of the 1,000 or so accredited four-year colleges and universities.

Another approach based on the assumption that students make the college is the typology of student subcultures described by Trow (1960) and used by Educational Testing Service in its College Student Questionnaire (Peterson, 1965). Impressions gained by Clark and Trow from visiting several campuses and from observing and interviewing students led them to speculate that there were four main types of campus subcultures — vocational, collegiate, academic, and nonconformist. In the ETS questionnaire the characteristic values

and orientations of each of these subcultures are presented to students in brief paragraph descriptions; and the student is asked to indicate which description comes closest to reflecting his values and interests, which come next closest, etc. The institutional atmosphere can be characterized by the proportion of students identifying themselves with each of these four value patterns.

A third question which has guided the study of college environments is: what demographic characteristics does the environment have? One of Astin's studies (1962a) illustrates this. He looked up some 33 pieces of information obtainable from directories or other public sources — such as size, form of control, proportion of men and women in the student body, number of fields in which degrees are offered, faculty-student ratio, percent of PhDs on the faculty, size of operating budget, ratio of library size to enrollment. From a factor analysis of these data on about 300 schools, he identified five factors which he called affluence, size, masculinity, homogeneity of offerings, and technical emphasis. A similar study (Richards, 1965) of junior colleges identified a somewhat different set of factors — cultural affluence, technological specialization, size, age, transfer emphasis, and business orientation. There appears to be no particular theory which underlies this type of approach.

The fourth guiding question is: how do people behave in the environment? Becker and others (1961) through extended participant observation in the Kansas Medical School viewed the student culture as illustrating a set of perspectives and responses to commonly perceived environmental pressures. In a subsequent study of general undergraduate life at the University of Kansas, Becker (1963) reported that pre-freshmen had very hazy perspectives. As they moved through the freshman year, however, they came to define college as a place in which one demonstrated that he has become a mature adult. This is demonstrated by being successful; and

success, in turn, is defined as earning acceptable grades, making friends, and participating in campus activities and organizations. How students behave on the campus is seen as a response to these perspectives about the institution.

As part of a larger study in which objectively observable behavior is the focus of inquiry, Astin (1965b) reported an analysis of classroom environments. He asked students to report about their own behavior and that of their instructors, using such items as the following: the instructor encouraged discussion; I was in the instructor's office one or more times; students had assigned seats; the instructor called students by their first names; I took notes regularly; we sometimes had unannounced quizzes. The results showed that there were systematic differences in classroom environments among various fields of study.

Within certain limits, no one methodology or measuring device is logically or empirically superior to all others. Moreover, a comparison of existing devices with Barton's analysis (1961) of organizational measurement suggests that much more needs to be measured. Some current approaches, however, are broader or more direct than others. The factoring of an assortment of demographic characteristics is probably the farthest removed from being a direct measure of what impinges upon the life of the students. The approaches which emphasize student characteristics have the limiting assumption that the character of the environment is largely determined by the character of the people who inhabit it. This is partly true, but it is not the whole truth. The EAT assumes that the choice of a major field of study produces the same sort of personality differentiations as the choice of an occupation, an assumption which may be considerably less valid for many women liberal arts students than it is for vocationally oriented men. In another sense, EAT is based on the proposition that the character of the environment is largely determined by the breadth of curricular offerings in

the college. Measures based on the collective perception of students or on observable student behavior appear to be the most direct. These two direct approaches are also complementary. The work by Becker and his colleagues (1963) illustrates this interrelationship. His basic data are directly observed events and behavior, but these data are given meaning and significance by showing that much of the behavior is a response to collectively perceived environmental or institutional demands.

MAJOR DIMENSIONS OF ENVIRONMENT

Despite differences in approach, strategy, and assumptions, and despite differences in item content, there appear to be some general similarities in the results that have been obtained. These similarities can be regarded as major dimensions along which college environments differ. All the investigations find some kind of an intellectual or scholarly dimension — indicated by perceived environmental press for academic achievement, or scholarship, intellectual orientation of students, academic selectivity of the institution, the importance of getting acceptable grades. Many of the studies also find a variable which appears similar to the Awareness scale on CUES, a variable which is also intellectual in its general character but which emphasizes humanistic and esthetic matters — for example, self-expression, humanistic-intellectual press, artistic orientation. Most of the investigations also find a vocational or pragmatic or instrumental variable — for example, vocational climate, faculty press for vocationalism and compliance, vocational student culture, realistic emphasis. To some extent this appears to be an opposite of the scholarship dimension. But there is also associated with this variable in some of the studies a mixture of collegiate and bureaucratic elements — for example, play, student camaraderie, press for status, collegiate student culture, the importance of student activities, and the sheer size

of the institution. Many of the studies also produce a dimension similar to the Community scale in CUES—friendliness, faculty affiliation, social orientation, small size, and the importance of making friends. To some extent there appears to be a dimension similar to the Propriety scale in CUES—suggested by such variables from other studies as social form, constraint, social conformity, age and tradition, and non-masculinity.

Although different approaches and different questions produce somewhat different answers, no approach has yet produced answers which are contrary or opposite to those produced by other methods. Whether the environment is characterized by the collective perceptions of the students who live in it, or whether it is described by information about student behavior, student characteristics, the emphasis in the college curriculum, or other factors such as size, selectivity, and financial resources, the results are generally congruent. In general, the degree of similarity which one might reasonably expect between the measures are expressed by correlations ranging from the low .30s to the high .60s.

ILLUSTRATIVE CONCLUSIONS

What has been demonstrated up to this point is that college environments differ greatly from one another in many measurable characteristics. These differences in environments are at least as great as the differences between student bodies. Moreover, the accumulated results indicate clearly that the common classifications of institutions mask a great deal of diversity. For example, liberal arts colleges, as a class, run the gamut from top to bottom scores on all five of the dimensions measured by CUES. At the same time, recent analyses of CUES scores from a national assortment of 100 institutions show that there are groups of institutions which tend to have quite similar profiles. Highly selective liberal arts colleges, private nonsectarian, typically have very high

scores on Scholarship and Awareness, very low scores on Practicality, and substantially above average scores on Community and Propriety. Highly selective universities, public and private, also typically have very high scores on Scholarship and Awareness, and very low scores on Practicality; but they have very low scores on Community and Propriety. Colleges of Engineering and Sciences typically have very high scores on Scholarship, and typically low or below average scores on all the other scales. State colleges, as distinguished from more comprehensive universities, tend to have low scores on Scholarship, Awareness, and Community, about average scores on Propriety, and high scores on Practicality. Junior colleges tend to have low scores on Scholarship, Awareness, average scores on Community, and above average scores on Propriety and Practicality. Strongly denominational colleges have very high scores on both Community and Propriety. Having identified certain clusters of homogeneity within the wide diversity of institutions, we have not yet gone on to see whether there might be any common organizational characteristics associated with any of these homogeneous clusters.

Another conclusion which might be drawn from many of the college studies, although it has not been emphasized in the literature, is that many pieces of the college environment fit together in ways which do not correspond to common organizational categories. For example, one might think that independent study programs and honors programs were academic matters; but they are not entirely so, for their objectives are not likely to be attained unless many other pieces of the college environment are supportive. How can one foster independence and responsibility in scholarship, if, at the same time, students cannot help themselves to books in the library stacks, if student organizations are closely supervised to guard against mistakes, if fraternities and sororities have "study hours," if dormitories have curfews, if student

newspapers are censored, if in most classes professors take attendance and give frequent tests? In other words, classroom practices, student personnel policies, library rules, peer group activities, all of which are organizationally separate, are nevertheless functionally related; and the extent to which they produce a congruent and cumulative environmental press is crucial for the attainment of a particular objective.

In one of my own studies a few years ago (Pace, 1964) I developed a test called the CCA (College Characteristics Analysis) in which the content of the items was systematically determined as described earlier in this paper. Each content category was represented by the same number of items. In this way one could examine how an institution got its scores: a Practicality press score of 20, for example, might in one school consist of 16 items reflecting Student sources of press, and 2 each reflecting Administrative and Faculty sources of press; whereas in another school, a score of 20 might be composed of 10 Student items, 10 Administrative items, and no Faculty items. In the first case one might say that the administration and the faculty were working together to reduce (or at least not to support) the Practicality press of the school. In the other case, one might say that the administration and the students were mutually supportive in maintaining a Practicality press in opposition to the faculty. More analyses of this kind might be fruitful.

SOME NEW DIRECTIONS

Future studies of college environments and colleges as organizations need to examine new dimensions and explore new directions. So far as theory and concepts are concerned, my own past studies and those of Holland, Astin, Thistlethwaite, and Stern have gone about as far as they are likely to go; although a good deal more will continue to be learned from applying the instruments that have been produced. I would not presume to say where research and theorizing

ought to go, but there are some lines of inquiry that impress me as well worth following.

The recent book, *College Peer Groups*, edited by Newcomb and Wilson (1966), has two chapters which I think are especially suggestive: one by Clark and Trow on "The Organizational Context," and one by Rossi on "Research Strategies in Measuring Peer Group Influences." I mention this simply to comment that the study of subcultures and subenvironments is a significant and enriching counterpart to the study of total environments. In addition to student cultures we should be studying faculty cultures and administrative cultures.

If our concept of environments is mainly one of interpersonal relations, then various notions from role theories are relevant. Leonard Baird's doctoral dissertation (1966) at UCLA, *Role Stress in Graduate Students*, is an excellent example of using role theories in understanding stress and performance in the graduate school environment. Part of the model for Baird's research came from the significant work of Kahn and others (1964) in the study of industrial organizations.

Whether one uses role theories or some other point of departure, it should be possible to characterize major patterns of student group associations, for these obviously influence the extent to which various educational goals are attained.

There are many other dimensions along which colleges and universities might be described: for example, variety and innovation in teaching modes, flexibility vs. rigidity in curricula and academic requirements, centralization vs. autonomy in organization, modes of internal communication among major segments of the institution, institutional anonymity vs. belongingness, and institutional morale.

It may be useful to re-examine many of the common descriptive statistics which institutional research offices rou-

tinely collect and which are often reported in educational directories — such as faculty-student ratio, ratio of men to women, ratio of graduate to undergraduate students, ratio of part-time to full-time students, percent of PhDs on the faculty, dollars per student spent on the library, class size, costs per credit hour, withdrawals and transfers. It is possible that some or many of these bits of information can and should be thought of as “test items” rather than as more generally meaningful indexes, and that some of them might be combined to form more useful characterizations. Moreover, there is surely a need to examine their relevance to the effectiveness of instructional programs. Many colleges may know that the faculty-student ratio, for example, is going up or going down, as the case may be, and that this has some connection with costs per student credit hour; but they rarely, if ever, have known whether there is any connection with the criterion of instructional effectiveness.

The development of better criterion measures is essential. It seems to me, at any rate, that organizational arrangements or indeed any sort of organized programs are meant to serve reasonably definable purposes. If we are ultimately to judge the goodness of organizational climates, the effectiveness of instructional programs, or any other institutional characteristic, we will have to develop better criterion measures of the multiple purposes of such organizations and programs.

CONTENT AND APPROACH IN THE GENERAL STUDY OF ENVIRONMENTS

Partly because theory is not explicit enough to prescribe what ought to be studied about environments in general, or about particular types of environments, the problem of deciding on the content of inquiry has no sure solution. The problem can, of course, be approached pragmatically, informed by broad knowledge about the situation to be studied

and familiarity with the relevant literature. S. B. Sells' list* of suggested categories provides a useful guide line for considering what kinds of content might be included. Many of the content categories I have used in writing items about college environments can be classified under Sells' categories. Given some such general guide line, one can develop a list of many specifics, or elements, or items which might be worth observing and tabulating. Having collected these specific data — demographic, perceptual, behavioral, etc. — from a sample of environments, one then can determine how these elements are combined to form variables or dimensions. And finally, examining how various organizations or environments "score" on these larger variables or measures, one can identify major types — patterns, profiles — of environments. This general sequence — from elements, to variables, to types — is similar to the approach of empirical psychologists interested in individual differences and personality. One begins with many specific observations: physical facts, abilities, skills, attitudes, values, interests, appreciations, activities; many of these specific facts or elements about individuals are related, so that, by various methods of data reduction, they can be combined to produce measures of traits or general characteristics; and finally, when traits are arranged in different patterns, one ends with the identification of different personality types.

This sequence of inquiry is applicable whether one chooses to look at the group environment of large businesses or the individual environment of one eleven-year-old boy in a small Kansas town. Beginning with the environment of an individual, as Herbert Wright does, one could go on to look for similarities in the environments of different individuals, and of individuals in different communities. Conceivably, the major dimensions and types that would emerge from extending Wright's approach to larger aggregates of indi-

* See Sells' paper in this volume.

viduals might resemble in many ways the dimensions and types that would emerge from a quite different starting point. In the studies of college environments, we have found a recognizable similarity in major variables and types, whether the starting point was demographic items, or collective perceptions, or aggregates of personal characteristics and behavior.

At several points in this paper I have referred to the importance of criterion measures in the study of organizations. The general approach described above, however, is not criterion-based; it is, rather, eclectic and comprehensive. If one approaches the task of characterizing environments in relation to some criterion measure, the resulting characterizations will be limited to those aspects of the environment related to the criterion, and other perhaps equally significant aspects of the environment in general will be by-passed. But, having followed a more comprehensive strategy which attempts to encompass an initially varied set of observations, and having subsequently identified significant dimensions and types, one can then introduce any number of criterion questions. For example, if a criterion is the production of scholars, using the percent of graduating seniors who enter graduate school and eventually obtain PhDs as an index of this criterion, we can then determine what aspects of the environment and what combinations of environmental characteristics are related to high productivity of scholars. The word "climate" seems most appropriate as the label for this type of inquiry—namely as the particular combination of characteristics associated with a criterion or a product: the climate for research, the climate for profit, the climate for innovation, the climate for happiness, the climate for learning, or the climate for productivity.

REFERENCES

- ASTIN, A. W. (1962a) "An Empirical Characterization of Higher Educational Institutions," *Journal of Educational Psychology*, 53: 224-235.
- ASTIN, A. W. (1962b) "Influences on the Student's Motivation to Seek Advanced Training: Another Look," *Journal of Educational Psychology*, 53: 303-309.
- ASTIN, A. W. (1965a) *Who Goes Where to College?* Chicago: Science Research Associates.
- ASTIN, A. W. (1965b) "Classroom Environment in Different Fields of Study," *Journal of Educational Psychology*, 56: 275-282.
- ASTIN, A. W. and J. L. HOLLAND (1961) "The Environmental Assessment Technique: A Way to Measure College Environments," *Journal of Educational Psychology*, 52:308-316.
- BAIRD, L. L. (1966) *Role Stress in Graduate Students*. Unpublished doctoral dissertation, University of California, Los Angeles.
- BARTON, A. H. (1961) *Organizational Measurement and Its Bearing on the Study of College Environments*. Princeton: College Entrance Examination Board.
- BECKER, H. S. (1963) "Student Culture," in *The Study of Campus Cultures*. Boulder, Colorado: Western Interstate Commission for Higher Education.
- BECKER, H. S. et al. (1961) *Boys in White: Student Culture in Medical School*. Chicago: University of Chicago Press.
- DARLEY, J. G. (1962) *Promise and Performance: A Study of Ability and Achievement in Higher Education*. Berkeley: University of California Press.
- DAVIS, J. A. et al. (1961) *Great Aspirations: Career Plans of America's June 1961 College Graduates*. Chicago: University of Chicago, National Opinion Research Center.
- DRESSEL, P. L. and L. B. MAYHEW (1954) *General Education: Explorations in Evaluation*. Washington, D.C.: American Council on Education.
- EDDY, E. D., Jr. (1959) *The College Influence on Student Character*. Washington, D.C.: American Council on Education.
- GEE, H. and R. J. GLAZER (1958) *The Ecology of the Medical Student*. Evanston, Ill.: Association of American Medical Colleges.
- GOLDSSEN, R. K. et al. (1960) *What College Students Think*. Princeton: Van Nostrand.

- JACOB, P. E. (1956) *Changing Values in College*. Hayfield, Minn.: Edward W. Hazen.
- KAHN, R. L. et al. (1964) *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: Wiley.
- KIRK, J. (1965) *Cultural Diversity and Character Change at Carnegie Tech*. Pittsburgh: Carnegie Institute of Technology.
- LAZARFELD, P. F. and W. THIELENS, Jr. (1958) *The Academic Mind: Social Scientists in a Time of Crisis*. New York: Free Press.
- McCONNELL, T. R. and P. HEIST (1962) "The Diverse College Student Population," in *The American College*. New York: Wiley.
- MERTON, R. K. et al., eds. (1957) *The Student Physician: Introductory Studies in the Sociology of Medical Education*. Cambridge: Harvard University Press.
- NEWCOMB, T. M. (1962) "Student Peer Group Influence," in *The American College*. New York: Wiley.
- Newcomb, T. M. and E. K. Wilson, eds. (1966) *College Peer Groups*. Chicago: University of Chicago, National Opinion Research Center.
- NICHOLS, R. C. (1965) *Personality Change and the College*. Evanston: National Merit Scholarship Corporation.
- PACE, C. R. (1969) "Five College Environments," *College Board Review*, 41: 24-28.
- PACE, C. R. (1963) *College and University Environment Scales: Technical Manual*. Princeton: Educational Testing Service.
- PACE, C. R. (1964) *The Influence of Academic and Student Subcultures in College and University Environments*. Los Angeles: University of California, USOE Cooperative Research Project 1083.
- PACE, C. R. and A. McFEE (1960) "The College Environment," *Review of Educational Research*, 30: 311-320.
- PACE, C. R. and G. G. STERN (1958) "An Approach to the Measurement of Psychological Characteristics of College Environments," *Journal of Educational Psychology*, 49: 269-277.
- PETERSON, R. E. (1965) *College Student Questionnaires and Technical Manual*. Princeton: Educational Testing Service.
- PLANT, W. T. (1962) *Personality Changes Associated with a College Education*. San Jose, Calif.: San Jose State College, USOE Cooperative Research Project 348.
- RICHARDS, J. M., Jr. et al. (1965) *A Description of Junior Colleges*. Iowa City: American College Testing Program.
- SAUNDERS, D. R. (1962) *A Factor Analytic Study of the AI and the CCI*. Princeton: Educational Testing Service.
- SELLS, S. B. (1968) "An Approach to the Nature of Organizational

- Climate," in R. Tagiuri and G. H. Liwin, eds., *Organizational Climate: Explorations of a Concept*. Boston: Division of Research, Harvard Business School.
- STERN, G. G. (1960) "Student Values and Their Relationship to the College Environment," in *Research on College Students*. Boulder, Colorado: Western Interstate Commission for Higher Education.
- STERN, G. G. (1962) "Characteristics of the Intellectual Climate in College Environments," *Harvard Educational Review*, 5: 41.
- STERN, G. G. (1965) "Student Ecology and the College Environment," in *Research in Higher Education*. Princeton: College Entrance Examination Board.
- THISTLETHWAITE, D. L. (1959) "College Press and Student Achievement," *Journal of Educational Psychology*, 50: 183-191.
- THISTLETHWAITE, D. L. (1962) "Rival Hypotheses for Explaining the Effects of Different Learning Environments," *Journal of Educational Psychology*, 53: 310-315.
- THISTLETHWAITE, D. L. (1965) *Effects of College upon Student Aspirations*. Nashville, Tenn.: Vanderbilt University, USOE Cooperative Research Project D-098.
- TROW, M. (1960) "The Campus Viewed as a Culture," in *Research on College Students*. Boulder, Colorado: Western Interstate Commission for Higher Education.
- WALLACE, W. L. (1963) *Peer Groups and Student Achievement*. Chicago: University of Chicago, National Research Opinion Center.
- WEBSTER, H. et al. (1962) "Personality Changes in College Students," in *The American College*. New York: Wiley.

CENTER FOR THE STUDY OF EVALUATION
Moore Hall 145
University of California, Los Angeles
Los Angeles, California 90024