Developing a measure of Marine Corps recruiting effectiveness.

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DEVELOPING A MEASURE OF MARINE CORPS RECRUITING EFFECTIVENESS

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THESIS

DEVELOPING A MEASURE
OF
MARINE CORPS RECRUITING EFFECTIVENESS

by

Robert J. Sullivan

June 1976

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A measure of recruiting effectiveness was proposed. The model developed in the study gave a predicted productivity figure for a cross-validation sample of thirteen recruiting substations. The actual productivity of each substation was compared to the predicted value. This ratio was used as the measure of effectiveness.

Developing A Measure of Marine Corps Recruiting Effectiveness

by

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A. BACKGROUND

The United States Marine Corps actively recruits young men and women in the 18-24 age range. This is done in competition with the other military services and the civilian labor market. This competition intensified when the draft was eliminated in 1973.

In the spring of 1975 the Senate Armed Services Committee questioned whether the Marine Corps was sacrificing quality with certain segments of its forces to retain overall numbers of people and highly sophisticated weapons systems. The Commandant of the Marine Corps submitted a report [Ref. 1] in response to this committee's questions. His report concluded that the overall quality of first-term enlisted Marines fell below the high level desired in the past four years. The report stated that inadequate emphasis was being placed on the importance of recruiting high school graduates to maintain a quality force. One of the actions taken to correct this deficient manpower quality was to require that 67% of all recruits be high school graduates in fiscal year 1976 and 75% in fiscal year 1977.

B. REVIEW OF THE LITERATURE ON RECRUITING

In recent years that have been many studies of the recruiting efforts of the military services.

1. Studies Published in 1972

Cook and White [Ref. 2] in 1970 examined the quality of Air Force recruits (quality was measured by an index constructed from weighted percentile scores on the Armed Forces Qualification Test) as a function of net advantages (the present value of an enlistment term in the Air Force divided by the present value of the income an individual could receive in the civilian economy); draft pressure; unemployment rate (seasonally adjusted unemployment rate for males, ages 16-19); population (the number of civilian, noninstitutinalized males, ages 16-20); airmen recruits; and six variables to account for changes occurring outside the model. One variable represented the Berlin crisis of 1961 when 75,000 reserves were called to active duty. A second variable represented the period when a marriage deferment exempted all married young men from the draft. A third variable represented the Vietnam War which changed young men's perception of military service and thereby affected the overall quality of volunteers. In addition Cook and White included three variables to account for seasonal variation in recruit quotas and recruit quality. Their data consisted of quarterly observations of these variables from the first quarter of 1959 through the second quarter of 1967. They concluded that the military-to-civilian earnings ratio was the most significant variable for quality changes in airmen recruits.

In 1972 Stephan and Horowitz [Ref. 3] studied recruiting quotas and the distribution of canvassers (recruiters).

They examined the number of recruits as a function of the district recruited from (territory), the number of canvassers, and the size of the eligible population seasonally adjusted. They used data from the eight Navy recruiting districts for a seven-month period (Sept. 1971-Mar. 1972). They found that the overall total number of recruits attained was not very sensitive to changes in the distribution of canvassers. The implication was that recruiters attained their recruiting quotas regardless of area assignment.

2. Study Published in 1973

In 1973 Bennett and Haber [Ref. 4] investigated the factors which influence the productivity of individual Marine recruiters. They examined gross productivity (average number of recruits enlisted per month) for each recruiter as a function of 16 variables describing the recruiter's characteristics. These explanatory variables were as follows: GCT score, age, race, level of education, volunteered for recruiting duty, previous duty as a career planner (a reenlistment counselor), number of dependents, financial hardship (recruiter's perception of the financial burden of recruiting duty), distance from home of origin, the type of area assigned to (urban, suburban, or rural), number of times reassigned to a different area on the current tour of recruiting duty, hours-per-week spent recruiting, time out of the office spent on recruiting, months on recruiting duty (current tour) and the recruiter's class standing in recruiter school.

The sample consisted of 29 recruiting stations (RS) from all sections of the country. These stations provided information on 259 recruiters for fiscal year 1971. Using this data, Bennett and Haber found that not all of the variation in average monthly productivity among recruiters could be attributed to differences in recruiter characteristics. They also found that some areas of the country were more productive than others in that the propensity to enlist was higher. This meant that the enlistment rate (number of enlistments divided by number of qualified males) varied by region. They further concluded that recruiters who worked in areas near their home were likely to have an advantage, as did a recruiter who worked in urban or suburban environment instead of in a rural area. Because the explanatory variables explained only 12% of the variance in recruiter productivity they considered their model to lack predictive power. They found that the most important determinant of gross productivity was the propensity to enlist in an area.

3. Studies Published in 1974

In 1974 Waller [Ref. 5] produced a condensation of a study done in 1972 by Johnston, Jerome, and Bachman [Ref. 6]. The objective of the study by Johnston, Jerome, and Bachman was to discover what factors influenced young men to enlist in the military service as opposed to taking jobs or continuing their education. The study covered a span of four years, 1966-1970, for a sample of 2213 young men. The study tracked them beginning in the early tenth grade and ending

one year after most of the group had graduated from high school.

The study examined the enlistment behavior as a function of the following predictor variables: perceived affinity for service life, vocational indecision, draft status, race, geographical region, broken home, family size, parental punitiveness, social class, father's military experience, brother's military experience, influence of others (anticipated response of parents, peers, and school officials to the possibility of enlisting), intelligence test score, average classroom grades, attitudes toward school, educational attainment (dropping out), failing a grade prior to high school, high school curriculum, attitudes toward Vietnam war, area unemployment, and area wages.

It was found that one combination variable, twelfth grade plans to enlist plus certainty of plans, contributed more to the prediction of enlistment than all other variables combined. It was concluded that, in fact, there is no single "military type." This meant that enlistees were not characterized by an particular profile of background, ability, or personality which clearly set them apart from other young men their age.

In 1974 Fisher and DiSario [Ref. 7] examined the results of a national survey conducted in November 1972 aimed at studying the enlistment motivation of American youth as well as their attitudes towards military service. The sample size was 1,924 male youths aged 16 to 21. Among high school

graduates in the sample, 50% expressed a negative attitude toward enlisting for military service. Considerable enlistment influence was attributed to having been in personal contact with a recruiter. Information provided by the recruiter had more influence on an enlistment decision than did television or other media. The majority of youth reported recruiter contact at some time. The preceding facts imply that it is very important in obtaining recruits to make personal contact due to the strong influence this has on youth.

In 1974 Fisher and Harford [Ref. 8] examined the number of enlistees for each military service who were converted from those initially applying to that service. In the case of conversion of initial Marine Corps applicants to Marine Corps enlistees the 12 potential predictor variables studied were as follows: perception of career opportunities, maturity, travel, advanced education, choice of service, age, race, Armed Forces Qualification Test (AFQT) category, influence of relatives, influence of publications, influence of posters, and influence of movies. The survey data was compiled in fiscal year 1972 from a sample of 25 Armed Forces Entrance and Examining Stations (AFEES) nationwide. A total of 25,878 enlistees in all branches of the service was questioned during routine entrance processing. Fisher and Harford found that the following variables influenced, in descending order, the Marine Corps applicant: age, influence of relative endorsing choice of service, enlisting for career opportunities, influential media, AFQT category, and race. The implication was

that the Marine Corps appealed to the younger applicant who received positive support from relatives in deciding to enlist. The applicant was also influenced by movies, posters, and military publications. He tended to be in AFQT mental groups I and II and Caucasian.

In 1973, Caroll and Jehn [Ref. 9] examined how the supply of Navy enlistments depended on pay, unemployment, and policy variables such as the number of recruiters and advertising expenditures. They used productivity data for the entire Navy recruiting force during the period January 1970 through August 1972. They found that the measured effect of pay and advertising was generally statistically insignificant. On the other hand, in all cases the effect of recruiters was so high as to be hard to believe, according to Caroll and Jehn. The reasons cited for these results were the high correlations of each variable with the others thus causing multicollinearity in the model. They were unable to tell which of these independent variables -- increases in military pay, numbers of recruiters, and advertising expenditures -- caused increases in enlistments during the period productivity was being studied.

4. Studies Published in 1975

In 1975 Grissmer, Lanigan, Scuder, Goldberg, Peterson, and Sterrett [Ref. 11] provided a plan of action for an analysis of factors which might affect recruiter productivity. They proposed a model to study the propensity of the marketplace to enlist in the Army. Their model examined the supply

of contracts per QMA as a function of recruiters and canvassers per QMA, military pay relative to fulltime civilian pay adjusted for unemployment, negative attitudes toward the military, unemployment rates, percentage of QMAs enrolled in college, other services' recruiters plus recruiter assistants per QMA, advertising contacts per QMA, and eight variables representing the effects of various recruiting policies and enlistment options. The model was proposed after the researchers concluded that the current methodology for arriving at the QMA market caused a significantly increasing error as the time moved away from the 1970 Census population base. They also stated that actual field experience had shown that a high QMA market does not necessarily result in a high enlistment rate because of varying influences which motivate individuals to enlist. (There is no statistical basis cited for this "actual experience".) This reference provides a useful guide for a large scale approach to examining the propensity of the marketplace to yield recruits.

In 1975, Brown, Wood, and Harris [Ref. 12] examined the total number of Army accessions as a function of: average production per recruiter in subject's district recruiting command (DRC), average market share for station zone, proportion of zone which is suburban, months of experience as a recruiter, number of high school seniors in zone, average production per recruiter for subject's regional recruiting command (RCC), the degree of Armed Services Vocational Aptitude Battery testing saturation in subject's DRC, number of 17-21

years-olds in college in station zone, size of station zone in square miles, proportion of zone which is rural, proportion of zone which is metropolitan, and the ratio of QMA to MA (the total male population aged 17-21 in a particular territory). The sample consisted of 500 recruiters from the nation as a whole. The sample pulled 100 recruiters randomly from each of the five Army Regional Recruiting Commands (RCCs). The data covered the period from July to December 1973.

The best single predictor they found was "average production per recruiter in the subject's district recruiting command." This variable alone accounted for 48% of the variance in production scores. This implied that district or territorial productivity was strongly influenced by the characteristics of the district which could be social or cultural features not measured in the study. Further, they concluded that it was possible that "average production per recruiter in the DRC" was itself a function of local personnel management practices and of the quality of the individual recruiters.

C. THE CRITERION PROBLEM

There is a need to develop some measure of recruiter effectiveness. Currently the attainment of the assigned recruiting quota is the accepted measure. It is questionable whether raw production figures in themselves are adequate to compare the effectiveness of different recruiters. The simplicity of using attainment of quota to measure effectiveness makes it convenient to do so. But, it needs to be

determined if a rational basis for assigning quota is being applied before this simple measure is used. Does the recruiter in the rural area, where he spends a good deal of time traveling, have the same opportunities to recruit his quota as the recruiter in a large city or suburban area? Can there be any standard method to categorize high schools in a given recruiting territory so that a propensity to produce recruits can be uniformly assessed?

The aim of this study was to develop a criterion for measuring recruiting performance based on the characteristics of the territory being recruited from.

D. OVERALL STUDY PLAN

This study plan required productivity data on California-based Marine Corps recruiters for fiscal year 1975 and data pertaining to the California Public School System for school year 1973-74. Once collected, the productivity data of the recruiters was to be matched with the data describing the school district(s) covered by the recruiters. Next, a statistical analysis was to be attempted to identify those factors outside of the recruiter's control (school district variables) that accounted for variance in territorial productivity.

A multiple regression equation was to be developed and used to predict total productivity of each territory. This predicted productivty would represent the production that a recruiter of average ability could be expected to attain in

that territory. This would be the criterion for measuring actual performance in that territory.

This study was to differ from previous studies in that it would examine the recruiter's territory strictly from the qualities of the public school system. This was deemed appropriate in light of the renewed emphasis given to obtaining high school graduates by the Commandant of the Marine Corps [Ref. 1].

II. DEVELOPMENT OF A CRITERION OF RECRUITING EFFECTIVENESS

A. INTRODUCTION

The popular measure of recruiter effectiveness has been the percentage of objective achieved. But, it does not provide an indication of the territory the recruiter has to work with. The questions which need to be answered are: (1) How can the recruiter's territory be evaluated and (2) how should quotas for enlistment be assigned based on the recruiter's territory?

This study attempted to deal with these questions. First, it was assumed that the recruiter's territory could be described in terms of the characteristics of public high schools in a recruiter's territory. The use of multiple regression, it was hoped, would be useful in predicting productivity of an area based on these school characteristics. The answer to the second question would be a simple matter of equalizing the distribution of recruiters based on the dominant predictor variables found in the multiple regression formula/equation.

B. LIST OF POTENTIAL PREDICTORS OF TERRITORY PRODUCTIVITY

The variables chosen for this study and the rationale for including them are described in the following paragraphs.

1. Enrollment in Grades 10-12 (ENROL)

This variable represents total enrollment in the school district. It is a measure of the recruitable population in the district over the coming two years when the recruiter can take them as graduates.

2. Male High School Graduates (GRADM)

This variable represents the number of male high school graduates in each school district. It was included because of the increasing emphasis on getting high school graduates to enlist.

3. Male General Work Experience (GWRKM)

The California Public School System permits students to substitute actual work experience for some of their classroom work. This variable represents the number of students per district which are participating in the general work experience program--males only.

4. Male Vocational Education Program Enrollment (VOCEDM)

This variable represents the number of male students enrolled in a vocational education program. Such students were believed to be more favorably inclined to enlist than a student following a college preparatory course of study.

5. Minority Male Vocational Education Program Enrollment (VOCMM)

This variable represents the number of minority male students enrolled in a vocational education program per district. It was thought that these students would have a high propensity to enlist because of the opportunity to further vocational skills.

6. Average Daily Attendance for Second Period 1973-74(ADA2)

This variable represents a planning base and authorization figure for which school districts receive State financial support. It was believed that a large value for ADA2 would be an indicator of a large student population. It would compensate for not considering the ninth grade students in the ENROL variable described earlier.

7. Modified Assessed Valuation Per Unit of ADA2 (ASSVAL)

This variable represents the assessed property values on which the school district tax base is built. The ability of a school district to provide local revenues can be measured by the amount of assessed valuation that exists for each unit of average daily attendance. This variable was included because it gives a measure of economic wealth in the district.

8. Public Law 81-874 Income (FEDIN1)

This variable represents Federal reimbursement to school districts for the loss of taxable base which occurs when students attending schools in the district reside on Federal property. The inclusion of this variable in the model enabled it to consider the impact of proximity to a military reservation on productivity.

9. Total Federal Income (FEDIN2)

This variable represents the total federal income received by the school district. Federal revenues are largely directed to categorical use in support of specific programs.

10. Total Current Expense of Education - Administration (CUREXP)

This variable represents total current expenditures of the school district to support its educational programs. A portion of this is dedicated to pupil transportation costs. This variable was included to see what proportion of a district's total current expenditure was attributed to transporting students. Thus it would measure the relative rural nature of the district.

11. Pupil Transportation Expenditures (PUTRANS)

This variable represents the expense of transporting students. It was chosen as a rough measure of student dispersion in the school district. Thus it should indicate the need for a recruiter to travel in order to contact the students at home in a given district.

12. Percent of Income from Local Sources (PLOCIN)

This variable represents the percent of income derived from local sources for a school district. It was chosen to be an indicator of economic wealth. A high percent of income derived from local taxes would indicate a wealthy district.

13. Average High School Teacher's Salary (TCHSAL)

This variable represents the average high school teacher's salary in a school district. It was included as a surrogate for local income level. It was reasoned that the average high school teacher's salary would rise with the rising wealth of a district.

14. Number of Recruiters Assigned Per RSS (NRCTRS)

This variable represents the number of Marine Corps recruiters assigned per recruiting substation (RSS). Rosters of the 12th Marine Corps District were consulted for recruiter names which were then cross referenced to the CMC Net Productivity Report. There were some instances when a recruiter's name could not be located on the CMC report. In that case the value was assigned a missing values code of -1 for the variable. Another shortcoming of this variable was that the recruiters on the CMC report were carried thereon for one year after leaving recruiting duty. Thus, recruiters were implicitly assigned for an entire year for this study which causes this variable to be inflated in some instances. Despite the weaknesses inherent to this variable it was used because the cumulative productivity figures on the CMC report were related to NRCTRS.

15. Man-Months of Recruiters Assigned (MMRCTR)

This variable represents the number of recruiters assigned to each recruiting substation (RSS) per month during fiscal year 1975. The values came from 12th Marine Corps District files. For example, 3 recruiters if assigned to a given RSS for the entire year would give a value of 36 man-months of recruiters. This variable was chosen because it gave a good indication of the amount of recruiting effort the Marine Corps was applying to different areas.

C. OBTAINING A SAMPLE OF RECRUITER TERRITORIES

In formulating the research plan it was decided to restrict the study to the State of California. California was, due to its geographic size and diversity, thought to be representative of the various areas that the recruiters are working in nation wide. This does not mean that the regional attitudes of the West coast are comparable or similar to those on the East Coast. It simply means the population dispersion and the effects this dispersion has on a recruiter could be compared. Another reason that the study was limited to California was the ease and minimal cost with which data on the public school system could be collected.

The Director, 12th Marine Corps District, has jurisdiction over the Marine Corps recruiters operating in California. The cooperation of his staff made the collection of productivity data possible. Data on the productivity of 179 Marine recruiters assigned to 66 recruiting substations (RSS) in California was collected for fiscal year 1975.

Data describing the California Public School System was obtained from the State Board of Education. Financial data was aggregated by school district. Enrollment data was collected by individual schools. In order to maintain a common data base the enrollment data was aggregated by school district also. There did not appear to be a way to disaggregate the financial data from district level to school level.

D. DEFICIENCIES IN THE TERRITORIAL INFORMATION

Ideally, each item descriptive of the recruiter's territory should be confined to the specific territory he covers. The lowest level of aggregation in the public school system was, commonly, at the school district level. Since a recruiter segments his territory by individual high schools, the school district level of aggregation is not appropriate to define his territory. Several recruiters may, in fact, cover a single school district.

The productivity data did not cover the identical period that educational data covered. Productivity figures were available for fiscal year 1975 (1 July 1974 - 30 June 1975). Enrollment and financial data on the school districts were available for school year 1973-74 (September 1973 - June 1974). This is a weakness in the study which could be overcome by obtaining productivity and school data for the same period. It was not considered too erroneous to proceed on the basis of available data because it did not seem likely that significant changes would have occurred in the relative standing of school districts in one year's time. Population shifts would affect the school data. Time and cost considerations prevented further data collection.

Private schools were omitted from the study mainly because insufficient data was available. They appear to be more numerous in the urban areas of California. Because of the family income level necessary to send children to private high schools the

effect of having a private high school in a recruiters' territory may be partly captured by the assessed valuation variable (ASSVAL). The study would have been more complete if private schools had been included in the data base.

E. EXPLANATION FOR AGGREGATING RECRUITING SUBSTATIONS

In order to map the productivity of Marine Corps recruiters on the school district data base it was first necessary to group recruiters by their RSS assignment. The attempt to map productivity of actual RSSs was prevented because RSS territorial boundaries were not coincident with the school district boundaries. Certain school districts were so large that they received coverage from more than one RSS. This was very evident in the Los Angeles area. More often it was the case where one RSS covered more than one school district and overlapped with other RSS coverages. The method chosen for eliminating duplicative coverages and overlaps was to aggregate recruiting substations (RSSs) until one aggregated RSS covered a unique subset of the school districts. The result of doing this was that no longer could "recruiter" productivity be assessed. Instead the study could only address "recruiting" effectiveness as it pertained to these aggregated RSSs.

F. COMPOSITION OF SCHOOL DISTRICTS

In the 1973-74 school year approximately two-thirds of the average daily attendance in California's public elementary and secondary schools was registered in 251 unified school

districts. The 803 individual elementary and high school districts served the remaining one-third of the students comprising the total state average daily attendance. Approximately 55% of these 803 districts operated a single school.

G. COMPOSITION OF SCHOOLS

According to the State Board of Education few California school districts can maintain a consistent pattern of grades in all of the elementary or secondary schools they operate because of obsolete buildings or population shifts within the districts. Typically, secondary schools are junior high schools, senior high schools having grades 10-12, or high schools having grades 9-12. In this study the enrollment figures were used for grades 10-12 as being the least common denominator for the data base.

H. NORMALIZATION OF SCHOOL DISTRICT FINANCIAL VARIABLES

It was necessary to distinguish between unified and high school district types when dealing with financial variables for these districts (ADA2, ASSVAL, PLOCIN, FEDIN1, FEDIN2, PUTRANS, CUREXP, and TCHSAL). The reason for separately evaluating these variables by type of district was due to the different financial base used. Unified districts incorporated elementary and secondary school students in their bases. High school districts relied only on high school students for their bases. Because it was common to see both district types being covered by an RSS it was necessary to

standardize these variables in order to aggregate financial data of various districts to map onto their respective RSS. Standardization was done by a Z-score transformation. The formula used was $Z = \frac{X-\bar{X}}{SD}$ where X equals the value of the variable being normalized, $\bar{X}$ equals the mean value of that variable, and SD equals the standard deviation of that variable. The financial variables were thus transformed and relabeled (ZADA2, ZASSVAL, ZPLOCIN, ZFEDIN1, ZFEDIN2, ZPUTRANS, ZCUREXP, and ZTCHSAL).

I. DESCRIPTION OF RECRUITER PRODUCTIVITY VARIABLES

There were two separate variables used to represent productivity. The variable chosen to represent productivity for one model was labeled CONCMC. CONCMC values came from the CMC Recruiter Net Productivity Report. The variable representing productivity for the other model was labelled CON12. CON12 values came from the 12th Marine Corps District records for FY-75. Both of these variables were measured in terms of total contracts for enlistment obtained by each aggregated RSS.

J. MAPPING SCHOOL DISTRICTS ON RECRUITING SUBSTATIONS

Productivity variables were arranged initially on 42 RSS cases (each case representing one aggregated RSS). These cases were then made into 42 subfiles of an SPSS (Statistical Package for the Social Sciences) system file.

School district variables were initially arranged on 364 cases (1 case per school district). The appropriate RSS code was punched on each school district case. These 364 cases were sorted by RSS code and aggregated statistics were computed for each aggregation of school districts. These aggregated school district cases were saved on another SPSS system file. The aggregated mean was used to represent the value of each variable for the aggregated case. The 42 aggregated school district cases were then arranged in the same sequence as the aggregated RSS cases in the productivity file. Next, the cases of the school district file were merged with the cases of the RSS productivity file. This mapping of school districts on recruiting substations enabled subsequent statistical analysis of the predictor variables of the school district with the dependent variable of productivity (either CONCMC or CON12) for the aggregated RSS.

K. HANDLING OF MISSING DATA PERTAINING TO NRCTRS

A missing values code of (-1) was used for the variable NRCTRS when the recruiter productivity file was constructed. Recruiters carried on the roster of 12th MCD for FY-75 were not all found on the CMC Net Productivity report. When this occurred it was assumed that the 12th MCD data was more accurate than that of its higher headquarters. Therefore, some RSSs had a missing values code assigned when a recruiter's name did not appear on the CMC report. In the aggregation of

RSSs this meant that there was missing data. Fortunately, this resulted in only 8 of 42 RSSs (aggregated RSSs) showing missing values for the variable NRCTRS.

The SPSS system of computer programs enables the user to specify missing values for each of the variables so that cases with incomplete data may still be conveniently processed. In this study the SPSS programs were instructed to omit cases entirely which had the missing values code.

L. CREATION OF ANALYSIS AND CROSS-VALIDATION SAMPLES

In order to test the accuracy of the model produced by this study, in predicting productivity, a reduced sample size was used for purposes of analysis. A random sample of 29 aggregated RSSs was selected from the original sample for data analysis. There were 6 of the 29 which had missing values for the NRCTRS variable. This caused a further reduction in sample size to 23 cases or aggregated RSSs. The remaining 13 cases were used to cross validate the results of the study by comparing the productivities predicted by the model for these cases with the actual values.

III. DEVELOPMENT OF MODELS PREDICTING PRODUCTIVITY AND RECRUITING EFFORT

A. INTRODUCTION

The first two models in the study were developed to predict productivity, either CONCMC or CON12, using the predictor variables descriptive of the school districts. In each of these models the variable representing recruiting effort (NRCTRS in CONCMC model and MMRCTR in CON12 model) were initially omitted from the model as predictors. This gave a representation of the effects on productivity of just the school district variables. In other words, an effort was made to examine productivity only as a function of those variables beyond Marine Corps controllability. A subsequent analysis was then made of each model with the recruiting effort variable included as a predictor.

The next modeling procedure used a composite variable representing productivity. Specifically, the productivity variable for the CONCMC model (CONCMC) was divided by the recruiting effort variable (NRCTRS). This gave a productivity variable normalized for recruiting effort and labeled CONCADJ. The predictive qualities of this model were evaluated. A similar procedure was followed with the CON12 model. A productivity variable normalized for recruiting effort (CON12AJ) was formed by dividing CON12 by MMRCTR.

Finally, an attempt was made to model the recruiting effort variables (NRCTRS and MMRCTR) as a function of the school district variables. The predictive qualities of these two models were then evaluated.

B. PRODUCTIVITY AS A FUNCTION OF THE PREDICTOR VARIABLES

In order to predict productivity, as shown by total contracts (CONCMC or CON12), it was first necessary to examine the relationships between the predictor variables and in turn their relation to the dependent variable representing productivity (CONCMC or CON12).

1. Preliminary Examination of Predictors of Productivity

The correlations between the variables used in this study are shown in Table I.

TABLE I

Pearson-Product-Moment Correlation Coefficients of Predictor Variables with Productivity Variables (N=23)

VARIABLE	CONCMC	CON12
CONCMC	1.00000	0.96421
CON12	0.96421	1.00000
NRCTRS	0.95913	0.98295
MMRCTR	0.94774	0.99431
ENROL	0.44393	0.48119
GRADM	0.44380	0.48434
GWRKM	0.27752	0.34450
VOCEDM	0.63474	0.71355
VOCMM	0.71575	0.78305
ZASSVAL	-0.06063	-0.01273
ZFEDIN1	0.25660	0.32559
ZFEDIN2	0.64358	0.73032
ZADA2	0.61998	0.70215
ZCUREXP	0.23206	0.26672
ZPUTRANS	0.19639	0.20776
ZPLOCIN	0.00467	0.10641
ZTCHSAL	0.08108	0.13628

The Pearson product-moment correlation coefficient, denoted by r, is a measure of association indicating the strength of the linear relationship between two variables. When the value of r approaches +1.0 or -1.0, a strong linear relationship is indicated. It is evident from Table I that a strong positive correlation exists between productivity (number of contracts--either CONCMC or CON12) and other variables. The strongest correlations (above 0.6) are shown below:

Variables	r
CONCMC with CON12	0.96421
CONCMC with NRCTRS	0.95913
CONCMC with MMRCTR	0.94774
CONCMC with VOCMM	0.71575
CONCMC with ZADA2	0.61998
CON12 with NRCTRS	0.98295
CON12 with MMRCTR	0.99431
CON12 with VOCEDM	0.71355
CON12 with VOCMM	0.78305
CON12 with ZFEDIN2	0.73032
CON12 with ZADA2	0.70215

These correlations imply that the number of contracts is affected by the number of recruiters, the number of man-months of recruiting effort, the number of vocational minority male students, the number of vocational education male students, the total federal income (normalized) of the district and the average daily attendance (normalized) in the district. The relationships between the number of contracts and the number of recruiters and the number of recruiter man-months is expectedly obvious. The more recruiters in the field the

more contracts should be expected in total. The more interesting relationships are those concerning the number of contracts with vocational enrollments, average daily attendance and total federal income in the school districts. These latter relationships suggest that the greater the vocational enrollments and average daily attendance and federal income the easier it is to recruit. However, due to the confounding that exists among the many predictors such possible relationships must be looked at more closely. This is done in the next section.

2. Modeling Productivity as a Function of the Predictors

Because of the suggested relationships discussed in the previous section, an attempt was made to model CONCMC as a linear function of the 12 predictor variables excluding NRCTRS. Excluding NRCTRS permitted focusing on those variables which were outside the control of the Marine Corps. NRCTRS was subsequently included in a later analysis of the predictor variables on CONCMC. This analysis is discussed in the next section.

A multiple stepwise linear regression with CONCMC as the dependent variable representing recruiting productivity was performed. The results are shown in Table II.

The predictor variables are arranged in descending order of their contribution to accounting for productivity (CONCMC). The best single predictor is VOCMM representing vocational minority male enrollment. Table II shows the correlation coefficient as 0.71575. Table II also shows

TABLE II

Multiple Stepwise Regression of CONCMC with 12 Predictor Variables--NRCTRS Excluded
(N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
VOCMM	0.71575	0.51229	0.51229	0.71575
GWRKM	0.74456	0.55437	0.04208	0.27752
GRADM	0.80316	0.64506	0.09069	0.44380
ZTCHSAL	0.85130	0.72471	0.07965	0.08108
ZCUREXP	0.86897	0.75511	0.03041	0.23206
ZFEDIN1	0.88883	0.79002	0.03491	0.25660
VOCEDM	0.89448	0.80009	0.01006	0.63474
ZASSVAL	0.89811	0.80660	0.00651	-0.06063
ZPUTRANS	0.90007	0.81012	0.00353	0.19639
ZADA2	0.90206	0.81371	0.00359	0.61998
ZPLOCIN	0.90299	0.81538	0.00167	0.00467
ZFEDIN2	0.90397	0.81716	0.00178	0.64358

that VOCMM accounts for approximately 51% (R^2 equals 0.51229) of the variance in CONCMC. That is, knowledge of the vocational minority male enrollment causes a reduction in variability in CONCMC by more than one-half. Thus, productivity is strongly influenced by the vocational minority males in California high schools.

The same procedure was followed using CON12 as the productivity variable representing the total contracts for enlistment as shown in the records of the 12th Marine Corps District (FY-75). The results of the multiple stepwise linear regression with CON12 as the dependent variable and excluding MMRCTR are shown in Table III.

The predictor variables are arranged in descending order of their contribution to accounting for productivity (CON12). Table III shows the correlation coefficient as

TABLE III

Multiple Stepwise Regression of CON12 with 12 Predictor Variables--MMRCTR Excluded
(N-23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
VOCMM	0.78305	0.61316	0.61316	0.78305
ZPLOCIN	0.83155	0.69.48	0.07832	0.10641
ZTCHSAL	0.85458	0.73030	0.03882	0.13628
ZADA2	0.88719	0.78711	0.05681	0.70215
GWRKM	0.89889	0.80800	0.02090	0.34450
GRADM	0.91136	0.83058	0.02258	0.48434
ZCUREXP	0.93292	0.87033	0.03975	0.26672
ZFEDIN1	0.94400	0.89114	0.02080	0.32559
ZASSVAL	0.94817	0.89903	0.00789	-0.01273
ZPUTRANS	0.95081	0.90404	0.00502	0.20776
ZFEDIN2	0.05164	0.90561	0.00157	0.73032
VOCEDM	0.95200	0.90630	0.00069	0.71355
ENROL	0.95216	0.90661	0.00031	0.48119

0.78305. Table III also shows that VOCMM accounts for approximately 61% (R^2 equals 0.61316) of the variance in CON12. Thus, VOCMM was shown to be the best single predictor for productivity in both models (CONCMC and CON12). This was the case when the variable representing recruiting effort was removed from consideration.

Tables II and III also show that, given a value for VOCMM, the other individual variables contributed little additional information about CONCMC and CON12.

3. Inclusion of Recruiting Effort as an Explanatory Variable

The analysis of section 2 was repeated with NRCTRS included among the predictor variables. The results of the multiple stepwise linear regression with CONCMC as the

dependent variable and 13 predictor variables including NRCTRS are shown in Table IV.

TABLE IV

Multiple Stepwise Regression of CONCMC with 13 Predictor Variables--NRCTRS Included
(N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
NRCTRS	0.95913	0.91993	0.91993	0.95913
ZADA2	0.97087	0.94258	0.02265	0.61998
ZPLOCIN	0.97784	0.95617	0.01358	0.00467
ZTCHSAL	0.98068	0.96174	0.00557	0.08108
ZPUTRANS	0.98267	0.96563	0.00389	0.19639
ENROL	0.98518	0.97057	0.00494	0.44393
ZCUREXP	0.98673	0.97364	0.00307	0.23206
GRADM	0.98790	0.97594	0.00230	0.44380
VOCMM	0.98842	0.97697	0.00103	0.71575
ZFEDIN2	0.98966	0.97944	0.00247	0.64358
ZFEDIN1	0.99082	0.98172	0.00228	0.25660
VOCEDM	0.99085	0.98178	0.00006	0.63474
GWRKM	0.99091	0.98191	0.00013	0.27752
ZASSVAL	0.99092	0.98193	0.00002	-0.06063

It can be seen in Table IV that the number of recruiters assigned per RSS (according to CMC reports) explains 96% (R^2 equals 0.95913) of the variance in productivity--CONCMC. Thus, all other variables can explain an additional amount of 4% of the variability in CONCMC. Therefore, in order to predict CONCMC with considerable accuracy, the number of recruiters is all that is needed.

The same procedure was followed with CON12 as the dependent variable and including the number of recruiter man-months per RSS (MMRCTR) as a predictor variable. The results are shown in Table V.

TABLE V

Multiple Stepwise Regression of CON12 with 13 Predictor Variables--MMRCTR Included
(N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
MMRCTR	0.99431	0.98865	0.98865	0.99431
ZPLOCIN	0.99530	0.99062	0.00197	0.10641
ENROL	0.99637	0.99275	0.00213	0.48119
GWRKM	0.99694	0.99390	0.00115	0.34450
ZADA2	0.99715	0.99430	0.00041	0.70215
ZTCHSAL	0.99801	0.99603	0.00173	0.13628
ZFEDIN1	0.99815	0.99630	0.00027	0.32559
VOCMM	0.99821	0.99641	0.00011	0.78305
ZASSVAL	0.99823	0.99646	0.00005	-0.01273
ZCUREXP	0.99824	0.99649	0.00003	0.26672
VOCEDM	0.99826	0.99652	0.00003	0.71355
ZPUTRANS	0.99826	0.99653	0.00001	0.20776
ZFEDIN2	0.99826	0.99653	0.00000	0.73032

It can be seen in Table V that the number of recruiters assigned per RSS per month (according to 12th MCD reports) explains 99% (R^2 equals 0.98865) of the variance in productivity--CON12. Thus, <u>all</u> other variables explain an additional amount of a little more than 1% of the variability in CON12. Therefore, an accurate prediction of CON12 can be made knowing only the number of man-months of recruiter effort being assigned to a territory.

The remaining variables listed in Tables IV and V add insignificantly to the predictive power of their respective model (CONCMC or CON12) as is shown by the change in R square (R^2) value with each additional variable as the table is scanned from top to bottom. While several of the simple

correlations between productivity and the other variables are greater than zero, they do not add significantly to the Multiple R column because they were largely duplicating other predictor variables with which they were correlated. As an example of this, Vocational Minority Male enrollment (VOCMM) correlated 0.71575 with CONCMC (refer to Table I); but, because it also correlated highly (r equals 0.83229) with Vocational Education Male Enrollment (VOCEDM), it made essentially no unique contribution to prediction and ranked only ninth among the predictor variables in Table IV and eighth in Table V.

4. Normalizing Production by Recruiting Effort

An attempt was made to control for the dominating effect of NRCTRS on CONCMC and MMRCTR on CON12. The method used was to divide CONCMC by NRCTRS and likewise CON12 by MMRCTR, for each of the 23 cases and form two new variables as a result.

Considering first the CONCMC model, when productivity (CONCMC) was divided (normalized) by recruting effort (NRCTRS) the new variable was labeled CONCADJ. The effect of this normalization on the ability of the predictor variables to predict productivity was significant. A multiple stepwise linear regression was performed with CONCADJ as the dependent variable and using the same 12 predictor variables as before. The results of this regression are shown in Table VI.

The predictor variables are arranged in descending order of their contribution to predicting productivity--CONCADJ. The first (best) predictor to enter the regression was GRADM representing male graduates. Referring to Table VI it is

TABLE VI

Multiple Stepwise Regression of CONCADJ with 12 Predictor Variables--
(N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
GRADM	0.26692	0.07125	0.07125	-0.26692
GWRKM	0.32823	0.10774	0.03649	0.01340
VOCMM	0.35468	0.12580	0.01806	-0.02815
ZFEDIN2	0.44635	0.19923	0.07343	-0.22332
ZPLOCIN	0.47905	0.22949	0.03027	0.14795
ZFEDIN1	0.50488	0.25490	0.02541	-0.19378
ENROL	0.51917	0.26953	0.01463	-0.26529
RZPUTRAN	0.52687	0.27760	0.00806	0.03933
ZASSVAL	0.53658	0.28792	0.01033	0.12930
ZTCHSAL	0.53802	0.28947	0.00154	-0.10193
VOCEDM	0.53960	0.29117	0.00170	-0.04277
ZADA2	0.54300	0.29485	0.00368	-0.21261

seen that GRADM explained only 7% (R^2 equals 0.07125) of the variance in the adjusted productivity variable--CONCADJ. The remaining variables added only slightly to the predictive power of the model. The amount of variation explained by all 12 predictor variables was only 29%

The meaning of these results is that RSS productivity, on the average, can be predicted on the basis of NRCTRS. Because the productivity is based on aggregated RSS data the model does not permit distinguishing individual recruiter productivity. Apparently recruiter productivity is all balanced out at the RSS level towards achieving RSS quota.

The CON12 model was treated in a similar manner. Productivity (CON12) was divided by recruiting effort (MMRCTR) to produce a new productivity variable--CON12AJ. Again, the

effect of normalizing the dependent productivity variable affected the ability of the predictor variables to predict productivity. The results are shown in Table VII.

TABLE VII

Multiple Stepwise Regression of CON12AJ with 12 Predictor Variables (N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B
ZASSVAL	0.36997	0.13687	0.13687	-0.36997	0.06810
GWRKM	0.42005	0.17644	0.03957	0.31208	-0.00024
ZFEDIN2	0.48189	0.23222	0.05578	0.01290	-0.26484
VOCMM	0.65036	0.42297	0.19075	0.29143	0.33307
ZFEDIN1	0.69152	0.47820	0.05523	-0.01597	0.08618
VOCEDM	0.73245	0.53649	0.05829	0.26242	0.09661
ZTCHSAL	0.74642	0.55715	0.02066	0.16897	0.37542
ENROL	0.75882	0.57581	0.01866	0.06343	-0.03076
ZPLOCIN	0.76686	0.58807	0.01226	-0.30018	-0.35297
GRADM	0.77692	0.60361	0.01554	0.08341	0.20244
ZADA2	0.77889	0.60668	0.00307	0.05603	-0.03992
RZPUTRAN	0.77988	0.60822	0.00155	0.02886	0.00434
(CONSTANT)					1.77937

The predictor variables are arranged in descending order of their contribution to predicting productivity--CON12AJ. The first predictor to enter the regression (best predictor) is ZASSVAL (normalized assessed valuation). ZASSVAL explains 14% (R^2 equals 0.13687) of the variation in the productivity variable--CON12AJ. The combined effect of all 12 predictor variables in the model explain 61% (R^2 equals 0.60822) of the variation in CON12AJ.

The "B-column" in Table VII is a listing of the partial regression coefficients for this model. The last value in the column is the Y-intercept or "constant" term. To derive the mathematical expression of the CON12AJ model it is merely necessary to multiply each variable by the partial regression coefficient (e.g. predicted value of the contribution of ZASSVAL equals 0.06810 x ZASSVAL) and add each of these predicted variables to the constant or Y-intercept to obtain the linear model. This procedure is followed in a later section of this study in an attempt to cross-validate the CON12AJ model.

The CON12AJ model is an improvement over the CONCADJ model. This can be seen by comparing the results shown in Table VII with those in Table VI. The amount of variation in CON12AJ explained by the predictors is 60%. The amount of variations in CONCADJ explained by the predictors is 29%. One important reason for this greater explanatory power of the CON12AJ model is that the variable MMRCTR has much greater range than NRCTRS as seen below. (The below statistics were calculated for sample size N=23.)

	NRCTRS	MMRCTR
Mean	5.348	59.690
Variance	44.328	7201.148
Range	31.000	442.000
Std. Dev.	6.658	84.860
Minimum	1.000	3.000
Maximum	32.000	445.000

This greater range permits more detailed information and a more definitive analysis of the effect of recruiter effort. Because CON12AJ or CON12 controlling for MMRCTR has greater

range (there are less ties) and is more "predictable" it does a better job of taking recruiter effort out of productivity.

C. PREDICTING RECRUITING EFFORT USING SCHOOL VARIABLES

The large influence of recruiting effort on productivity made it necessary to perform a multiple stepwise linear regression on MMRCTR using the school variables as predictors in order to determine the bases for assigning recruiter effort to an RSS. Table VIII shows the results of this regression.

TABLE VIII

Multiple Stepwise Regression of MMRCTR using 12 Predictor Variables
(N=23)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
VOCMM	0.76967	0.59239	0.59239	0.76967
ZPLOCIN	0.83458	0.69652	0.10413	0.15112
ZTCHSAL	0.85357	0.72857	0.03206	0.15174
ZADA2	0.90153	0.81275	0.08417	0.72757
GWRKM	0.91466	0.83661	0.02386	0.33995
GRADM	0.93087	0.86652	0.02991	0.51541
ZCUREXP	0.94860	0.89984	0.02991	0.51541
ZFEDIN1	0.95530	0.91260	0.01277	0.33111
ZASSVAL	0.95917	0.92002	0.00741	0.01203
ZPUTRANS	0.96130	0.92409	0.00408	0.25122
ZFEDIN2	0.96203	0.92550	0.00141	0.74870
VOCEDM	0.96226	0.92594	0.00043	0.72581
ENROL	0.96263	0.92666	0.00072	0.51380

Table VIII shows that there was a significant reduction in the variation in recruiting effort (MMRCTR) by knowing the vocational male minority enrollment (VOCMM) in a school district. That is, with VOCMM alone the amount of explained

variation is nearly 60% (R^2 equals 0.59239), when predicting MMRCTR. To further illustrate this point, the mean of MMRCTR is 59.690 and the standard deviation is 84.860. In the first step of the regression of MMRCTR with the 12 predictor school variables when VOCMM was added the standard error of the estimate (SEE) was 60.463. This means that the width of a confidence interval about the predicted number of recruited man-months of effort (MMRCTR) is reduced by about 29% just by knowing the value of VOCMM. Further inclusion of the other 11 variables reduced the standard error to 39.177. Referring to Table VIII it can be seen that the R-square value combining all predictors was 0.92666. This means that nearly 93% of the variation in predicting MMRCTR is explained by the predictor variables. However, looking at the change in R-square (R^2) it appears that the last five variables shown in Table VIII do not add significantly to the predictive power.

The meaning of the regression analysis of MMRCTR with the 12 predictor variables is that the amount of recruiting effort, measured in terms of recruiter man-months (MMRCTR), of the aggregated RSSs used in this study can be fairly accurately predicted knowing the enrollment of male minority students. If the percent of income which is local is also known then the amount of explained variation in predicting MMRCTR jumps 10% to 69%. Knowing additionally the average high school teacher's salary and the average daily attendance (ZTCHSAL and ZADA2) increases the ability to predict with 81% of the variation in MMRCTR explained.

A comparison was made of the 29 aggregated recruiting substations in the sample by dividing each of the enrollment variables by the recruiting effort (MMRCTR) of each RSS. The results are shown in Table IX. Judging from these results there are inconsistencies in the method of assigning recruiting effort for recruitment among the aggregated RSSs. If recruiting effort were based on some aspect of high school student enrollment or male graduates a fairly equal distribution would be seen in Table IX. In the absence of any numerical patterns among the 29 RSSs aggregated for this study it is concluded that some basis other than high school enrollment is used to assign recruiting effort. It might be that the frequency of 3's in the CON12X column indicates that the number of contracts tallied by the 12th MCD for FY-75 was evenly distributed among the recruiting effort appplied--MMRCTR.

D. CROSS-VALIDATION OF THE CON12AJ MODEL

The 13 remaining aggregated RSS cases purposely excluded from the analysis to this point were next used to test the power of the CON12AJ model to predict productivity. The method used was to multiply each of the 12 predictor variables by the partial regression coefficients as discussed in section B.4. These variables were coded as 'P' variables indicating that they were being used to predict productivity for the sample of 13 remaining RSSs. The Pearson product-moment correlation coefficient for CON12AJ and the predicted productivity for

TABLE IX

A Comparison of Aggregated Recruiting Substations when Enrollment Variables are Divided by Recruiting Effort (MMRCTR)

CASE-N	MMRCTR	ENROLX	GRADMX	GWRKMX	VOCEDMX	VOCMMX	CON12X
1	185	9	1	0	3	0	3
2	72	18	3	0	5	2	4
3	50	22	3	1	7	1	3
4	36	16	2	1	6	0	3
5	128	52	7	1	9	1	3
6	36	45	6	2	13	3	3
7	36	204	31	11	29	3	2
8	12	85	11	2	20	5	3
9	36	141	18	9	43	9	4
10	29	428	46	0	9	19	3
11	24	84	13	5	17	4	3
12	25	107	13	11	26	16	5
13	445	18	2	1	6	2	3
14	34	36	5	1	15	2	3
15	48	62	9	3	16	4	3
16	45	62	9	3	14	6	4
17	40	82	12	3	15	2	3
18	29	96	11	5	30	5	3
19	16	191	23	6	49	2	3
20	43	36	5	2	17	6	3
21	152	32	5	1	6	2	3
22	60	123	13	2	17	4	3
23	47	17	2	1	5	0	2
24	33	10	2	0	3	0	3
25	19	76	10	6	17	2	2
26	12	211	29	13	60	14	3
27	24	232	34	7	59	4	4
28	3	535	70	24	131	20	2
29	12	139	18	10	34	12	3

this remaining smaple of 13 RSSs--CON12AJP was calculated as a measure of the goodness of the predictions. The correlation was found to be only 0.0781, indicating poor agreement between predicted and actual contracts.

The results of the cross-validation of the CON12AJ model are shown in Table X.

TABLE X

Comparison of Predicted Productivity and Acutal Productivity as a Suggested Measure of Effectiveness (N=13)

CASE-N	MMRCTR	CON12AJ	CON12AJP	MOE
1	38	3	2	1.50
2	133	3	2	1.50
3	20	2	2	1.00
4	54	2	2	1.00
5	36	3	4	0.75
6	65	2	2	1.00
7	17	11	3	3.67
8	49	2	2	1.00
9	74	3	2	1.50
10	19	2	2	1.00
11	33	2	3	0.67
12	12	2	3	0.67
13	24	7	2	3.50

A comparison of the actual observations (CON12AJ) with the predicted observations (CON12AJP) shows that the difference rarely exceeded one contract. Thus, the low correlation notwithstanding, the agreement between CON12AJP and CON12AJ was fairly good. The differences, although usually of at most one contract are magnified in the correlation calculation

because of the restricted range (low variability) of CON12AJ. For this reason, the low correlation is somewhat misleading.

The measure of effectiveness (MOE) displayed in Table X is the ratio of actual contracts (productivity) to predicted contracts, i.e.,

$$MOE = \frac{CON12AJ}{CON12AJP}$$

If the regression model had good predictive ability, such a ratio would be useful as an index for evaluating the effectiveness of a recruiting substation. A value of the MOE significantly larger than one (1.00) would indicate a very effective recruiting substation. Whereas a value significantly less than one (1.00) would indicate a substation which required attention. For example, in case #7 of Table X the MOE was found to be 3.67 indicating that this substation had recruited almost four times the number of recruits that were predicted.

Because of the low variability of CON12AJ from one recruiting substation to another, it is not obvious that the information about the environmental factors significantly improves the ability to predict the number of contracts over the use of a simple average number of contracts per recruiter. Regardless of the territorial characteristics the recruiting substations examined in this study appeared to meet their productivity goals.

IV. CONCLUSIONS

A. FINDINGS OF THE STUDY REGARDING PRODUCTIVITY

This study attempted to predict recruiting productivity of Marine Corps recruiting substations in the 12th Marine Corps District's California recruiting area. The prediction was based on 12 predictor variables which described the financial and enrollment characteristics of the California Public School System.

The dominance of recruiting effort, represented by NRCTRS or MMRCTR, confounded the analysis by accounting for an overwhelming amount of the variation in productivity (CONCMC or CON12). To take out the effect of recruiting effort two models were tested. Both used a productivity variable which was normalized by recruiting effort. The CONCADJ model which used CONCMC divided by NRCTRS as the adjusted productivity variable showed a combined effect of the 12 predictors to explain only 29% of the variation in productivity--CONCADJ. The CON12AJ model, which used CON12 divided by MMRCTR as the adjusted productivity variable, showed a combined ability of the 12 predictor variables to explain 60% of the variation in productivity. This CON12AJ model was used to predict what productivity would be with the 13 RSS cases which were held aside from the total of 42 aggregated RSS cases in the beginning of the study for cross-validation of the model produced in the study. The cross-validation showed that the predictive power of the CON12AJ model was not very strong.

B. THE HUMAN ELEMENT WAS IGNORED

This study concentrated on quantifiable data describing the school districts which make up the California public school system. This data it was hoped would be descriptive of the school system, relative wealth of the territory, pupil dispersion, and some racial compositional information. The study neglected to consider the psychological makeup of the recruiter or the prospective recruits he was seeking. In the introduction to this study there were several studies described which used surveys and attempted to assess factors affecting "quality" of recruits. These studies revealed no particular military "type" was evident in the environment the recruiter worked in.

The belief that there are areas with a high propensity to enlist as stated by Bennett and Haber [Ref. 4] cannot be reinforced by this study's results. It appears from the results of this study that productivity is fairly evenly distributed among the recruiting substations.

C. EDUCATIONAL BASIS FOR ASSIGNMENT OF RECRUITING EFFORT

The amount of recruiting effort applied to a given territory measured in terms of recruiter man-months (MMRCTR) for the aggregated recruiting substations of this study can be fairly accurately predicted knowing certain educational variables used in this study. If the enrollment of male minority students is known and if the percentage of income in the

school district from local sources is high the amount of recruiting effort (MMRCTRS) can be predicted with 69% of the variation in recruiting effort explained. Knowing the average high school teacher's salary and the average daily attendance explains another 12% of the variation in recruiting effort. Thus, it appears that the amount of recruiting effort is greater in school districts with substantial minority male enrollments in vocational programs and these districts are economically able to support their educational programs with little state or federal support.

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