

THE CLERICAL LABOR FORCE AND LABOR FORCE
AREA OF THE MANNED SPACECRAFT CENTER
NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

By

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PREFACE

This thesis is an analysis of the personal characteristics, residence and commuting patterns, and the comparative wage rates of the clerical personnel of NASA's Manned Spacecraft Center in Houston, Texas. My research was made possible by an Internship at the Space Center in summer 1967.

Preparation of the thesis was done while I was studying under a Manpower Fellowship from the United States Department of Labor.

I would like to acknowledge the counsel given me by my adviser, Dr. John C. Shearer and the staff of the MSC Manpower Management Branch, especially Mr. James E. Zemanek, Mr. Charles W. F. Ulm, and Mr. A. V. Towns.

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CHAPTER I

INTRODUCTION

Background and Literature on Labor Force Areas

In past years, a substantial body of data has been developed, through a series of studies at Oklahoma State of the character of the civilian labor markets of a number of large military installations in Oklahoma. These surveys were original investigations of the personal characteristics of the labor force of a single large employer, including wage and job structures and residence and commuting patterns of the employees.

A typical hypothesis underlying these studies was succinctly stated by Leonard Drinko in his (1963) study of Clinton-Sherman Air Force Base:

"...that certain socio-economic characteristics of the labor force under consideration are co-determining or at least co-variable."¹

Prior to these studies most of the empirical data in this field were drawn from one or a combination of three primary types of sources:

- (1) secondary studies using census data to measure the quantity and characteristics of the population and labor force residing in a given geographic area;
- (2) "Origin-and-destination" traffic studies which illuminate some aspects of commuting patterns; and
- (3) management records which reveal personal and job-related data.²

The Oklahoma State series of studies presented a detailed profile of general labor force characteristics and delimited the areas from which present employees were drawn. Personal characteristics such as age, sex, marital status and length of service were found to be partially co-determining. Commuting patterns were found to be related to social, economic, and geographic characteristics of the labor force as well as to type of employment.³

The present study singles out the clerical occupations - revealing some of the characteristics peculiar to this labor force - in particular, the clerical labor force of the National Aeronautics and Space Administration's Manned Spacecraft Center (MSC) in Houston, Texas.

The Clerical Occupations in Perspective

The clerical occupations are in the white collar, middle-class range. They attract mostly females,⁴ (95 percent nationally) and draw heavily on girls with rural and small town backgrounds.⁵ Although personnel are not drawn from any particular socio-economic class, it is an "up-ward mobile" occupation.⁶ The nature of the occupation allows for a great range of vertical mobility and flexibility. It can be pursued intermittently or used as a stepping stone to higher jobs.

Nationwide, clerical and related occupations employed almost 11 million in 1965. There is a very large nationwide demand for these standardized skills which require a moderate degree of training. Openings for secretaries and stenographers may total more than 200,000 annually and for typists 50,000 annually the next few years.⁷

The Manned Spacecraft Center

In 1966, there were about 7,000 secretaries, stenographers and typists employed in the Houston, Texas Metropolitan area.⁸ About four percent of them were employed by the Manned Spacecraft Center (MSC).

N.A.S.A.'s Manned Spacecraft Center (MSC) was established in Houston, Texas, in 1961. It started with the 664 employees of the Space Task Group (S.T.G.) transferred from Langley Air Force Base, Virginia. Since that time it has grown to where it now directly employs approximately 4,600. It has an annual budget of approximately \$1.3 billion.

The mission of MSC is to carry out manned explorations of space within the authority of the Space Act of 1958. To carry out its assigned mission, MSC uses other facilities of NASA extensively.

The primary functions presently under the direction of MSC are the provision of spacecraft used specifically for manned space flight, the integration of these spacecraft into existing missile systems, direction and control of the craft while in space, and the training of astronauts. These functions include the coordinating activities between MSC and the other NASA establishments connected with manned space flight.

MSC is primarily a program management organization. A large part of its activities are the planning, administration, and coordination of activities carried out by contractors.

Scope and Method of Study

This study is divided into three parts:

- 1) personal characteristics of the clerical personnel;
- 2) definition of residence and commuting areas; and
- 3) comparative wage data.

For purpose of this study, I selected five job categories that include those employees usually considered clerical support personnel. They are: Secretaries - GS0318, Stenographers - 0312, Clerk-Typists - 0322, Clerks (general) - 0301, and Mail and File Clerks - 0305.* MSC has about 640 employees in these categories, most of them in the first three.

The primary sources of information are existing personnel records, published Bureau of Labor Statistics figures, and a questionnaire sent to all of the employees in the above five civil service series.

The data are for June-July, 1967, making it comparable to the annual Bureau of Labor Statistics data gathered from the Houston, Texas Metropolitan Area.

The questionnaire (Appendix B) was sent to the 639** permanent clerical employees on July 10, 1967. There were 471 (75 per cent) returned, of which 465 (72 per cent) were usable. For analysis, the returns were tabulated on IBM punched cards.

The questionnaire was used to gather information on age, marital status, geographic origins, commuting patterns, experience, length of employment, previous federal employment, education, family relationships to other MSC and MSC contractor personnel, sources of job information and opinions of pay and benefits at MSC.

The ratio, by Civil Service Series, of questionnaires returned is about the same as those sent out. Table I gives the number and percent of the total in each Civil Service Series as well as the corresponding

*A description of these series is presented in Appendix A.

**38 MSC clerical employees assigned to duty stations outside the Houston area are excluded.

number and percentage for the returned questionnaires. They are about equally divided among typists, stenographers, and secretaries, with only a few general and mail and file clerks.

The ratio, by sex, of the returned questionnaires -- 98.5 percent female -- is also approximately the same as for the entire clerical force. For all practical purposes, the clerical labor force is all female.

Existing personnel records were used to find pay levels of the employees. The Bureau of Labor Statistics Area Wage Survey for Houston, Texas, was used as area comparison data.

Two primary findings of the study were: personal characteristics differ more by job series than by any other factor; and there are two dominant mobility patterns.

FOOTNOTES

¹Drinko, Leonard, "Characteristics of the Civilian Labor Force of Clinton-Sherman Air Force Base, Oklahoma", (unpub. M.S. thesis, Oklahoma State University, 1963).

²Schnore, L., The Urban Scene, "Three Sources of Data on Commuting", The Free Press, N. Y. 1965, pp. 346-365.

³Poole, Richard W., Characteristics and Commuting Patterns of the Oklahoma City Air Material Area Labor Force, (Tinker Air Force Base, Oklahoma: United States Air Force, 1962).

⁴Occupational Outlook Handbook 1966-1967, Bureau of Labor Statistics, Bull. 1450.

⁵Bryant, Clifton D., "White-Collar Women: The Secretarial-Stenographic Occupation", (unpub. M.A. thesis, University of Mississippi, 1957).

⁶Ibid.

⁷Occupational Outlook Handbook 1966-1967, p. 281.

⁸Area Wage Survey: The Houston, Texas Metropolitan Area, June, 1967, United States Department of Labor, Bureau of Labor Statistics, Bulletin no. 1530-85.

CHAPTER II

PERSONAL CHARACTERISTICS OF MSC CLERICAL PERSONNEL

The personal characteristics of the sample of clerical personnel studied differ markedly in a number of areas. Probably the most important and pronounced difference is between job series. One area that stands out here is educational level (a Chi-square test shows significant differences at the .05 level).

Over 98 percent of the clerical personnel have attended at least 4 years of high school. This is a reflection of the requirements for employment.* Four years of high school are required for all of the jobs in the five series covered, although as little as 6 months of appropriate experience may be substituted in all but the secretarial series, where a minimum of 3 years of experience or 4 years of college is required. Education above high school or experience is required for all positions above the entrance level.

Of the clerical employees, 57 percent have some post high school training. A quarter of them have attended at least some courses in business school as their highest level of education. Over 30 percent have attended college, many of these also have some business school.

An interesting pattern is brought out by Table II. About 35 percent of the stenographers have attended college, slightly more than typists or

*Appendix A details the requirements for hiring and promotions.

secretaries, but a much larger percentage of secretaries have attended business school. In overall percentages, 65 percent of the secretaries and 60 percent of the stenographers have post high school education. The corresponding percentage for typists is less than 50 percent.

Education and experience requirements, as well as promotion policies, are reflected in the age distribution presented in Table III. Secretaries, while only 28 percent of the clerical force, account for 53 percent of those 26 and over. The percentage of each age group in the typist and stenographic series tends to drop and in the secretarial series tends to rise as age increases. The over-40 group, though, reverses the trend, and there are fewer in the secretarial and more in the stenographic series. The age group 26-29, although accounting for only about 40 percent of the total secretaries, is 57 percent secretaries, twice the percentage for all age groups.

One would expect, since the secretaries tend to be older and also to have more education, that the older clericals would have more education. Table IV shows this to be the case. More of those in the 19-29-year-old groups, corresponding to stenographers, have attended college, but more of those in the 30 and over age groups, corresponding to secretaries, have attended business school. As a whole, a greater proportion of those in the older age brackets have education past high school.

As might be expected, the number having clerical experience prior to employment at MSC is significantly higher for stenographers than for typists and still higher for secretaries. This is because of hiring and pay policies, as well as promotion policies. Typists are usually hired at the GS-2 level and stenographers at the GS-3 level. Secretaries

are usually promoted from typist or stenographer. GS-5 is the usual entrance level for secretaries.

Table V shows that more than 80 percent of the secretaries have 2 or more years of experience. The corresponding percentage for stenographers and typists is about 30 percent. Part of the reason for this is the rapid growth that the Center has experienced in the past few years. Many of those with the necessary experience for a secretarial job of necessity acquired it prior to their employment at MSC. Here again the stenographers differ from the typists. There is a distinctly greater percentage of stenographers with prior experience, almost twice as many of them have 3 or more years of previous experience.

The distribution by years of service at MSC presented in Table VI shows a common trend in clerical employment--half of the personnel have been on board for 2 years or less. This is the segment of the clerical force that gives it its high turnover. Those in the over-40 age category have a much lower turnover and form a more stable core.

The most pronounced separation between the Civil Service Series is in number of years worked for MSC. Of the secretaries, 84 percent have been on board for 3 or more years. The corresponding percentage for stenographers and typists are 29 and 8 respectively. Table VII shows clearly the difference in length of service between stenographers and typists. There are 84 percent of the typists and only 63 percent of the stenographers that have 2 or less years service at MSC.

The stenographic series has been shown to have a larger proportion of older women than the typist series. It also has a larger proportion of married women, as would be expected. The secretarial series has a larger proportion in both the "married" and in the "other" groups.

Marital status varies widely among Civil Service Series. Almost 50 percent of the typists and 40 percent of the stenographers are single. Less than 15 percent of the secretaries are single (Table IX).

Table X shows a trend that is not surprising. The percentage in the married group rises constantly with age through the 30-39-year-old group, but drops for the 40 and over group where the number in the "other" group is quite high.

Length of service is definitely a function of age. The marital status distributions are quite clearly a function of the age distribution and its implications. The tendency for a larger percentage of the older age groups to be married carries over into the experience distribution where longer service is associated with greater incidence of marriage (Table VIII).

An important factor in clerical recruitment is the dissemination of employment information. Table XIX presents the sources of information from which the present employees first heard that employment might be available at MSC. While the schools were an important source of information, about a third of the present employees contacted MSC or the Civil Service Office at MSC to inquire about employment.

An interesting fact is brought out by Table XX. Of the clerical employees, 30 percent are related to another MSC employee or have a close relative that works for an MSC contractor. Of those who applied while living out of state, 46.5 percent had a husband working for MSC or an MSC contractor. Apparently relatives are an important source of employment information.

Replies to the question on opinion of MSC pay scales didn't differ much between job series. About 85 percent in each series said they

believed the pay scale of MSC was the same or better than that of the area. Expressed opinions of pay scales though, are usually believed to be an indication of some other job-related factor than the actual pay level itself.

About half of the employees said that they would prefer to work closer to home if they could find comparable employment. Many, though, qualified this answer with, ". . . it must be Federal employment." Interestingly, the replies to this question didn't correlate with distance from work except for those living in the Baytown area.

A highly significant factor in the MSC clerical labor force is previous Federal employment. Of the present employees, 43 percent have worked for the Federal Government and 24 percent had career status before employment at MSC. Department of Defense agencies were the employers of over three-fourths of them, and the Veterans Administration was the employer of about 8.5 percent.

A quarter of those with previous experience in the Federal Government are in that group, comprising 9 percent of the total, that applied for employment while living out of state. Of those with prior career status, 37 percent are in that group.

Table XVII shows that almost half of those with prior Federal service are now secretaries. It also shows that the greater proportion of these are married. More of these in each series are married than in the series as a whole. This can be explained by their higher age.

The age distribution of those with prior career status is shown in Table XVIII. Over half are 40 or over and more than three-fourths are over 30.

CHAPTER III

RESIDENCE AND COMMUTING PATTERNS OF MSC

CLERICAL PERSONNEL

The state of residence at the time last attending high school is shown in Table XI. This gives, perhaps, the best indication of mobility because it is when individuals begin to exhibit their own. Residence at date of birth is more likely to be a function of parental mobility.

A dichotomy highlighted by residence data is the significant differences between "Mobiles" and "Locals". "Mobiles" are those who were living outside of Texas when they applied for employment at MSC. "Locals" are those who were living within the Houston SMSA when they applied for employment. Of the sample, 26 percent (122) were living outside of Texas when they last attended high school. There were 55 percent (250) living within the Houston metropolitan area. Those living outside of the state were from 36 states and 3 foreign countries. Those contributing the most, other than the three outlying states of Louisiana, Arkansas, and Oklahoma, are Alabama and Virginia. Transfers from NASA installations in these states account for this.

The place of residence when applying for employment, shown in Table XII, A and B, is indicative of the nature of the clerical market. Of the clerical employees, 84 percent (390) in the sample lived within the metropolitan area at the time they applied for employment ("Locals"). Another 7 percent lived outside the area but within the state. Only 9

percent lived outside the state ("Mobile"). Of those from out of the state, 95 percent worked for the Federal Government, and 56 percent of them had attained career status prior to employment at MSC.

Analysis of the distance lived from MSC at the time of application for employment (Table XIII) reveals that almost half of the employees sampled lived within 20 miles and three-fourths lived within 30 miles. The larger part of those living over 50 miles away were from out of state.

There does not seem to be any particular patterns relating the area lived in at the time of application to any other factor except for the "Mobiles." The "Mobiles" differ by Civil Service Series and by all those factors that have been shown to vary with the series such as age, marital status, education, years of experience, and length of service at MSC. The ratios between series for "Mobiles" and "Locals" differ markedly. The stenographer-secretary-typist ratio is 36:26:32 for "Locals" and 14:54:23 for "Mobiles." One would expect that the "Mobiles" would contain more stenographers than typists, but this isn't the case.

The present residence pattern, shown in Table XIV, is not highly different than the pre-employment pattern. Those who lived outside the state or area have all moved into the area and there has been some tendency for those living in the area north and west of downtown to move farther south. There has been some shifting of residence to areas closer to the Gulf Freeway.

Table XV, which depicts the distance presently living from work, when viewed in comparison to Table XIII, of distance lived at time of application for employment, gives an idea of the effect that commuting patterns have had on employment and residence. There were 47 percent

that had lived within 20 miles at the time of applying for employment. The present figure is 71 percent.

Of those who lived in the Houston metropolitan area prior to employment, 46 percent have since moved. Most of the shifting, however, has been by those living in the areas north of MSC. There has been much less changing of residence in the areas to the south.

Of the 77 who had lived outside of the metropolitan area, 23 percent indicated that their reason for moving to Houston was because their husband moved to Houston, and 16 percent said their reason was to get closer to work.

Of those originally living in the area, 13 percent said that they had moved in order to get closer to work. Less than 10 percent moved because their husband moved or for better housing. Half of those that did move to get closer to work were from the areas north and west of Old Spanish Trail, where only 15 percent of the total number from the local area originated.

The driving time required to get to work forms a distribution presented in Table XVI. One-third of the employees fall in the half hour or more group. Over 40 percent are in the 20-30 minutes group. This makes over three-fourths living 20 minutes or more from work.

All of the respondents indicated that they get to work by car. There are 22 percent that said that they belong to a car pool. Baytown is the only area which has a significant concentration of car pools. The areas north of Old Spanish Trail have only 12 percent in car pools. They seem to be more a function of employee density than of distance from work.

CHAPTER IV

CLERICAL WAGE SCALE COMPARISONS OF MSC AND THE HOUSTON METROPOLITAN AREA

The study of wage rates is an area in which a considerable amount of work has been done and for which a large amount of data is available. In fact, it is very tempting to make crude comparisons of wage rates at MSC with those reported in a number of private and government surveys. But, in order to derive meaningful conclusions one must be careful that the data used are comparable.

Another important factor to consider is that relative pay levels may not necessarily be indicative of relative levels of total job benefits. Many other factors can be significant and also may vary widely from employer to employer. Some of these factors are fringe benefits such as insurance, retirement benefits, paid holidays and vacations, and paid sick leave, promotions and advancement possibilities, and availability of overtime.

A pitfall to avoid is comparing pay rates for jobs which have the same title but are really not comparable. Another is not to compare pay rates in one labor area with those of another area or an inappropriately delimited area such as a region or the entire nation if the competition and wage scales are determined in a more restricted or local area.

The significance of wage rates in recruitment, particularly for

clerical employment, is even open to question. Stigler says that "...the realized dispersion of wage rates should be smaller the longer the prospective period of employment. Women generally expect to stay in the labor force a shorter period than men do, so among homogeneous groups of men and women we should expect the latter to have larger dispersions. The occupational wage surveys do reveal this expected difference."¹ Ullman found there is a significant negative relation between wage rates and the proportion of clerical workers hired through newspaper advertisements and private agencies.² In clerical occupations, high wage rates and high search costs are probably substitutes.

It has also been found that neither pay³ nor recruitment costs⁴ were related to turnover rates. As a general rule, clerical turnover is more likely to be an inverse function of organization size.⁵

Stahl raises a question as to what the proper relation of Federal pay scales to local wage scales should be. He argues that "...in the case of the Federal service...the government should serve as a stabilizing and nationalizing influence on pay levels rather than [be] a follower."⁶ The data presented below bear out the fact that this is probably what is happening in the clerical occupations. Bureau of Labor Statistics data show quite clearly that prevailing clerical wage rates, as most wage rates, in Southern Standard Metropolitan Statistical Areas are below national averages, but Federal Clerical pay rates are fairly uniform nationally. The Federal Clerical pay rates in most of these areas are above the prevailing rate. The trend is also for clerical pay rates in Southern SMSA's to be getting closer year by year to the national average.

An appropriate point to make at this time is that these same data

show that, although the percentage of Houston SMSA clerical employment accounted for by the Federal government has been increasing since and because of the establishment of MSC, and although Federal clerical wage rates are higher than the Houston prevailing rates, Houston prevailing rates have risen slower than and are lower than those in other Southern SMSA's.

The general conception of a clerical labor market is that it is highly local in nature. Lack of geographic mobility of the labor supply is considered its hallmark. This lack of mobility should prevent supply, and therefore wages, from responding to geographic differentials, other than by entrance and exit from the labor force itself.

Competition within the market may, nonetheless, be substantial because of the large supply and demand within even a small area. The standard skills required and the ease of training effectively contribute to competition.

A widely held belief is that the market supply, and also supply available to the individual firm of clerical personnel are not highly responsive to small differentials in wages. An employer can effectively adjust his recruitment and selection policies and his turnover rate in order to maintain his clerical force.

Wage surveys are a popular tool for measuring prevailing levels of competition. They are not particularly difficult to make and large samples are easy to find. It is questionable, though, whether the area any particular one covers is appropriately a market area in terms of realistic possibilities of competition.

Groenekamp has compared use of wage surveys to determine "prevailing rates" to trying to "...measure a jellyfish with a rubberband."⁷

At best they can be used as a rough guide in pay administration.

A number of clerical wage surveys are made in the MSC area. Some of them, such as the Bureau of Labor Statistics National Survey of Professional, Administrative, Technical and Clerical Pay, and the Standard Oil salary survey, cover such a large geographic area that their applicability to any particular market is doubtful. Surveys such as those of Bell Telephone, the Houston Hospital Association, and the Bureau of Labor Statistics Area Wage Survey, which focus on the local area are more useful.

A local wage survey is the more appropriate as a measure of the "prevailing rate" in a given area. The BLS Area Wage Survey for the Houston Metropolitan Area⁸ is perhaps the best. It covers the Houston, Texas City, and Galveston area - the principle area from which the present clerical personnel have been drawn. This, therefore, is the comparison data used in this study. Following references to both MSC and BLS pay data are for June, 1967. The BLS data does not include any government employees.

Table XXII of comparative wage rates shows that MSC clerical rates are clearly well above area prevailing rates. Yet, the evidence presented above indicates that this has not affected the prevailing rate. Another survey, not presented here, conducted by the Hospital Personnel Association of the Houston area 1966,⁹ compared to the 1966 BLS Survey shows that pay rates in the five job classifications here investigated, as well as many others, in hospital and related medical facilities are well below the prevailing rate yet this does not seem to be an insurmountable obstacle to their recruiting sufficient qualified personnel.

These facts stand out even though care was taken to assure that

all three of the above wage profiles, BLS, Houston Hospital Association, and my own of MSC, were from the same area and the job descriptions were carefully checked and matched.* Because MSC's clerical pay rates are set above the market "prevailing rates" it has a more price elastic supply of labor than the market as a whole.

*The job descriptions for general clerks and mail and file clerks - GS0301 and 0305 - were found to be significantly different than those used in other surveys and thus no comparisons are made.

FOOTNOTES

¹Stigler, George, Journal of Political Economy, Vol. 70, 1962, Oct., pp. 98-99.

²Ullman, Joseph, "Inter-firm Differentials in the Cost of Search for White Collar Workers" (unpub. dissertation, School of Business, Univ. of Calif., 1965).

³National Manpower Council, Government and Manpower, Columbia University Press, N. Y., 1964.

⁴Mendell, M. M., Recruiting and Selecting Office Employees, American Management Association, N. Y., 1956.

⁵Ibid.

⁶Stahl, Public Personnel Administration, Harper & Row, N. Y., 1962.

⁷Groenekamp, W. A., "How Reliable are Wage Surveys?" Personnel, Jan. - Feb. 1967, Vol. 44, no. 1, pp. 32-37.

⁸Area Wage Survey, USDL, BLS, Bull. no. 1530-85, U. S. Gov. Print. Off., Wash. D. C., Aug. 1967.

⁹Sixth Annual Salary Survey: Metropolitan Houston Industrial, Hospital and Related Medical Facilities, Hospital Personnel Assoc. of the Houston Area, 1966.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study has brought out a number of significant facts with respect to the clerical labor force of the Manned Spacecraft Center in Houston. Some of them are not surprising and are even predictable; others are previously unknown but important particular characteristics of the MSC clerical labor force.

In the first category is the fact that the Gulf Freeway and transportation time are major determinants of the residence and commuting patterns observed. Another is the co-variability of a large number of personal characteristics of the clerical personnel such as age, experience, previous Federal employment, education, and marital status; and the fact that the most pronounced difference is between job series.

More important is the conclusion that the supply of clerical personnel to MSC is probably more price elastic than the supply to the Houston market as a whole.

The indication that employee participation in car pools is probably more a function of employee density than of distance lived from work is not original but is consistent with trends shown by other studies.

In the second category are a number of significant particulars, among them the extent of family relationships between MSC clerical personnel and other MSC employees and contractor personnel. This indicates the importance of family members as a source of employment

information. Also in this category is the strong evidence that a major factor in the recruitment and retention of the more skilled and experienced clerical personnel is previous Federal employment.

BIBLIOGRAPHY

- Area Wage Survey: The Houston, Texas, Metropolitan Area, June 1967, United States Department of Labor, Bureau of Labor Statistics, Bulletin no. 1530-85.
- Bryant, Clifton D. "White Collar Women: The Secretarial-Stenographic Occupation." (unpub. M.S. thesis, University of Mississippi, 1957.)
- Drinko, Leonard. "Characteristics of the Civilian Labor Force of Clinton-Sherman Air Force Base, Oklahoma." (unpub. M.S. thesis, Oklahoma State University, 1963.)
- Groenekamp, W. A. "How Reliable are Wage Surveys?" Personnel, Jan. 1 - Feb. 1, 1967, Vol. 44, no. 1, pp. 32-37.
- Lanham, Administration of Wages and Salaries, Harper and Row, 1963.
- Mendell, M. M. Recruiting and Selecting Office Employees, N. Y. American Management Association, 1956.
- Occupational Outlook Handbook 1966-1967, U.S.D.L., Bureau of Labor Statistics, Bulletin 1450.
- Poole, Richard W. Characteristics and Commuting Patterns of the Oklahoma City Air Material Area Labor Force, (Tinker Air Force Base, Oklahoma: United States Air Force, 1962).
- Sixth Annual Salary Survey: Metropolitan Houston Industrial, Hospital and Related Medical Facilities, The Hospital Personnel Association of the Houston Area, 1966.
- Stahl, Public Personnel Administration, N. Y., Harper and Row, 1962.
- Stigler, George, Journal of Political Economy, Vol. 70, Oct. 1962, pp. 98-99.
- Thomas, K. A. "Clerical Salaries Survey." Red Tape, Vol. 56, no. 3, Dec. 1966, pp. 82-83.
- Ullman, Joseph C. "Inter-Firm Differentials in the Cost of Search for White Collar Workers." (unpub. diss. Graduate School of Business, University of California, 1965).
- What About Women's Absenteeism and Labor Turnover? U. S. Department of Labor, Women's Bureau, Wash. D. C.: U. S. Government Printing Office, 1965.

APPENDIX A

GENERAL POSITION REQUIREMENTS

General Requirements for: GS-322-2, -3, -4; GS-312-3, -4

- A. Appropriate education and experience,
- B. Pass written test,
- C. Demonstrate skill in typing, and
- D. Be 18 years old or be a high school graduate and 16 years old.

In addition, GS-312 must demonstrate skill in taking and transcribing dictation.

Education and Experience for: GS-322-2; GS-312-3

- A. Successful completion of a 4-year high school course, or
- B. Have 6 months of appropriate experience.

Education and Experience for: GS-322-3; GS-312-4

- A. One academic year of substantially full-time study in a residential school above the high school level, or
- B. One year of appropriate experience.

General Requirements for: GS-318-5-11

- A. Appropriate education and experience,
- B. Preferably promotion from typist or stenographer, and
- C. Verbal test.

Education and Experience for: GS-318-5-11

<u>Grade</u>	<u>General Experience</u>	<u>Specialized Experience</u>	<u>Total Experience</u>
5	2 1/2 yrs.	1/2 yrs.	3 yrs.*
6	2 1/2 yrs.	1 yr.	3 1/2 yrs.
7	2 1/2 yrs.	1 1/2 yrs.	4 yrs.
8	2 1/2 yrs.	2 yrs.	4 1/2 yrs.
9	2 1/2 yrs.	2 1/2 yrs.	5 yrs.
10	2 1/2 yrs.	3 yrs.	5 1/2 yrs.
11	2 1/2 yrs.	3 1/2 yrs.	6 yrs.

* or 4 years of college

General Requirements for: GS-301-305-2-6

<u>Grade</u>	<u>General Experience</u>	<u>Specialized Experience</u>	<u>Education</u>
2	6 mos.	None	or graduation from high school
3	1 yr.	None	or 1 year above high school
4	1 yr.	1 yr.	
5	1 yr.	2 yrs.	
6	1 yr.	2 1/2 yrs.	

Education above high school may be substituted for general experience.

APPENDIX B

July 10, 1967

Dear MSC Employee:

MSC is aiding me in my research into their work force. Would you please fill out and return the enclosed questionnaire to BP2.

Fill in the blank or blanks, or circle the letter preceding the one correct answer to each question. This information is to be machine coded.

Please fill in the zip code blank referring to your present address. For those in the Houston area, there is a zip code map located on page 14 of the Houston phone book. I need the zip code to establish the area in which you live.

I would appreciate having this questionnaire returned to me by July 20, 1967. Your cooperation will be greatly appreciated.

Thank you,

John Noyes
Graduate Student
Oklahoma State University

MSC LABOR FORCE QUESTIONNAIRE

1. Name _____; Social Security No. _____
2. Age? (a) 17-18, (b) 19-21, (c) 22-25, (d) 26-29, (e) 30-39,
(f) 40 or over.
3. Sex.....(a) male, (b) female
4. Marital Status (a) married (b) single (c) other.
5. Where did you live when you last attended high school?
State _____ City _____
6. Where did you live when you applied for employment at MSC?
State _____ City _____ Zip code _____
7. How far was this from where you work now? (a) less than 10 miles,
(b) 10 to 20 miles, (c) 20 to 30 miles, (d) 30 to 50 miles,
(e) more than 50 miles.
8. What town do you now live in or closest to? Town _____
Zip code _____.
9. If you moved closer to MSC after applying for employment, circle
the reason. (a) to live closer to work, (b) because husband or
wife moved, (c) better housing (not related to distance from MSC),
(d) other, (e) not applicable.
10. How many miles do you now live from work? (a) less than 10 miles,
(b) 10 to 15 miles, (c) 15 to 20 miles, (d) 20 to 30 miles, (e) 30
to 50 miles, (f) more than 50 miles.
11. How do you normally get to work? (a) auto, (b) other.
12. Approximately how many minutes does this trip take? (a) less than
5, (b) 5 to 10, (c) 10 to 15, (d) 15 to 20, (e) 20 to 30,
(f) 30 to 45, (g) more than 45.
13. Do you belong to a car pool?..... (a) yes, (b) no.

14. How long have you worked for MSC-Houston? (a) less than one year, (b) one to two years, (c) two to three years, (d) three to four years, (e) more than four years.
15. If you worked for the Federal Government prior to employment at MSC-Houston, years _____, agency _____, location _____.
16. Had you attained Federal career status prior to employment at MSC?
(a) yes, (b) no
17. What is the highest level of education you have attained? high school (a) freshman, (b) sophomore, (c) junior, (d) senior; Business School (e) attended, (f) graduated; College (g) freshman, (h) sophomore, (i) junior, (j) senior or higher.
18. Does any other member of your immediate family work for MSC? (a) no, (b) father or mother, (c) brother or sister, (d) husband or wife.
19. Does any other member of your immediate family work for a NASA-MS-C contractor? (a) no, (b) father or mother, (c) brother or sister, (d) husband or wife.
20. How did you find that employment was available at MSC? (a) friend, (b) school, (c) civil service announcement, (d) newspaper, (e) Texas employment service, (f) different Federal agency, (g) contacted MSC, (h) other.
21. If you had experience in work similar to that for which you were initially hired, how many years? (a) less than 1, (b) 1 to 2, (c) 2 to 3, (d) more than 3, (e) none.
22. How do you thing your pay and benefits at MSC compare to thos of similar jobs in the area? (a) better, (b) about the same, (c) not as good.
23. Would you work closer to home if you could find a job with similar benefits? (a) yes, (b) no.

TABLE I

NUMBER BY CIVIL SERVICE CODE OF QUESTIONNAIRES
DISTRIBUTED AND RETURNED

CIVIL SERVICE CODE	DISTRIBUTED		RETURNED	
	No.	%	No.	%
301	17	2.7	9	1.9
305	8	1.3	6	1.3
312	201	31.5	158	34.0
318	203	31.8	131	28.2
322	210	32.9	147	31.6
Not Marked	0	0.	14	3.0
TOTAL	639	100	465	100

TABLE II

EDUCATION IN RELATION TO CIVIL SERVICE CODE

EDUCATION	<u>301</u>		<u>305</u>		<u>312</u>		<u>318</u>		<u>322</u>		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<u>High School</u> Freshman	1	12.5	0	0	1	.6	0	0	1	.7	3	.7
Sophomore	0	0	0	0	1	.6	0	0	1	.7	2	.4
Junior	0	0	1	16.6	0	0	0	0	0	0	1	.2
Senior	4	50.0	2	33.3	62	39.5	45	35.2	73	50.0	186	41.8
<u>Business School</u> Attended	0	0	1	16.6	13	8.3	22	17.2	12	8.2	48	10.8
Graduated	2	25.0	1	16.6	24	15.3	22	17.2	18	12.3	67	15.1
<u>College</u> Freshman	0	0	1	16.6	34	21.7	20	15.6	22	15.1	77	17.3
Sophomore	0	0	0	0	11	7.0	11	8.6	11	7.5	33	7.4
Junior	1	12.5	0	0	9	5.7	2	1.6	4	2.7	16	3.6
Senior	0	0	0	0	2	1.3	6	4.7	4	2.7	12	2.7
TOTAL	8	100	6	100	157	100	128	100	146	100	445	100

TABLE III

CIVIL SERVICE SERIES BY AGE

AGE	<u>301</u>		<u>305</u>		<u>312</u>		<u>318</u>		<u>322</u>		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
17 - 18	0	0	0	0	5	3.2	0	0	23	15.8	28	6.3
19 - 21	1	10.0	0	0	73	46.5	1	1.0	69	47.3	144	32.4
22 - 25	1	10.0	0	0	32	20.4	20	16.0	23	15.8	76	17.1
26 - 29	0	0	0	0	11	7.0	21	16.8	5	3.4	37	8.3
30 - 39	1	10.0	1	16.7	9	5.7	28	22.4	9	6.2	48	10.8
40 +	7	70.0	5	83.3	27	17.2	55	44.0	17	11.6	111	25.0
TOTAL	10	100.0	6	100.0	157	100.0	125	100.0	146	100.0	444	100.0

TABLE IV

EDUCATION BY AGE GROUP (HIGHEST LEVEL REACHED)

EDUCATION	AGE													
	17 - 18		19 - 21		22 - 25		26 - 29		30 - 37		40 & over		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<u>High School</u>														
Freshman					2	2.5	2	5.3			2	1.8	6	1.3
Sophomore									1	2.1	1	0.9	2	0.4
Junior											1	0.9	1	0.2
Senior	25	89.3	82	56.6	25	30.9	14	36.8	16	34.0	25	21.9	187	41.3
Sub Total	25	89.3	82	56.6	27	33.3	16	42.1	17	36.2	29	25.4	196	43.3
<u>Bus. School</u>														
Attended			6	4.1	9	11.1	5	13.2	11	23.4	24	21.1	55	12.1
Graduated	1	3.6	9	6.2	14	17.3	5	13.2	6	12.8	28	24.6	63	13.9
Sub Total	1	3.6	15	10.3	23	28.4	10	26.3	17	36.2	52	45.6	118	26.0
<u>College</u>														
Freshman	2	7.1	32	22.1	9	11.1	7	18.4	10	21.3	18	15.8	78	17.2
Sophomore			13	9.0	11	13.6	1	2.6	1	2.1	8	7.0	34	7.5
Junior			2	1.4	8	9.9	2	5.3	1	2.1	3	2.6	16	3.5
Senior or Higher			1	0.7	3	3.7	2	5.3	1	2.1	4	3.5	11	2.4
Sub Total	2	7.1	48	33.1	31	38.3	12	31.6	13	27.7	33	28.9	139	30.7
TOTAL	28	100	145	100	81	100	38	100	47	100	114	100	453	100

TABLE V

PREVIOUS EXPERIENCE BY CIVIL SERVICE CODE

YEARS	CIVIL SERVICE CODE											
	<u>301</u>		<u>305</u>		<u>312</u>		<u>318</u>		<u>322</u>		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
None	0	0	1	16.6	50	31.6	8	6.1	65	44.2	124	27.5
Less than 1	1	11.1	0	0	39	24.7	6	4.6	27	18.4	73	16.2
1 - 2	1	11.1	1	16.6	16	10.1	9	6.9	15	10.2	42	9.3
2 - 3	4	44.4	1	16.6	9	5.7	15	11.5	19	12.9	48	10.6
3 or more	3	33.3	3	50.0	44	27.8	93	71.0	21	14.2	164	36.4
TOTAL	9	100	6	100	158	100	131	100	147	100	451	100

TABLE VI
NUMBER OF YEARS WORKED FOR MSC

Years	Number	Per Cent	Cum. %
More than 4	101	21.7	21.7
3 - 4	69	14.8	36.5
2 - 3	63	13.5	50.0
1 - 2	106	22.8	72.8
Less than 1	126	27.1	100

TABLE VII

NUMBER OF YEARS WORKED FOR MSC BY CIVIL SERVICE SERIES

CIVIL SERVICE SERIES												
YEARS	<u>301</u>		<u>305</u>		<u>312</u>		<u>318</u>		<u>322</u>		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 1	1	11.1	1	16.7	46	29.1	4	3.1	73	49.7	125	27.7
1 - 2	-	-	-	-	54	34.2	4	3.1	46	31.3	104	23.1
2 - 3	3	33.3	-	-	28	17.7	13	9.9	16	10.9	60	13.3
3 - 4	3	33.3	1	16.7	23	14.6	35	26.7	3	2.0	65	14.4
4 or more	2	22.2	4	66.7	7	4.4	75	57.3	9	6.1	97	21.5
TOTAL	9	100	6	100	158	100	131	100	147	100	451	100

TABLE VIII

MARITAL STATUS BY LENGTH OF SERVICE

	Length of Service											
	< 1 year		1-2 years		2-3 years		3-4 years		> 4 years		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Married	61	48.4	48	45.3	37	58.7	40	58.0	68	68.7	254	54.6
Single	60	47.6	49	46.2	20	31.7	20	29.0	11	11.1	160	34.4
Other	5	4.0	8	7.5	6	9.5	9	13.0	20	20.2	48	10.3
TOTAL	126	100.0	106	100.0	63	100.0	69	100.0	99	100.0	462	99.6

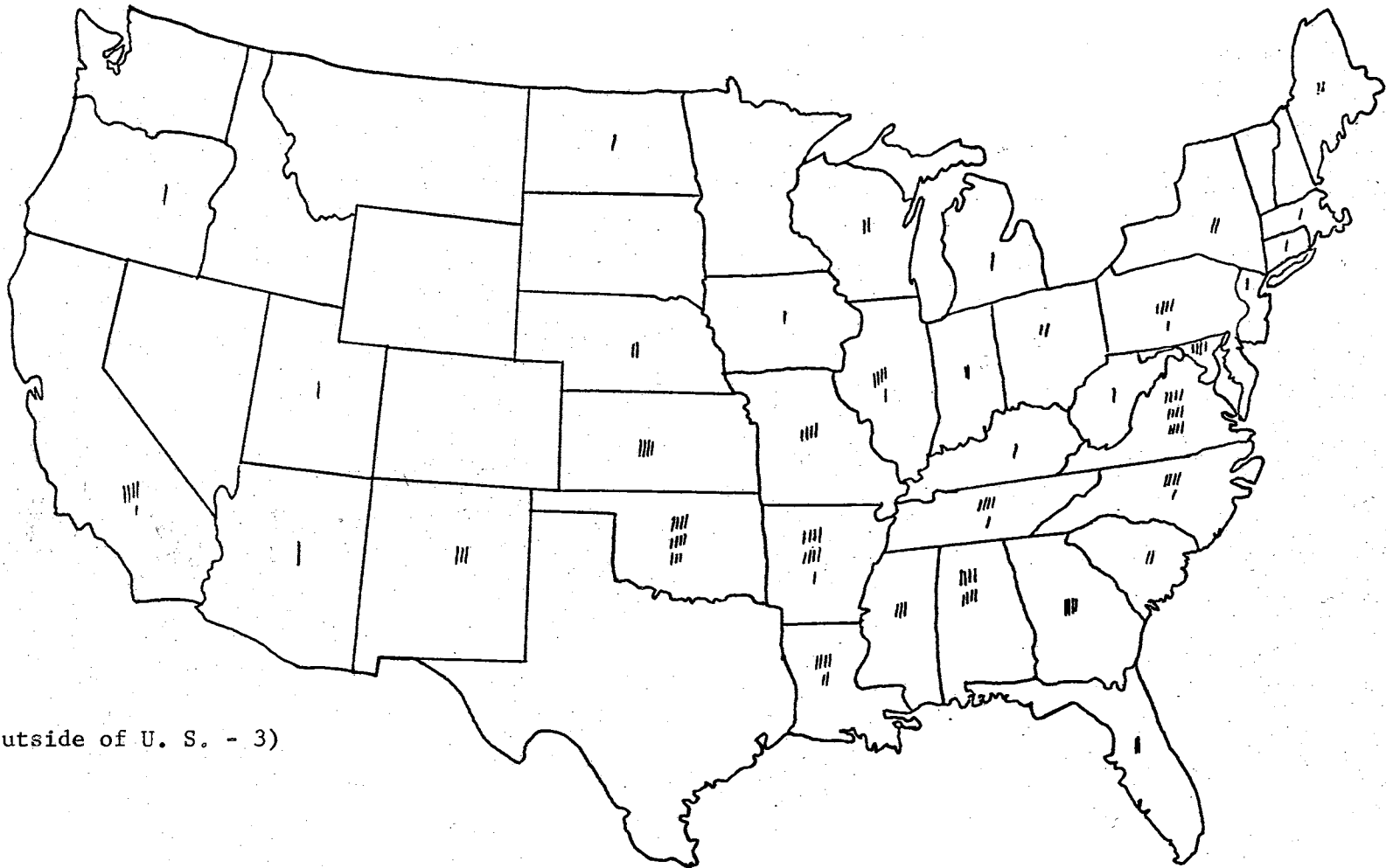
TABLE IX

MARITAL STATUS BY CIVIL SERVICE SERIES

	Civil Service Series											
	301		305		312		318		322		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Married	5	55.6	5	83.3	84	53.2	95	72.5	58	39.7	247	54.9
Single	2	22.2	0	0	63	39.9	18	13.7	71	48.6	154	34.2
Other	2	22.2	1	16.7	11	7.0	18	13.7	17	11.6	49	10.9
Total	9	100.0	6	100.0	158	100.0	131	100.0	146	100.0	450	100.0

TABLE X
MARITAL STATUS BY AGE

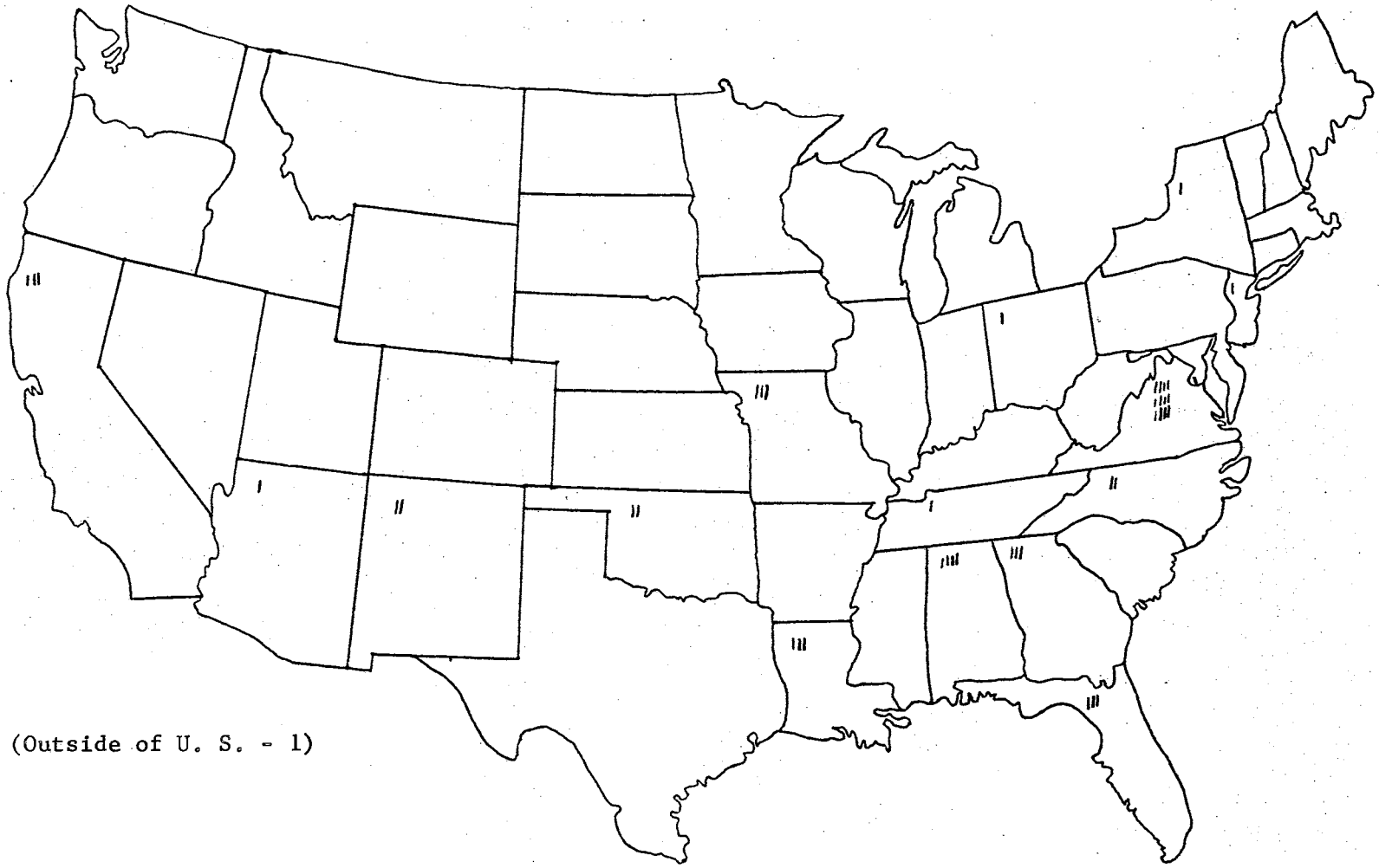
Marital Status	Age													
	17-18		19-21		22-25		26-29		30-39		40 +		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Married	3	10.7	80	54.4	45	57.7	30	76.9	36	73.5	73	63.5	267	58.6
Single	25	89.3	62	42.2	31	39.7	6	15.4	4	8.2	13	11.3	141	30.9
Other	0	0	5	3.4	2	2.6	3	7.7	9	18.4	29	25.2	48	10.5
Total	28	100.0	147	100.0	78	100.0	39	100.0	49	100.0	115	100.0	456	100.0



(Outside of U. S. - 3)

TABLE XI

RESIDENCE WHEN LAST ATTENDING HIGH SCHOOL



(Outside of U. S. - 1)

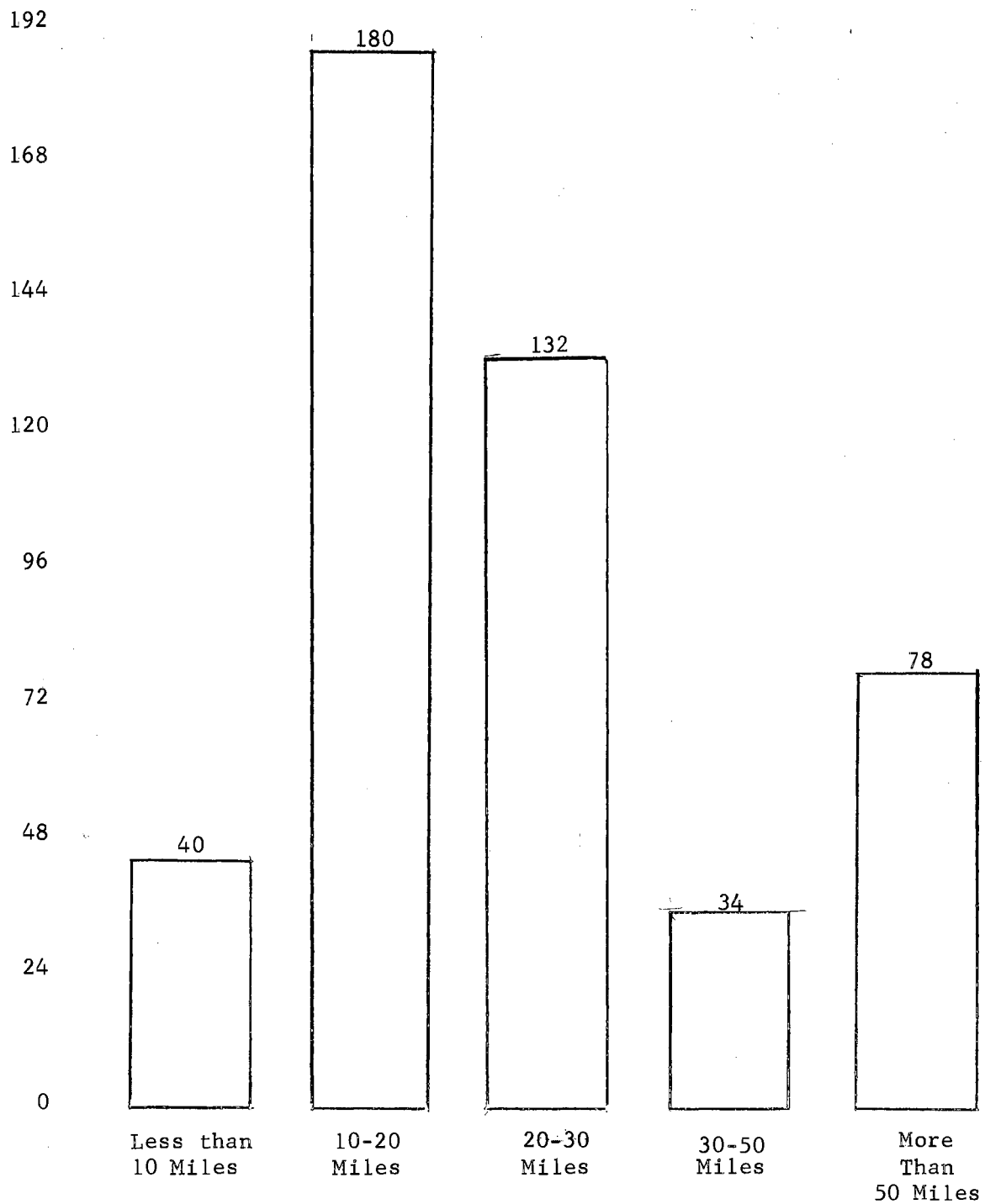
TABLE XIIA

RESIDENCE ON DATE OF APPLICATION FOR EMPLOYMENT

TABLE XIII

DISTANCE LIVED FROM MANNED SPACECRAFT CENTER AT TIME
OF APPLICATION FOR EMPLOYMENT (IN MILES)

%	8.6	38.7	28.4	7.3	16.8
Cumul. %	8.6	47.3	75.7	83.0	100



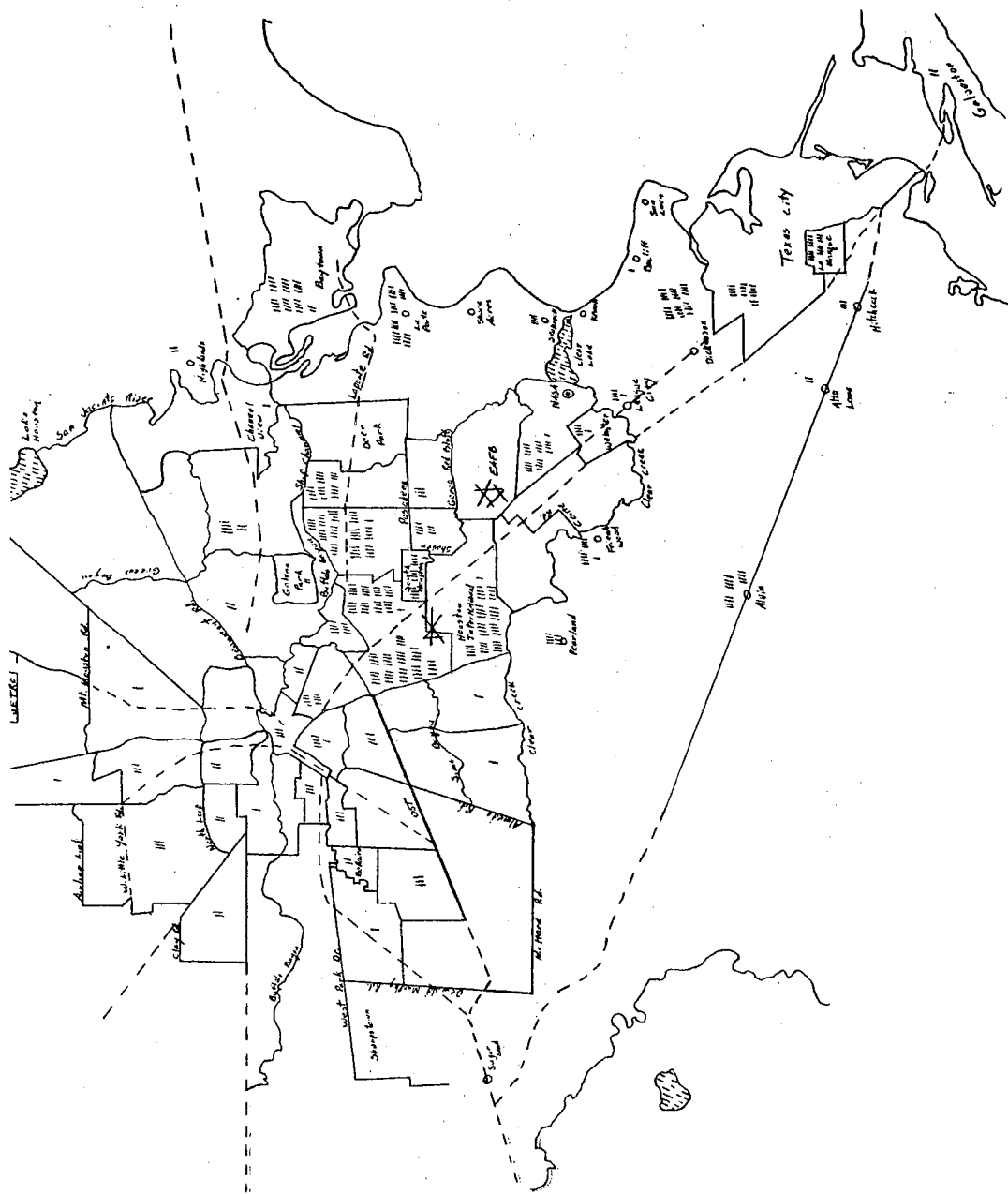


TABLE XIV
PRESENT RESIDENCE

TABLE XV

DISTANCE PRESENTLY LIVING FROM WORK
(IN MILES)

%	17.2	53.5	21.9	6.9	.2
Cumul. %	17.2	70.7	92.6	99.5	100

280

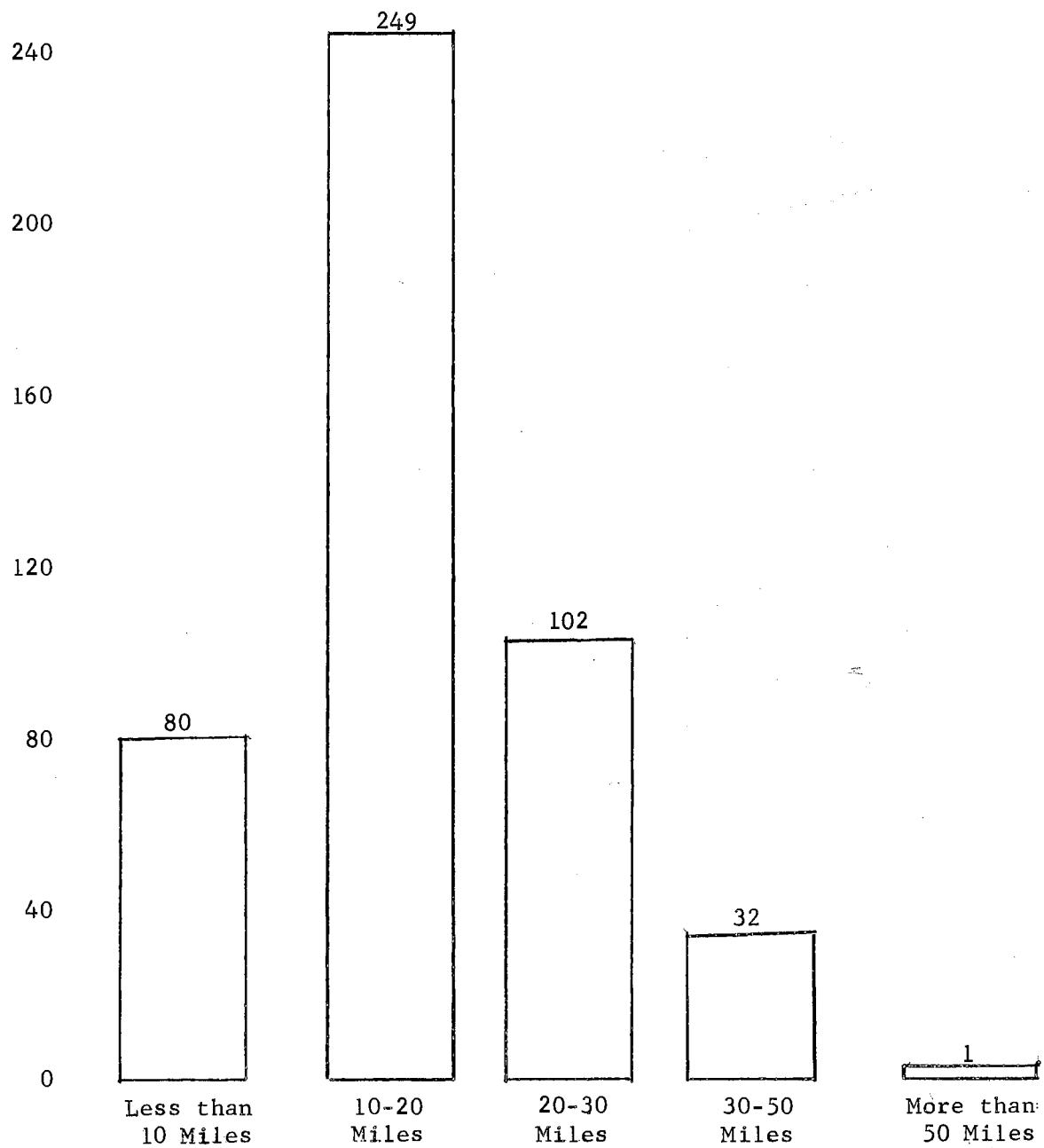


TABLE XVI

DISTRIBUTION OF DRIVING TIME

%	2.2	3.7	6.5	11.4	42.8	27.5	6.0
Cum. %	2.2	5.9	12.4	23.8	66.6	94.1	100.0

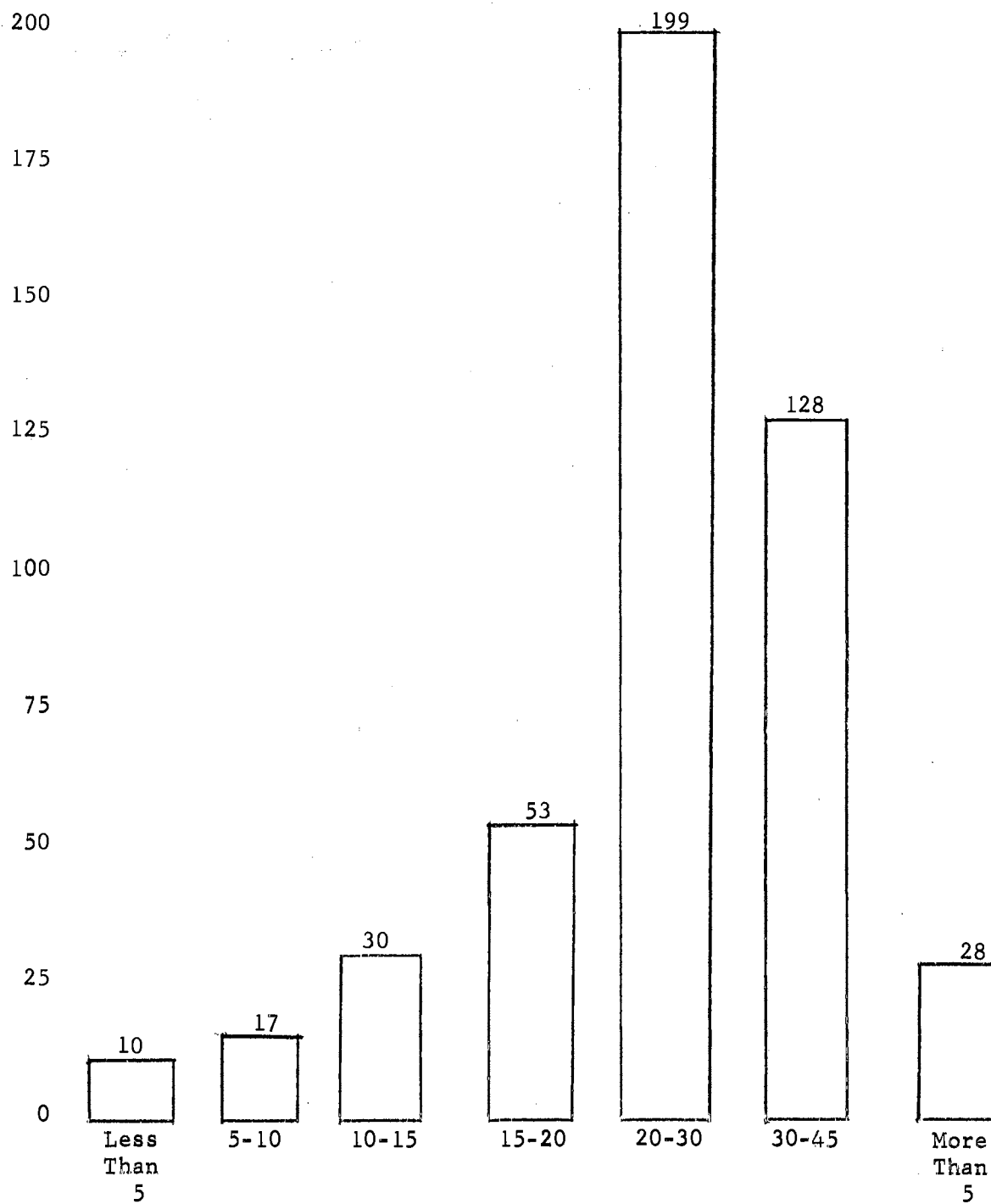


TABLE XVII
 CIVIL SERVICE SERIES AND MARITAL STATUS OF CLERICAL
 EMPLOYEES HAVING PREVIOUS GOVERNMENT SERVICE
 (BY CAREER AND NON-CAREER STATUS PRIOR
 TO EMPLOYMENT AT MSC)

Career Status				Non-Career Status			
CSC	No.	%	Marital Status	CSC	No.	%	Marital Status
			Married 75.0%				Married 33.3%
			Single -				Single 66.7%
			Other 25.0%				Other -
301	4	3.6	100 %	301	3	3.3	100 %
			Married 83.3%				Married -
			Single -				Single -
			Other 16.7%				Other -
305	6	5.5	100 %	305	0	0	-
			Married 77.8%				Married 77.8%
			Single 18.5%				Single 11.1%
			Other 3.7%				Other 11.1%
312	27	24.5	100 %	312	27	29.7	100 %
			Married 65.1%				Married 83.9%
			Single 15.9%				Single 3.2%
			Other 19.0%				Other 12.9%
318	63	57.3	100 %	318	31	34.1	100 %
			Married 50.0%				Married 63.3%
			Single -				Single 20.0%
			Other 50.0%				Other 16.7%
322	10	9.1	100 %	322	30	33.0	100 %
TOTAL	110	100		TOTAL	91	100	

TABLE XVIII

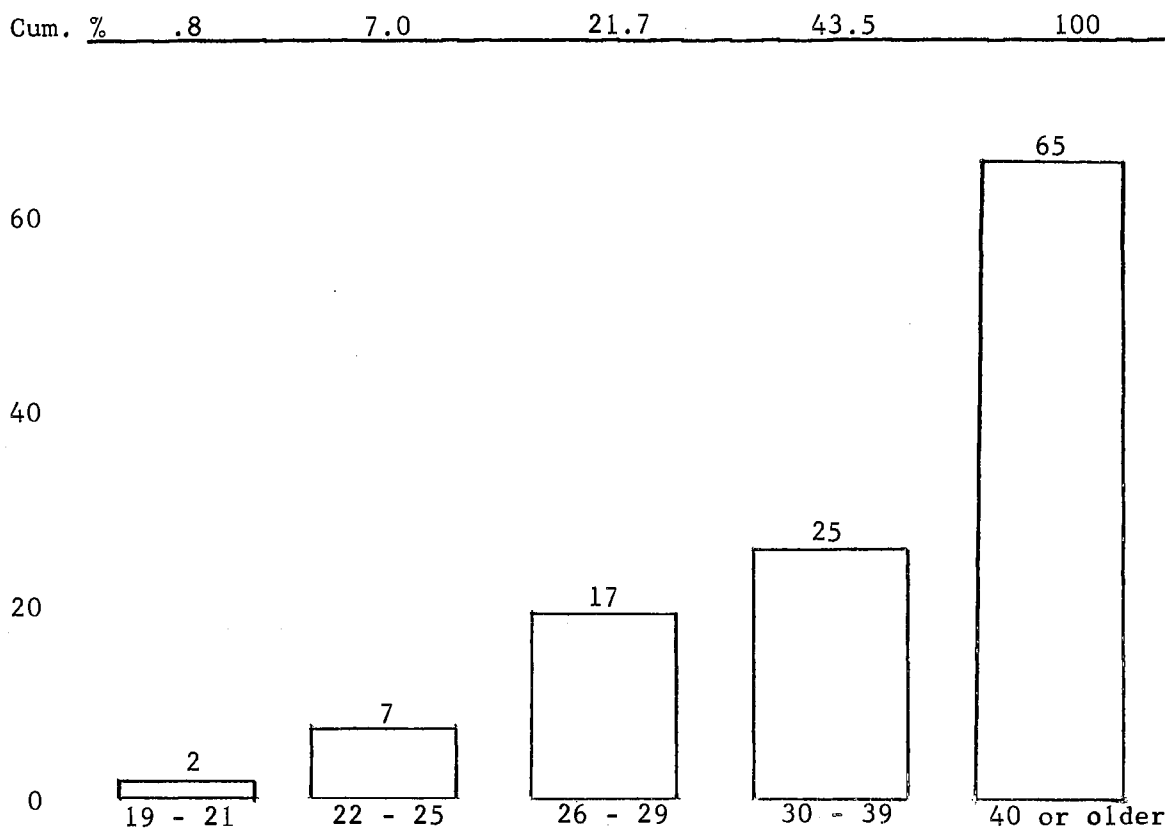
AGE DISTRIBUTION OF EMPLOYEES HAVING FEDERAL CAREER
STATUS PRIOR TO EMPLOYMENT AT MSC

TABLE XIX

SOURCES FROM WHICH PRESENT CLERICAL EMPLOYEES LEARNED
EMPLOYMENT WAS AVAILABLE AT MANNED SPACECRAFT CENTER

192

160

128

96

64

32

0

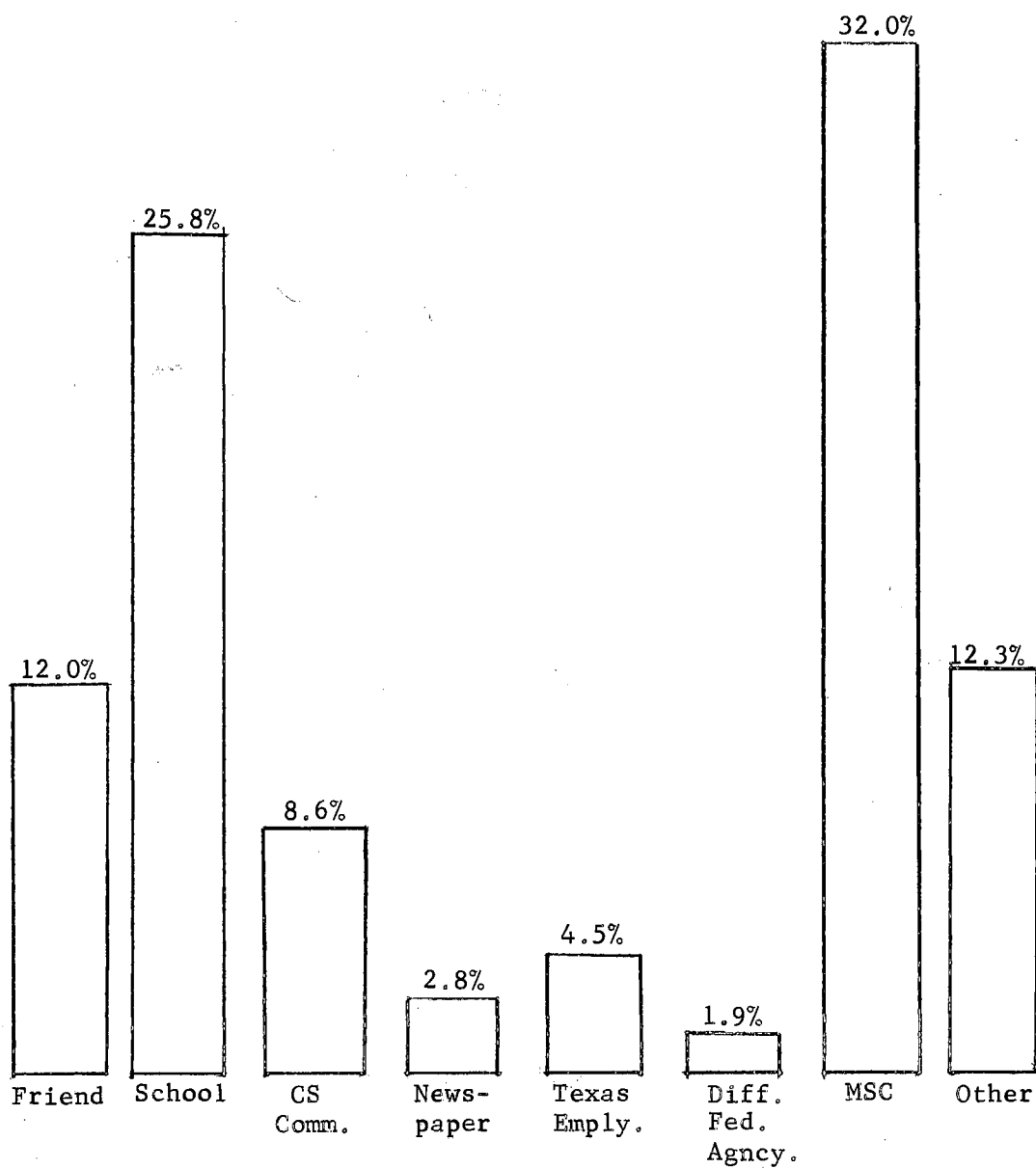
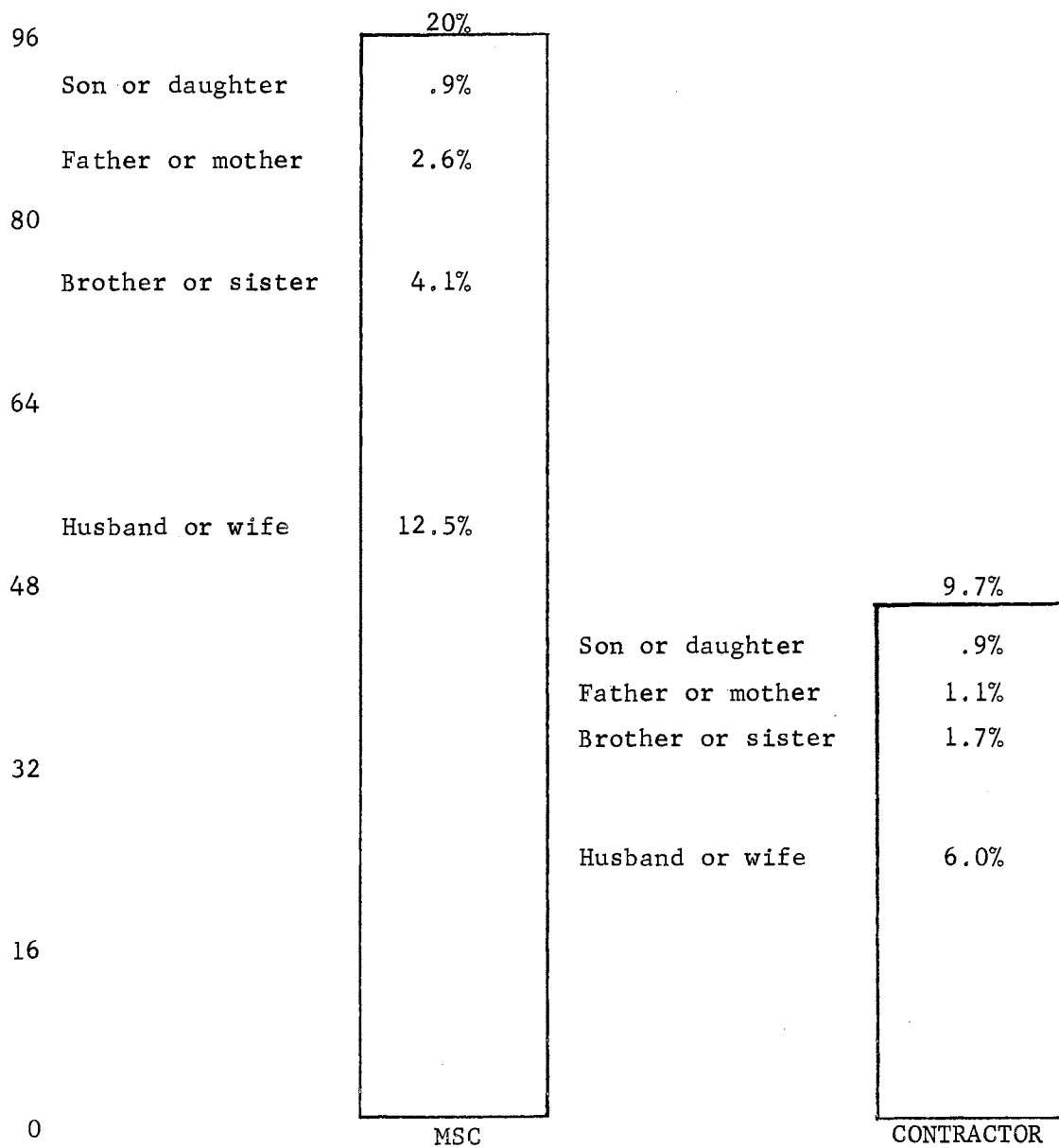


TABLE XX

MANNED SPACECRAFT CLERICAL PERSONNEL HAVING A RELATIVE
WORKING FOR MSC OR A MSC CONTRACTOR (BY PERCENT)

128

112



96

Son or daughter

20%

.9%

Father or mother

2.6%

80

Brother or sister

4.1%

64

Husband or wife

12.5%

48

9.7%

Son or daughter

.9%

Father or mother

1.1%

Brother or sister

1.7%

32

Husband or wife

6.0%

16

0

MSC

CONTRACTOR

TABLE XXI

EMPLOYEE OPINIONS OF MSC PAY SCALE
BY CIVIL SERVICE SERIES

Opinion	Civil Service Series							
	312		318		322		Total	
	No	%	No	%	No	%	No	%
Better	68	43.3	50	38.2	58	39.7	176	40.6
Same	64	40.8	62	47.3	65	44.5	197	44.0
Not As Good	18	11.5	14	10.7	21	14.4	53	12.2
No Response	7	4.5	5	3.8	2	1.4	14	3.2
Total	157	100.0	131	100.0	146	100.0	434	100.0

TABLE XXII

COMPARATIVE WAGE RATES

MSC vs Houston Metropolitan Area
(June, 1967 Weekly Wages)

	MSC			BLS*		
	Hours	Number	Wages	Hours	Number	Wages
Jr. Clerk Typist 0322	40	111	77.29	39.5	1,111	74.50
Clerk Typist	40	104	93.44	40	548	85.00
Jr. Clerk Stenography 0312	40	196	92.46	40	1,484	88.00
Clerk Stenography	40	14	112.48	40	993	102.50
Secretary 0318	40	211	117.37	40	2,847	113.00

*Source: Area Wage Survey: The Houston, Texas, Metropolitan Area, June 1967, United States Department of Labor, Bureau of Labor Statistics, Bulletin no. 1530-85.

VITA

John Stewart Noyes

Candidate for the Degree of

Master of Science

Thesis: THE CLERICAL LABOR FORCE AND LABOR FORCE AREA OF THE MANNED SPACECRAFT CENTER NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Major Field: Economics

Biographical:

Personal Data: Born in Sioux Falls, South Dakota, June 17, 1943, the son of Mr. and Mrs. Norman E. Noyes.

Education: Graduated from Cathedral High School, Sioux Falls, South Dakota in June, 1961; attended South Dakota State University 1961 and 1962; received the Bachelor of Science degree from the University of South Dakota in 1966, with a major in Business Economics; completed requirements for the Master of Science degree at Oklahoma State University in July, 1968, as a United States Department of Labor Manpower Fellow.

Professional Experience: Summer Intern in Manpower Management Branch Manned Spacecraft Center National Aeronautics and Space Administration, 1967. Member, American Economics Association.