DOCUMENT RESUME

ED 248 925 JC 840 518

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TITLE Assessment, Historical Perspective, and Prediction of the Academic Performance at Senior Institutions of Transfer Students from a Multi-Campus Community College District.
PUB DATE May 82
NOTE 244p.; Ed.D. Dissertation, University of Southern California
AVAILABLE FROM Library Photographic Duplicating Services, University of Southern California, University Park, M.C. 0182, Los Angeles, CA 90089-0182 (Order No. 2865A; $29.13)
PUB TYPE Reports - Evaluative/Feasibility (142) -- Historical Materials (060) -- Dissertations/Theses - Doctoral Dissertations (041)

EDRS PRICE MF01/PC10 Plus Postage.
DESCRIPTORS *Academic Achievement; *College Graduates; College Students; *College Transfer Students; *Educational Trends; Grade Point Average; Postsecondary Education; Predictor Variables; *Two Year College Students
IDENTIFIERS *California; *San Mateo County Community College District CA

ABSTRACT

A study was conducted to assess the academic performance of San Mateo County Community College District (SMCCD) students after transfer to a University of California (UC) or California State University (CSU) campus; to compare study results with previous research on College of San Mateo transfer students; and to determine the variables most predictive of academic success at a four-year institution. The study sample of 3,139 SMCCD students was drawn from students who transferred to a UC or CSU campus between fall 1974 and spring 1980. Study findings, based on data obtained from academic performance reports, included the following: (1) the CSU cumulative grade point averages (GPA's) earned by SMCCD transfers were essentially equivalent to those of all CSU undergraduates and all community college transfer students; (2) the CSU 3-year transfer rate of SMCCD transfers was significantly higher than the 5-year graduation rate of CSU freshmen and the 3-year graduation rate of all community college transfers; (3) SMCCD transfers to the UC system experienced some sort of transfer shock as evidenced by a first-year post-transfer drop in GPA of approximately .40 grade points; (4) GPA and graduation rates of SMCCD transfers to UC were higher than those attained by transfers to CSU; and (5) studies conducted since 1932 indicated that the large majority of SMCCD transfers were academically successful after transfer. (LAL)

ASSESSMENT, HISTORICAL PERSPECTIVE, AND PREDICTION OF THE ACADEMIC PERFORMANCE AT SENIOR INSTITUTIONS OF TRANSFER STUDENTS FROM A MULTI-CAMPUS COMMUNITY COLLEGE DISTRICT

by

Frank Howard Young

A Dissertation Presented to the

FACULTY OF THE SCHOOL OF EDUCATION

UNIVERSITY OF SOUTHERN CALIFORNIA

In Partial Fulfillment of the

Requirements for the Degree

DOCTOR OF EDUCATION

May 1982

This dissertation, written by

Frank Young

under the direction of the Chairman of the candidate's Guidance Committee and approved by all members of the Committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education.

Date ..... May, 1982 .....

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ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to the many people who provided assistance for this study.

Gratitude is expressed to the dissertation committee: Dr. Clive Grafton, chairman; Dr. Leonard Murdy; and Dr. Jeri Benson.

For their expeditious cooperation in the gathering of data, appreciation is expressed to the Registrars of the three Colleges of the San Mateo County Community College District, and the Directors of the Office of School and College Relations at San Francisco State University, San Jose State University, and the Berkeley, Davis, and Los Angeles campuses of the University of California.

Finally, the author dedicates this dissertation to his wife, Barbara, for her exceptional word processing of the manuscript, for her understanding, her encouragement, and most important, her love.

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CHAPTER I

INTRODUCTION

Background of the Problem

With over 1,000 community/junior colleges in the United States serving more than 4,300,000 students (American Association of Community and Junior Colleges, 1980), the community college movement has become a dominant factor in postsecondary education. As the open admissions policy became widely accepted in the 1960s, community colleges experienced rapid expansion and spiraling enrollment growth, prompting the Carnegie Commission (1971) to conclude that by 1980 between 34 percent and 45 percent of undergraduates in the United States would be found in two-year colleges. Recent statistics, however, indicate the Carnegie projection to be quite conservative; the National Center for Education Statistics (NCES), for example, reported that the community college share of total college enrollment had already reached 36 percent by 1977. Moreover, enrollment in community colleges had grown by 169 percent from 1967 to 1977 compared to a growth of 65 percent for all higher/postsecondary institutions during the same period (Dearman & Dahlstrom, 1979).

The community college movement has had its greatest impact in California. Craig (1979) reported that enrollment in California community colleges jumped from 340,000 students in 66 colleges in 1960, to 1,300,000 students in 106 colleges in 1978; combined state and local community college expenditures grew from $241 million to $1.24 billion during the ten-year period ending in 1978. Schwartz (1978) noted that an estimated 75 percent of California high school graduates who continue on to higher education attend community colleges. More recently, the California Department of Finance (1979) indicated that the 1979 undergraduate enrollment in California's public institutions of higher education totaled 1,577,648 students of which 1,234,556 (79 percent) were enrolled in California's public community colleges.

The original function of the "junior" college was to provide the first two years of undergraduate education to students who would subsequently transfer to four-year institutions (Thornton, 1972). Indeed, the early junior college was judged almost entirely upon the success of its graduates who pursued their education at the university level (Eells, 1943). However, as the "junior" college evolved into the "community" college, its initial role was expanded to include occupational training and adult education (Brubacher & Rudy, 1976). Enrollment trends in the

last two decades suggest that both vocational and community education have replaced the transfer function as the major activity of community colleges, and statistics at the college, state, and national level attest to this phenomenon (Lombardi, 1978a, 1978b).

The extraordinary enrollment growth in community college vocational courses since the early 1960s has prompted Lombardi (1978a) to conclude that the community college has become a predominantly occupational-oriented institution, a trend foreseen much earlier by Eells, who in 1941 viewed occupational education as the "most significant aspect of the rapidly spreading junior college movement" (Eells, 1941, p. vi). Whereas, Monroe (1975) had estimated that one-third of all community college students were enrolled in occupational courses during the early 1970s, Parker's 1975 survey of selected two-year institutions placed 1974-75 occupational enrollment at 57 percent of the total enrollment (Parker, 1975). For the near future, Lombardi (1978a) predicted that credit enrollment in occupational courses will level off at about one-half of the total credit enrollments, but he noted that adult and non-credit occupational students could swell total vocational enrollments to 70 percent of total community college enrollments.

The nationwide emphasis on vocational education within the community colleges is mirrored in California.

The California Community Colleges (1977) reported that 60 percent of all their students pursued some occupational training goal during the 1976-77 fiscal year. The Los Angeles Community College District (1977) reported that 65 percent of its students in 1975 were classified as vocational students. Lombardi (1978a) warned, however, that such statistics can be misleading in that both national and state funding patterns favor vocational education programs and, thus, tend to encourage community colleges to reclassify or incorporate some general education or liberal arts courses into their vocational programs. In order to obtain more reliable data, various states are refining their statistical procedures for counting vocational students. California, for example, has developed a Student Accountability Model (SAM) in order to provide a uniform method for classification of occupational courses and majors (Gold & Morris, 1977).

The shift towards a vocational emphasis within the community college is a cause of great concern among liberal arts and general education advocates, many of whom view occupational education as a serious threat to the traditional community college transfer function (Jacobson, 1977). Lombardi (1978a) pointed out, however, that the number of students enrolled in "transfer" courses (science, humanities, liberal and general education, etc.) far exceeds the number enrolled in vocational courses, and

that "occupational" students comprise a significant percentage of the total "transfer" enrollment. In a sense, therefore, the transfer and occupational functions bear a symbiotic relationship to each other. In any case, Lombardi (1978a) concluded that the community college transfer function faces a greater threat from the growth of the community education movement than from the growth of occupational education.

"Community education" is a term whose definition seems to depend primarily on the user. It may include adult basic education, adult education, lifelong learning, continuing education, community services, and/or a variety of other activities housed under different acronyms. The Community, Junior, and Technical College Directory has attempted to provide some clarification by defining community education enrollment as the "total number of people participating in noncredit activities sponsored by a college" (American Association of Community and Junior Colleges, 1976, p. 3) and "service, recreational, and cultural programs that are not part of an academic program" (American Association of Community and Junior Colleges, 1980, p. 2). Lombardi (1978b) noted that community education, as so defined, has more community college participants and has grown at a faster rate than either occupational or transfer education. Although its clientele consists almost exclusively of part-time students, these

students constitute 59 percent of the total community college enrollment according to the National Center for Education Statistics (Justice & Amperse, 1979). The total enrollment for continuing education and non-credit adult programs was estimated to be in excess of four million students in 1975 (Wade, 1977), and the growth rate for adult participation in part-time course work had increased by 52 percent from 1972 to 1975 (Loring, 1978).

The community education phenomenon in California community colleges is a reflection of the national trend. In 1976, the California Postsecondary Education Commission (CPEC) noted that two-thirds of the total California community college enrollment consisted of part-time students, a phenomenon which prompted the Commission to conclude that "continuing education for part-time adult students has become the dominant function of the community colleges" (CPEC, 1976, p. i). In 1979, the Commission added that more Californians were attending postsecondary education on a part-time basis and over longer periods of their lives (CPEC, 1979b).

To what extent does community education pose a threat to the traditional community college transfer function? As the previous statistics suggest, there is clearly a "market" for community education. The National Center for Education Statistics reported that 41 percent of adults surveyed in 1978 expressed an interest in taking

an adult education course the following year if such a course could be offered at an appropriate time and cost. This percentage translates into a potential clientele of 60 million adults, a figure which would overwhelm existing instructional facilities (Dearman & Dahlstrom, 1979). Faced with significant declining enrollments of traditional students over the next two decades (Scully, 1980), the anticipated competition for students may encourage the community colleges to shift their educational attention and resources away from transfer education and towards the more fertile field of community education.

Quite a few educators welcome the concept of a new type of community college in which community service functions are paramount. Gleazer (1964), for example, has long anticipated the day when community colleges will be community oriented and not simply post-high school or college preparatory institutions. Similarly, Pifer of the Carnegie Corporation urged the community colleges to "consider themselves primarily as community service agencies rather than institutions of higher education" (Talbot, 1976, p. 84). McCabe (1979) envisions the community college as a lifelong learning institution. Critics of community education, however, view such attitudes as a threat to the higher education status of the community college; they fear the consequences to the transfer function which could result from a fraternization with the

"frills and entertainment courses" (Watkins, 1978, p. 1) often associated with community education in the minds of taxpayers, state officials, and legislators.

Vocational and community education are not the only community college activities which concern defenders of the traditional transfer function. Remedial and developmental education, concomitants of the "open door" policy so enthusiastically adopted by the community colleges during the 1960s, pose an additional source of concern. Many observers feel that the current trend towards the integration of remedial and developmental education into the regular curriculum (Lombardi, 1979a), in an apparent attempt to accommodate the educationally disadvantaged, can only result in a weakened transfer curriculum. Lombardi (1978b) pointed out that community college programs which focus upon the educationally disadvantaged and the chronic underachievers must, by definition, attract students of low ability and motivation who in turn will lower the status of the institution which they attend, a phenomenon Bowen (1977) terms a "double selection process".

Lombardi (1979a) estimates that the current enrollment in remedial and developmental education programs is approximately 10 to 15 percent of the total community college enrollment, but that in all likelihood this figure will grow to 50 percent during the 1980s. Thus, it seems highly probable that remedial and developmental education,

which includes pre-transfer education, adult/basic education (ABE), education of the handicapped, and basic skills remediation, will demand a growing share of the community college's curriculum effort, dwindling funds, and educational resources. Unfortunately, remedial education is disproportionately expensive in that its students frequently are in need of educational specialists, and additional tutors and instructional materials. Cohen (1979b) asserts that the community college may not be able to afford remedial education in the 1980s, not only because of its excessive monetary cost, but also because of the negative public image that may result from the college's commitment of more of its efforts and the taxpayers' resources to subcollege education. The community college's "steady drift toward becoming an element in the welfare system" (Cohen, 1979b, p. 104) is viewed as a stark reality by an increasing number of disenchanted citizens.

Being cognizant of the under-representation of ethnic minorities and low-income students in its public colleges and universities, the California Legislature emphasized the high priority it assigns to remedial and developmental education within its community colleges when it distributed significant funds for these purposes following the passage of Proposition 13 (Lombardi, 1979a). Similarly, the California Community and Junior College

Association (1978) stressed the importance of remedial programs in its response to questions posed by Governor Brown's Commission on Government Reform. The Association noted that the community colleges can conduct these programs more efficiently and at less cost than other educational institutions. Taxpayer revolts notwithstanding, it is quite likely that California will continue to place significant emphasis upon remedial and developmental education within its community colleges, especially in light of the rising proportion of ethnic minorities and low-income students within the State (CPEC, 1979b). Craig (1979) noted that these under-represented populations, which constitute the major potential source of enrollment growth, will necessitate changes in instructional methods within California's community colleges.

Despite the important implications inherent in the dramatic shift within the community college towards vocational, community, and remedial/developmental education, many observers feel that declining enrollments represent the most serious threat to the community college transfer function. Keough (1978) asserted that education is a declining industry which, having passed through its initial period of dynamic growth, finds itself quite naturally in a succeeding period of conflict. The Carnegie Council on Policy Studies in Higher Education estimated that the 18-24 year old age cohort will decline by

23 percent by 1997 (Scully, 1980). As a consequence, the Council anticipates that survival may well replace excellence as the dominant theme of education, with four-year institutions of higher education competing vigorously with community colleges for the ever-dwindling supply of students. Clearly, the transfer function seems the most natural arena for competition.

The impact of declining enrollments upon the community college transfer function is compounded by taxpayer revolts which intensify the competition for dwindling local, state, and federal funds, a competition which comes not only from within the educational establishment, but from other social priorities as well. Beleaguered state legislatures are necessarily reassessing their educational priorities. Consequently, the community college transfer function can be expected to receive closer scrutiny, especially in light of the decreasing percentage of community college students who transfer to four-year institutions. Although it is virtually impossible to accurately count transfer students (Cohen, 1979a; CPEC, 1979a), Lombardi (1979b) estimates that less than 10 percent of all community college students actually transfer to senior institutions. Kissler (1980) noted that the number of community college transfers to the California State University and Colleges (CSUC) system dropped by 10 percent in the period 1975-1980. Cohen (1979a) observed

that there are probably more California higher education students transferring from four-year to two-year colleges than the reverse, a phenomenon which apparently is becoming a national trend (NCES, 1977).

The declining enrollment projections for California are no brighter than the national picture. The California Postsecondary Education Commission (1979b) anticipates a marked enrollment decline in the late 1980s with postsecondary education experiencing an enrollment loss of perhaps one-third or more. Speaking as Chancellor of the California Community Colleges, Craig (1979) echoed this projection while adding that there will be a conspicuous shift in enrollments towards the under-represented populations, i.e., minorities, women, low-income students, and the handicapped. He, too, envisions a sharp increase in competition for students, particularly between California's four-year state colleges and its community colleges, with the focus of the competition falling upon the adult learner and the transfer student. Knoell (1979) added that very soon California's public and private four-year institutions of higher education will be able to enroll all the high school graduates who wish to obtain a baccalaureate degree. Consequently, she considers the serious curtailment or elimination of the community college transfer function to be a distinct possibility.

By embracing the "open-door" policy, the community colleges have obligated themselves to provide a myriad of programs and services to a highly diverse clientele, including the educationally and economically disadvantaged, the physically handicapped, women reentrants, and the variety of technical/vocational and business people who come to the community college for retraining or skills development. The transition from "junior" college to "community" college has necessitated that increased attention, if not acquiescence, be paid to student differences in ability, rates of learning, learning styles, and career goals. Searching for more effective and accountable pedagogy, the colleges are placing added emphasis upon course objectives, measurements of achievement, and individualized instruction, with special attention being given to minority and high-risk students (Moore, 1970). Some critics believe that the community college's embracement of the "open-door" policy has resulted in a serious degradation of its transfer function. Lynes (1966), for example, saw the community college as a "second-rate place for second-rate kids" (p. 60), a sentiment endorsed by Jencks and Riesman (1968), who added that the major function of the community college may well be to divert less capable or motivated students away from "higher" education. Devall (1968) opined that the community college has been

reduced to a state of confusion and futility by its attempt to perform too many diverse functions.

Statement of the Problem

Community colleges have become a dominant force in postsecondary education, particularly in California. However, their embracement of the "open-door" policy and its attendant philosophy that every individual shall be provided with the opportunity for appropriate education to fulfill his or her potential (California Community and Junior College Association, 1978), has resulted in a dramatic shift in numbers, if not in importance, from transfer education to vocational, community, and remedial/developmental education. Consequently, the community colleges now provide a wider range of educational offerings to students who represent a much broader spectrum of competency and motivation. Understandably, many observers question the community college's ability to continue to provide undergraduate education comparable to that attainable at a four-year institution while concurrently attending to community needs and demands for remedial, vocational, and continuing education. Of equal concern to defenders of the transfer function is the threat posed to it by the current and projected decline in enrollments; by the anticipated increased competition for students from four-year institutions; by the dissipation of public support;

by the serious financial constraints imposed by taxpayer revolts and legislative response thereto; by the growing loss of local control; and by the increased demand for accountability. It should come as no surprise, therefore, when Cohen (1979b) asserts that the traditional community college transfer function and its curriculum are in jeopardy.

Lombardi (1978a) warns that "it would be a serious mistake for the community college to adopt a benign neglect of the transfer function" (p. 27). Students still aspire for the baccalaureate degree; an extensive study by Holmstrom and Bisconti (1974) for the American Council on Education indicated that 52 percent of all persons who entered a community college in 1968 as first-time, full-time students had transferred to a four-year college by 1972. Lombardi (1978a) added that credit hours in courses which comprise the transfer curriculum still far outnumber those in "occupational" courses; vocational students still need the liberal arts courses embedded in the transfer curriculum if they are to have a realistic chance for career advancement; and the promise of upward mobility for the disadvantaged can only have meaning if they are offered both transfer and occupational programs.

In order to counter the threats to the transfer function, to assess and improve its efficacy, and to reaffirm its credibility, the community colleges must be

prepared to demonstrate that the academic performance of their transfer students (a) has not deteriorated historically, and (b) does not differ significantly from that of students who spend their first two years of college at a senior institution. Thus, the community colleges must convince their critics (and themselves) that, despite their myriad functions and diverse clientele, the colleges have not "watered down" their curriculum to accommodate the underachiever, the high-risk student, and the lifelong learner; that the "open-door" policy has not reduced the effectiveness of the community college transfer function.

The community colleges must also strive to improve their transfer function by searching for factors which could predict student academic success upon transfer. Such information might enhance the academic performance of transfer students and could be most helpful to their counselors and to senior college admissions officers. Traditionally, high school GPA and scholastic aptitude test (SAT) scores have been used to predict the future academic performance of college students (Phleger, 1978). Recent evidence suggests, however, that other variables might be more predictive of academic success upon transfer (Rinehart, 1977).

Each community college must assess the efficacy of its own transfer function rather than rely upon findings at other community colleges. Martorana and Williams

(1954) insisted that investigations need to be conducted periodically in individual institutions in order to avoid fallacious generalizations from one college to another. Cross (1968) noted that community college populations change so rapidly that research on student characteristics and academic performance should be a continuous process. Moore (1970) reported that community colleges had grown and changed to such an extent that existing studies were too old to be currently applicable to the needs of the community colleges.

Purpose of the Study

The purpose of the present study was threefold: (1) to assess the academic performance of San Mateo County Community College District students after transfer to the University of California or to selected campuses of the California State University and Colleges; (2) to provide an historical perspective of this academic performance by comparing it with that reported in previous studies of College of San Mateo transfer students; and (3) to determine and rank those variables which are most predictive of academic success at four-year institutions after transfer from the San Mateo County Community College District.

Questions of the Study

The study sought answers to the following questions:

1. How does the academic performance of San Mateo County Community College District transfer students compare with that of other community college transfers and with that of native students at selected campuses of the California State University and Colleges?

2. How does the academic performance of San Mateo County Community College District transfer students compare with that of other community college transfers and with that of native students at the University of California?

3. How does the senior institution academic performance of San Mateo County Community College District transfer students compare with that reported in previous studies of College of San Mateo transfer students?

4. Are there variables which can predict senior institution GPA prior to transfer from the San Mateo County Community College District?

Setting of the Problem

The transfer function has been a continuing concern of the San Mateo County Community College District ever since its founding in 1922 as San Mateo Junior College. Its initial 35 students attended classes at

San Mateo High School. Although the "junior" college moved to a separate facility in 1923, it continued to share with the high school a common governing board and superintendent until 1937, when a separate Junior College Board of Trustees was established (Stanger, 1947). The continuing popularity of the college necessitated the acquisition of additional sites to alleviate overcrowding; as a result, during the period 1947-1955 students attended classes at three different locations (Massing, 1977). Finally, in 1963, the College of San Mateo moved to its present 153-acre site which provides a panoramic view of the entire south San Francisco Bay Area. Two additional campuses, Canada College and Skyline College, were added in 1968 and 1969, respectively. When the multi-campus District's boundaries became coterminous with those of the County in 1976, the District became the San Mateo County Community College District.

The District's three colleges serve more than 30,000 day and evening students throughout San Mateo County (College of San Mateo, 1979-80). The population of the County (which occupies the central part of the peninsula south of San Francisco), estimated at 586,300 in January, 1978 (College of San Mateo, 1978a), has experienced a continual reduction in its growth rate since the 1960s. This reduction has been caused primarily by the general decline in the birthrate, the diminishing supply

of buildable land in the County, and the meteoric rise in the cost of housing which has made it increasingly more difficult for low- and medium-income families to establish residency within the County.

County residents can elect to attend any one of the three colleges within the District. Slightly over one-half of the students attend the College of San Mateo which is located in the center of the County. The remaining students are divided about equally between Skyline College to the north and Canada College to the south. Although the District has not experienced a sharp decline in student attendance, the percentage of day students taking a full-time load has decreased significantly. At the College of San Mateo, for example, this percentage has declined from 65 percent in 1973 to 56 percent in 1978; during this same period, the average number of units taken has dropped from 11.5 to 10.4 (College of San Mateo 1978b). The resulting loss in average daily attendance has been accompanied by a continuing shift in the age, sex, and ethnic distribution of the College's student population. At the College of San Mateo, 66 percent of the day students are 21 years of age or younger, but 49 percent of the continuing education (evening, weekend) students are over 30 years of age. Currently, 50 percent of the students are women, as opposed to 44 percent in 1972. Minority student enrollment has increased from 15

to 21 percent during this period, with the largest increase occurring among Southeast Asian and Hispanic ethnicities (College of San Mateo, 1978a). Similar trends have been evident at the District's Canada and Skyline campuses.

In its attempt to respond to the educational needs of its constituents, the San Mateo County Community College District has established clearly defined goals to:

> ...provide varied educational opportunities which acquaint students with the broad outlines of human knowledge and experience; provide lower-division transfer programs which prepare students for continued education in four-year colleges and universities; offer occupational education programs directed toward personal and career development, in cooperation with business, industry, labor, and public service agencies; offer developmental education courses to enable students to improve those basic skills essential to successful completion of college goals; identify and meet community needs, not otherwise served by college credit courses, through offering short-term, non-credit community services programs, courses and activities; provide a comprehensive program of student services to assist students in attaining their educational goals; actively support a program of affirmative action in student recruitment and personnel employment; make programs accessible through varied methods of instruction, scheduling patterns, and support services at appropriate locations and facilities. (Smith, 1979, p. 3)

To achieve its goals, the District's colleges provide programs in general education, college-transfer education, career education, and extended educational opportunities. General education instruction helps the student function effectively as an individual and as a

citizen with local, national, and global responsibilities. College-transfer courses enable the student to satisfy the lower-division requirements of four-year colleges in the liberal arts and in scientific, engineering, and other professional and technical fields. Career programs provide instruction designed to develop the personal and technical competencies necessary for successful employment in specific careers. Extended educational classes provide opportunities for all persons living in the area to broaden their educational, vocational, and aesthetic horizons.

Limitations and Delimitations

Caution should be exercised in generalizing the results of this study to a broad population. Among the factors to be considered are:

Limitations

1. The study was limited by the fact that the San Mateo County Community College District, being located in the suburbs of a large metropolitan city, is not necessarily representative of all community colleges.

2. The study was limited by a lack of knowledge of the variation in grading standards both within and between institutions.

3. The study was limited in that ex post facto research methods were employed to take advantage of data already available. Consequently, random assignment of

students to different treatments was not feasible and variation in student performance was obtained as a function of pre-selected variables.

4. The study was limited by inability to determine the impact of counseling upon student academic success.

Delimitations

1. The study was delimited to San Mateo County Community College District transfer students who were in attendance at senior institutions during the period 1974 to 1980.

2. The senior institutions considered in this study were limited to those which are attended by over two-thirds of San Mateo County Community College District transfer students. These four-year institutions include the University of California, and the California State Universities at San Francisco and San Jose.

3. In the investigation of factors predictive of transfer student academic achievement at four-year institutions, the study was delimited to students who had completed at least 24 units in the San Mateo County Community College District, and the criterion of success after transfer was limited to senior institution GPA.

Definitions of Terms

Cumulative GPAs. Includes the senior institution GPAs of both new and continuing transfer students.

Full-Time Student. A student enrolled for 12 or more units per semester.

Native Student. A student who has received both lower- and upper-division undergraduate education at the same senior institution.

Originally-Eligible Student. A community college student who was eligible for admittance to a senior institution upon graduation from high school.

San Mateo County Community College District. A tax-supported California public community college district, located in the greater San Francisco Bay Area, which conducts grades 13 and 14, and which consists of three community colleges: College of San Mateo, Canada College, and Skyline College.

Senior Institution. An accredited four-year institution of higher learning offering a baccalaureate degree.

Transfer Shock. The adverse effect experienced by a transfer student during his first term or first year at a senior institution which would result in a lower grade point average than that attained at the community college from which the student transferred.

Transfer Student. A student who transfers from a community college to a four-year institution.

Organization of the Remainder of the Study

The remainder of the study is organized into four chapters. A review of the literature concerned with the academic performance of community college students after transfer to senior institutions is provided in Chapter II. Findings of previous investigators are presented in regard to community college GPA versus that attained upon transfer to a senior institution, the effect of transfer shock upon first-year senior institution academic performance, and the success of community colleges with students who were initially scholastically ineligible to attend a senior institution. An historical review of previous studies of the academic performance of the College of San Mateo transfer students is included. Efforts of several investigators to determine factors which might predict transfer success are then reviewed. The population of the study, the sample chosen from this population, a description of the data collected, and the methods for its analysis, are described in Chapter III. The findings obtained from the study are presented in Chapter IV. Conclusions and recommendations for further study are given in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of the present study was threefold: (1) to assess the academic performance of San Mateo County Community College District students after transfer to the University of California or to selected campuses of the California State University and Colleges; (2) to provide an historical perspective of this performance by comparing it with that reported in previous studies of College of San Mateo transfer students; and (3) to determine and rank those variables which are most predictive of academic success at four-year institutions after transfer from the San Mateo County Community College District.

In order to provide a proper perspective in which to assess the results of the current study, findings of previous investigators are presented in this chapter which relate to the academic performance of community college transfer students at senior institutions. This performance is measured primarily by comparing upper division GPA of the transfer students with their community college GPA, and with the GPA of students native to the senior institutions. Findings are also presented which relate to the

relative tendency of transfer and native students to withdraw or to persist towards degrees, and the possible effects of transfer shock u on first-year senior institution academic performance of the transfer student.

To a limited extent, the literature review presented in this chapter provides an historical perspective of the academic performance of community college transfer students at senior institutions. The review moves from the macroscopic to the microscopic, i.e., from the national picture, to the California scene, to the San Mateo County Community College District. This historical perspective is followed by a critique of the efforts of various investigators to determine factors which might predict transfer success. The chapter concludes with a summary of the findings of previous investigators and reiterates the need for the present research.

A National Perspective of the Academic Performance of Community College Transfer Students at Senior Institutions

The academic performance of community college students after transfer to four-year institutions has been the subject of close scrutiny almost from the inception of the public junior college near the turn of the century. A remarkable and exhaustive study of the early junior college movement was conducted by Koos (1925) who summarized the status and achievements of the 207 junior colleges

(46 public, 137 private, and 24 state-affiliated institutions) in existence in 1921-22. Koos found that 95 junior college graduates who transferred to prestigious four-year institutions performed slightly better academically in their junior year than did 75 University of Minnesota upperclassmen to whom they were compared. This and other pertinent data led Koos to conclude that:

> ...not only does the junior college offering give promise of meeting the needs of the situation in providing the first two years of work in colleges and universities, not only have the new units made excellent progress toward achieving an adequate instructional situation, and not only do graduates of accredited junior colleges compare favorably in scholarship with those who have done their work in a standard university, but the new unit is well on its way to a recognition by universities and colleges of work done by its students. (p. 99)

Koos further opined that the higher mastery of subject matter attained by college and university teachers was in part "offset by the higher level of teaching skill in the junior college." (p. 97)

This early, tentative finding by Koos (1925) of transfer student success at senior institutions was corroborated by Congdon (1932) in his five-year survey of 258 Michigan public junior college transferees to the University of Michigan during the period 1924-1928. Congdon reported that these transfer students were less often in academic difficulty, had fewer drop-outs, achieved more

scholastic honors, and academically outperformed the native students.

The "junior" college which Koos studied in 1925 was primarily a transfer-oriented institution. By 1943, however, its emphasis had clearly shifted towards terminal education, with three-fourths of its students completing their formal full-time college education in the junior college (Eells, 1943). Despite this shift, however, the junior college had apparently sustained the high quality of its transfer function which Koos (1925) and Congdon (1932) had noted earlier. Thus, Eells reported that, of the numerous studies of the academic performance of junior college graduates at colleges and universities conducted in the 15 years prior to 1943:

> ...most of these studies have shown that the great majority of junior college graduates have done satisfactory work in the higher educational institutions which they have entered, and in many cases, distinctly superior work. (p. 372)

Since the junior college curriculum emphasis had shifted towards terminal vocational education, Eells (1943) was concerned with the fate of students who had enrolled in terminal programs but who later decided to transfer to four-year institutions. In an extensive analysis of the academic performance of 2,080 junior college graduates of terminal curricula between 1934 and 1940 who subsequently transferred to four-year institutions, Eells found that 56 percent of these students had

graduated or were still in residence at the senior institutions, and only five percent had withdrawn because of academic difficulty; moreover, the mean GPA earned by these transferees in the senior institutions was higher than their junior college average. Eells' findings, which encompassed 67 junior colleges and 319 senior colleges, prompted him to accord high marks to the junior college transfer function. It is interesting to note that more than a quarter of a century after Eells reported his findings, Block (1970) and Stone (1975) found very little difference between the academic performance and persistence at senior institutions of "occupational" and "academic" community college graduates.

As the "junior" college evolved into the "community" college, its transfer function began to receive mixed reviews. In perhaps the best known and most comprehensive study of transfer student achievement, Knoell and Medsker (1965) analyzed the academic performance of 7,000 students who transferred from 345 community colleges to 43 senior institutions, and found an average GPA drop of up to one-half a grade point during the first semester following transfer. Although the transfer students made a significant recovery from this "transfer shock," their upper division cumulative GPA remained below that of the students native to the senior institutions. In addition, Knoell and Medsker reported that the transfer students

suffered higher attrition rates and made slower progress towards graduation than did the native students.

Not all contemporaries of Knoell and Medsker categorically support their finding that native students academically outperform the transfer students at the senior institutions. Martorana and Williams (1954), for example, found that transfer students who majored in engineering and physical science at the State College of Washington had a mean GPA which was slightly higher than that of the native students, although the total population of transfer students had a mean GPA which was slightly below that of the natives. Similarly, Hoyt (1960) at Kansas University, Needham (1964) at the University of Kentucky, Lambe (1964) at Western Michigan University, and Beals (1968) at the University of Massachusetts reported no significant difference between native student and transfer student academic performance. However, there were various studies whose findings were basically in agreement with those obtained by Knoell and Medsker, such as those by Hills (1965), Hoffman (1965), Hood (1967), and Walker (1969), which supported the contention that transfer students attain lower upper-division grade point averages, are less likely to graduate, and take longer to complete degree programs than the native students.

In the decade of the 1970s, findings continued to be mixed in regard to the academic performance of

community college transfer students at senior institutions. Eckard (1971), Henderson (1972), Nayle (1973), Wiggins (1974), and Williams (1976) all found no significant difference between transfer and native student GPAs at the time of graduation. In a comparison of 1,361 native North Texas State University students with 312 community college transfers, Brown (1976) found that the transfer students had a significantly larger percentage of graduates in four years. In their study of 1,523 transfers from New Jersey community colleges, Miller, Janawsky, and Katz (1977) found that these students had attained junior-year GPAs of 3.0 and 2 9 at public and independent senior institutions, respectively, while the native students at these institutions had compiled GPAs of 2.9 and 2.8, respectively. Conversely, Hensen (1970) compared the academic performance of 1,234 transfers from five Michigan community colleges to Michigan State University (MSU) with that of 11,897 MSU native students and found that those students who entered MSU as freshmen earned higher GPAs than did the transfer students. Moreover, the achievement of the transfer students had shown no sign of improvement since 1965. Similarly, Anderson (1977) found that community college transfers to the University of Illinois consistently achieved at a lower GPA than did the native students. Similar findings were obtained in Illinois by

William Rainey Harper Community College (1978) and by Sloan and Farrelly (1979).

Controlling for Differences Between Transfer and Native Students

Many of the studies in the 1970s began to reflect a growing realization that a strict comparison of the upper division GPA of native and transfer students may not necessarily be the best standard by which to measure the performance of the community colleges in their preparation of students for transfer to senior institutions. Such a direct comparison ignores the fact that an appreciable number of transfer students were originally ineligible for admission to a senior institution at the time of their entry into a community college and, consequently, were possibly less capable academically than those students who entered the four-year institutions as freshmen and persisted to the junior year. Pearce (1968) found that over half of 1,610 College of San Mateo transfers in attendance at campuses of the California State University and Colleges during the fall 1967 semester were ineligible for admission to those senior institutions when they left high school. More recently, statistics released by the University of California revealed that 55 percent of the students who transferred to the University from community colleges in 1978-79 were academically ineligible to attend the University when they graduated from high school.

These students, while in attendance at the University, compiled an average GPA of 2.76 as compared to a GPA of 2.86 for those transferees who were originally eligible to attend the University as freshmen (California Postsecondary Education Commission, 1981). Much earlier, Ammerman (1960) had found that originally-eligible transfer students to the University of Michigan had outperformed the originally-ineligible students in both academic performance and persistence.

Other studies have attempted to provide a more equitable comparison of transfer and native student academic performance at senior institutions. In a study of 1,600 potential transfer students seeking admission to senior institutions, Fincher (1964) found both the SAT verbal and SAT math scores of these students to be significantly lower than those of students who enter public senior institutions as freshmen; consequently, he cautioned other investigators that any comparison of community college transfer students with native students must take into account the initial advantage enjoyed by the latter. Heeding the advise of Fincher, Nickens (1972) discovered no statistical difference in the mean GPAs of native and transfer students in their first-term junior year at Florida State University after the variance accounted for by the Florida Twelfth Grade Test had been removed. Similarly, in a study of the relative academic

performance of transfer and native students who graduated from the University of North Carolina in 1974-75, Harmon and Morrison (1977) found no significant difference in GPAs to exist between the transfer and the native students after controlling for academic aptitude. In a comparable study, Fernandez, Raab, and Baldwin (1978) also found scant difference in the academic performance of transfer and native student graduates at 12 New York senior institutions after correcting for differences in aptitude between the two student groups. Phlegar (1978) found that transfer students who graduated from a community college with a GPA of 3.0 or higher had the same degree of success at Virginia Polytechnic Institute as did the native students.

Persistence of Transfer Students

Another important measure of the efficacy of the community college transfer function is obtained by a comparison of the relative tendencies of transfer and native students to persist to the baccalaureate degree. Attrition rates are necessarily difficult to obtain in that (1) students frequently take longer than four years to graduate, and (2) a significant number of students withdraw from one senior institution and later graduate from another (Cohen, 1979a). In an early study of persistence, McNeeley (1938) reported on the progress of 15,535 students who had entered 25 senior institutions in 1931 and 1932; he estimated that these institutions had

suffered an attrition rate of 45 percent. In a study of 12,667 students entering 149 institutions in 1950, Iffert (1959) found a four-year graduation rate of 39 percent which he extrapolated to 59 percent by allowing for transfer to other senior institutions and subsequent graduation therefrom. More recent studies, however, suggest that eventual graduation rates may be substantially higher. By extending his observation period to ten years, Eckland (1964), for example, attained a graduation rate of 69 percent in his study of 1,332 male students who enrolled at the University of Illinois in 1952; furthermore, he suggested that this rate could be extrapolated to 74 percent if one were willing to assume that seniors still enrolled in good standing at the end of the 10-year period would eventually graduate.

There seems to be almost unanimous agreement in the literature that community college transfer students do not attain high two-year graduation rates at senior institutions; yet, their graduation rates seem to compare quite favorably with those reported for native students by McNeeley (1938), Iffert (1959), and Eckland (1964). In their landmark study of community college transfers, for example, Knoell and Medsker (1965) concluded:

> Students who transfer from a two-year college with full junior standing have slightly less than two chances in three of completing their baccalaureate degree programs within a period of three years after transfer, if they enroll on a

> full-time basis. About two-thirds of those who complete degree programs do so within only two years after transfer with junior standing. The odds are about four chances in five that the students will complete a degree program eventually, with the time and institution unspecified. (p. 26)

The findings of subsequent investigations appear to be in general agreement with those reported by Knoell and Medsker. Eckard (1971) reported that, while only 58 percent of the fall 1968 transferees to Appalachian State University graduated in two years, 86 percent persisted to graduation within their third year after transfer. Nayle (1973) reported that transfer students at Eastern Kentucky University took slightly longer to graduate than did the native students. Henderson (1972) found the transfer student rate of persistence to the senior year at four North Carolina public universities to be about four percent below that of the native students. In a somewhat surprising finding, however, Brown (1976) reported that native students at North Texas University suffered a much higher attrition rate and a significantly lower four-year graduation rate than did the community college transfers to that institution.

Transfer Shock

Most investigators have found that transfer students do experience a drop in grade point average during their first term after transfer to a senior institution. Knoell and Medsker (1965) documented this "transfer shock"

but pointed out that it is not a uniform phenomenon and can vary widely depending on a multitude of factors, such as the college from which, or to which, the student transferred, the number and type of units transferred, and the senior-institution program in which the transferee is enrolled. Rinehart (1977), pointed out that more recent findings have corroborated both the existence of transfer shock and the wide variation in GPA decline that it produces. He cautioned, however, that a student's drop in GPA during the first term after transfer could possibly be more indicative of a relatively liberal or non-punitive grading policy at the community college rather than an increase in academic difficulty experienced by the student at the senior institution. Henderson (1972), Nayle (1973), Brown (1976), and Williams (1976), for example, all found that the transfer students had a higher mean GPA than did the native students at the beginning of the junior year, but that there was no significant difference in native and transfer mean GPA at the time of graduation.

Knoell and Medsker (1965) had estimated the mean GPA drop experienced by transfer students in their first term after transfer to be in the neighborhood of one-half a grade point. Other investigators have reported a comparable decline but many of them, including Ammerman (1960), Needham (1964), Beals (1968), Eckard (1971), and Williams (1976) found that there was no significant difference in

mean GPA attained by native and transfer students during the senior year.

Studies have corroborated the contention that the transfer shock phenomenon is by no means uniform. Moughamian, Lach, Kohl, and Wellman (1978), for example, in their three-year longitudinal study of 10,504 Illinois community college students who transferred to the University of Illinois during fall 1973, found that the mean GPA of these students in their first year after transfer was only .16 points below their community college mean GPA, an average which they equaled at the end of their second year at the senior institution. In their study of 1,523 transfer students to both public and independent senior institutions in New Jersey, Miller et al. (1977) reported that these students had attained a junior-year mean GPA which was slightly higher than both their junior college GPA and the GPA earned by students native to the senior institutions. Conversely, in his six-semester University of Illinois study of the academic performance of 1,136 transfer students versus that of 3,542 native students, Anderson (1977) found the mean GPA of the transfer students to be consistently below that of the native students in each of 12 subject areas studied; nonetheless, since (1) only a small percentage of the transfers withdrew due to academic difficulty, and (2) two-thirds of these students either graduated or were still persisting, Anderson

concluded that the community colleges were successful in their mission to provide further access to education.

Recent Follow-Up Studies of Transfer Students

Several follow-up studies conducted in the 1970s provide further informative insights into the academic performance of community college transfer students. A survey conducted by Jackson and Drakulich (1976) of former transfer students from Essex County College (ECC) in New Jersey revealed that, although 88 percent of the 413 respondents felt that ECC had prepared them adequately or very well for their senior-college studies, as a group their mean GPA dropped .65 points below their community college GPA. A similar follow-up study conducted by Losak and Corson (1976) disclosed that, of 298 Miami-Dade Community College graduates who entered Florida State University in 1970 or 1971, 205 had graduated by 1976 and 32 were still enrolled at that time. This finding appears to be in harmony with that of the Florida State Department of Education (1977) whose follow-up study revealed that the majority of the State's 1974-1976 community college transfers to the State University earned a GPA of 2.0 or better. The Illinois Community College Board conducted a follow-up study of 10,504 former Illinois public community college students who had transferred to 24 senior institutions in fall 1973. The Board found that these students

had compiled a mean GPA of 2.8 at the end of their second year at the senior institution, an average which was similar to their pre-transfer GPA; moreover, 73 percent of the transfers had either graduated or were pursuing the baccalaureate degree as of spring 1976 (Moughamian et al., 1978).

Summary of National Perspective

From this brief national perspective of the community college transfer function, several generalizations seem credible. The early "junior" college, chronicled so well by Koos (1925), performed its dominant transfer function quite successfully. The subsequent shift toward a more vocational orientation did not diminish the efficacy of the transfer function; in fact, "occupational" students who transferred seemed to perform as well at senior institutions as did the academic transfer students (Eells, 1943; Block, 1970; Stone, 1975). As the "junior" college evolved into the "community" college, however, the transfer students began to experience some academic difficulty in their transition to senior institutions; they experienced initial transfer shock, from which they essentially recovered, and they took longer to complete degree programs than did the native students (Knoell & Medsker, 1965). However, investigators who controlled for academic aptitude found that differences in the academic achievement of native and transfer students tended to disappear

(Harmon & Morrison, 1977; Fernandez et al., 1978). Recent investigators, particularly those dealing with large samples of transfer students (Knoell & Medsker, 1965; Florida State Department of Education, 1977; Moughamian et al., 1978), tend to accord the community college passing grades in the performance of its transfer function.

A California Perspective of the Academic Performance of Community College Transfer Students at Senior Institutions

When Koos (1925) compared the academic performance at senior institutions of junior college graduates and native students, approximately one-half of the former students were transferees from California junior colleges to the University of California, Stanford University, or the University of Southern California. Hence, his conclusion that the transfer students compared favorably in scholarship with the native students reflected positively upon the quality of the transfer function being performed by California's junior colleges. Similarly, when Eells (1943) reported on the "above average" senior-institution academic performance of junior college graduates of "terminal" curricula, he noted that the largest number of transfers occurred in California, where junior college terminal curricula had experienced its longest and most significant development. Thus, the early success of the junior

college transfer function was as conspicuous in California as it was nationally.

The University of California (1950a) reported in 1950 that, by the time of graduation, junior college transfers to that institution were performing at an academic level comparable to that of the native students. However, a slight decline in transfer student GPA in the first semester after transfer had been well documented by the University since 1936 (University of California, 1950b).

A remarkable and most informative chronicle of the academic success of California transfer students in their first semester after transfer was provided by Aumack (1953) in his 20-year follow-up study of Compton Junior College transfer students. Aumack's data covered continuously the period 1929-30 to 1948-49 and included the pre- and post-transfer comparative records of 3,212 Compton transferees to universities, state colleges, and independent four-year institutions. His analysis showed that these students did about as well academically in their first semester after transfer as they had done at Compton Junior College. Some transfer shock was experienced by students transferring to universities, however, where their first-term mean GPA showed a decline of from .25 to .30 grade points. On the other hand, the mean GPA of those students who transferred to California state

colleges or to out-of-state colleges rose an average of .30 grade points during their first semester after transfer.

The outstanding record of Compton transferees came as no surprise to Aumack whose literature review had indicated that "junior college transfers to collegiate institutions had a better than average chance of being successful." (Aumack, 1953, p. 27) What was surprising, however, was his finding that there had been no significant variation in transfer student academic performance at either Compton Junior College or at the receiving senior institutions at any time during the two decades covered by the study. Aumack concluded, therefore, that "the transfer function of the junior college is a successful enterprise, and the quality of teaching and the caliber of students turned out is generally good." (p. 181)

Other California studies contemporary to that of Aumack tended to concur in his finding that junior college transfers, though perhaps suffering some initial transfer shock, were able to compete successfully with native students at senior institutions. Dodson (1951), for example, reported that 81 of 241 transferees from Los Angeles City College to California senior institutions raised their GPA in their first semester after transfer, while the remaining students experienced little or no change in GPA. In a more extensive study, Osner (1961) compared the academic

performance of 316 originally-eligible transferees to California state colleges at Fresno, Sacramento, San Francisco, and San Jose with the upper-division achievement of 778 native students attending those institutions. He found no significant difference in mean GPA between the two groups; moreover, the senior-institution GPA of the transfer students was slightly higher than their junior college GPA. In a somewhat similar study, however, Place (1961) reported that junior college transferees who majored in business at California state colleges suffered some transfer shock during their first two semesters after transfer from which they eventually recovered.

Hall (1967) made the important point that transfer students of average academic ability can realistically aspire to the baccalaureate degree. Defining an average student as one with an IQ between 90 and 110, or one whose percentile ranking on a nationally-normed college aptitude test was between 40 and 60, Hall examined the academic performance of 435 such students who transferred from the College of the Sequoias to a California senior institution during the period 1953-54 to 1963-64. Hall found that over half of these students graduated, although most required seven or more semesters after transfer to attain their baccalaureate degree.

As was the case nationally, the success of the transfer function in California began to receive mixed

reviews as the "junior" college evolved into the "community" college. The problems of transfer shock, higher attrition rates, and slower progress towards graduation, documented nationally by the important Knoell and Medsker (1965) study, began to emerge more frequently in studies of the academic achievement of California's transfer students. A comprehensive study by Medsker (1960), for example, revealed that California community college transferees to Fresno State College, San Jose State College, the University of California at Berkeley, and the University of California at Los Angeles had suffered significant first-term transfer shock; however, originally-eligible students did attain a mean GPA in their senior year which was within one-tenth of that earned by the native students.

Findings of studies conducted in the 1970s, although by no means unanimous, suggest that California's transfer students experienced more post-transfer academic difficulty in the 1970s than they did in prior decades, particularly at the University of California. Stine (1976), for example, reported that grade point averages of transfers from Los Angeles City College (LACC) to the University of California at Los Angeles (UCLA) declined by .39 points in the first year after transfer. However, about three times as many LACC students transfer to the California State University at Los Angeles (CSULA) where,

between 1957 and 1977, the differential between LACC GPA and first-quarter CSULA GPA has ranged from a decline of .13 points to an increase of .21 points; the differential for 1976-77 transferees was -.11 points (Stine, 1977). In its extensive follow-up study of 1972 through 1975 California community college transfers to public senior institutions in California, CPEC (1979a) found that 78 percent of these transfer students were enrolled in the California State University and Colleges (CSUC) system. Forty percent of the CSUC transferees earned first-term grades of B or better while only 17 percent fell below a grade of C; the cumulative CSUC grades of these transfer students were distributed almost identically. CPEC noted, however, that students who transferred to the University of California apparently experienced more academic difficulty than did the CSUC transfers, as only 24 percent of the former students equaled or exceeded their pre-transfer grades as opposed to 49 percent of the latter. Kissler (1980) found transfer shock for transferees to the University of California to be as great as that experienced by students who enter the University directly from high school. Kissler added that the community college transfers get lower grades, suffer higher probation rates, and have lower graduation rates than their native student counterparts; moreover, he reported that the gap in the academic performance of native and transfer students appears to be

widening. He contends that a "decline in academic performance of community college transfers occurred during the early 1970s." (p. 11) Becker (1974), however, found little evidence of such a decline in his study of 1972-73 Long Beach City College transferees to the University of California; he reported that 44 percent of these students attained an A or B average after transfer.

Persistence of Transfer Students

The tendency of California's transfer students to persist to the baccalaureate degree constitutes an important criterion of transfer success. Knoell and Medsker (1965) had estimated an after-transfer three-year graduation rate of from 53 to 73 percent, and Rinehart (1977) found that recent evidence tends to corroborate this estimate. In its follow-up study of 1972-1975 transfer students, CPEC (1979a) noted that rates of graduation and persistence were difficult to calculate because the students transferred at different times and grade levels, and many of the students were still enrolled in the senior institutions when the study was completed in 1978. Nonetheless, CPEC estimated that 38 percent of all the transfer students to the CSUC system had graduated by 1977, while an additional 30 percent were still enrolled at that time. The graduation rate estimated by CPEC seems somewhat low, however, when compared to either the previous estimate provided by Knoell and Medsker or the 60 percent

three-year graduation rate reported by Kissler (1980) for transfer students entering the University of California in 1975. Kissler noted that the 1975 graduation rate was down from the 67 percent figure reported in 1972 but was comparable to the graduation rate reported in 1953.

Performance of Eligible vs. Ineligible Transfer Students

In order to obtain a more realistic appraisal of the efficacy of the California community college transfer function, several investigators have distinguished between the after-transfer academic achievement of students who were originally eligible to attend a senior institution as high school graduates, and those who were not. Osner (1961), for example, found academic comparability between originally-eligible transfer students and their native student counterparts. In his study of 1973-74 Bakersfield College transfer students, Scott (1974) found that the originally-eligible and originally-ineligible transferees to the University of California compiled first-term GPAs of 2.99 and 2.68, respectively. These figures are in close agreement with those disclosed by the University which reported that the 1978-79 originally-eligible and originally-ineligible transfers from all community colleges within the State earned mean GPAs of 2.86 and 2.76, respectively (California Postsecondary Education Commission, 1981). Kissler (1980) noted that originally-

eligible transfers to the University of California have always done well at that institution. Thus, there is strong support for the contention that originally-eligible and originally-ineligible students differ in academic ability and that, consequently, only the academic achievement of the former should be compared with that of University of California native students.

The distinction between academically-eligible and academically-ineligible transfer students takes on added significance in view of the high percentage of transfer students who are originally ineligible to attend senior institutions. Aumack (1953), for example, noted that 70 percent of the Compton transfer students were originally ineligible to attend the University of California. Similarly, Stine (1976) and Gold (1977a) reported that over 85 percent of transfers from Los Angeles City College to the University of California at Los Angeles (UCLA) were originally ineligible to attend that institution. Statistics revealed by the University of California indicate that 55 percent of fall 1977 transfers would not have been eligible for freshman admission to the University as high school graduates (University of California, 1978).

Academic Performance at CSUC vs. University of California

Cross (1968) has pointed out that community college populations change so rapidly that research on

student characteristics and performance should be a continuing process. Since Aumack's (1953) work at Compton, no California community college has epitomized this philosophy more admirably than Los Angeles City College (LACC) where there has been an organized accumulation of data on the academic performance of LACC transfer students dating back to 1957. Gold (1975) noted that, since 1957, the average GPAs earned by new transfers to the California State University at Los Angeles (CSULA) have ranged from 2.36 to 2.63, with differentials between CSULA and LACC GPAs ranging between -.13 to +.21. The first-term CSUC GPAs for 1972-73 and 1976-77 transferees were 2.63 and 2.55, respectively, while their corresponding LACC GPAs were 2.50 and 2.64, respectively (Gold, 1974b, 1977b). Forty percent of the 1972-73 CSUC transferees earned A's or B's (Gold, 1974b) as opposed to 36 percent of the 1975-76 transferees (Stine, 1976). Thus, there appears to have been no significant change in academic performance of LACC transfer students in either their community college work or in their achievement at California State University and Colleges (CSUC) over the period 1957 to 1977. When this observation is coupled with Aumack's (1953) report of the success of Compton Junior College transfer students over the period 1929 through 1949, and with the earlier findings of transfer student success reported by Koos (1925) and Eells (1943), a plausible argument can be made

that there has been no appreciable variation in the efficacy of the California community college transfer function, vis-a-vis the CSUC senior institutions, since the first California community college opened its doors in 1913 (Koos, 1925).

The data presented by Gold and Stine relative to the first-year academic performance of LACC transferees to the University of California suggests that these students experience more academic difficulty after transfer than do the transfers to the CSUC system. Gold (1974a) reported that first-year mean GPA after transfer of the 1972-73 LACC transferees was one-tenth below that of the 1971-72 group but was higher than that of any LACC group which transferred prior to 1969. However, 1974-75 and 1975-76 LACC transferees to the University suffered first-year GPA declines of .39 and .37 points, respectively, below their LACC averages (Stine, 1976; Gold, 1977a). In addition, while 57 percent of the grades earned by the 1972-73 group were A's or B's and only 8 percent were D's or F's (Gold, 1974a), only 52 percent of the grades earned by the 1974-75 group were A's or B's while 14 percent were D's or F's (Stine, 1976).

More generally, Kissler (1980) noted that California community college students transferring to campuses of the University of California with GPAs between 2.4 and 2.8 experienced more academic difficulty in 1976 than they did

in 1972. Thus, while first-year attrition and probation rates for such 1972 transferees were 17 percent and 41 percent, respectively, the corresponding rates in 1976 had climbed to 28 percent and 68 percent, respectively, for transfer students with 2.4 to 2.8 pre-transfer GPAs. Such data led Kissler to conclude that the academic performance of California community college transfers to the University had declined in the 1970s.

Summary of California Perspective

The prevalent attitude of those who have analyzed the California community college transfer function prior to the 1970s was perhaps best summarized by the California Postsecondary Education Commission upon the completion of its "open-door" study. The Commission concluded that California's community college transfer students:

> ...earn grades which compare favorably with those earned before transfer and by "native" students of comparable ability; they persist in degree programs in satisfactory numbers; and they experience relatively little difficulty in completing degree programs in a timely manner. (CPEC, 1976, p. 22)

However, the more cautious assessment provided by CPEC in their follow-up of the "open-door" study seems more in keeping with the latest findings regarding the success of California's community college transfer students. In this later study, CPEC (1979a) concluded that:

> ...grade point averages earned by the community college students after transfer were satisfactory for a large majority of the students, in

> terms of their being in good academic standing after transfer and experiencing a relatively small drop in grade point average. (p. 36)

A San Mateo County Community College District Perspective of Transfer Student Academic Performance at Senior Institutions

Roach (1932) Study

Ten years after the founding of San Mateo Junior College (SMJC) in 1922, Roach (1932) presented the results of his follow-up study of approximately 1,500 students who had attended SMJC during the period 1922-1930. Roach's primary concern was focused upon the subsequent academic achievement of the College's 475 transfer students, particularly those who had graduated from SMJC. Roach found that about one-third of all the students who had completed at least one semester at SMJC transferred to a senior institution; 41 percent of these transfers attended the University of California at Berkeley and another 29 percent enrolled at Stanford University. The transfer rate of 31 percent reported by Roach compares quite favorably with the 20 percent transfer rate recently reported by CPEC (1979a) for students who had attended at least two consecutive terms in a community college.

Fifty-eight percent of the transfer students studied by Roach were SMJC graduates, and, while only 38 percent of these graduates would have been originally-eligible to enter the University of California directly

upon graduation from high school, 73 percent of them subsequently entered a senior institution; conversely, only 17 percent of the non-SMJC graduates transferred to senior institutions. Through a careful search of student records at the senior institutions, Roach was able to determine that at least 54 percent of originally-ineligible SMJC graduates had actually transferred and obtained passing grades in their first semester at the senior institutions. Consequently, Roach concluded that the "salvage" function of the junior college was greatly in evidence.

Both the SMJC graduates and non-graduates who transferred experienced some academic difficulty at the senior institutions, especially during the first semester after transfer. Those SMJC graduates who transferred to the University of California or to Stanford University, for example, attained a mean GPA of 2.18 while the non-graduates earned a mean GPA of 2.03. Nonetheless, Roach's data suggests a tendency on the part of the transfer students to persist towards the baccalaureate degree; of an estimated 277 students who had transferred to senior institutions from SMJC by June 1928, 41.5 percent had earned a baccalaureate degree as of June 1930. This early District transfer student graduation rate compares favorably with the 38 percent of all 1973-1978 community college transfers who had graduated by 1979 from campuses of the

California State University and Colleges (CPEC, 1979a), but is well below the 63 percent three-year graduation rate reported by Kissler (1980) for 1975-76 community college transfers to the University of California.

Roach found that originally-eligible students were twice as likely to graduate from SMJC as those who were originally ineligible, thus providing further support for the contention that these two categories of students differ significantly in academic achievement, a point reiterated much later by Kissler (1980). According to Roach, approximately 70 percent of the SMJC transfer students were originally ineligible to attend the University of California upon graduation from high school. It is interesting to note that, over 20 years later, Aumack (1953) reported an identical percentage of originally-ineligible Compton students transferring to the University of California. In 1981, however, the California Postsecondary Education Commission reported that the percentage of community college transfers in 1978-79 who were originally ineligible to attend the University had dropped to 55 percent (CPEC, 1981).

Taggart (1941) Study

A second follow-up study of San Mateo Junior College transfer students was conducted by Taggart (1941), whose primary interest was the determination of the percentage of originally-ineligible SMJC transfers who

subsequently graduated from the University of California or from Stanford University in the years 1937 to 1940. Of 263 former SMJC students who had graduated from the University of California, Taggart found that 71 percent had been originally ineligible to attend that University directly from high school; this percentage is in remarkable agreement with the 70 percent figure reported by Roach (1932). Taggart further noted that 83 percent of the University of California transferees had previously graduated from SMJC and an additional seven percent had completed four or more semesters at SMJC prior to transfer to the University. Of the 121 SMJC students who subsequently graduated from Stanford University, Taggart found that 75 percent had been originally ineligible to enter that University directly from high school. Taggart gave no indication, however, as to the percentage of these Stanford graduates who had also graduated from SMJC.

Both Roach (1932) and Taggart (1941) stressed the point that a very high percentage of those students who graduated from the University of California or from Stanford University, after transferring from San Mateo Junior College, originally would have been denied admission to those universities because of deficiencies in their high school work. Both researchers concluded, therefore, that the junior college, in addition to preparing the majority of its students for terminal vocational

education, was rendering an important service by providing capable students the opportunity to attain the baccalaureate degree irrespective of their previous academic record. Taggart emphasized that a poor high school record provides no proof of a student's lack of capacity to do university work. Conversely, a successful high school record does not necessarily predict college success; after conducting a five-year literature review, Rinehart (1977) found that most researchers concluded that high school grades or class rank were uncorrelated or were much less correlated with senior institution success than were grades in a two-year college.

Pearce (1968) Study

An extensive study of College of San Mateo (CSM) transfer students was conducted by Pearce (1968) who reported on the academic performance of CSM transfers to the University of California and to the California State University and Colleges. The purpose of Pearce's study was to assess the effectiveness of CSM in preparing its students for transfer; consequently, Pearce investigated differences in pre-transfer and post-transfer grades and looked for student or curricular characteristics which might distinguish between successful and unsuccessful transfer students. The study involved 126 CSM students who transferred to the University of California during the academic year 1966-67, and 1,610 former CSM students who

were in attendance at various campuses of the California State University and Colleges during fall 1967.

Pearce found that the academic performance of the 1966-67 transfers to the University of California exceeded that of students who had transferred during the previous three academic years, despite the fact that the latter students had achieved a higher CSM GPA. Students who transferred during 1966-67 attained a first-year GPA of 2.51 at the University as compared to the 2.36 first-year GPA compiled by CSM transfers in the prior three years. These latter students also suffered a post-transfer first-year GPA decline of .50 grade points as compared to the .32 GPA decline experienced by the 1966-67 transferees. Pearce cautioned, however, that the differences cited might be more apparent than real in view of the relatively small number of students who transferred to the University.

Pearce reported that 56 percent of the transfer students to the University of California would have been ineligible for admission to the University when they enrolled at CSM. This figure is significantly below the 70 and 71 percent reported by Roach (1932) and Taggart (1941), respectively, but is almost identical to the 55 percent recently reported by CPEC (1981) for all community college transfers to the University of California. Unlike Scott (1974), Pearce found no appreciable difference in

academic performance at the University between originally-eligible and originally-ineligible transfer students, although the latter students did complete more units prior to transfer. Furthermore, while 18 percent of the transfer students withdrew during the first year after transfer, there was no significant difference in withdrawal rate between the two classes of students.

A number of other variables were found by Pearce to have little or no effect upon transfer student academic performance at the University. Thus, neither sex, nor the number of units completed before transfer, nor attendance at another college prior to enrolling at CSM seemed to influence student GPA after transfer. University GPA and CSM GPA, however, were found to be directly related to each other.

While first-year GPA for the 1966-67 transferees to the University of California had declined by .32 grade points after transfer from CSM, Pearce found that the 1,610 CSM transfer students in attendance at campuses of the California State University and Colleges during fall 1967 had accumulated a CSUC mean GPA of 2.50 which slightly exceeded their CSM mean GPA of 2.45. Pearce cautioned, however, that evidence of transfer shock would be more apparent at the University where only the academic performance during the first year after transfer was reported. Nonetheless, Pearce's finding of a significant GPA decline

for University transfers and none for CSUC transfers is identical to that reported by Stine (1976, 1977). Pearce also reported that three out of four CSM transfers to the CSUC system earned a GPA after transfer that was equal to or greater than their CSM GPA. Moreover, their CSUC academic performance was found to be essentially independent of the CSUC campus attended.

Other findings reported by Pearce, relative to students who transferred to a CSUC campus, were virtually identical to those he reported for CSM transfers to the University of California. Thus, more than half of the CSUC transferees were originally ineligible to attend CSUC campuses when they enrolled at CSM, and academic performance at a CSUC campus was unrelated to a student's sex, the number of units completed at CSM before transfer, or attendance at another college prior to enrollment at CSM. Senior institution GPA, however, was again found to be strongly related to CSM GPA, and, to a lesser extent, to junior standing at the time of transfer, and to the length of time between departure from CSM and enrollment at a CSUC campus.

Summary of District Perspective

Although their studies spanned four decades, Roach (1932), Taggart (1941), and Pearce (1968) all reached the dominant conclusion that College of San Mateo students have been academically successful after transfer to

California senior institutions, despite the fact that most of these students were ineligible to attend those institutions when they enrolled at CSM. Additionally, all three investigators found evidence of initial transfer shock experienced by transfers to the University of California, a trend which Kissler (1980) found is still very much in evidence today.

While Roach (1932) and Taggart (1941) found significant support for the contention that originally-eligible students will achieve greater success at senior institutions than students originally ineligible to attend those institutions, Pearce (1968) found no difference in senior institution academic success between these two classes of students. All three investigators, however, found senior institution academic performance to be most highly correlated with the grade point average earned at the College of San Mateo. Taggart noted that high school record was an inadequate predictor of subsequent college success, and Pearce added that a student's sex, junior college major, possible attendance at a college prior to CSM enrollment, or number of CSM units completed prior to transfer seemed unrelated to senior institution academic achievement. While Pearce found that the attainment of junior-year standing prior to transfer had some effect upon senior institution academic achievement, he did not investigate the influence of CSM graduation upon this achievement.

Both Roach and Taggart, however, found CSM graduation to be an important ingredient in subsequent success at California senior institutions. All three investigators concluded that the College of San Mateo was performing competently its important role of providing suitable lower-division education to students in pursuit of the baccalaureate degree.

Factors Predictive of Community College Student Transfer Success

Many investigators have sought to determine characteristics of the community college and/or its students which would enhance transfer student academic performance at senior institutions. The variables most frequently studied for their possible predictive potential include: (1) community college GPA; (2) high school grades and class rank; (3) scores on various standardized tests; (4) grades or units completed in specific community college curricula; (5) junior status upon transfer, or units transferred to the senior institution; (6) the type of community college or senior institution attended; (7) senior institution major; (8) age, sex, and marital status of the student; and (9) various non-cognitive variables such as SES, motivation, and study habits. Traditionally, high school GPA and various tests of scholastic aptitude have been used to predict the future academic achievement of transfer students (Phlegar, 1978), although one

suspects that this has been done perhaps more out of convenience than utility. Most recent studies, however, have found community college GPA to have a higher correlation with senior institution academic performance of transfer students than any other factor (Rinehart, 1977).

After the computation of a total of 92 linear regression models, in an attempt to predict upper division grades of 1,221 transfer students from 17 Florida junior colleges to Florida state universities, Sims (1966) concluded that lower division GPA was the most significant predictor of future academic success; he also found that none of 25 institutional variables were predictive of transfer success. Similarly, Beals (1968), Nickens (1972), Elseroad (1971), Federico and Shoemaker (1974), and Holahan and Kelley (1976) found community college GPA to be the variable most predictive of senior institution academic success. In his study of 730 junior-level transfer students who had either graduated or withdrawn from the University of Florida for academic reasons, Sitzman (1972) found that the GPA prior to transfer accounted for almost all the predictive accuracy of senior institution success, and that type of community college attended, student age and marital status, and senior institution major contributed only marginally to predictive accuracy. While Eckard (1971) and McCook (1973) found community college GPA to be an unreliable predictor of transfer

success, Lindia (1971) and Lach (1971) found that community college GPA was essentially the only predictor of academic achievement after transfer. More recently, in a predictive study of the academic success of 361 community college students transferring to Virginia Polytechnic Institute, Phlegar (1978) incorporated 32 variables in a step-wise regression analysis and found community college GPA to be the best indicator of senior institution academic achievement.

High school grades and class rank, while constituting convenient criteria for qualification to senior institutions upon graduation from high school, generally have been found to be significantly inferior to community college GPA as predictors of senior institution academic success. Thus, Lach (1971) found that, while high school rank was a significant predictor of successful transfer to a community college from high school, after the completion of two years at a community college only community college GPA was a significant predictor of upper-division success at senior institutions. Similarly, in a multiple-regression analysis of the senior institution performance of 316 community college transfers to Central Connecticut State College, Lindia (1971) found that high school class rank predicted neither first nor second semester GPA at the senior institution. Elseroad (1971), however, in his study of community college transfers to the University of

Maryland, found that high school rank added 25 percent to the 41 percent of predictive efficiency contributed by community college GPA. Similarly, Federico and Shoemaker (1974) found that high school rank enhanced the prediction of academic success at senior institutions; however, both community college GPA and student age were more predictive. Segner (1978) found high school rank to be of limited usefulness in identifying successful transfer students after community college GPA had been considered. Rinehart (1977) noted that most research has indicated that a student's high school record is essentially insignificant as a predictor of transfer success when compared to the student's community college GPA.

In their landmark study of transfer student academic performance at senior institutions, Knoell and Medsker (1965) concluded that test scores do not effectively distinguish between successful and unsuccessful transfer students and that these scores add little beyond community college GPA to the prediction of senior institution academic success. While Sims (1966) had reported that Florida's 12th Grade Testing Program was a significant predictor of upper-division grades for community college students transferring to Florida state universities, Sitzman (1972) later found that this Program contributed only marginally to the prediction of transfer student academic success at the University of Florida.

Lach (1971) found that ACT scores, while somewhat predictive of success in a community college, added no significance to prediction of senior institution success beyond that provided by community college GPA. Federico and Shoemaker (1974) found ACT composite scores to be a poor fourth behind community college GPA, age, and high school class rank in its potential for the prediction of transfer success. Similarly, Phlegar (1978) reported that SAT scores were of inconsequential significance in the prediction of transfer student academic performance at senior institutions.

Pearce (1968) had suggested that there might be some relationship between senior institution GPA and community college grades, or number of units transferred, in mathematics and English. Phlegar (1978) did indeed find that community college math and English grades and hours transferred enhanced the prediction of transfer success in specific senior institution major programs. Rinehart (1977) felt, however, that such prediction could not be related to a student's general progress at a senior institution.

If community college experience does indeed adequately prepare a student for transfer to a senior institution, one might expect that the number of community college units transferred, or the attainment of a community college Associate in Arts (AA) or Associate in

Science (AS) degree, or the achievement of junior standing prior to transfer, would to some extent be predictive of senior institution success. Findings, however, are at best mixed and indicate that the above characteristics are far less predictive of upper-division achievement than is community college GPA. Knoell and Medsker (1965) concluded that the probability of obtaining the baccalaureate degree is probably lower for those community college students who transfer with less than junior standing. Pearce (1968) found that the number of units transferred by 126 transfer students from the College of San Mateo had no appreciable influence on their University of California GPA; however, in the much larger sample of 1,610 students who transferred to the California State University and Colleges, those students who had attained junior standing were more likely to maintain a senior institution GPA of 2.0 or better. Similarly, Autrey (1970) concluded that students achieve a higher senior institution GPA if they transfer from a community college with the maximum amount of transferable credit. Yet, neither Lindia (1971), nor Elseroad (1971), nor Federico and Shoemaker (1974) found any significant relationship between community college hours transferred and senior institution GPA. Phlegar (1978), on the other hand, found that both credit hours transferred from the community college and the completion

of an AA or AS degree prior to transfer added to the prediction of senior institution academic success.

Several investigators have considered the influence of the size or location of a community college upon senior institution academic performance. Place (1961) found some evidence which suggested that students from larger community colleges were more successful in their upper division work. Conversely, Hartman and Caple (1969) reported that students from rural community colleges outperformed those who attended urban community colleges. Elseroad (1971), Sitzman (1972), and Nayle (1973) found size or type of community college to have no impact upon senior institution GPA. On the other hand, Lindia (1971), McCook (1973), and Young (1974) found that the community college attended correlated significantly with transfer student achievement at a senior institution. Phlegar (1978) reported that community college attended was fourth in predictive importance behind community college GPA, community college math and English programs, and number of community college hours transferred to the senior institution. As might be expected from these findings, an extensive literature review by Rinehart (1977) revealed highly conflicting results concerning the relationship between senior institution achievement and either size or classification (rural or urban) of community college.

While results regarding the importance of type, size, or location of community college upon senior institution academic performance are at best mixed and often contradictory (Rinehart, 1977), there is considerable agreement that a student's upper-division achievement is dependent upon the type of senior institution attended. Thus, Knoell and Medsker (1965) reported a GPA drop of .50 points for students transferring to major universities as compared to a decline of .22 grade points for those students transferring to other colleges and universities. Similarly, Pearce (1968) noted a first-year decline of .30 grade points for College of San Mateo transfer students attending the University of California while no drop in GPA was evident for those transfer students enrolled in the California State University and Colleges (CSUC). More recently, the California Postsecondary Education Commission (1979a) found that, while 49 percent of the transfers to the CSUC system earned the same or higher grades after transfer, only 24 percent of the University of California transferees achieved this distinction. Not all evidence, however, supports the contention that community college transfer students will experience academic difficulty at a major university. For example, while Anderson and Riehl (1974) found that community college transfers to the University of Illinois experienced a significant GPA decline after transfer, Moughamian et al. (1978) later

reported that the transfer students suffered a GPA decline of only .16 grade points in their first year at that University, and that this grade point differential had disappeared by the end of their second year at the University.

There is some evidence to support the contention that choice of senior institution major can effect a student's subsequent academic performance. Martorana and Williams (1954), for example, reported that transfer students majoring in engineering and physical sciences at the State College of Washington achieved a higher mean GPA than did transfer students who opted for other majors. Lindia (1971), however, could find no significant relationship between transfer student field of study and senior institution GPA. Conversely, Pearce (1968), Hartman and Caple (1969), and McCook (1973) found evidence of higher transfer student academic achievement in particular senior institution majors. Unfortunately, there is no unanimity among these findings as to which majors result in higher transfer student senior institution GPA; thus, these findings are not generalizable.

Conflicting conclusions have been drawn in regard to the relationships between a transfer student's age, sex, or marital status, and the student's senior institution academic performance. Klein and Snyder (1969), Lunnenborg and Lunnenborg (1967), and Federico and

Shoemaker (1974) all found support for the supposition that older transfer students outperform their younger counterparts at the senior institutions. Conversely, Elseroad (1971), Lindia (1971), and Sitzman (1972) found no significant relationship to exist between student age and senior institution academic achievement. Similarly, while Hughes (1968) reported that females achieved higher than males in his study of 752 transfer students from Mississippi junior colleges to Mississippi State University, Elseroad (1971), Lindia (1971), McCook (1973), and Federico and Shoemaker (1974) found the relationship between sex and academic achievement at the senior institution to be of no consequence. Klein and Snyder (1969) and Nickens (1972), on the other hand, found this relationship to be significant. Similar conflicting evidence is found in studies of the relationship between marital status and senior institution academic achievement. Thus, while Lindia (1971) and Sitzman (1972) reported this relationship to be insignificant, Hayes and Bradshaw (1977) reported that senior institution GPA was somewhat related to marital status.

It is generally accepted that intellectual potential is not the sole predictor of a student's academic achievement; motivation, attitude, interest, and SES, among other variables, assert their influence upon a student's academic performance (Cattell & Butcher, 1968).

Nix (1959) found that motivation and self-concept correlated positively with academic achievement and Holahan and Kelley (1976) found a relationship between student attitude and academic performance. However, while a review of 13 studies by Lavin (1965) indicated that SES is positively related to academic performance, Lindia (1971) could find no significant relationship between parents' educational or occupational status and their offspring's senior institution academic performance. Despite the influence of background characteristics upon a student's academic performance, Knoell and Medsker (1965), in their definitive study, concluded that such characteristics bore much less relationship to senior institution academic achievement than did community college GPA. They added that findings support the belief that lower class students who have been academically successful at the community college level are just as likely to succeed in the senior institution as are middle and upper class students. Holstrom and Bisconti (1974) also observed that background factors are less important determinants of success after transfer than is academic performance at the community college. More recently, upon a review of the literature on student characteristics and their predictive potential for academic achievement, Margraine (1978) noted that findings, while often contradictory, generally indicate that background characteristics account for little variance in

academic achievement beyond that explained by intellectual ability.

The literature concerned with the prediction of senior institution academic performance of community college transfer students supports the following contentions. Community college GPA is the variable most predictive of transfer student success. Test scores and high school grades or class rank contribute little to the variance in senior institution academic achievement beyond that accounted for by community college GPA. The status of senior institution eligibility at time of community college enrollment, community college record in math and in English, and senior institution major may have some predictive potential. Similarly, community college graduation or attainment of junior class standing may ameliorate senior institution performance. On the other hand, size and location of the community college attended and nonacademic student background characteristics, with the possible exception of age, sex, and marital status, appear to have little potential for the prediction of senior institution academic success. It must be emphasized, however, that inferences drawn from the literature reviewed are necessarily tentative because of the frequent contradictions and extreme variation in the findings reported.

Summary

The review of the literature has been presented under four major headings: (1) a national perspective of the academic performance of community college transfer students at senior institutions; (2) the academic performance of California community college transfer students at California senior institutions; (3) an historical perspective of the academic performance of San Mateo County Community College District transfer students at California senior institutions; and (4) factors predictive of community college student transfer success.

The literature has provided abundant evidence that, throughout its history, the community college has performed with distinction the transfer function it was originally assigned. The senior institution academic performance of its transfer students has shown remarkable similarity whether viewed from a national, a California, or a San Mateo County Community College District perspective. However, as the "junior" college evolved into the "community" college, via the assumption of the additional functions of vocational, remedial/developmental, and community education, reports of student difficulty upon transfer to senior institutions have become more frequent, particularly during the last two decades. Efforts to ameliorate the transfer function have led to a host of studies designed to determine factors which would enhance

the senior institution performance of transfer students. To date, only community college GPA has emerged as a variable with substantial predictive potential. However, findings suggest that the status of senior institution eligibility at time of community college enrollment, community college record in math and English, senior institution major, community college graduation or attainment of junior class standing, and age, sex, and marital status may enhance the prediction of senior institution academic achievement of transfer students.

Today's community college is faced with increased demands for educational accountability; it is exposed to intensified competition for students; and it is the subject of continual skepticism from critics who question the college's ability to maintain the quality of its transfer function while concurrently providing vocational, community, and remedial education. Consequently, it has become vital for the community college to be able to demonstrate the efficacy of its transfer function and to seek ways to improve it. The wide discrepancies in findings reported underscore the necessity for each community college to evaluate its own transfer function rather than rely solely upon conclusions drawn elsewhere. Thus, each community college must continually evaluate the academic performance of its transfer students and must attempt to identify predictive factors which might enhance this performance.

CHAPTER III

METHODOLOGY

The purpose of the present study was threefold: (1) to assess the academic performance of San Mateo County Community College District students after transfer to the University of California or to selected campuses of the California State University and Colleges; (2) to provide an historical perspective of this performance by comparing it with that reported in previous studies of College of San Mateo transfer students; and (3) to determine and rank those variables which are most predictive of academic success at four-year institutions after transfer from the San Mateo County Community College District.

This chapter consists of four sections. The population and sample of the study are identified in the first section. The second section contains a description of the design and procedure of the study. The method of data analysis is discussed in the third section and the final section contains a summary of the chapter.

Population and Sample

The sample for the study was drawn from the population of San Mateo County Community College District

students who transferred to the University of California (UC) from fall 1974 through spring 1979 or to campuses of the California State University and Colleges (CSUC) during the period fall 1976 through fall 1980. The sample selected was governed by the relative number of District students transferring to the various UC and CSUC campuses and by the availability of UC and CSUC academic performance data on these transfers. Consequently, transfer patterns of District students were first determined and then matched to available data.

From fall 1977 through fall 1979, 83 percent of District transfers to California's public four-year institutions attended a CSUC campus (see Table 1). This transfer rate is almost identical to that reported for all of California's community colleges (Aikman, 1980). The fall 1979 flow of transfer students to UC and CSUC from each of the three campuses of the District is depicted in Table 2. Although the College of San Mateo (CSM) had only 49 percent of the District's fall 1978 total credit enrollment, the College contributed 69 percent and 54 percent of the District's fall 1979 UC and CSUC transferees, respectively (see Table 3).

In both fall 1977 and fall 1979, over 60 percent of the District transfers to the CSUC system enrolled at either San Francisco State University (SFSU) or San Jose State University (SJSU) (CPEC, 1981). The campus at

Table 1

Flow of Community College Transfers to UC and CSUC
Fall 1977, Fall 1979[a]

Fall Term	District Transfers		All CC Transfers	
	UC	CSUC	UC	CSUC
1977	205	1,079	6,392	33,931
	(16%)	(84%)	(16%)	(84%)
1979	189	888	5,654	30,458
	(18%)	(82%)	(16%)	(84%)

[a]Source: CPEC (1981)

Table 2

Flow of Transfer Students to UC and CSUC
by District Campus
Fall 1979[a]

District Campus	Fall 1979 Transfers		
	UC	CSUC	Total
San Mateo	131	477	608
	(22%)	(78%)	
Canada	35	170	205
	(17%)	(83%)	
Skyline	23	241	264
	(9%)	(91%)	

[a]Source: Aikman (1980)

Table 3

Percentage of Transfers to UC and CSUC
Contributed by Each District Campus
Fall 1979

District Campus	UC	CSUC
San Mateo	69%	54%
Canada	19%	19%
Skyline	12%	27%

Hayward, third in popularity among District transfers to CSUC, attracted only seven percent of the CSUC transferees (see Table 4) despite its commuter proximity to all three campuses of the District. The propensity among District transfers for the San Francisco and San Jose campuses is reflected in the fall 1979 flow of transfers to CSUC from each campus of the District (see Table 5). Skyline College, located approximately 10 miles from San Francisco State University, sent 71 percent of its CSUC transfers to that campus in fall 1979. Both Canada College and the College of San Mateo sent over 55 percent of their CSUC transfers to either San Francisco or San Jose in fall 1979.

The assessment of the academic achievement (as measured by GPA) of District students after transfer to the CSUC system was based primarily upon their performance at San Francisco State University or San Jose State

Table 4

Flow of District Transfer Students to Selected Campuses of the California State University and Colleges Fall 1977, Fall 1979a

Fall Term	San Francisco	San Jose	Hayward	San Diego	Chico	Other
1977	416 (38.6%)	271 (25.1%)	76 (7.0%)	70 (6.5%)	60 (5.6%)	186 (17.2%)
1979	386 (43.5%)	168 (18.9%)	64 (7.2%)	63 (7.1%)	52 (5.9%)	155 (17.5%)

[a]Source: Aikman (1980)

Table 5

Flow of Transfer Students by District Campus to Selected Campuses of the California State University and Colleges Fall 1979[a]

District Campus	San Francisco	San Jose	Hayward	San Diego	Chigo	Other	Total
San Mateo	167 (35.0%)	98 (20.5%)	37 (7.8%)	40 (8.4%)	32 (6.7%)	103 (21.6%)	477
Canada	48 (28.2%)	49 (28.8%)	15 (8.8%)	14 (8.2%)	10 (5.9%)	34 (20.0%)	170
Skyline	171 (71.0%)	21 (8.7%)	12 (5.0%)	9 (3.7%)	10 (4.1%)	18 (7.5%)	241
Total	386 (43.5%)	168 (18.9%)	64 (7.2%)	63 (7.1%)	52 (5.9%)	155 (17.5%)	888

[a]Source: Aikman (1980)

University, the two CSUC campuses which receive a significant majority of the District transfers to CSUC. With the exception of the spring and fall 1979 SFSU reports, academic performance reports were available on new and continuing College of San Mateo transfers to SFSU or SJSU for every semester during the period fall 1976 to fall 1980. While similar reports were available only sporadically during this period for the Skyline and Canada College transfers, spring and fall 1980 SFSU and SJSU performance reports on new and continuing transfers were available for all three campuses of the District, thereby providing intra-District comparative data. The fall 1976 through fall 1980 SFSU and SJSU academic performance reports provided GPA data on 3,139 new District transfer students.

Estimates of three-year graduation rates for District transfers to CSUC were based upon a sample of 336 students who transferred as juniors to San Francisco State University in fall 1976 or San Jose State University in fall 1977. The search for factors having potential for the prediction of CSUC grade point averages employed a sample of 318 District students who entered SFSU or SJSU as juniors in fall 1980.

Assessment of the academic achievement of District transfers to the University of California was based upon summaries of their first-year University grade point

averages. University academic performance reports for the years 1974-75 through 1978-79 were available for each campus of the District and provided usable data on 867 UC transferees (see Table 6), over two-thirds of whom transferred to either UC Berkeley or UC Davis (University of California, 1980).

Table 6

Flow of Transfer Students to the University of California by District Campus and Academic Year

	District Campus			Total
	San Mateo	Canada	Skyline	
1974-75	125	51	16	192
1975-76	129	40	26	195
1976-77	128	37	20	185
1977-78	104	32	14	150
1978-79	95	34	16	145
Total	581 (67.0%)	194 (22.4%)	92 (10.6%)	867

Note. Data was obtained from University of California academic performance reports of District transfers

University of California reports on individual District transfers to the University were available only for District students who transferred from the College of San Mateo to the University during 1975-76 (the last year for which the University provided student-specific data). Consequently, 1975-76 samples of CSM transfers were utilized to estimate a three-year UC graduation rate for

District junior-level transfers, and to search for factors which might predict transfer student success at the University; the sample sizes for these two tasks were N=107 and N=123, respectively. Results obtained from these samples should be representative of the District as a whole since over two-thirds of the District's transfers to the University come from the College of San Mateo (see Table 3 and Table 6).

Design and Procedure

The primary sources of data for this study were the academic performance reports obtained from the University of California (UC), San Francisco State University (SFSU), San Jose State University (SJSU), and student records housed at the three campuses of the San Mateo County Community College District. Other significant sources of data included the UC, SFSU, and SJSU Offices for School and College Relations, the California Postsecondary Education Commission (CPEC), the Office of the Chancellor for the California Community Colleges, and the Office of the Chancellor for the California State University and Colleges. The data obtained in this study were used to assess the UC and CSUC academic performance of District transfer students, to compare this performance with that of native students and other community college transfer students, to compare this performance with that

reported in earlier studies of District transfers, and to investigate the extent to which senior institution GPA could be predicted prior to transfer.

All available San Francisco State University and San Jose State University semester reports on the academic achievement of District transfer students for the period fall 1976 through fall 1980 were collected from the three District campuses. Where possible, copies of missing reports were procured from the appropriate senior institution School and College Relations Office. From each report, a summary of semester GPA for new District transfers and a summary of semester and cumulative GPA for continuing District transfers were obtained.

University of California reports on the academic achievement of District transfer students during the academic years 1974-75 through 1978-79 were obtained from the District campuses or from the University of California at Berkeley Office for School and College Relations. Data obtained from each report included the first-year UC summary grade point average of all originally-eligible (for acceptance to UC upon graduation from high school) and originally-ineligible District transfer students, and the differential between their District GPA and their UC GPA. Comparable information on all of California's community college transfers to UC was also furnished by the reports.

Estimation of three-year graduation rates for District transfers to the California State University and Colleges was based upon the progress of students who transferred as juniors from Skyline College to SFSU in fall 1976, from College of San Mateo (CSM) to SFSU in fall 1976, or from CSM to SJSU in fall 1977. These three groups were chosen because transfer student progress could be followed (via the academic performance reports) for six consecutive semesters. Graduation commencement programs for the academic years 1976-77 through 1979-80 were obtained from the SFSU and SJSU Offices for School and College Relations and were carefully searched to determine graduation dates of District transfers.

The estimation of graduation rates for District transfers to the University of California was based upon the progress of those students who transferred as juniors in 1975-76 from the College of San Mateo to the UC campuses at Berkeley, Davis, or Los Angeles (data was unavailable for UC Santa Barbara and insignificant at other UC campuses). A letter (see Appendix A), accompanied by a pertinent list of District transfer students, was sent to the registrar of each of the above campuses requesting graduation or withdrawal dates of the transferees.

A sample (N=318) of fall 1980 junior-level transfers from the three campuses of the District to San Francisco State University (SFSU) and San Jose State

University (SJSU) was utilized to investigate the extent to which CSUC GPA could be predicted from other variables. All transfers who had completed a minimum of 24 units at a District campus were included in the prediction study. A multiple regression analysis was performed in which values of the dependent variable, first semester senior-institution GPA, were obtained from the SFSU and SJSU academic performance reports. The independent variables used in the regression analysis are listed in Table 7. Values for these variables were obtained from student records located in the Office of the Registrar of the appropriate District campus (the form utilized to gather the data is shown in Appendix B_1). Each of the categorical (i.e., nominal) independent variables (sex, District graduation status, CSUC campus, and District campus) was orthogonally coded (Kerlinger and Pedhazur, 1973) to provide quantitative representation to the variable's nominal form. The value assigned to such a variable simply represents one of its categories and permits its inclusion in the multiple regression analysis. If a nominal variable has k classifications, it must be represented by (k-1) vectors (Kerlinger & Pedhazur, 1973); thus, the three classifications of District campus have two orthogonal representations in Table 7.

The multiple regression analysis for the prediction of CSUC GPA was performed on the Stanford University

Table 7

Independent Variables Utilized in the Prediction of CSUC GPA

Continuous/Interval Student Variables	N = 318	
- Age		
- District math units completed with grade of C or better		
- District English units completed with grade of C or better		
- District total units completed		
- District GPA		
Categorical Student Variables	**Coding**	
- Sex		
Male	1	
Female	-1	
- District graduation status		
AA degree recipient	1	
No AA degree	-1	
- CSUC campus attended		
SFSU	1	
SJSU	-1	
- District campus attended		
College of San Mateo	1	1
Canada College	-1	1
Skyline College	0	-2

IBM 370/3033 computer using subprogram NEW REGRESSION (Hull & Nie, 1981) from the Statistical Package for the Social Sciences (SPSS). For each transfer student, values of the dependent variable and the independent variables were entered via a computer terminal into a data file for subsequent analysis (student names were excluded

from the file in order to maintain the confidentiality of each student's record).

A similar GPA prediction study was performed for District transfers to the University of California (UC). The analysis used a sample (N=123) of College of San Mateo students who had transferred to the Berkeley, Davis, or Los Angeles campus of the University during the academic year 1975-76. As was the case with the CSUC sample, all of the students in the UC sample had completed a miniumum of 24 semester units prior to transfer. The dependent variable in the multiple regression analysis was University GPA. The independent variables were similar to those employed in the CSUC prediction study; these variables and the coding used to represent the categorical variables are shown in Table 8. Data on each student were collected using the form shown in Appendix B_2. The subsequent data file was processed in the manner described for the CSUC data.

The independent variables utilized in the UC and CSUC regression analyses were selected for their senior institution GPA predictive potential (inferred from the review of the literature). Special consideration was given to those factors whose impact upon senior institution GPA had been contemplated by Pearce (1968) in his earlier study of the academic performance of College of San Mateo transfer students.

Table 8

Independent Variables Utilized
in the Prediction of UC GPA

Continuous/Interval Student Variables	N = 123
- Age	
- CSM math units completed with grade of C or better	
- CSM English units completed with grade of C or better	
- CSM total units completed	
- CSM GPA	
Categorical Student Variables	**Coding**
- Sex	
Male	1
Female	-1
- CSM graduation status	
AA degree recipient	1
No AA degree	-1
- UC eligibility	
Eligible upon high school graduation	1
Not eligible upon high school graduation	-1

Data Analysis

In response to the purposes of the study, answers were sought to four questions. Questions 1 and 2 relate to the first purpose of the study (assessment of District transfer student senior institution academic performance), question 3 relates to the study's second purpose (historical perspective of this performance), and question 4 relates to the final purpose of the study (prediction of

District transfer student senior institution GPA). The questions of the study were:

1. How does the academic performance of San Mateo County Community College District transfer students compare with that of other community college transfers and with that of native students at selected campuses of the California State University and Colleges?

2. How does the academic performance of San Mateo County Community College District transfer students compare with that of other community college transfers, and with that of native students at the University of California?

3. How does the senior institution academic performance of San Mateo County Community College District transfer students compare with that reported in previous studies of College of San Mateo transfer students?

4. Are there variables which can predict senior institution GPA prior to transfer from the San Mateo County Community College District?

CSUC Academic Performance

In response to the first question, summary grade point averages were obtained for students who had transferred from the San Mateo County Community College District to San Francisco State University (SFSU) or San Jose State University (SJSU) during the period fall 1976 through fall 1980. These GPAs were then compared with

those of all CSUC students and with those of all community college transfers to the CSUC system.

Through the use of SPSS subprograms (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975), more detailed analysis of GPA data was obtained for those District students who transferred as juniors to SFSU or SJSU for the fall 1980 semester. For these students, the subprogram CONDESCRIPTIVE supplied statistical data which enabled comparison of the GPAs of the junior-level entrants with their District GPAs and with the CSUC GPAs of all District transfers. Subprogram BREAKDOWN allowed intra-District comparisons of CSUC GPA and District GPA.

Graduation rates for District transfers to San Francisco State University (SFSU) and San Jose State University (SJSU) provided another measure of the CSUC academic performance of District transfer students. Estimates of graduation rates were obtained for 336 District students who transferred as juniors to SFSU or SJSU in fall 1976 or fall 1977. These graduation rates were compared with those reported by the CSUC Chancellor's Office (California State University and Colleges, 1979) for CSUC native students and for transfers from all of California's community colleges to the CSUC system.

UC Academic Performance

The evaluation of the academic performance of District transfers at the University of California (UC) was

based upon the achievement of those students who transferred to the University during the academic years 1974-75 through 1978-79. The summary first-year UC GPAs of these transferees were compared with those of transfers from all of California's community colleges. In addition, data supplied by the California Postsecondary Education Commission (CPEC, 1981) allowed comparison of the UC academic achievement of District transfers with that of students native to the University. In all of the above comparisons, careful attention was paid to the distinction between originally-eligible (for acceptance to the University upon graduation from high school) and originally-ineligible community college transfer students.

Student-specific data on the 1975-76 District transfers to the University enabled analysis, via SPSS subprograms (Nie et al., 1975), of the influence of various factors on the University academic achievement of District transfers. Subprogram FREQUENCIES provided statistical data on categorical variables and subprogram CONDESCRIPTIVE provided comparable data on continuous variables. Subprogram ANOVA was used to investigate the influence of University campus on UC GPA.

The three-year graduation rate of the 1975-76 District transfers to the University was obtained from University records. This graduation rate was contrasted with that of all of California's community college transfers to

the University and with the five-year graduation rate of UC native freshmen. These latter graduation rates were obtained from a University report (Kissler, 1980) on student retention and transfer.

Historical Perspective of Senior Institution Academic Performance

In response to the third question of the study, the senior-institution academic performance of District transfer students, as assessed in the present study, was compared to that reported earlier by Roach (1932), by Taggart (1941), and by Pearce (1968). The percentage and achievement of originally-eligible versus originally-ineligible transfers, and District graduate versus non-graduate transfers, were contrasted. Particular attention was focused upon the apparent similarities and differences in findings of the present study and those reported by Pearce in the prior decade, since, while both Roach and Taggart reported almost exclusively upon the academic performance of District transfers to UC Berkeley and Stanford University, Pearce assessed the performance of District transfers to both the UC and CSUC systems.

Prediction of Senior Institution Academic Performance

A response to the final question of the study was obtained by the execution of two multiple linear stepwise regression analyses which examined the extent to which District transfer student senior institution GPA could be

predicted from various independent variables. A prediction equation was obtained for the dependent variable, CSUC GPA, from the set of independent variables listed in Table 7; a separate equation for the prediction of UC GPA was generated from the variables listed in Table 8.

Subprogram NEW REGRESSION (Hull & Nie, 1981) from SPSS was utilized to perform each regression analysis. The procedure is described herein for the CSUC sample (an identical procedure was applied to the UC sample). For the CSUC sample, procedure TEST of NEW REGRESSION was first applied to the entire sample (N=318) to determine which interactions between variables resulted in an insignificant increment to R^2 when entered last into the regression equation (R^2 is the square of the correlation between the observed and the predicted values of senior institution GPA). The insignificant interactions were then eliminated from further analysis. Only the two-way interactions of the categorical variables with all other categorical and all continuous variables were considered. As shown in Appendix C_1, with the exception of the correlation between math units and total units (r=.263) and that between English units and total units (r=.264), all correlations between the independent continuous CSUC variables (see Table 7) were less than .20 and hence their interactions were not considered. Since the regression model which included English and math units produced a slightly

higher value of R^2 than that which included total District units, the latter variable was dropped from subsequent analysis.

Prior to the final stepwise analysis, a double cross-validation (Kerlinger & Pedhazur, 1973, pp. 282-284) was performed with the remaining variables in order to obtain an approximation of the stability of the regression equation and of R^2. The total sample (N=318) was randomly split into two subsamples using a table of random numbers (Snedecor & Cochran, 1978) and stratified sampling (to ensure equal representation from each District and senior institution campus); a stepwise analysis was applied to each subsample (N=159). The regression equation obtained from each subsample was then used with the independent variables of the alternate subsample to generate another estimate of R^2. The four values of R^2 and the two regression equations which resulted from the double cross-validation were then compared. Suitable stability of both R^2 and the regression equation having been evidenced, the subsamples were then recombined and the final stepwise regression analysis was performed on the entire sample (N=318) to determine which of the independent variables made a significant contribution (significance level = .10) to the prediction of CSUC GPA.

Summary

The population and sample utilized in the study were described in the chapter. The sample was drawn from those students who transferred from the San Mateo County Community College District to the University of California during the period fall 1974 through spring 1979, or to San Francisco State University (SFSU) or San Jose State University (SJSU) during the period fall 1976 through fall 1980. An outline of the design and procedures to be used in the study, the method and sources for data collection, and the comparative and statistical procedures employed to analyze the data collected were detailed. SPSS programs were used to perform the statistical analyses of data.

In response to the first research question, the GPAs of 3,139 fall 1976 through fall 1980 District transfers to SFSU or SJSU and the graduation rates of 336 fall 1976 and fall 1977 District transfers to SFSU or SJSU were assessed and compared with the GPAs and graduation rates of other students attending those Universities. Similarly, a response to the second research question was obtained by a comparison of the first-year GPAs of 867 1974-75 through 1978-79 District transfers to the University of California and the graduation rates of 107 1975-76 District transfers to that University with the GPAs and graduation rates of other students attending the University.

In response to the third research question, the senior-institution academic performance of District transfer students, as assessed in the present study, was compared to similar evaluations reported by Roach (1932), Taggart (1941), and Pearce (1968). Historical comparisons were made of grade point averages and graduation rates, the original eligibility (to attend senior institutions directly from high school) of District transfer students, their tendency to obtain a community college degree prior to transfer, their susceptibility to transfer shock during their first year after transfer, and their relative proclivity for CSUC campuses versus those of the University of California.

In response to the final research question, the extent to which District transfer student senior institution GPA can be predicted prior to transfer was investigated. Two multiple linear stepwise regression analyses were performed; the dependent variables were CSUC GPA (N=318) and UC GPA (N=123), respectively. Independent variables considered in the analyses included: transfer student (1) age, (2) sex, (3) District math units, (4) District English units, (5) total District units, (6) District GPA, (7) District graduation status, (8) District campus attended, (9) senior institution campus attended, and (10) senior institution eligibility.

CHAPTER IV

FINDINGS

The purpose of the present study was threefold: (1) to assess the academic performance of San Mateo County Community College District students after transfer to the University of California or to selected campuses of the California State University and Colleges; (2) to provide an historical perspective of this performance by comparing it with that reported in previous studies of College of San Mateo transfer students; and (3) to determine and rank those variables which are most predictive of academic success at four-year institutions after transfer from the San Mateo County Community College District.

The chapter consists of five sections. In the first section, the senior institution summary grade point averages and graduation rates of District transfers to the San Francisco and San Jose campuses of the California State University and Colleges are compared with those of native students and other community college transfers. Similar comparisons are provided in the second section for District transfers to the University of California. Thus, the first and second sections of the chapter contain

responses tc the first ahd second questions of the study, respectively. A response to the third question of the study is provided in the next section of this chapter in which the academic performance of District transfer students is compared to that reported previously by Roach (1932), Taggart (1941), and Pearce (1968). In the fourth section of this chapter the extent to which the senior institution grade point average of District transfer students can be predicted prior to transfer is discussed in response to the last question of the study. A summary of the chapter is presented in the final section.

Academic Performance of San Mateo County Community College District Transfer Students at Campuses of the California State University and Colleges

The first research question sought to define the senior institution academic performance of District transfers to the California State University and Colleges (CSUC). To answer this question, summary grade point averages and graduation rates of District transfers at the San Francisco and San Jose campuses of the CSUC system were assessed and compared with those of other students attending those Universities. Academic performance data on District transfer students at other CSUC campuses were obtained to verify findings.

First-Term Grade Point Averages of District Transfers at CSUC Campuses

The first-term grade point averages (GPAs) earned during the spring and fall 1980 semesters by District transfer students to San Francisco State University (SFSU) and San Jose State University (SJSU) are shown in Table 9. The GPAs are given for each of the three District campuses; District GPAs have been computed as a weighted average of the campus grade point averages. The semester GPAs of all undergraduates who attended SFSU and SJSU are included in Table 9 for comparative purposes.

The spring 1980 and the fall 1980 data presented in Table 9 provide different perspectives of the first-term academic performance of District transfers at San Francisco State University and San Jose State University. The spring 1980 District GPAs were .36 and .54 points below that of all students at SFSU and SJSU, respectively (significant mid-year transfer shock may have been experienced by the District transfers). The Canada transfers, in particular, encountered academic difficulty during the spring 1980 semester. In fall 1980, however, District SFSU and SJSU GPAs were not only appreciably higher, they were within .17 and .12 points, respectively, of the GPAs earned by all undergraduates attending SFSU and SJSU. Moreover, the difference in senior institution academic performance among the three District campuses, apparent in

Table 9

First-Term GPAs of District Transfers at the San Francisco and San Jose CSUC Campuses Spring and Fall 1980

	Academic Term	
	Spring 1980	Fall 1980
San Francisco State University		
District Campus	GPA	GPA
CSM	2.70 (75)[a]	2.70 (194)
Canada	2.14 (17)	2.67 (32)
Skyline	2.43 (74)	2.68 (144)
District	2.52 (166)	2.69 (370)
SFSU Undergraduates	2.88	2.86
San Jose State University		
District Campus	GPA	GPA
CSM	2.04 (61)	2.30 (125)
Canada	1.78 (27)	2.21 (38)
Skyline	2.14 (9)	2.24 (20)
District	1.98 (97)	2.27 (183)
SJSU Undergraduates	2.52	2.39

[a]the number of new transfer students

spring 1980, was not in evidence during fall 1980; the range in fall 1980 District campus GPA was only .03 and .09 grade points at SFSU and SJSU, respectively.

The different perspectives gained from contrasting the spring and fall 1980 GPAs of District transfers suggest the desirability of gathering data over several semesters before drawing conclusions regarding transfer student academic performance. The fall 1976 through fall 1980 data shown in Table 10 enable comparison of the first-term GPA of District transfers with the semester GPA of all SFSU and SJSU undergraduates. While each District campus GPA was below that for all undergraduates at both SFSU and SJSU for every semester considered, the differences in GPA (see Table 11) were not severe. From the data contained in Tables 10 and 11, however, it seems apparent that the first-term transfers from the College of San Mateo (CSM) outperformed those from Skyline College at SFSU and those from Canada College at SJSU over the period fall 1976 through fall 1980. While the GPA of the CSM transfers was .18 grade points below the GPA of all the CSUC students, the combined average GPA of the Canada and Skyline students was .34 grade points below that of all CSUC students. The combined District first-term GPA was .24 grade points below that of all CSUC students during the period fall 1976 through fall 1980.

Table 10

First-Term GPAs of District Transfers at the San Francisco and San Jose CSUC Campuses
Fall 1976 through Fall 1980

District Campus	CSUC Campus	Academic Term F'76	S'77	F'77	S'78	F'78	S'79	F'79	S'80	F'80	Average
CSM	SFSU	2.74 (157)[a]	2.71 (135)	2.73 (198)	2.80 (100)	2.84 (190)	-	-	2.70 (75)	2.70 (194)	2.75 (1,049)
Skyline	SFSU	2.68 (157)	2.44 (111)	2.63 (180)	2.63 (112)	2.66 (175)	-	-	2.43 (74)	2.68 (144)	2.61 (953)
SFSU Undergraduates		2.91	2.94	2.99	3.01	3.00	-	-	2.88	2.86	2.95
CSM	SJSU	2.56 (159)	2.61 (69)	2.27 (177)	2.24 (75)	2.40 (152)	2.28 (75)	2.39 (101)	2.04 (61)	2.30 (125)	2.36 (994)
Canada	SJSU	-	-	-	-	-	2.41 (24)	1.92 (54)	1.78 (27)	2.21 (38)	2.05 (143)
SJSU Undergraduates		2.75	2.79	2.43	2.50	2.45	2.51	2.42	2.52	2.39	2.53

[a]the number of new students who transferred; data for Canada transfers to SFSU and Skyline transfers to SJSU were not available prior to the spring 1980 semester

Table 11

GPA of All Undergraduates Minus First-Term GPA of District Transfers
Fall 1976 through Fall 1980

District Campus	CSUC Campus	Academic Term									
		F'76	S'77	F'77	S'78	F'78	S'79	F'79	S'80	F'80	Average[a]
CSM	SFSU	.17	.23	.26	.21	.16	-	-	.18	.16	.20
Skyline	SFSU	.23	.50	.36	.38	.34	-	-	.45	.18	.33
CSM	SJSU	.19	.18	.16	.26	.05	.23	.03	.48	.09	.16
Canada	SJSU	-	-	-	-	-	.10	.50	.74	.18	.39

[a]indicates the average GPA differential (GPA of all undergraduates minus first-term GPA of District transfers) over the period fall 1976 through fall 1980

Yet another perspective of District transfer student first-term academic performance at SFSU and SJSU is gained by a comparison of the percentage of students from each District campus who achieved at a particular grade level. Judging from the percentage of spring and fall 1980 transfers who earned GPAs less than 2.0 in their first semester after transfer (see Table 12), it is apparent that the Canada College transfers performed somewhat below the level of the CSM and Skyline College transfers during the spring 1980 semester. The fall 1980 intra-District senior-institution academic performance, however, is again much more uniform at both SFSU and SJSU. The combined spring and fall 1980 level of achievement of first-term District transfers (see Table 13) indicates that these students had somewhat more success at San Francisco State University than they did at San Jose State University during the 1980 academic year. Their first-term performance at both Universities, however, is only slightly below the first-term level of achievement reported by CPEC (1979a) for all of California's fall 1973 through spring 1977 community college transfers to the CSUC system (see Table 13).

During the period fall 1976 through fall 1980, 23 percent of the District's transfers to SFSU or SJSU entered those senior institutions as freshmen or sophomores; 24 percent did so in fall 1980 (just another reason

Table 12

Percentages of District Transfers at SFSU and SJSU with First-Term GPAs at Specific Grade Levels Spring and Fall 1980

Level of Achievement	Spring 1980			Fall 1980		
	CSM	Canada	Skyline	CSM	Canada	Skyline
	San Francisco State University					
3.00-4.00	44.0	25.0	41.7	41.4	42.0	41.8
2.00-2.99	34.7	43.8	30.5	37.7	38.7	38.3
0.00-1.99	21.3	31.2	27.8	20.9	19.3	19.9
N[a]	(75)	(16)	(72)	(191)	(31)	(141)
	San Jose State University					
3.00-4.00	28.9	20.8	37.5	32.8	35.2	47.0
2.00-2.99	50.0	41.7	37.5	43.2	44.1	35.3
0.00-1.99	21.1	37.5	25.0	24.0	20.7	17.7
N	(52)	(24)	(8)	(116)	(34)	(17)

[a]number of students who attempted at least one unit for credit

to heed the caveat of Hunter and Sheldon (1980) that all transfer students are not alike). Consequently, a final perspective of District transfer student first-term CSUC academic performance was obtained by focusing attention only upon the achievement of those students who transferred with junior status to San Francisco State University or San Jose State University in fall 1980 (all of these students had completed a minimum of 24 units at a District campus). Subprogram BREAKDOWN from SPSS (Nie et al.,

Table 13

Percentages of 1980 District Transfers and All 1973-1977 Community College CSUC Transfers with First-Term CPAs at Specific Grade Levels

Level of Achievement	District - 1980		All CC Transfers to CSUC
	SFSU	SJSU	Fall 1973 - Spring 1977
3.00-4.00	41	33	41
2.00-2.99	37	44	42
0.00-1.99	22	23	17
N[a]	(526)	(251)	(2,353)

[a]number of students in calculations

1975) was used to obtain the fall 1980 senior institution GPAs of junior-level transfers (see Table 14). Analyses of variance (using subprogram ANOVA from SPSS) indicated that both the effect of District campus on transfer student District GPA, and CSUC campus on transfer student CSUC GPA were significant at the .01 level; the influence of District campus on the CSUC GPA of fall 1980 junior-level transfers, however, was found to be insignificant.

From a comparison of the data in Table 14 with that in Table 9, it can be noted that, while junior-level status had no appreciable affect on fall 1980 District transfer student achievement at SFSU (2.75 SFSU GPA for the junior-level transfers vs. 2.69 for all District SFSU transferees), the SJSU GPA (2.44) of the District's junior-level transfers was .17 points greater than that

Table 14

Grade Point Averages at SFSU and SJSU Earned by District Students Who Transferred as Juniors Fall 1980

Students	Grade Point Averages			
	District GPA	CSUC First-Term GPA		
		SFSU	SJSU	CSUC[a]
CSM	2.84 (188)[b]	2.79 (103)	2.44 (35)	2.63
Canada	2.96 (38)	2.65 (12)	2.45 (26)	2.51
Skyline	3.02 (92)	2.71 (80)	2.37 (12)	2.67
District	2.91 (318)	2.75 (195)	2.44 (123)	2.63
CSUC Undergraduates		2.86	2.39	

[a] each CSUC GPA is a weighted average of the SFSU and SJSU GPAs
[b] number of students in calculation

of all District transfers to SJSU and exceeded the first-term GPA (2.39) reported for all SJSU students. Thus, if transfer shock were measured by the difference in CSUC GPA earned by first-term junior-level transfers and that earned by all CSUC undergraduates, such "shock" would be minimal (.11 grade points at SFSU, none at SJSU). If, however, the traditional measure of transfer shock (the difference between pre-transfer GPA and senior-institution GPA), were employed, then the conclusion would be drawn that the junior-level transfers from all three District

campuses, with the exception of those who transferred from CSM to SFSU, experienced significant transfer shock during the fall 1980 semester (see Table 15). A closer look at Table 14, however, reveals that the larger grade point differentials experienced by the Canada and Skyline junior-level transfers were more indicative of the higher District grades they received than of poor senior-institution academic performance. If a generous grading policy is the rule rather than the exception among California's community colleges, then transfer shock as traditionally measured seems of dubious value as an assessment of the senior institution academic performance of California's community college transfer students.

Cumulative Grade Point Averages of District Transfers at CSUC Campuses

The spring and fall 1980 cumulative GPAs earned by new or continuing District transfer students at San Francisco State University (SFSU) and San Jose State University (SJSU) are shown in Table 16. The SFSU GPAs of District transfers are in close agreement with the cumulative GPAs of all SFSU undergraduates, and the District SJSU GPAs are almost identical to those earned by the SJSU undergraduates. The contrast between the first-term and the cumulative GPAs of District transfers is perhaps best illustrated by the difference between each of these GPAs and those earned by all senior-institution undergraduates

Table 15

Transfer Shock Experienced by District Junior-Level Transfers to San Francisco and San Jose CSUC Campuses Fall 1980

District Campus	SFSU	SJSU
CSM	.05[a]	.40[a]
Canada	.31	.51
Skyline	.31	.65
District	.16	.47
All CC Transfers	.14[b]	.18[b]

[a]pre-transfer District GPA minus first-term senior-institution GPA
[b]pre-transfer GPA minus cumulative senior-institution GPA. Source: Whitesel (1980)

(see Table 17). The intra-District variation in senior-institution GPA, and the difficulty experienced by students in their transition from District campus to CSUC campus, virtually disappears when the academic achievement of continuing transfers is combined with that of first-term transfer students. Thus, the academic performance of the 1980 District transfers to SFSU and SJSU clearly supports the contention of Knoell and Medsker (1965) that transfer students usually experience initial academic shock upon transfer to senior institutions but subsequently perform at an academic level commensurate with that of all undergraduate students.

Table 16

Cumulative GPAs of All District Transfers at the San Francisco and San Jose CSUC Campuses Spring and Fall 1980

	Academic Term	
	Spring 1980	Fall 1980
	San Francisco State University	
District Campus	GPA	GPA
CSM	2.77 (532)[a]	2.79 (588)
Canada	2.95 (129)	2.93 (115)
Skyline	2.71 (503)	2.73 (505)
District	2.76 (1,164)	2.78 (1,208)
SFSU Undergraduates	2.90	2.88
	San Jose State University	
District Campus	GPA	GPA
CSM	2.67 (407)	2.61 (413)
Canada	2.62 (157)	2.55 (130)
Skyline	2.61 (53)	2.51 (55)
District	2.65 (617)	2.59 (598)
SJSU Undergraduates	2.68	2.60

[a]the total number of new and continuing transfer students

Table 17

GPA of All Undergraduates Minus GPA of District Transfers
Spring and Fall 1980

District Campus	Academic Term			
	Spring 1980		Fall 1980	
	First-Term	Cumulative	First-Term	Cumulative
	San Francisco State University			
CSM	.18	.13	.16	.09
Canada	.74	-.05	.19	-.05
Skyline	.45	.19	.18	.15
District	.36	.14	.17	.10
	San Jose State University			
CSM	.48	.01	.09	-.01
Canada	.74	.06	.18	.05
Skyline	.38	.07	.15	.09
District	.54	.03	.12	.01

Judging from the GPA data provided in the SFSU and SJSU academic performance reports, it would appear that SJSU undergraduates (including District transfers) earn GPAs significantly below those of SFSU undergraduates (see Table 16). Yet, data provided by Whitesel (1980) from the Office of the Chancellor for the California State University and Colleges indicate close agreement among SFSU, SJSU,

and CSUC undergraduate GPAs (see Table 18). Moreover, according to the CSUC report the grades granted in undergraduate courses (not to be confused with the grades earned by undergraduate students) at SFSU and SJSU have been in very close agreement throughout the period 1976 through 1980 (see Table 19), differing by no more than .05 grade points in any one year. Consequently, until more uniform reporting is obtainable it seems advisable to make comparisons between the achievement of District students and that of other students on the basis of GPA differentials (such as those given in Tables 11 and 17); such differentials provide a more accurate barometer of District transfer student academic performance and enable realistic comparison of that performance at different CSUC campuses.

Cumulative GPAs of District transfers to SFSU and SJSU for the period fall 1976 through fall 1980 are shown in Table 20 (unfortunately, data was not available each semester for transfers from each District campus). These grade point averages, ranging from a low of 2.69 to a high of 2.94 at SFSU, and from a low of 2.55 to a high of 2.72 at SJSU, are clearly indicative of satisfactory academic performance. Moreover, despite the negative influence of first-term GPAs upon cumulative GPAs, the differentials between the cumulative GPAs of all the undergraduate students and those of District transfers (see Table 21)

Table 18

Comparison of the Cumulative GPAs Reported by the CSUC Chancellor's Office with Those Obtained from the SFSU and SJSU Academic Performance Reports Spring 1980

CSUC Institutions	CSUC Report		University Report	
	All Undergraduates[a]	CC Transfers[b]	All Undergraduates	District Transfers
SFSU	2.77	2.74	2.90	2.76
SJSU	2.74	2.76	2.68	2.65
All CSUC Campuses	2.71	2.70	-	-

[a]Source: Whitesel (1980), Table 15
[b]Source: Whitesel (1980), Table 19

Table 19

Trend in Average A to F Grades Granted in Undergraduate Courses at SFSU, SJSU, and the CSUC System[a] Spring 1971 through Spring 1980

Campus	1976	1977	1978	1979	1980	Average
SFSU	2.88	2.90	2.85	2.82	2.81	2.85
SJSU	2.83	2.86	2.80	2.80	2.78	2.81
All CSUC Campuses	2.86	2.86	2.80	2.80	2.79	2.82

[a]Source: Whitesel (1980), Table 8

Table 20

Cumulative GPAs of District Transfers at the San Francisco and San Jose CSUC Campuses Fall 1976 through Fall 1980

District Campus	CSUC Campus	Academic Term F'76	S'77	F'77	S'78	F'78	S'79	F'79	S'80	F'80	Average
CSM	SFSU	2.74 (695)[a]	2.78 (710)	2.80 (704)	2.82 (651)	2.82 (643)	2.94 (450)	-	2.77 (532)	2.79 (588)	2.80
Skyline	SFSU	2.75 (575)	2.74 (571)	2.79 (560)	2.73 (618)	2.69 (594)	-	-	2.71 (503)	2.73 (505)	2.73
SFSU Undergraduates		2.94	2.94	2.95	2.94	2.93	2.93		2.90	2.88	2.93
CSM	SJSU	2.72 (494)	2.71 (462)	2.57 (522)	2.64 (473)	2.61 (495)	2.63 (470)	2.68 (426)	2.67 (407)	2.61 (413)	2.65
Canada	SJSU	-	-	-	-	-	2.72 (179)	2.56 (181)	2.62 (157)	2.55 (130)	2.62
SJSU Undergraduates		2.78	2.79	2.60	2.67	2.61	2.67	2.62	2.68	2.60	2.67

[a]number of District transfers in attendance; data for Canada transfers to SFSU and Skyline transfers to SJSU were not available prior to the spring 1980 semester

Table 21

GPA of All Undergraduates Minus Cumulative GPA of District Transfers
Fall 1976 through Fall 1980

District Campus	CSUC Campus	Academic Term								
		F'76	S'77	F'77	S'78	F'78	S'79	F'79	S'80	F'80
CSM	SFSU	.20	.16	.15	.12	.11	-.01	-	.13	.09
Skyline	SFSU	.19	.20	.16	.21	.24	-	-	.19	.15
CSM	SJSU	.06	.08	.03	.03	.00	.04	-.06	.01	-.01
Canada	SJSU	-	-	-	-	-	-.05	.06	.06	.05

averaged only .16 grade points at SFSU and .02 grade points at SJSU over this period.

The spring 1980 grade point differentials (undergraduate GPA minus the cumulative GPA of transfer students) for District transfers and for all community college transfers to SFSU and SJSU are provided in Table 22. According to these differentials, at SJSU the District transfers achieved at essentially the same level in spring 1980 as did all community college transfers but were .11 points below the achievement of the latter group at SFSU. It should be noted that the statewide senior institution achievement of all of California's community college transfer students during spring 1980 was essentially identical to that of all CSUC undergraduates (Whitesel, 1980).

The distribution of cumulative GPAs revealed no appreciable intra-District difference in the performance of the District's transfer students at either SFSU or SJSU during the spring 1980 semester (see Table 23). As would be expected, however, the GPA achievement of all District transfers at both SFSU and SJSU was somewhat higher than that of first-term District transfers to those institutions (see Table 24); thus, 83 percent of the SFSU and 89 percent of the SJSU District cumulative GPAs were above 2.0 as opposed to 75 percent and 74 percent, respectively, of the District first-term GPAs at those institutions.

Table 22

GPA of All Undergraduates Minus Cumulative GPA of Community College Transfers
Spring 1980

Senior Institution	Transfer Students	
	District	All CC's
SFSU	.14[a]	.03[b]
SJSU	.03	.02
CSUC		.01

[a]see Table 17
[b]see Table 18

Table 23

Percentages of District Transfers at SFSU and SJSU with Cumulative GPAs at Specific Grade Levels
Spring 1980

Level of Achievement	SFSU			SJSU		
	CSM	Canada	Skyline	CSM	Canada	Skyline
3.00-4.00	44	52	39	37	38	37
2.00-2.99	40	37	43	53	51	48
0.00-1.99	16	12	18	10	11	15
N	(530)[a]	(128)	(503)	(399)	(152)	(52)

[a]number of transfer students who attempted at least one unit for credit

Table 24

Comparison of GPA Level of Achievement of District Transfers with that of Other Undergraduate Students (in Percents)

Level of Achievement	Grade Point Averages							
	District - Spring 1980				All Undergraduates[a]		CC Transfers to CSUC[b] F'73-S'77	
	First-Term		Cumulative		Cumulative			
	SFSU	SJSU	SFSU	SJSU	SFSU	SJSU	First-Term	Cumulative
3.00-4.00	41	28	42	37	44	39	41	39
2.00-2.99	34	46	41	52	44	52	42	46
0.00-1.99	25	26	17	11	12	9	17	15

[a]Source: Whitesel (1980)

[b]Source: CPEC (1979a)

The spring 1980 SFSU and SJSU cumulative GPA levels achieved by District students were comparable to those reported by the CSUC Chancellor's Office (Whitesel, 1980) for all CSUC undergraduate students, and were in close agreement with the cumulative GPA distribution reported by CPEC (1979a) for community college transfers in attendance at CSUC campuses during the period fall 1973 through spring 1977.

The San Francisco and San Jose campuses receive the majority of San Mateo County Community College District transfers to the CSUC system. Next in popularity among District CSUC transferees are the campuses at Hayward, Chico, and San Diego, each of which receives approximately six to seven percent of all District transfers to CSUC (see Table 4). Well over half of the District transfers to the California State University at Hayward (CSUH) emanate from the College of San Mateo (see Table 5). As shown in Table 25, the academic performance of the College of San Mateo transfers to the Hayward campus has been most satisfactory over the period fall 1976 through fall 1980; the average cumulative GPA (2.75) of the District transfers exceeded the average GPA (2.70) earned by all CSUH undergraduates over this period. Similarly, the achievement of District transfer students at the Chico and San Diego campuses of the CSUC system appears to be quite satisfactory when contrasted with the academic performance

Table 25

Cumulative GPAs of College of San Mateo Transfer Students at the California State University at Hayward

Fall Semester	CSM Transfers	All CSUH Undergraduates
1976	2.63 (111)[a]	2.68
1977	2.65 (131)	2.69
1978	2.80 (131)	2.67
1979	-	-
1980	2.91 (129)	2.74

[a]number of District students in attendance

of all undergraduates attending those Universities (see Table 26). Thus, the fall 1980 average cumulative GPA (2.73) of District transfers to Chico was identical to that of all Chico undergraduates, while the average GPA (2.57) of the Districts transfers at San Diego slightly exceeded the GPA (2.56) of the San Diego undergraduates.

Three-Year Graduation Rates of District Transfers at CSUC Campuses

Another important measure of the efficacy of the community college transfer function is the percentage of students who graduate from the senior institution to which they transfer. The three-year graduation rates of community college transfers are commonly compared to the

Table 26

Academic Performance of District Transfer Students at the California State Universities at Chico and San Diego Fall 1980

Level of Achievement	CSU, Chico			CSU, San Diego		
	CSM	Canada	Skyline	CSM	Canada	Skyline
3.00-4.00	42.5[a]	26.7	50.0	31.7	15.6	27.8
2.00-2.99	41.6	53.3	38.9	49.7	65.5	44.4
0.00-1.99	15.9	20.0	11.1	18.6	18.6	27.8
District GPA	2.72 (113)[c]	2.66 (60)	2.98 (18)	2.60 (145)	2.44 (32)	2.55[b] (18)
GPA of all Undergraduates		2.73[d]			2.56[d]	

[a] percent of students who earned cumulative GPAs at this grade level
[b] Fall 1979 data
[c] number of District students in attendance.
[d] Spring 1980 GPA (Whitesel, 1980)

five-year graduation rates of students who entered the senior institutions directly from high school.

Three-year graduation rates were obtained for San Mateo County Community College District students who transferred as juniors to San Francisco State University (SFSU) from College of San Mateo (CSM) in fall 1976, from Skyline College to SFSU in fall 1976, and from College of San Mateo to San Jose State University (SJSU) in fall 1977. Graduation rates could not be obtained for Skyline transfers to SJSU or Canada transfers to SFSU or SJSU because academic performance reports were not retrievable

for such transfers prior to 1979. Graduation commencement programs for the period 1977 through 1980, obtained from both the SFSU and the SJSU Office of School and College Relations, were searched to determine if, and when, a transfer student graduated. The three-year graduation rates obtained for District transfers to SFSU and SJSU (see Table 27) were found to be in close agreement with each other; the rates for CSM transfers to SFSU and SJSU differ by only 2.1 percent, and those for CSM and Skyline transfers to SFSU differ by only 4.1 percent.

Table 27

Three-Year Graduation Rates for Junior-Level District Transfers to San Francisco and San Jose State Universities

Semester Transferred	District Campus	CSUC Campus	3-Year Graduation Rate (%)
Fall 1976	CSM	SFSU	46.4 (112)[a]
Fall 1976	Skyline	SFSU	42.3 (104)
Fall 1977	CSM	SJSU	48.3 (120)

[a]number of junior-level transfer students

The graduation rates attained by the junior-level District transfers to SFSU and SJSU are considerably higher than the graduation rates reported by CSUC (1979) for all freshmen entrants and for all community college

transfers to SFSU and SJSU (see Table 28). Since approximately one-fourth of the District students transferred as freshmen or sophomores, their exclusion from District graduation rate calculations undoubtedly had an inflationary effect on those rates; indeed, the systemwide graduation rate of 40.3 percent reported by CSUC for 1975 junior-level community college transfers to the CSUC system is much closer to the combined SFSU and SJSU graduation rate of 45.8 percent obtained for junior-level District transfers. The systemwide three-year graduation rates reported by CSUC for all transfers from the District's three colleges (see Table 29) are in line with the 34.1 percent rate reported by CSUC for all community college transfers to CSUC and, consequently, are significantly below the District SFSU and SJSU junior-level rates found in the current study. Clearly, caution must be exercised when contrasting graduation rates of senior-institution native students with those of community college transfer students to assure that equitable comparisons are being drawn.

The eventual graduation rates of District transfers may be considerably higher than the three-year rates found in this study; thus, while CPEC (1979a) reported that about 38 percent of the 1973-1978 community college CSUC transferees had graduated by 1979, CPEC also

Table 28

Comparison of CSUC Graduation Rates of Native Students, Community College Students, and District Transfers

CSUC Campus	Graduation Rates: 1973 Freshmen 5-Year Rate (%)	1975 CC Transfers 3-Year Rate (%)	1976-77 District 3-Year Rate (%)
SFSU	28.4[a]	33.5[a]	44.4
SJSU	29.4	37.8	48.3
Systemwide	29.6	34.1	

[a]Source: California State University and Colleges (1979)

Table 29

Comparison of Three-Year Graduation Rates of Junior-Level District Transfers as Reported by CSUC and as Found in the Current Study

District Campus	Three-Year Graduation Rates (in percent): CSUC[a]	Current Study
CSM	38.4	47.4
Skyline	31.2	42.3
Canada	40.5	-

[a]Rates reported by CSUC (1979) for 1975 District Transfers to CSUC by District Campus

estimated that approximately two-thirds of these transfer students would eventually graduate. Data from the current study support CPEC's supposition. While 45.8 percent of the District's junior-level transfers had graduated within three years after transfer, an additional 11.3 percent were still actively pursuing the baccalaureate degree at SFSU or SJSU at the end of the three years and only 13.4 percent of the transfers had withdrawn because of academic difficulty. Moreover, the three-year graduation rate for District junior-level transfers who had entered SFSU or SJSU as full-time students (enrolled for at least 12 units) was 61.1 percent.

Summary of the CSUC Academic Performance of District Transfer Students

The academic performance of San Mateo County Community College District transfer students at campuses of the California State University and Colleges (CSUC) was measured primarily by their grade point averages (GPAs) and graduation rates at San Francisco State University (SFSU) and San Jose State University (SJSU). Over the period fall 1976 through fall 1980, the first-term GPAs of District transfers averaged .24 grade points below the GPAs of all undergraduates at those Universities, with the District's College of San Mateo (CSM) transfers averaging .16 grade points higher than the combined GPA of the District's Canada College and Skyline College transfer

students. During the fall 1980 semester, however, intra-campus variation in first-term GPAs was virtually nonexistent and the first-term GPAs of District transfers at SFSU and SJSU were within .17 and .12 points, respectively, of the GPAs of all undergraduates attending those Universities. Fall 1980 junior-level District transfers earned first-term GPAs which were essentially equivalent to the GPAs earned by all undergraduates at SFSU and SJSU. Seventy-eight percent of the 1980 District transfers to SFSU or SJSU earned first-term GPAs greater than 2.0; by way of comparison, CPEC (1979a) estimated that 83 percent of first-term community college transfers to the CSUC system achieved at this level during the period fall 1973 through spring 1977.

From fall 1976 through fall 1980, the cumulative GPAs of District transfers to SFSU and SJSU were most satisfactory and no appreciable intra-District differences in these GPAs were in evidence. During this period, the average cumulative GPAs of the District transfers were only .16 and .02 points, respectively, below the cumulative GPAs of all undergraduates at SFSU and SJSU. The distribution (above 3.0, above 2.0, etc.) of the cumulative GPAs of spring 1980 District transfers to SFSU and SJSU were very similar to (1) those reported by CSUC (Whitesel, 1980) for all spring 1980 undergraduates attending those Universities, and (2) those estimated by CPEC

(1979a) for fall 1973 through spring 1977 community college transfers to the CSUC system.

While the majority of District transfers to the CSUC system attend the San Francisco or San Jose campuses, the Hayward, Chico, and San Diego campuses each receive about six percent of the District's CSUC transfers. During the period fall 1976 through fall 1980, the average cumulative GPA (2.91) of College of San Mateo transfers to the Hayward campus exceeded the GPA (2.74) of all Hayward undergraduates. During fall 1980, the cumulative GPAs of District transfers at Chico (2.73) and at San Diego (2.57) were essentially identical to those of all undergraduates attending those Universities.

Graduation rates of junior-level transfers provided a second measure of the academic performance of District students who transferred to the CSUC system. The three-year graduation rates of 1976 District transfers to SFSU and 1977 District transfers to SJSU were 44.4 percent and 48.3 percent, respectively; these rates are significantly higher than the 29.6 percent five-year graduation rate of 1973 CSUC freshmen and the 34.1 percent three-year graduation rate of 1975 community college CSUC transfers reported by the CSUC Chancellor's Office (California State University and Colleges, 1979). Only 13.4 percent of the 1976 and 1977 District transfer students to SFSU and SJSU had withdrawn in academic difficulty and 11.3 percent of

the transfers were still pursuing the baccalaureate degree at SFSU or SJSU at the end of three years. Thus, whether measured by GPAs or by graduation rates, the academic performance of District transfer students to the CSUC system was found to be most satisfactory during the period fall 1976 through fall 1980.

Academic Performance of San Mateo County Community College District Transfer Students at the University of California

In response to the second research question, the academic performance of District transfer students at the University of California was assessed. First-year grade point averages and graduation rates of District transfers were evaluated and compared with those of other students attending the University.

First-Year Grade Point Averages of District Transfers

Since University of California reports on the academic performance of community college transfer students do not include cumulative grade point averages (GPAs), the assessment of the GPAs earned by District transfers was based upon their first-year achievement at the University. Academic performance data was available on 867 of the 1,122 District students who transferred to the University during the academic years 1974-75 through 1978-79. Of the 867 District students, 67 percent transferred to the University from the College of San Mateo (CSM), 22 percent

from Canada College, and the remaining 11 percent from Skyline College. Thus, the College of San Mateo, with one-half of the District's credit enrollment, contributed two-thirds of the District's transfers to the University during the five-year period.

The first-year GPAs earned by the District transfers to the University during the academic years 1974-75 through 1978-79 are shown in Table 30 for each District campus. The GPAs are provided for both transfers who were and who were not eligible for freshmen admission to the University on the basis of their high school records; 51 percent of the District transfers were originally ineligible to attend the University as compared to 55 percent of all 1978-79 community college transfers to the University (CPEC, 1981). While the District's College of San Mateo (CSM) transfers earned the highest first-year GPAs over the five-year period in both the eligible and ineligible categories, at each campus the eligible transfers outperformed those who were originally ineligible to attend the University. The difference between eligible and ineligible University GPA was least pronounced for CSM transfers (.17 grade points) and was about the same for transfers from Canada College (.27 grade points) and Skyline College (.30 grade points). For the District as a whole, the first-year differential in the GPAs earned by eligible and ineligible transfers to the University was .21 grade

Table 30

First-Year GPAs of District Transfers at the University of California
by District Campus
1974-75 through 1978-79

Academic Year	College of San Mateo		Canada		Skyline		District	
	Eligible[a]	Ineligible	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
1974-75	2.93[b] (68)	2.76 (57)	2.93 (26)	2.71 (25)	3.28 (9)	2.45 (7)	2.96 (103)	2.72 (89)
1975-76	3.00 (61)	2.77 (68)	2.90 (15)	2.71 (25)	2.78 (17)	2.28 (9)	2.94 (93)	2.71 (102)
1976-77	2.97 (65)	2.70 (63)	3.03 (12)	2.72 (25)	2.75 (9)	2.22 (11)	2.96 (86)	2.65 (99)
1977-78	3.02 (49)	2.81 (55)	2.83 (18)	2.47 (14)	2.31 (3)	2.80 (11)	2.94 (70)	2.75 (80)
1978-79	2.85 (48)	2.94 (47)	2.91 (18)	2.43 (16)	2.90 (3)	2.89 (13)	2.87 (69)	2.82 (76)
Average	2.96 (291)	2.79 (290)	2.91 (89)	2.64 (105)	2.86 (41)	2.56 (51)	2.94 (421)	2.73 (446)

[a] students eligible for freshmen admission to the University on the basis of their high school records
[b] number of students in the calculation

points over the five-year period. The average first-year GPA for all District transfers to the University was 2.83 over the period 1974-75 through 1978-79. This GPA exceeded the cumulative GPAs of 2.77 and 2.65 earned during the period fall 1976 through fall 1980 by District transfers at the San Francisco and San Jose CSUC campuses, respectively.

The University GPAs earned by the District transfer students compare quite favorably with those of other students at the University. For the academic years 1974-75 through 1978-79, the GPAs of eligible and ineligible transfers from the District exceeded those reported by the University for all of California's community college transfers by .07 grade points in each category (see Table 31). Moreover, for the 1975-76 academic year, the 2.94 GPA earned by the eligible District transfers to the University was only .16 grade points below the 3.10 GPA reported by Kissler (1980) for 1975-76 juniors who had started in the University as freshmen.

The percentages of District transfers and all community college transfers who earned University first-year grades of B or better and C or less during the period 1974-75 through 1978-79 are shown in Table 32. Intra-District variation in grades earned was not appreciable among the District's eligible transfers to the University. The Skyline College ineligible transfers, however, experienced

Table 31

Comparison of First-Year GPAs of District Transfers and All Community College Transfers at the University of California 1974-75 through 1978-79

Academic Year	District Transfers		All CC Transfers	
	Eligible	Ineligible	Eligible	Ineligible
1974-75	2.96	2.72	-	-
1975-76	2.94	2.71	2.88	2.62
1976-77	2.96	2.65	2.87	2.62
1977-78	2.94	2.75	2.88	2.63
1978-79	2.87	2.82	2.86	2.76
Average	2.94	2.73	2.87	2.66

Table 32

Percentages of District and All Community College Transfers at the University of California with GPAs at Specific Grade Levels 1974-75 through 1978-79

Transfer Students	Percent of Transfers					
	Eligible		Ineligible		Combined	
	%>B	%<C	%>B	%<C	%>B	%<C
CSM	47	6	33	10	40	8
Canada	42	3	38	19	40	12
Skyline	39	5	16	21	28	13
District	45	5	33	14	39	10
All CCs	42	10	29	19	35	15

considerably more difficulty at the University than did those from CSM or Canada College; thus, the percentage of Skyline ineligibles with grades of B or better was less than half of that of the ineligible transfers from either of the other two District campuses, and the Skyline campus had the highest percentage of ineligibles with grades below C. It should be noted, however, that there were only 51 ineligible transfers from Skyline College to the University during the five-year period as compared to 105 from Canada College and 290 from CSM. The District as a whole had a higher percentage of both eligible and ineligible first-year transfers with grades of B or better, and a lower percentage with grades less than C, than was reported by the University for all of California's community college transfer students during the 1974-75 through 1978-79 academic years. The first-year grades earned by the District transfers (39 percent B or better; 10 percent less than C) also compared favorably with those reported by CPEC (1979a) for 1973-1978 California community college transfers to the University (33 percent B or better; 12 percent less than C).

The transfer shock experienced by community college students upon transfer to a four-year institution is traditionally measured by the difference between their community college GPA and their first-term or first-year senior institution GPA. For both the eligible and the

ineligible District transfers, this difference was largest for the Skyline transfers and smallest for the CSM transfers to the University during the period 1974-75 through 1978-79 (see Tables 33 and 34). As was the case with District transfers to the CSUC campuses, however, the intra-District variation in pre- minus post-transfer GPA is attributable in part to the fact that both the eligible and ineligible transfers from Canada College and Skyline College had higher District GPAs than did their CSM counterparts.

For the District as a whole, the difference between pre- and post-transfer GPA was .37 grade points for eligible transfers to the University and .39 grade points for ineligible transfers over the period 1975-76 through 1978-79; the corresponding differences for all of California's community college transfers to the University during this period were .46 and .45 grade points, respectively (see Table 35). Thus, in their first year at the University, both eligible and ineligible transfers from the District experienced essentially the same "transfer shock", which was somewhat less than that encountered by all of California's community college transfers to the University.

Table 33

Grade Point Averages and GPA Differentials for Eligible District Transfers to the University of California 1974-75 through 1978-79

Academic Year	CSM			Canada			Skyline			District		
	CC	UC	Diff.	CC	UC	Diff.	CC	UC	Diff.	CC	UC	Diff.
1974-75	3.28	2.93	.35[a]	3.27	2.93	.34	3.56	3.28	.28	3.30	2.96	.34
1975-76	3.29	3.00	.29	3.37	2.90	.47	3.44	2.78	.66	3.33	2.94	.39
1976-77	3.20	2.97	.23	3.47	3.03	.44	3.39	2.75	.64	3.26	2.96	.30
1977-78	3.43	3.02	.41	3.40	2.83	.57	3.10	2.31	.79	3.41	2.94	.47
1978-79	3.25	2.85	.40	3.22	2.91	.31	3.61	2.90	.71	3.26	2.87	.39
Average	3.28	2.96	.32	3.33	2.91	.42	3.44	2.86	.58	3.31	2.94	.37

[a] community college GPA minus University GPA

Table 34

Grade Point Averages and GPA Differentials for Ineligible District Transfers to the University of California 1974-75 through 1978-79

Academic Year	CSM			Canada			Skyline			District		
	CC	UC	Diff.	CC	UC	Diff.	CC	UC	Diff.	CC	UC	Diff.
1974-75	3.00	2.76	.24[a]	3.18	2.71	.47	3.13	2.45	.68	3.06	2.72	.34
1975-76	3.06	2.77	.29	3.20	2.71	.49	2.85	2.28	.57	3.08	2.71	.37
1976-77	3.06	2.70	.36	3.25	2.72	.53	3.05	2.22	.83	3.11	2.65	.46
1977-78	3.19	2.81	.38	3.04	2.47	.57	3.25	2.80	.45	3.17	2.75	.42
1978-79	3.15	2.94	.21	3.18	2.43	.75	3.34	2.89	.45	3.19	2.82	.37
Average	3.09	2.79	.30	3.18	2.64	.54	3.14	2.56	.58	3.12	2.73	.39

[a] community college GPA minus University GPA

Table 35

Comparison of Transfer Shock Experienced By District Transfers and All Community College Transfers at the University of California 1975-76 through 1978-79

Academic Year	Eligible Transfers		Ineligible Transfers	
	District	All CCs	District	All CCs
1975-76	.39[a]	.44	.37	.39
1976-77	.30	.45	.46	.46
1977-78	.47	.47	.42	.47
1978-79	.39	.48	.37	.47
Average	.37	.46	.39	.45

[a]community college GPA minus first-year University GPA

Three-Year Graduation Rates of District Transfers

The 1975-76 academic year was the last for which the University of California provided student-specific academic performance reports on San Mateo County Community College District transfers to the University. Unfortunately, student-specific data was retrievable only for transfers from the District's College of San Mateo (CSM) campus. Consequently, an estimate of the University of California three-year graduation rate for District transfers is based solely upon the percentage of fall 1975 through spring 1976 CSM junior-level transfers who graduated within three years of entry into the University. Since approximately two-thirds of all District transfers

to the University emanate from CSM, however, the graduation rate obtained for the CSM transfers should be fairly representative of the District as a whole.

During the academic years 1974-75 through 1978-79, 76 percent of the College of San Mateo (CSM) transfers (and 73 percent of District transfers) to the University of California had enrolled at either the Berkeley, Davis, or Los Angeles campus of the University. A letter (see Appendix A), accompanied by a pertinent list of junior-level transfers who had completed a minimum of 24 units at CSM, was sent to the registrar of each of these campuses. The letter requested the dates of graduation or withdrawal of the transferees; data was obtained on 107 1975-76 CSM transfers to the University.

The three-year graduation rates of the College of San Mateo (CSM) transfers to the Berkeley, Davis, and Los Angeles campuses of the University are shown in Table 36 along with the three-year University graduation rates of all 1975-76 California community college transfers and the five-year graduation rates of 1973 University freshmen at those campuses. The overall graduation rate of 66 percent attained by the CSM transfers compares favorably with the 63 percent and 57 percent rates achieved by all 1975-76 California community college transfers and by the 1973 University freshmen, respectively (Kissler, 1980). Eight additional District transfers graduated from these

Table 36

Comparison of University of California Graduation Rates of College of San Mateo Transfers with Those of Other University Graduates (In Percents)

University Campus	1975-76 District Transfers (3-Year Rate)	All 1975-76 CC Transfers (3-Year Rate)	1973 University Freshmen (5-Year Rate)
Berkeley	63 (57)[a]	65	59
Davis	69 (42)	65	62
Los Angeles	75 (8)	56	53
Average	66 (107)	63	57[b]

[a] number of junior-level transfers
[b] calculated as a weighted average using as weights the 1973 freshmen enrollments provided by Kissler (1980)

University campuses after three years, thereby raising the known eventual graduation rate of the 1975-76 CSM transfers to 74 percent; coincidentally, this is precisely the three-year graduation rate reported by Kissler for 1975 University juniors who started in the University in 1973 as freshmen. Three years after admittance, an additional seven CSM transfers who had not graduated were still in attendance at the same University campus in which they had enrolled; only 20 percent of the 1975-76 CSM junior-level transfers to the University had withdrawn

within three years after admittance. This three-year attrition rate is well below the first-year attrition rate (30 percent) of all 1975 community college transfers, and the two-year attrition rate (30 percent) of 1975 freshmen entrants to the Berkeley, Davis, and Los Angeles campuses of the University (Kissler, 1980).

Summary of the University of California Academic Performance of District Transfer Students

The academic performance of San Mateo County Community College District transfer students at the University of California was measured by the first-year grade point averages (GPAs) earned by District transfers at the University during the academic years 1974-75 through 1978-79, and by the graduation rates achieved by 1975-76 District students who transferred as juniors to the Berkeley, Davis, and Los Angeles campuses of the University. The GPAs were obtained both for students who were and were not originally eligible for admission to the University on the basis of their high school records; 51 percent of the District transfers were originally ineligible to attend the University.

The average GPA of all District transfers to the University during the academic years 1974-75 through 1978-79 was 2.83, with eligible transfer student GPA (2.94) exceeding that of the ineligible transfers by .21 grade points. Intra-District variation in GPA was

negligible among the District's eligible transfers, but the average GPA earned by College of San Mateo ineligible transfers was appreciably higher than that attained by the Skyline and Canada ineligible transfers to the University. Some transfer shock was experienced by both the eligible and ineligible District transfers; for both groups, however, the difference between pre- and post-transfer GPA was less than .40 grade points as compared to the .45 grade point drop experienced by all community college transfers to the University during the five-year period. Transfer shock was experienced least by the CSM transfers and most by the Skyline transfers to the University.

For the academic years 1974-75 through 1978-79, the average GPAs of the eligible and ineligible District transfers to the University slightly exceeded the corresponding GPAs earned by all of California's community college eligible and ineligible transfers to the University; moreover, the District had both a higher percentage of transfers with grades of B or better, and a lower percentage of transfers with grades of less than C than did the California community college system as a whole. Comparative data on University native students was not accessible over the five-year period, but the 1975-76 District eligible transfers had a first-year GPA of 2.94 which was only .16 grade points below the GPA of 1975-76 juniors who had started in the University as freshmen. Thus, as measured

by grade point averages, the academic achievement of the 1974-75 through 1978-79 San Mateo County Community College District transfers to the University of California seems quite satisfactory.

The three-year graduation rate of 66 percent achieved by the 1975-76 CSM junior-level transfers to the Berkeley, Davis, and Los Angeles campuses of the University exceeded both the five-year graduation rate (57 percent) of 1973-74 freshmen and the three-year graduation rate (63 percent) of all 1975-76 community college transfers at these University campuses. Moreover, in three years only 20 percent of the District transfers withdrew from the University campus at which they had originally enrolled; this attrition rate compares most favorably with both the 30 percent two-year attrition rate of 1975 University freshmen at the Berkeley, Davis, and Los Angeles campuses, and the 30 percent first-year attrition rate of all 1975 community college transfers to the University (Kissler, 1980). Consequently, as measured by the graduation rate of the 1975-76 CSM District transfers, the academic performance of San Mateo County Community College District transfers to the University of California is most satisfactory.

An Historical Perspective of the Academic Performance of San Mateo County Community College District Transfer Students at Senior Institutions

In response to the third research question, the recent academic performance of District transfer students at senior institutions was compared with that reported in earlier studies conducted by Roach (1932), Taggart (1941), and Pearce (1968). Roach reported upon the academic achievement of 475 College of San Mateo (CSM) students who transferred to senior institutions during the period 1922-1930. Taggart investigated the original eligibility of 384 CSM students who graduated from the University of California or from Stanford University during the years 1937 through 1940. Pearce reported the 1966-67 first-year GPA of 126 CSM transfers to the University of California and the cumulative GPA of 1,610 CSM transfers who attended campuses of the California State University and Colleges during the fall 1967 semester.

Senior Institution Eligibility and District Graduation Status of Transfer Students

A dominant theme recurrent in all of the studies of San Mateo County Community College District transfer students is that the majority of these students would have been originally ineligible to attend California's senior institutions directly from high school because of academic deficiencies. It has also been the case, however, that the percentage of transfer students who could have entered

senior institutions directly from high school, but opted to first attend a District campus, has steadily increased since the founding of the District in 1922. At the University of California, for example, the percent of originally eligible District transfer students has risen from 30 percent in the period 1922-1930 to 49 percent during the period 1974-1979 (see Table 37). While both Roach (1932) and Taggart (1941) reported that the large majority of District transfers to Stanford University were ineligible to attend that University directly from high school, Pearce (1968) noted that almost half of the 1,610 District transfers attending campuses of the California State University and Colleges during the fall 1967 semester would have been accepted at those campuses without prior attendance at a community college.

During the District's first two decades, there was a strong tendency among its transfers to earn a junior college degree prior to transfer (see Table 38). Taggart (1941), for example, reported that 83 percent of 1937-1940 District transfers who subsequently graduated from the University of California had previously graduated from the District. On the other hand, of 123 1975-76 junior-level District transfers to the University, only 33 percent had obtained a two-year degree from the District. Data obtained in the current study, however, indicate that the tendency to obtain a community college degree prior

Table 37

Historical Comparison of the Percent of San Mateo County Community College District Transfers Originally Eligible to Attend the University of California

Data Source	Period	Number of Transfers	Percent Eligible
Roach (1932)	1922-30	196	30%
Taggart (1941)	1937-40	263	29%
Pearce (1968)	1966-67	126	44%
Current Study	1974-79	867	49%
CPEC (1981)	1978-79	4,188[a]	45%

[a]all California community college transfers to the University

Table 38

Historical Comparison of the Percent of Transfer Students Who Graduated from the District Prior to Transfer to Senior Institutions

Data Source	Period	Number of Transfers	District Graduates
Roach (1932)	1922-1930	475	58%
Taggart (1941)	1937-1940	263[a]	83%
Current Study	1975-1976	123[b]	33%
Current Study	Fall 1980	318[c]	57%

[a]District transfers who graduated from the University of California
[b]District transfers to the University of California
[c]District junior-level transfers to SFSU or SJSU

to transfer is much higher for District transfers to the CSUC system than it is for those students entering the University (see Table 38).

An inter-decade comparison of District transfer student GPA is provided in Table 39. Although the comparisons are undoubtedly inequitable, they do imply that the senior institution academic performance of the District transfers has improved with time. Thus, the first-year senior institution GPAs of 1975-76 District graduate and non-graduate transfers to the University of California exceeded the corresponding GPAs of the 1922-1930 transfers by .72 and .82 grade points, respectively. Similarly, the first-year GPAs of 1974 through 1979 eligible and ineligible transfers to the University were .34 and .23 grade points higher, respectively, than the corresponding GPAs reported by Pearce (1968) for 1966-67 District transfers to the University; moreover, Pearce noted that the 2.51 first-year GPA earned by all 1966-67 District transfers to the University exceeded the 2.36 first-year University GPA compiled by District transfers in the prior three years. District transfer student academic performance at campuses of the CSUC system also indicates a substantial increase in senior institution GPA with time; thus, the average cumulative GPAs of fall 1980 District transfers at San Francisco State University (SFSU) and San Jose State University (SJSU) exceeded the

Table 39

Historical Comparison of Grade Point Averages of District Transfer Students

Data Source	Period	Grade Point Average[a]	
		District Graduates at UC	Non-Graduates at UC
Roach (1932)	1922-30	2.03 (85)[b]	1.86 (66)
Current Study	1975-76	2.75 (41)	2.68 (82)
		UC Eligibles	UC Ineligibles
Pearce (1968)	1966-67	2.6 (55)	2.5 (71)
Current Study	1974-79	2.94 (421)	2.73 (446)
		SFSU Transfers	SJSU Transfers
Bearce (1968)	Fall 1967	2.55 (653)	2.44 (559)
Current Study	Fall 1980	2.78 (1,208)	2.59 (598)

[a]the UC GPAs represent first year of attendance only; both new and continuing students are represented in the SFSU and SJSU GPAs

[b]number of students

corresponding GPAs of the fall 1967 District transfers by .23 and .15 grade points, respectively (see Table 39).

A comparison of additional data furnished by Pearce (1968) with findings of the present study give further indication that a higher level of achievement at senior institutions has been attained by the most recent District transfers (see Table 40). At the University of

Table 40

Historical Comparison of Levels of Achievement of District Transfers at the University of California and at Campuses of the CSUC System

Data Source	Period	Number of Students	Student Achievement	
			B or Better	Below C
		University of California[a]		
Pearce (1968)	1963-1967	380	18%	20%
Current Study	1974-1979	867	39%	10%
		CSUC System[b]		
Pearce (1968)	Fall 1967	1,336	31%	17%
Current Study	Fall 1980[c]	1,729	45%	18%

[a] achievement in first year of transfer
[b] achievement of both new and continuing transfers
[c] SFSU and SJSU transferees only

California, for example, the percentage of 1974-1979 transfers who earned first-year grades of B (3.0 GPA) or better was more than twice that of the 1963-1967 transfers, while the percentage of 1974-1979 transfers who earned grades of less than C (2.0 GPA) was half that of the 1963-1967 transfers. Similarly, at CSUC campuses, although the percentage of former District students who received grades below C was virtually the same in fall 1967 and fall 1980, the percentage earning grades of B or better was considerably higher in fall 1980.

While Roach (1932), Taggart (1941), and Pearce (1968) all found evidence of transfer shock, only Pearce

documented the phenomenon in terms of the differential between pre- and post-transfer GPA. Pearce found this differential to be more greatly in evidence for District transfers to the University of California; his finding in this regard parallels that of the current study (see Table 41). Unlike the present study, however, Pearce found that District transfers in attendance at CSUC campuses during the fall 1967 semester had earned essentially the same grade point average both before and after transfer. The small difference observed by Pearce between pre- and post-transfer GPA of CSUC transfers is no doubt influenced by the fact that the CSUC GPAs included grades of both first-term and continuing District transfers. As other investigators have reported (Knoell & Medsker, 1965; Eckard, 1971; and Williams, 1976, for example), evidence of transfer shock tends to disappear after a student's first term at a senior institution.

Several other findings of the previous investigators of District transfer students are worthy of comparison. While Roach (1932) reported that 41 percent of 1922-1930 District transfer students enrolled at the University of California, CPEC (1981) reported that only 17 percent of 1977-1979 District transfers to California's public senior institutions had enrolled at the University. Pearce found that 18 percent of the 1966-67 District transfers to the University had withdrawn during that

Table 41

Historical Comparison of District GPA Minus Senior Institution GPA

Data Source	Period	Number of Students	Grade Point Differential
			University of California
Pearce (1968)	1963-1967	380	.44[a]
Current Study	1974-1979	867	.38
			CSUC System
Pearce (1968)	Fall 1967	1,610[b]	- .05
Current Study	Fall 1980	318[c]	.28

[a] reflects first-year University performance only
[b] new and continuing District transfers
[c] new junior-level District transfers to SFSU or SJSU

academic year; conversely, only 9 percent of the 1975-76 District transfers to the University subsequently withdrew during that academic year. Pearce also noted that 78 percent of fall 1967 District transfers to CSUC campuses had enrolled at either San Francisco State University or San Jose State University; this percentage had dropped to 62 percent during the period 1977-1979 (CPEC, 1981).

Of the three previous investigators of the academic performance of District transfer students, only Roach (1932) provided information on the relative number of these transfers who subsequently earned a four-year

degree. Roach reported that 115 of an estimated 277 District students who had transferred during the period 1922-1928 had earned a baccalaureate degree by 1930; approximately 70 percent of the transfers had enrolled at either the University of California or at Stanford University. This graduation rate of 41.5 percent obtained during the formative years of the San Mateo County Community College District approximates the 44 percent and 48 percent three-year graduation rates attained by 1976-77 District transfers to SFSU and SJSU, respectively (see Table 28), but is well below the 66 percent three-year graduation rate obtained by 1975-76 District transfers to the University of California (see Table 36).

Summary of the Inter-Decade Comparison of District Transfer Student Senior Institution Academic Performance

The senior-institution academic performance of 1974-1980 District transfer students, as assessed in this study, was compared to similar evaluations conducted by Roach (1932), Taggart (1941), and Pearce (1968). Although the four studies spanned six decades, the predominant conclusion reached by all investigators was that the large majority of San Mateo County Community College District transfers have been academically successful after transfer to California's public four-year universities and colleges.

All four investigations of District transfer student academic performance revealed that the majority of the District transfers would have been academically ineligible to attend California's senior institutions directly from high school. With the exception of Pearce (1968), the investigators found that originally-eligible District transfers were generally more successful at the senior institutions. Nonetheless, all investigators reached the unanimous conclusion that the large majority of both eligible and ineligible District transfers were academically successful after transfer.

Certain historical tendencies evident from the four studies are worth noting. Fewer transfer students seem to be obtaining a two-year degree from the District prior to transfer; this is especially true among transfers to the University of California. Second, a greater percentage of students who were eligible to attend the University of California directly from high school are opting to enroll in the San Mateo County Community College District. Third, the grades earned by District transfers at senior institutions have steadily risen; this phenomenon, however, is perhaps primarily a reflection of a general historical trend towards grade inflation. Fourth, all four studies found evidence that significant transfer shock was experienced by District transfers to the University of California; unlike the present study, however,

Pearce (1968) found no evidence of transfer shock among District transfers to campuses of the CSUC system. Finally, although only the study by Roach (1932) and the present study considered senior-institution graduation rates attained by District transfers, these rates appear to be rising.

Prediction of Senior Institution Academic Performance of San Mateo County Community College District Transfer Students

The final research question asked if there were variables which could predict senior-institution grade point average (GPA) prior to a student's transfer from the San Mateo County Community College District. In response to this question, two stepwise multiple linear regression analyses were performed. These analyses investigated the extent to which District transfer student GPA could be predicted at campuses of the California State University and Colleges (CSUC) and at the University of California. Fall 1980 junior-level District transfers (N=318) constituted the sample for the CSUC GPA prediction study, and College of San Mateo 1975-76 transfers (N=123) to the University of California (UC) comprised the sample for the UC GPA prediction study (1975-76 was the last academic year for which the University provided the District with the names of its transfer students). Students in both samples had completed a minimum of 24 units at a District

campus prior to transfer. Characteristics of the two samples are contrasted in Table 42.

Table 42

Comparison of Fall 1980 District Transfers to SFSU or SJSU with 1975-76 District Transfers to the University of California

Characteristic	SFSU or SJSU	University of California
Sample Size	318	123
Sex		
Male	48%	63%
Female	52%	37%
AA/AS Degree	57%	33%
Average Age	23	21
District Units		
Total	67.7	67.3
Math	5.2	9.0
English	7.1	6.5
Grade Point Average		
District	2.91	3.07
Senior-Institution	2.63	2.70

Prediction of the GPA of District Transfers at the California State University and Colleges

The independent variables used in the multiple linear regression analysis of CSUC GPA are listed in Table 7; variable means and standard deviations and the correlations between variables are shown in Appendix C_1. A preliminary regression analysis was performed to

determine which, if any, of the interactions of the categorical variables (sex, District graduation status, CSUC campus, and District campus) with the other independent variables made significant contributions to CSUC GPA variance when entered last into the regression equation. Only the two-way interactions of the categorical variables with the other independent variables (both categorical and continuous) were considered. As shown in Appendix C_1, with the exception of the correlation between math units and total units (r=.263) and that between English units and total units (r=.264), all correlations between the continuous independent variables were less than .20 and hence their interactions were not considered. Since the regression model which included English units and math units (the correlation between these variables was .037) produced a value of .432 for R-square which slightly exceeded the .425 value for R-square obtained when the variable District total units was used, the latter variable was dropped from subsequent analysis.

The influence of the interactions on CSUC GPA variance is shown in Table 43 for each CSUC independent categorical variable. As measured by their contribution to R-square, none of the interactions were significant at the .10 level and, hence, were eliminated from further analysis.

Table 43

Influence Upon CSUC GPA Variance of Categorical Variable Interactions When Entered Last Into the Regression Equation

	Effect of Interaction with Categorical Variables		
Categorical Variable	R-Square Change	F for Change	Significance Level
Sex	.016	.97	.460
District Graduation Status	.021	1.27	.258
CSUC Campus	.017	1.05	.399
District Campus	.020	.71	.763
All Interactions	.064	1.09	.353

Having determined that no interactions with categorical variables were significant, a second preliminary regression analysis was conducted in order to determine the relative importance of the independent variables when entered last into the CSUC GPA prediction equation. Only District GPA, District campus, and CSUC campus were significant at the .10 level (see Table 44); each of the other independent CSUC variables (see Table 7), when entered last into the regression equation, contributed less than .003 to R-square. District GPA was by far the most important CSUC GPA predictor variable.

Prior to the determination of the final model for CSUC GPA prediction, the CSUC sample (N=318) was

Table 44

Influence Upon CSUC GPA Variance of Independent Variables When Entered Last into the Regression Equation

Variable	Label	R-Square Change	F for Change	Significance Level
District GPA	X_9	.288	142.53	.000
District Campus	X_{11}, X_{12}[a]	.013	3.14	.045
CSUC Campus	X_{10}	.011	5.34	.022

[a]District campus is comprised of two variables (see Table 7)

randomly subdivided into two subsamples of equal size and double cross-validated (see Kerlinger & Pedhazur, 1973, pp. 282-284). The characteristics of the subsamples and the original sample are compared in Table 45. In the double cross-validation, the variables shown in Table 7 were used in two stepwise regression analyses (which used probabilities of F to enter and F to remove of .10 and .15, respectively) to generate a value of R-square and a regression equation for each subsample. Two additional values of R-square were obtained from the correlation of the observed values of CSUC GPA in each subsample with the values of CSUC GPA predicted from the independent variables in that subsample by the regression equation of the other subsample. The regression equations obtained for subsample-1 and subsample-2 were respectively:

Table 45

Characteristics of Total CSUC Sample and of Subsamples Used in Cross-Validation of CSUC GPA Prediction Model

	Total Sample		Subsample-1		Subsample-2	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
CSUC GPA	2.63	.844	2.64	.835	2.62	.855
District GPA	2.91	.478	2.91	.458	2.91	.498
Sample Size	318		159		159	

Note: S.D. = standard deviation

$$Y_1' = .993X_9 + .214X_{11} - .347$$

$$Y_2' = 1.063X_9 + .107X_{10} - .498$$

where the independent variables X_9, X_{10}, and X_{11} represent District GPA, CSUC campus, and District campus, respectively. The four values of R-square generated by the double cross-validation are shown in Table 46. While the range in R-square is .143, the four values of R-square are within .08 of their mean of .356; hence, the stability of R-square in the two subsamples was deemed sufficient to warrant derivation of a CSUC GPA regression model based upon the entire CSUC sample (N=318).

The final stepwise regression analysis (N=318) yielded a CSUC GPA prediction equation which contained only those predictor variables which contributed

Table 46

Values of R-Square Resulting from Double Cross-Validation of CSUC GPA Prediction Model

	Source of R-Square			
	Y_1Y_1'	Y_2Y_2'	Y_1Y_2'	Y_2Y_1'
R-Square	.311	.429	.286	.396

Note: Y_iY_j' indicates that R-Square is the square of the correlation between the observed CSUC GPAs of subsample-i and the predicted CSUC GPAs from subsample-i data by subsample-j regression equation.

significantly (.10 level) to the explanation of CSUC GPA variance (see Table 47). The coefficients of the regression equation obtained from this analysis are shown in Table 48; each coefficient was significant at the .05 level. The CSUC GPA prediction equation thus takes the form:

$$Y' = 1.044X_9 + .135X_{11} + .093X_{10} - .490$$

where X_9, X_{11}, and X_{10} represent the three independent variables, District GPA, District campus, and CSUC campus, respectively, and Y' represents the predicted variable, CSUC GPA. For this regression model, the square of the correlation between the actual (Y) and predicted (Y') values of CSUC GPA was .371 (i.e., R-square = .371). A linear regression model which utilized all the independent variables listed in Table 7 (with the exception of District total units) yielded an R-square of .379. Thus, the

Table 47

Influence Upon CSUC GPA Variance of Independent Variables in Final Regression Equation

Variable	Label	R-Square Change	F for Change	Significance Level
District GPA	X_9	.347	167.85	.000
District Campus	X_{11}	.012	6.11	.014
CSUC Campus	X_{10}	.011	5.63	.018

Table 48

Coefficients of Regression Equation for CSUC GPA Prediction

Variable	Label	Coefficient	Standard Error of Coefficient	Significance Level
District GPA	X_9	1.044	.081	.000
District Campus	X_{11}	.135	.055	.014
CSUC Campus	X_{10}	.093	.039	.018
(Constant)		-.490	.241	.043

ability to explain CSUC GPA variance is reduced by less than one percent when the regression equation is restricted to the independent variables, District GPA, District campus, and CSUC campus. It should also be noted, however, that District GPA alone explained 34.7 percent of the variance in CSUC GPA.

When performing a regression analysis, it is assumed that the residuals (Y - Y') are practically independent and follow a normal distribution with zero mean and common variance (Draper & Smith, 1981). A scatterplot of all standardized residuals, a scatterplot of the standardized residuals versus the standardized predicted values, and a normal probability (p-p) plot of the studentized residual (see Appendix D_1) revealed no indication that the above assumptions had been violated in the final regression model. Moreover, the 318 standardized residuals were positively and negatively signed with approximately equal frequency, and only one of the residuals was more than three standard deviations from the mean of zero. Thus, there was no distortion of the CSUC GPA multiple linear regression model due to outliers.

Prediction of University of California GPA of District Transfer Students

The independent variables used in the multiple linear regression analysis of University of California GPA are listed in Table 8; variable means and standard deviations and the correlations between variables are shown in Appendix C_2. A preliminary analysis was conducted to determine which, if any, of the interactions of the categorical variables (sex, CSM graduation status, and UC eligibility) with the other independent variables made significant contributions to an explanation of University

GPA variance when entered last into the regression equation. As was the case in the CSUC GPA prediction study, only the two-way interactions of the categorical variables with the other independent variables (both categorical and continuous) were considered. As indicated in Table 49, none of these interactions contributed significantly to R-square and, hence, were discarded from the regression model. A second preliminary analysis was conducted to determine the relative importance of the independent variables when entered last into the regression equation. Only the contribution to R-square of the variables CSM GPA, CSM math units, and age of student were found to be significant at the .10 level (see Table 50); however, both the variables CSM English units and sex of student influenced R-square to approximately the same degree as did age of student, and, hence, were retained for the final regression analysis.

Because the total sample (N=123) for the University GPA prediction study was relatively small, there was some reluctance to split the sample into two subsamples for the purpose of cross-validation in that this would provide only approximately 12 students per independent variable in each subsample. In order to obtain some estimate of the degree of shrinkage in R-square, however, the sample was double cross-validated (the characteristics

Table 49

Influence Upon UC GPA Variance of Categorical Variable Interactions When Entered Last Into the Regression Equation

	Effect of Interaction with Categorical Variable		
Categorical Variable	R-Square Change	F for Change	Significance Level
Sex	.007	.267	.930
CSM Graduation Status	.013	.502	.774
UC Eligibility	.014	.525	.757
All Interactions	.034	.533	.889

Table 50

Influence Upon University GPA Variance of Independent Variables When Entered Last Into the Regression Equation

Variable	Label	R-Square Change	F for Change	Significance Level
CSM GPA	X_9	.318	62.49	.000
CSM Math Units	X_6	.023	4.44	.037
Age of Student	X_3	.017	3.30	.072
CSM English Units	X_7	.012	2.34	.129
Sex of Student	X_4	.011	2.15	.146

of the two subsamples and of the original sample are compared in Table 51). The independent variables listed in Table 50 were considered in the two regression analyses; both analyses used probabilities of F to enter and F to remove of .10 and .15, respectively. The regression equations obtained from subsample-1 and subsample-2 were respectively:

$$Y_1' = .834X_9 - .118X_3 + .125X_4 + 2.614$$

$$Y_2' = 1.172X_9 - .019X_6 - .039X_7 - .533$$

The values of R-square attained from the double cross-validation are given in Table 52. The range of .270 in R-square is somewhat higher than the R-square range of .143 obtained in the CSUC double cross-validation (see Table 46). However, the CSUC subsamples were much more homogeneous in District GPA and in senior institution GPA than were the University subsamples (compare the data in Tables 45 and 51); consequently, the larger range in R-square obtained in the University cross-validation may be more a function of discrepencies in the randomly selected subsamples than of a true indication of shrinkage in R-square. Additionally, the presence of different variables in the two subsample regression equations (X_3 and X_4 in Y_1' equation; X_6 and X_7 in Y_2' equation) may be more indicative of the marginal contribution to R-square of

Table 51

Characteristics of Total UC Sample and of Subsamples Used In Cross-Validation of University of California GPA Prediction Model

	Total Sample		Subsample-1		Subsample-2	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
University GPA	2.70	.708	2.80	.630	2.61	.771
District GPA	3.07	.436	3.10	.455	3.04	.418
Sample Size	123		61		62	

Note: S.D. = standard deviation

Table 52

Values of R-Square Resulting from Double Cross-Validation of University of California GPA Prediction Model

	Source of R-Square			
	Y_1Y_1'	Y_2Y_2'	Y_1Y_2'	Y_2Y_1'
R-Square	.501	.386	.383	.231

Note: Y_iY_j' indicates that R-square is the square of the correlation between the observed University GPA of subsample-i and the predicted University GPA from subsample-i data by subsample-j regression equation.

these variables rather than a manifestation of a serious discrepancy in the results obtained from the two subsamples. In subsample-1, for example, CSM GPA alone contributed .406 to the total R-square value of .501; similarly, in subsample-2 CSM GPA contributed .319 to the total R-square value of .386.

The final stepwise regression analysis used the total University of California sample (N=123) together with those variables listed in Table 50 which contributed at the .15 level of significance to the explanation of UC GPA variance (see Table 53). The regression equation obtained from the analysis was:

$$Y' = .985X_9 - .048X_3 - .010X_6 - .019X_7 + .900$$

where Y' represents predicted University GPA, and the predictor variables X_9, X_3, X_6, and X_7 represent the independent variables CSM GPA, student age, CSM math units, and CSM English units, respectively. The significance of each of the coefficients in the regression equation is indicated in Table 54.

The final regression model explained 40.1 percent of the total variance in University of California GPA; CSM GPA contributed 35.3 percent to this total explained variance. As was the case in the CSUC GPA prediction study, only District GPA contributed appreciably to an explanation of the variance in University of California

Table 53

Influence Upon UC GPA Variance of Independent Variables in Final Regression Equation

Variable	Label	R-Square Change	F for Change	Significance Level
CSM GPA	X_9	.353	66.05	.000
Age of Student	X_3	.026	4.92	.028
CSM Math Units	X_6	.012	2.28	.134
CSM English Units	X_7	.011	2.13	.148

Table 54

Coefficients of Regression Equation for University of California GPA Prediction

Variable	Label	Coefficient	Standard Error of Coefficient	Significance Level
CSM GPA	X_9	.985	.119	.000
Age of Student	X_3	-.048	.025	.061
CSM Math Units	X_6	-.010	.006	.091
CSM English Units	X_7	-.019	.013	.148
(Constant)		.900	.675	.185

GPA. A linear regression model which utilized all the independent variables listed in Table 8 (with the exception of District total units) enhanced the explanation of UC GPA variance by .018 (R-square = .419); however, the

adjusted R-square, which compensates for the assumption that the zero-order correlations are error-free (see Kerlinger & Pedhazur, pp. 282-283), increased by only .001 from the adjusted R-square of .381 obtained with the prediction variables listed in Table 54.

An analysis of the regression model residuals indicated no violation of the assumptions made in the University of California regression analysis. Thus, the 123 standardized residuals were positively and negatively signed with approximately equal frequency, only one standardized residual was more than three standard deviations from the mean, and both scatterplots of the standardized residuals and the normal probability (p-p) plot of the studentized residual exhibited no significant departures from the plots that would have been obtained if the residuals had been selected from a normal distribution (see Appendix D_2).

Summary of Predictive Studies of District Transfer Student Senior Institution GPA

Two stepwise multiple linear regression analyses were performed to determine the extent to which District transfer student senior institution GPA could be predicted. The first regression analysis employed a sample of 318 fall 1980 District transfers to the San Francisco or San Jose campuses of the California State University and Colleges (CSUC). The regression analysis indicated that

only District GPA could predict CSUC GPA to any appreciable extent. District GPA contributed 35 percent to the 37 percent of CSUC GPA variance explained by the significant predictor variables District GPA, District campus, and CSUC campus.

College of San Mateo (CSM) students who transferred to the University of California during the 1975-76 academic year comprised the sample (N=123) in the second regression analysis. While the resulting regression equation contained CSM GPA, student age, CSM math units, and CSM English units, as predictors of University of California GPA, CSM GPA contributed 35 percent to the 40 percent of University GPA variance explained by all the predictor variables. Remarkably, these percents are almost identical to those obtained for District GPA explained variance and total explained variance in the CSUC GPA prediction study.

In both the CSUC GPA and UC GPA prediction studies, only District GPA contributed appreciably to the prediction of senior institution GPA. However, the total explained variance in senior institution GPA did not exceed 40 percent in either study. Thus, approximately 60 percent of the variance in senior institution GPA remains unexplained. A knowledge of the variation in curriculum and/or grading standards both within and between District and senior institution campuses could conceivable result

in a significant reduction in this unexplained variance. Both the District GPAs and the first-term senior institution GPAs of District transfers exhibited considerable campus-to-campus variation (see Tables 9-14). A reduction in the unexplained variance in senior institution GPA might also be achieved by the performance of regression analyses for specific senior institution majors or groups of majors. Phlegar (1978), for example, in his GPA prediction study of 361 community college transfers to Virginia Polytechnic Institute, obtained values of R-square of .305, .353, and .528 for science (N=92), engineering (N=110), and non-science (N=159) majors. As was the case in the current study, Phlegar found community college GPA to be the most important predictor of senior institution GPA.

Summary

In this chapter, the academic performance (as measured by grade point averages and graduation rates) of San Mateo County Community College District transfer students at campuses of the California State University and Colleges (CSUC) and at the University of California (UC) was assessed. This performance was then compared to that reported by previous investigators of District transfer students. Finally, an analysis was conducted to determine the extent to which transfer student senior institution

GPA could be predicted prior to transfer from the District.

Data on 3,139 fall 1976 through fall 1980 District transfers to San Francisco State University (SFSU) and San Jose State University (SJSU) revealed that the first-term GPAs of District transfers averaged .24 points below the GPAs of fall 1976 through fall 1980 undergraduates at those Universities; however, the first-term GPA of fall 1980 junior-level District transfers was found to be essentially identical to the GPA of all undergraduates attending SFSU and SJSU during this period. The difference between transfer and native student GPA tended to disappear after the first term, and no appreciable intra-District variation in senior-institution cumulative GPA was evident. Thus, over the period fall 1976 through fall 1980, the GPAs of new and continuing District transfers at SFSU and SJSU averaged only .16 and .02 grade points, respectively, below the GPAs of all undergraduates at those Universities. Similarly, the GPAs achieved by District transfers at other CSUC campuses were comparable to those of all undergraduates attending those Universities.

The average three-year graduation rate (45.8 percent) of 1976 and 1977 junior-level District transfers (N=336) to SFSU and SJSU was found to be appreciably higher than both the five-year graduation rate of 1973

CSUC freshmen and the three-year graduation rate of 1975 community college CSUC transfers. Thus, in terms of both grade point averages earned and graduation rates achieved, the academic performance of District transfers to CSUC campuses was found to be most satisfactory.

Assessment of the first-year academic achievement of 867 District transfers to the University of California during the academic years 1974-75 through 1978-79 revealed that the average GPA of the District transfers at the University was 2.83, with originally-eligible transfers outperforming those originally-ineligible to attend the University by .21 grade points. District transfer student University GPA slightly exceeded that of all community college transfers during the five-year period. Comparative GPA data on 1975-76 juniors who started in the University as freshmen indicated that these students had attained a GPA only .16 grade points higher than the District eligible transfers.

The three-year graduation rate of the 1975-76 junior-level District transfers to the University of California was 66 percent; this rate exceeded both the five-year graduation rate of 1973 University freshmen and the three-year graduation rate of all 1975-76 community college transfers to the University. Thus, as measured by either grade point average or by graduation rate, the academic performance of the District transfer students to

the University of California was found to be most satisfactory.

An historical perspective of the academic performance of District transfer students was obtained by comparing the findings of the present study with those obtained in previous studies of District transfer students conducted by Roach (1932), Taggart (1941), and Pearce (1968). All four studies reached the dominant conclusion that District students have been academically successful after transfer. Senior-institution grades of District transfers have steadily risen over the decades, as has the proportion of District students who transfer to the CSUC system as opposed to the University of California. Other historical tendencies were evident: a greater percentage of students eligible to attend four-year institutions are enrolling at District campuses; fewer District transfers earn a community college degree prior to transfer; District transfer students experience some first-term transfer shock (especially at the University of California) from which they eventually recover; and senior-institution graduation rates of District transfers appear to be rising.

Two multiple linear regression analyses revealed that only the variable District GPA had any appreciable potential for the prediction of senior-institution GPA. District GPA contributed 35 percent to the total explained

variance of 37 percent in CSUC GPA and 40 percent in UC GPA. Significant reduction in the unexplained variance might possibly be achieved by performing regression analyses for specific senior institution majors.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of the present study was threefold: (1) to assess the academic performance of San Mateo County Community College District students after transfer to the University of California or to selected campuses of the California State University and Colleges; (2) to provide an historical perspective of this performance by comparing it with that reported in previous studies of College of San Mateo transfer students; and (3) to determine and rank those variables which are most predictive of academic success at four-year institutions after transfer from the San Mateo County Community College District.

The Problem

The traditional community college transfer function and its curriculum are in jeopardy (Cohen, 1979b). The embracement of the "open-door" policy has compelled the community college to offer a wide range of courses to students who constitute a broad spectrum of ability and motivation. Vocational, community, and remedial/developmental education now compete with transfer education for

the community college focus and for its resources. Spurred, perhaps, by the decreasing percentage of community college students who transfer to four-year institutions (Kissler, 1980), some observers (Cohen, 1979b; Lombardi, 1979b; Kissler, 1980) have begun to question the ability of the community college to provide education for transfer students comparable to that obtainable in the lower division of four-year institutions, while concurrently accommodating the underachiever, the high-risk student, and the lifelong learner. The specter of declining enrollments coupled with the sober reality of dwindling local, state, and federal funds for education has led the Carnegie Council on Policy Studies in Higher Education to anticipate a vigorous competition for students between two-year and four-year colleges (Scully, 1980). The community college transfer function constitutes a natural arena for such competition. In order to counter the threat to its transfer function, each community college must be prepared to demonstrate that the senior institution academic performance of its transfer students has not deteriorated and does not differ significantly from that of students who are native to the senior institutions. In addition, each community college should search for pre-transfer variables which could predict or enhance transfer student senior institution academic performance.

The questions of the present study were: (1) How does the academic performance of San Mateo County Community College District transfer students compare with that of other community college transfers and with that of native students at selected campuses of the California State University and Colleges? (2) How does the academic performance of District transfer students compare with that of other community college transfers and with that of native students at the University of California? (3) How does the senior institution academic performance of District transfer students compare with that reported in previous studies of District transfer students? (4) Are there variables which can predict senior institution grade point average (GPA) prior to transfer from the District?

Methodology

The academic performance of San Mateo County Community College District transfer students at campuses of the California State University and Colleges (CSUC) and at the University of California (UC) was measured by comparing District transfer student senior institution GPAs and graduation rates with those of other undergraduates in attendance at CSUC or UC campuses. An estimate of the CSUC GPA of District transfers was obtained from a sample of 3,139 students who transferred from the District to the CSUC campuses at San Francisco (SFSU) or San Jose (SJSU) during the period fall 1976 through fall 1980. The

three-year CSUC graduation rate of District transfers was based upon a sample of 336 students who transferred as juniors from the District to SFSU in fall 1976 or to SJSU in fall 1977. The average first-year GPA earned by District transfers at the University of California was estimated from a sample of 867 students who transferred to the University during the academic years 1974-75 through 1978-79. The three-year UC graduation rate of District transfers was estimated from a sample of 107 students who transferred as juniors to the University during the 1975-76 academic year.

An historical perspective of the senior institution academic performance of District transfer students was obtained by comparing the senior institution GPAs and graduation rates found in the present study with those reported in the earlier studies of District transfer students conducted by Roach (1932), Taggart (1941), and Pearce (1968). The achievement of both originally-eligible and originally-ineligible District transfers was contrasted. Particular attention was focused upon the apparent similarities and differences in the findings of the present study and those reported by Pearce.

Two multiple linear regression analyses were performed to determine the extent to which the CSUC and UC GPAs of District transfer students could be predicted prior to transfer. The independent variables in both

regression analyses included: District GPA; student age and sex; math units, English units, and total units successfully completed (grade of C or better) at a District campus; and District graduation status. The CSUC regression analysis also included as independent variables the CSUC campus and the District campus attended, while student eligibility to enter the University of California directly from high school was an added variable in the UC GPA prediction study. The CSUC GPA prediction study employed a sample of 318 fall 1980 District transfers to San Francisco State University and San Jose State University, while 1975 transfers (N=123) from the District's College of San Mateo campus to the Berkeley, Davis, or Los Angeles campuses of the University of California constituted the sample utilized in the UC GPA prediction study. All students in both the CSUC and the UC prediction studies had completed a minimum of 24 units at a District campus prior to transfer.

Findings

During the period fall 1976 through fall 1980, District transfers in attendance at the CSUC campuses at San Francisco (SFSU) and San Jose (SJSU) earned average cumulative GPAs of 2.77 and 2.65, respectively. These GPAs were only .16 and .02 grade points, respectively, below the average cumulative GPAs of all undergraduates attending those Universities during this period, and no

appreciable intra-District variation in CSUC GPA was evident among the District's Canada College, Skyline College, and College of San Mateo transfers. The spring 1980 SFSU and SJSU cumulative GPAs (2.74 and 2.65, respectively) of District transfers were almost identical to the GPAs reported by Whitesel (1980) for all community college transfers to SFSU and SJSU in spring 1980. Similarly, the percentages of spring 1980 District transfers who earned cumulative GPAs of 3.0 or above (42 percent at SFSU; 37 percent at SJSU) and 2.0 or below (17 percent at SFSU; 11 percent at SJSU) were comparable to the levels of achievement reported by Whitesel for all 1980 undergraduates at SFSU and SJSU and to those reported by CPEC (1979a) for fall 1973 through spring 1977 community college transfers to the CSUC system.

While the majority of District transfers to the CSUC system attend the San Francisco or San Jose campuses, the Hayward, Chico, and San Diego campuses each receive about six percent of the District's CSUC transfers. During the period fall 1976 through fall 1980, the District's College of San Mateo transfers to the Hayward campus earned an average GPA of 2.91 which exceeded the 2.74 GPA earned by all Hayward undergraduates. During fall 1980, District transfers to the Chico and San Diego campuses earned GPAs of 2.73 and 2.57, respectively; these

GPAs were almost identical to those earned by all undergraduates at those Universities.

The fall 1976 through fall 1980 District transfers to SFSU or SJSU earned first-term CSUC GPAs which were .28 grade points below their District GPAs and .24 grade points below the GPAs of all undergraduates at those Universities. Thus, some transfer shock was experienced by the District transfers. This phenomenon was more pronounced for the District's Skyline and Canada transfer students whose first-term GPAs averaged .16 grade points below that of the District's College of San Mateo transfers. For the fall 1980 semester, however, first-term GPAs of the District transfers were within .17 and .12 grade points, respectively, of the GPAs earned by all SFSU and SJSU undergraduates, and no appreciable intra-District difference in first-term senior institution GPA was in evidence. Seventy-eight percent of spring and fall 1980 District transfers to SFSU and SJSU earned first-term GPAs greater than 2.0; CPEC (1979a) estimated that 83 percent of all fall 1973 through spring 1977 community college transfers to the CSUC system achieved at this level.

During the period fall 1976 through fall 1980, only 77 percent of the District's transfers to SFSU or SJSU had attained junior status; 76 percent of the fall 1980 District transfers had done so. During fall 1980, the first-term GPAs of the junior-level District transfers

(2.75 at SFSU; 2.44 at SJSU) were similar to the GPAs of all SFSU and SJSU undergraduates (2.86 at SFSU; 2.39 at SJSU). Thus, if transfer shock were measured by the difference in first-term GPA of junior-level District transfers and that of senior institution undergraduates, the fall 1980 District transfers would have experienced no significant transfer shock. Conversely, if the traditional measure of transfer shock (pre-transfer GPA minus first-term senior institution GPA) were employed, then the fall 1980 junior-level District transfers would have experienced a transfer shock of .16 and .47 grade points at SFSU and SJSU, respectively.

The graduation rates of junior-level transfers provided a second measure of the academic performance of District transfers to the CSUC system. The three-year graduation rates of 1976 District transfers to SFSU and 1977 District transfers to SJSU were 44.4 percent and 48.3 percent, respectively; these rates are significantly higher than the 29.6 percent five-year graduation rate of 1973 CSUC freshmen and the 34.1 percent three-year graduation rate of 1975 community college CSUC transferees (California State University and Colleges, 1979). An additional 11.3 percent of the District transfers were still pursuing the baccalaureate degree at SFSU or SJSU at the end of three years, and only 13.4 percent of the

District transfers had withdrawn from SFSU or SJSU in academic difficulty.

In response to the second research question, the academic performance of District transfer students at the University of California was assessed. The average first-year GPA earned by all District transfers at the University of California during the academic years 1974-75 through 1978-79 was 2.83, with originally-eligible transfer student GPA (2.94) exceeding by .21 grade points the GPA of District transfers who were originally-ineligible to attend the University directly from high school. During this period, 51 percent of the District transfers were originally ineligible to attend the University. The 2.83 University GPA of District transfers exceeded the fall 1976 through fall 1980 cumulative CSUC GPAs earned by District transfers at SFSU (2.77 GPA) and SJSU (2.65 GPA). The University GPAs earned by the eligible (2.94) and ineligible (2.73) District transfers exceeded by .07 and .06 grade points, respectively, the GPAs earned by all of California's eligible and ineligible community college transfers to the University during the 1974-75 through 1978-79 academic years. During this period, the District also had both a higher percentage of transfers to the University who earned grades of B or better (eligibles: 45 percent; ineligibles: 33 percent), and a lower percentage of transfers who earned grades of less than C (eligibles:

5 percent; ineligibles: 14 percent), than did the California Community College system as a whole. Comparative data on students native to the University was not generally available; however, the 1975-76 District eligible transfers had a first-year GPA of 2.94 at the University which was only .16 grade points below the GPA earned by 1975-76 juniors who had started at the University as freshmen.

During the 1974-75 through 1978-79 years, intra-District variation in UC GPA was insignificant among the District's originally-eligible transfers to the University, but the average UC GPA earned by the College of San Mateo's ineligible transfers (2.79) was appreciably higher than those attained by the Skyline (2.56) and Canada (2.64) ineligible transfers. Some transfer shock was experienced by both the eligible and ineligible District transfers; for both groups, however, the difference between pre-and post-transfer GPA was less than .40 grade points as compared to the .45 grade point drop experienced by all community college transfers to the University during the five-year period.

The three-year graduation rate of 66 percent achieved by the 1975-76 District transfers to the Berkeley, Davis, or Los Angeles campuses of University of California exceeded both the five-year graduation rate (57 percent) of 1973-74 freshmen at these campuses and the three-year graduation rate (63 percent) of all 1975-76

community college transfers to the University. Moreover, by spring of 1978, only 20 percent of the 1975-76 District transfers had withdrawn from the University campus at which they had originally enrolled; this three-year attrition rate compared most favorably with both the 30 percent two-year attrition rate of 1975 University freshmen at the Berkeley, Davis, and Los Angeles campuses, and the 30 percent first-year attrition rate estimated for all 1975 community college transfers to the University (Kissler, 1980).

In response to the third research question, the senior institution academic performance of 1974-1980 District transfer students, as assessed in the present study, was compared with that reported previously by Roach (1932), Taggart (1941), and Pearce (1968). Roach examined the academic achievement of 475 College of San Mateo (CSM) 1922-1930 transfers, Taggart investigated the original eligibility of 384 former CSM students who graduated from the University of California or from Stanford University during the years 1937 through 1940, and Pearce summarized the first-year GPA of 126 1966-67 CSM transfers to the University of California and the fall 1967 cumulative GPA of 1,610 CSM transfers to the CSUC system.

Roach (1932) reported that 41 percent of the 1922-1930 District transfer students had transferred to the University of California (UC); this percentage had

dropped to 17 percent during the period 1977-1979 (CPEC, 1981). While Pearce found that 18 percent of the 1966-67 District transfers to the University withdrew during the academic year, only 9 percent of the 1975-76 transfers to the University did so. Pearce also noted that 78 percent of fall 1967 District transfers to CSUC campuses enrolled at SFSU or SJSU; this percentage had dropped to 62 percent during the period 1977-1979 (CPEC, 1981).

The percentage of District transfers who were originally eligible to attend senior institutions directly from high school has risen appreciably since the founding of the District in 1922. Thus, the percentage of District transfers to the University of California who were originally eligible to enter the University was 30 percent during 1922-1930 (Roach, 1932), 29 percent in the period 1937-1940 (Taggart, 1941), 44 percent in 1966-67 (Pearce, 1968) and 49 percent in 1974-1979. Pearce reported that slightly less than half of the fall 1967 District transfers to the CSUC system were originally eligible to attend CSUC campuses directly from high school; unfortunately, more recent CSUC academic performance reports gave no indication of the original eligibility of District transfer students.

While a greater percentage of students who are originally eligible to attend senior institutions are enrolling at District campuses, fewer District transfers

are obtaining a two-year degree prior to transfer. Of District transfers to the University of California, for example, the percentage who had earned a community college degree was 58 percent during 1922-1930 (Roach, 1932), 83 percent in the period 1937-1940 (Taggart, 1941), but only 33 percent in 1975-76. Of 318 fall 1980 District transfers to the CSUC system, however, 57 percent had earned a community college degree prior to transfer.

The GPAs of District transfers at senior institutions appear to have risen decade by decade. Thus, while Roach (1932) reported University of California GPAs for District graduates and non-graduates of 2.03 and 1.86, respectively, the corresponding GPAs of 1975-76 District transfers were 2.75 and 2.68, respectively. Similarly, while Pearce (1968) reported 1966-67 University GPAs for eligible and ineligible District transfers of 2.6 and 2.5, respectively, the corresponding GPAs for 1974 through 1979 District transfers to the University were 2.94 and 2.73, respectively. Moreover, of the 1974-1979 District transfers to the University, 39 percent earned GPAs of 3.0 or higher and only 10 percent had GPAs below 2.0; according to Pearce, only 18 percent of 1963-1967 District transfers to the University earned GPAs above 3.0 while 20 percent had GPAs below 2.0.

The CSUC GPAs reported by Pearce (1968) were also lower than those observed in the present study. According

to Pearce, the 1967-68 District transfers to SFSU and SJSU earned cumulative GPAs of 2.55 and 2.44, respectively. These GPAs were exceeded by the 1976 through 1980 District transfer to SFSU and SJSU by .23 and .15 grade points, respectively. Moreover, while 45 percent of fall 1980 District transfers to SFSU or SJSU had GPAs of 3.0 or better, Pearce reported that only 31 percent of fall 1967 transfers to SFSU or SJSU had achieved at this grade level.

While neither Taggart (1941) nor Pearce (1968) investigated the senior institution graduation rates of District transfers, Roach (1932) reported that 115 of an estimated 277 students who transferred from the District to senior institutions during the period 1922-1928 had graduated by 1930; 70 percent of these transfers had enrolled at either the University of California or at Stanford University. This graduation rate of 41.5 percent approximates the three-year graduation rates of the fall 1976 District transfers to SFSU (44 percent) and the fall 1977 District transfers to SJSU (48 percent), but is well below the 66 percent three-year graduation rate of the 1975-76 District transfers to the University of California.

While all three previous investigators of District transfer students found evidence of transfer shock, only Pearce (1968) documented this phenomenon. He indicated

that the 1966-67 transfers to the University of California experienced a GPA drop of .44 grade points below their District GPA during their first year at the University. The corresponding GPA differential for 1974-1979 District transfers to the University was .38 grade points. On the other hand, while fall 1980 District transfers to SFSU or SJSU experienced a GPA decline of .28 grade points during their first semester after transfer, Pearce reported that the cumulative GPA of fall 1967 transfers to SFSU or SJSU was .05 grade points higher than their District GPA.

In response to the final research question, two stepwise multiple linear regression analyses were performed to determine the extent to which District transfer student senior institution GPA could be predicted prior to transfer. The CSUC GPA regression analysis utilized a sample of 318 fall 1980 District transfers to SFSU or SJSU. The analysis indicated that only District GPA could predict CSUC GPA to any appreciable extent. Of the 37 percent of CSUC GPA variance explained by the significant (.10 level) variables District GPA, District campus attended, and CSUC campus attended, 35 percent was contributed by District GPA.

The University of California GPA regression analysis utilized a sample of 123 District students who transferred to the University during the academic year 1975-76. While the resulting regression equation revealed District

GPA, student age, CSM math units, and CSM English units to be significant (.15 level) predictors of University GPA, District GPA contributed 35 percent to the 40 percent of University GPA variance explained by these predictor variables. Thus, in both the CSUC GPA and UC GPA regression analyses, District GPA contributed 35 percent to the total explained variance in senior institution GPA, and the other predictor variables provided only an additional two to five percent to this explained variance.

Conclusions

In response to the research questions of the study, the following conclusions are drawn:

1. The academic performance of San Mateo County Community College District transfer students at campuses of the California State University and Colleges (CSUC) is most satisfactory.

The CSUC cumulative GPAs (which includes the GPAs of both first-term and continuing transfers) earned by District transfers are essentially equivalent to those of all CSUC undergraduates and to the CSUC GPAs earned by all community college transfer students. While some first-term transfer shock is experienced by District transfers to CSUC, the post-transfer drop in GPA is insignificant for District students who transfer as juniors. However, appreciable variation in first-term senior institution GPA

was evident among District campuses. The CSUC three-year graduation rate of District transfers appears to be significantly higher than both the five-year graduation rate of CSUC freshmen and the three-year graduation rate of all community college transfers to the CSUC system.

2. The academic performance of San Mateo County Community County District transfer students at campuses of the University of California is most satisfactory.

Originally-eligible District transfers earn first-year University GPAs which are only slightly below those earned by juniors who enter the University as freshmen. These District transfers outperform those originally-ineligible to enter the University by approximately .22 grade points. Both types of District transfer students experience some transfer shock as evidenced by a first-year post-transfer drop in GPA of approximately .40 grade points. The University GPAs earned by both originally-eligible and originally-ineligible District transfers are essentially equivalent to the corresponding GPAs of all community college transfers to the University. However, the three-year graduation rate of District transfers to the University appear to be appreciably higher than both the five-year graduation rate of University freshmen and the three-year graduation rate of all community college transfers to the University.

3. Both the grade point averages and the graduation rates achieved by San Mateo County Community College District transfer students to the University of California are higher than those attained by District transfers to campuses of the California State University and Colleges.

The 1974-75 through 1978-79 District transfers to the University of California earned an average first-year GPA of 2.83; the fall 1976 through fall 1980 District transfers to the CSUC campuses at San Francisco or San Jose achieved an average cumulative GPA of 2.73. The three-year graduation rates of junior-level District transfers was 66 percent for 1975 transfers to the University of California and 46 percent for 1976-77 transfers to the CSUC campuses at San Francisco or San Jose.

4. The San Mateo County Community College District has been highly successful in the performance of its transfer function ever since the founding of the District in 1922.

A period of six decades was spanned by four studies of the senior institution academic performance of District transfer students. These studies include the present study and those conducted by Roach (1932), Taggart (1941), and Pearce (1968). All four investigations found that the large majority of District transfers have been academically successful after transfer even though the majority of these students were ineligible to attend the

senior institutions directly from high school. The senior-institution academic success of the transfer students was measured both in terms of grade point averages earned and graduation rates attained. The historical perspective gained from the four studies of the District transfer students led to several additional conclusions: first, fewer transfer students are obtaining a community college degree prior to transfer (this is especially true for transfers to the University of California); second, a greater percentage of students who are eligible to attend senior institutions directly from high school are choosing instead to enroll at campuses of the District; third, the senior institution grades earned by District transfers have steadily risen; and fourth, current senior institution graduation rates of District transfers appear to be somewhat higher than those reported in the past.

5. Only District GPA is a meaningful predictor of senior institution GPA.

In both the CSUC GPA and UC GPA regression analyses, 35 percent of the variance in senior institution GPA was explained by the single variable District GPA. While other independent variables were statistically significant (District campus and CSUC campus attended in the CSUC study; student age, CSM math units, and CSM English units in the UC study), these variables contributed only an additional two to five percent to the explained variance

in senior institution GPA. Thus, approximately 60 percent of senior institution GPA variance remains unexplained. Significant reduction in this unexplained variance might be achieved through the imposition of more uniform campus-to-campus curriculum and/or grading standards, thereby increasing the reliability of the most important predictor variable, District GPA. Further explanation of senior institution GPA variance might be attained through the performance of regression analyses for specific senior institution majors or groups of majors.

Recommendations

The following are recommendations for further study and consideration:

1. Each California community college district should periodically assess the efficacy of its own transfer function by conducting a study similar to the one reported here. Components of the study should include: (a) an estimation of the number of transfers as a percentage of both total and full-time credit enrollment; (b) a comparison of senior-institution GPA and graduation rates of transfer students with those of native students and other community college students; (c) an investigation of historical trends in transfer student senior institution academic performance; and (d) a search for factors which

might enhance or predict transfer student senior institution academic performance.

2. A central organization should coordinate, assimilate, summarize, and publish the results of the studies conducted by the various community college districts. This information should be presented to (a) California's policy-making educational organizations which affect community colleges, (b) the State legislature and the State Department of Finance, (c) high school and four-year counseling offices, and (d) the general public.

3. Each community college district should periodically survey the opinions of former students who have transferred to and/or graduated from senior institutions to ascertain their impressions of the efficacy of the transfer function and their opinions of how it might be improved.

4. Prediction studies should be conducted for individual senior-institution majors or groups of majors to determine if such specificity might reveal variables which appreciably enhance the senior institution GPA of transfer students having those particular majors.

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APPENDIX A

LETTER OF JUNE 1981 TO OFFICES OF ADMISSIONS AND RECORDS, UNIVERSITY OF CALIFORNIA, REQUESTING GRADUATION OR WITHDRAWAL DATES OF 1975-76 DISTRICT TRANSFERS TO THE UNIVERSITY

COLLEGE OF SAN MATEO

OFFICE OF THE PRESIDENT

June 19, 1981

Admissions and Records
University of California, Berkeley
120 Sproul Hall
Berkeley, CA 94720

Dear Sir:

We are currently conducting a study of the academic performance of our transfer students to the University of California. As an important part of this study, we wish to ascertain both the percentage of our transfer students who eventually graduate and the length of time they require to graduate. Enclosed is a list of students who transferred from the College of San Mateo (CSM) to your campus of the University of California during the Fall 1975 - Spring 1976 academic year. It would be most helpful to our study if you could indicate their date of graduation, or, if they did not graduate, their last semester in attendance at UC. Please be assured that all information provided by the University will be kept in strictest confidence.

Sincerely,

Lois A. Callahan

Lois A. Callahan, Ed. D.
President

LAC/mb

Enclosure

APPENDIX B_1

FORM UTILIZED TO GATHER DATA ON FALL 1980 DISTRICT TRANSFERS TO CSUC CAMPUSES

STUDENT NAME	CSUC GPA	AGE	SEX	AA/AS	CC MATH UNITS	CC ENGL. UNITS	CC UNITS	CC GPA	CSUC CAMPUS	CC CAMPUS

APPENDIX B_2

FORM UTILIZED TO GATHER DATA ON FALL 1980 DISTRICT TRANSFERS TO UNIVERSITY CAMPUSES

STUDENT NAME	UC GPA	AGE	SEX	AA/AS	CC MATH UNITS	CC ENGL. UNITS	CC UNITS	CC CPA	UC ELIG.

APPENDIX C_1

MEANS, STANDARD DEVIATIONS, AND CORRELATION COEFFICIENTS OF CSUC VARIABLES

FILE NONAME (CREATION DATE = 07/01/81)

* * * * MULTIPLE REGRESSION * * * *

VARIABLE LIST NUMBER 1. LISTWISE DELETION OF MISSING DATA.

	MEAN	STD DEV	LABEL
V1	2.628	0.844	CSUC GPA
V3	23.406	6.581	AGE
V4	-0.031	1.001	SEX
V5	0.132	0.993	SMCCCD DEGREE
V6	5.164	6.663	SMCCCD MATH UNITS
V7	7.116	4.101	SMCCCD ENGLISH UNITS
V8	67.660	16.886	SMCCCD TOTAL UNITS
V9	2.907	0.478	SMCCCD GPA
V10	0.226	0.976	CSUC CAMPUS
V11	0.472	0.700	SMCCCD CAMPUS
V21	0.132	1.362	V11-2

N OF CASES = 318

CORRELATION

	V1	V3	V4	V5	V6	V7	V8	V9	V10	V11	V21
V1	1.000	0.139	-0.228	0.098	-0.026	0.007	0.034	0.589	0.181	0.029	-0.029
V3	0.139	1.000	-0.079	0.080	0.017	0.029	0.112	0.188	0.131	-0.142	-0.154
V4	-0.228	-0.079	1.000	-0.129	0.208	0.012	0.108	-0.272	-0.174	0.012	0.008
V5	0.098	0.080	-0.129	1.000	-0.035	0.048	0.284	0.246	-0.005	-0.126	-0.153
V6	-0.026	0.017	0.208	-0.035	1.000	0.037	0.263	0.019	-0.089	-0.087	0.020
V7	0.007	0.029	0.012	0.048	0.037	1.000	0.264	-0.007	0.021	0.029	-0.011
V8	0.034	0.112	0.108	0.284	0.263	0.264	1.000	0.016	-0.049	0.034	-0.004
V9	0.589	0.188	-0.272	0.246	0.019	-0.007	0.016	1.000	0.127	-0.138	-0.150
V10	0.181	0.131	-0.174	-0.005	-0.089	0.021	-0.049	0.127	1.000	-0.009	-0.336
V11	0.029	-0.142	0.012	-0.126	-0.087	0.029	0.034	-0.138	-0.009	1.000	0.431
V21	-0.029	-0.154	0.008	-0.153	0.020	-0.011	-0.004	-0.150	-0.336	0.431	1.000

APPENDIX C_2

MEANS, STANDARD DEVIATIONS, AND CORRELATION COEFFICIENTS OF UC VARIABLES

FILE / NONAME (CREATION DATE = 06/30/81)

* * * * MULTIPLE REGRESSION * * * *

VARIABLE LIST NUMBER 1. LISTWISE DELETION OF MISSING DATA.

	MEAN	STD DEV	LABEL
V1	2.702	0.708	UC GPA
V3	20.854	2.043	AGE
V4	0.252	0.972	SEX
V5	-0.333	0.947	CSM DEGREE
V6	9.041	8.639	CSM MATH UNITS
V7	6.463	3.932	CSM ENGLISH UNITS
V8	67.325	16.099	CSM TOTAL UNITS
V9	3.068	0.436	CSM GPA
V11	-0.171	0.989	UC ELIGIBILITY

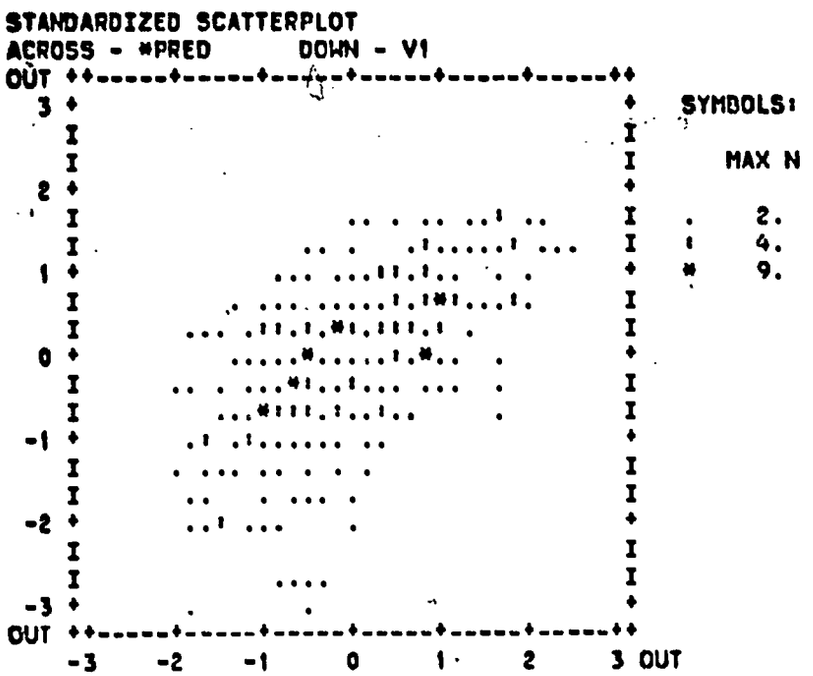
N OF CASES = 123

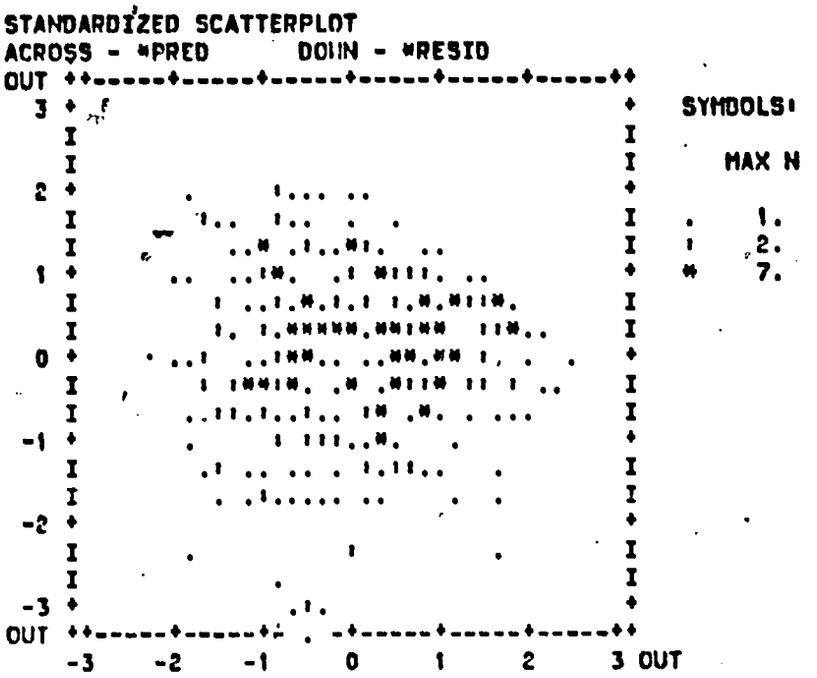
CORRELATION

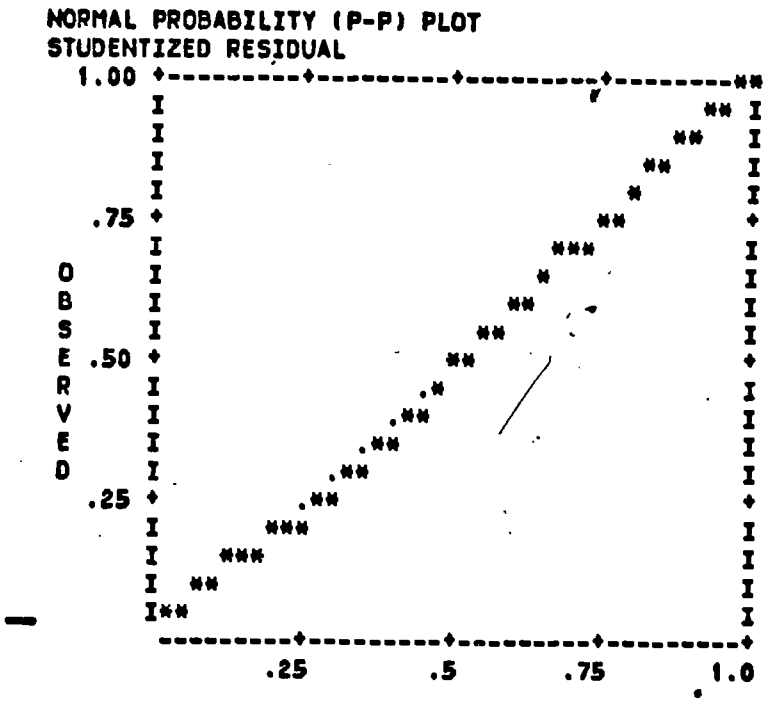
	V1	V3	V4	V5	V6	V7	V8	V9	V11
V1	1.000	-0.231	-0.044	0.046	-0.078	0.014	-0.107	0.594	0.255
V3	-0.231	1.000	0.159	-0.008	0.188	-0.054	0.240	-0.123	-0.313
V4	-0.044	0.159	1.000	-0.202	0.340	-0.132	0.180	-0.116	-0.270
V5	0.046	-0.008	-0.202	1.000	-0.067	0.163	0.190	-0.038	0.035
V6	-0.078	0.188	0.340	-0.067	1.000	-0.125	0.400	0.100	0.042
V7	0.014	-0.054	-0.132	0.163	-0.125	1.000	0.171	0.161	-0.070
V8	-0.107	0.240	0.180	0.190	0.400	0.171	1.000	-0.089	-0.102
V9	0.594	-0.123	-0.116	-0.038	0.100	0.161	-0.089	1.000	0.320
V11	0.255	-0.313	-0.270	0.035	0.042	-0.070	-0.102	0.320	1.000

APPENDIX D_1

SCATTERPLOTS AND NORMAL PROBABILITY PLOT OF RESIDUALS FROM CSUC GPA MULTIPLE LINEAR REGRESSION ANALYSIS

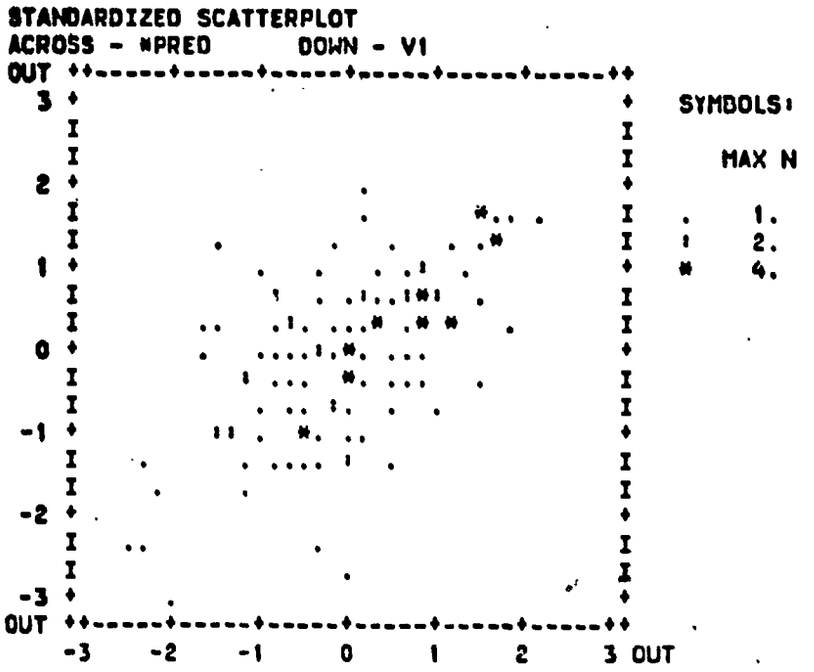

STANDARDIZED SCATTERPLOT
ACROSS - *PRED DOWN - V1
SYMBOLS:
MAX N
. 2.
: 4.
* 9.
-3 -2 -1 0 1 2 3 OUT

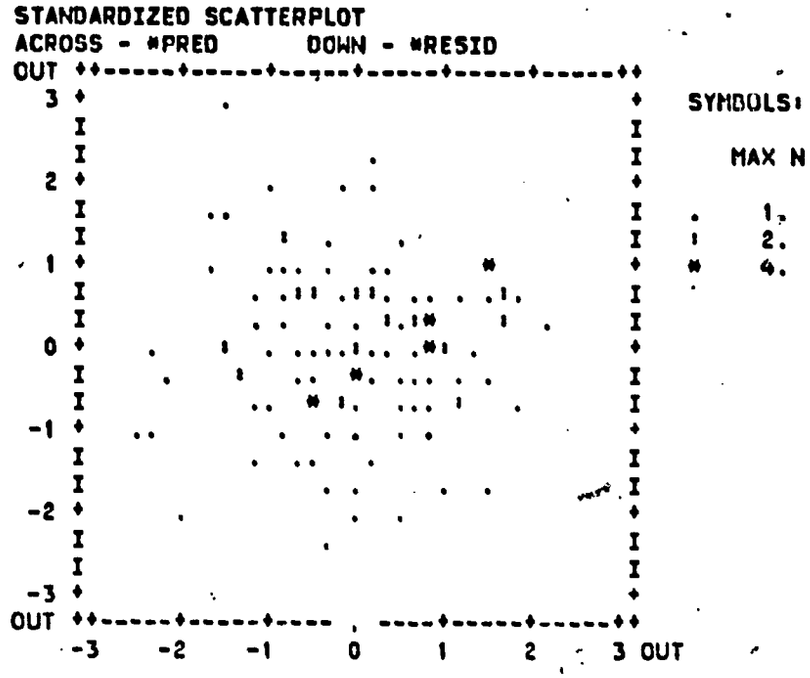

STANDARDIZED SCATTERPLOT
ACROSS - *PRED DOWN - *RESID
SYMBOLS:
MAX N
. 1.
: 2.
* 7.
-3 -2 -1 0 1 2 3 OUT


NORMAL PROBABILITY (P-P) PLOT
STUDENTIZED RESIDUAL
1.00
.75
.50
.25
OBSERVED
.25
.5
.75
1.0

APPENDIX D_2

SCATTERPLOTS AND NORMAL PROBABILITY PLOT OF RESIDUALS FROM UC GPA MULTIPLE LINEAR REGRESSION ANALYSIS


STANDARDIZED SCATTERPLOT
ACROSS - *PRED DOWN - V1
SYMBOLS:
MAX N
1. .
2. :
4. *
OUT
3
2
1
0
-1
-2
-3
-3 -2 -1 0 1 2 3 OUT


STANDARDIZED SCATTERPLOT
ACROSS - *PRED DOWN - *RESID
SYMBOLS:
MAX N
1. .
2. :
4. *
OUT
3
2
1
0
-1
-2
-3
-3 -2 -1 0 1 2 3 OUT