COMPUTER ANXIETIES IN ORGANIZATIONS: A PILOT STUDY

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Scope and Method of Study: This study analyzes the existence of computer anxieties in organizations and the presence of any support or training programs in the organizations to help solve this problem. A questionnaire was developed and distributed to MBA students at the University Center at Tulsa. Utilized statistical techniques include correlation, multiple regression, and factor analysis. The software package used was SAS.

Findings and Conclusions: A majority of the organizations have identified the existence of computer anxieties in their organizations. Only a few of them have any form of training or support programs available to their employees.

ADVISOR'S APPROVAL Marilyn G. Kletke

COMPUTER ANXIETIES IN ORGANIZATIONS:

A PILOT STUDY

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ACKNOWLEDGEMENTS

The purpose of this study was analyze the presence of computer anxieties in organizations. The study also analyzed the various training programs that were available to the microcomputer users in their organizations.

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CHAPTER 1

INTRODUCTION

Even though computers have been a part of large organizations since the late 1950s, few people other than computer programmers or those who worked for data processing centers used computers. Computers have become accessible to small businesses since microcomputers were made available in the late 1970s.

Microcomputers have been available to the general population since about the year 1980. Reasons for this accessibility include improvement of equipment, decrease in costs, and more user-friendly software.

With the increasing use of microcomputers, increasing incidences of computer anxiety have been noticed. This phenomenon was not recognized by many organizations during the early part of this decade. Organizations have begun to notice this problem due to its various side effects. Many users have experienced physical as well as psychological stress situations. This has seriously affected their abilities to perform well in their duties. As a direct consequence, the organizations' overall productivity has been reduced. Also, the users' efficiencies at their jobs have been affected.

CHAPTER 2

RESEARCH OBJECTIVES

This research seeks to identify the existence of this problem in organizations. If this problem has been identified in organizations, this research also seeks to find out the ways organizations have been using to solve this problem. A questionnaire was developed and a pilot study run to measure these effects. The resulting data were analyzed to see if further research should be conducted on computer anxiety in organizations.

CHAPTER 3

LITERATURE REVIEW

Computer Anxiety

Cyberphobia, or computer anxiety as it is commonly called, refers to the high anxiety response to interaction or anticipation of interaction with electronic data processing systems **(Weingberg, 1980).**

Even though psychologists have studied the phenomenon of anxiety intensively since the time of Freud, the research has not produced a broadly accepted theory of anxiety. However, it has been known that physiological reactions often accompany anxiety **(Lagina, 1971).** Physical reactions accompanying computer anxiety include nausea, vertigo, stomach aches, hysteria, and cold sweats **(Titus, 1983).** Studies by Weinberg **(1980)** have indicated that the phenomenon of computer anxiety does exist, that its incidence is widespread, and that its impact on organizations is significant. This impact on organizations is important because the ability to achieve productivity gains needed to remain competitive depends on how effectively they use the microcomputer-based management tools.

Literature Review

Although more microcomputers are being purchased, many people find that once they get them home, they do not use them. **Mossberg (1986)** states that microcomputers require far more effort, special knowledge, and expense to operate properly than any other popular home technology. Mossberg further states that:

> **"It is still impossible for computer buyers to tap all but a fraction of the power they bring home without learning a whole lot**

more about how computers and software operate than most people need to know. It takes work, study, phone calls and letters, added purchases, and lots of support from more experienced users to come anywhere near to getting the value from the computer that its makers led the buyer to expect. There are also plenty of frustrations along the way"

Hall-Sheehy (1985) commented that people look at advertising and think that learning to use microcomputers is easy. People feel that they don't need to worry about training because they think that they can learn it themselves. According to **Hall-Sheehy**, few people realize how much time it takes to get a system to do even the simplest of tasks that are shown in advertisements on television or in magazines.

Kneale (1986) points out that veteran users of microcomputers suggest twenty to forty hours of perseverence is required to learn to use a microcomputer. **Kneale** states that **"Learning to use a PC is an enormous sinkhole of time."** He notes that the computer will not increase productivity for a long time; in fact, in the beginning, it will actually decrease productivity.

With the increasing use of microcomputers, there is an increasing possibility of the existence of cyberphobia. According to **Frank James** of the Wall Street Journal, **"Computers don't have teeth. Yet some people dread their bytes."**

Introduction of microcomputers has met with resistance in some organizations. Two generic sources of this resistance have been identified. One is a simple lack of knowledge about and awareness of the capabilities of the microcomputers. A second source of resistance is some managers' innate fear of computers, evoked by microcomputers. This paper addresses this second source of resistance -- computer anxiety.

Even though microcomputers have been shown to increase productivity in

some studies, managers continue to show some resistance to using microcomputers. This resistance has three roots:

* **psychological**
* **educational**
* **operational**

The danger of bruising managerial egos is a source of psychologically-based resistance. **Bralove (1983)** noted that **"Executives feel that sitting at a computer terminal ill-suits their executive image."** Another ego problem arises from that fact that most technologically competent computer professionals are still rather young. **Bralove** notes that, **"Many managers find asking a computer analyst half their age for help, a daunting prospect."** Loss of control is another psychologically-based fear that is sometimes associated with the use of computers. Rout (1982) reports that managers and professionals have their own way of filing, doling out assignments, and reading mail. Many of these people perceive that the computer narrows that freedom.

In addition to psychologically-based fears, lack of knowledge about computers also causes fears. One of the fears about computers expressed most commonly -- even among managers -- is that they will be replaced by machines. Also, some managers regard computers as inhuman, incomprehensive machines. **Wysocki (1979)** reported that a vice president of an Illinois bank said, **"I was terrified of that thing,"** in reference to a computer terminal that was installed a few feet from her desk. Lack of knowledge of computer jargon is another source of intimidation and fear. Another contributor to computer anxiety is the fear of pushing a wrong button and damaging either the machine or the contents of its memory banks.

A third root of computer anxiety is the inability of managers to overcome simple operational problems. The ability to type is frequently lacking and adds to fears and frustrations.

Psychologist **David Ledecky** of the consulting firm of International Resource Development, Inc., Norwalk, Connecticut, has also done some research on computer anxiety. **Ledecky** shows that computer anxiety takes three distinct forms: the general fear of working with computers, fear of failure in using them, and the fear of being replace by a machine **(Healion, 1983).** The general fear of working with computers roughly parallels the operational roots discussed earlier; fear of failure in use parallels psychological roots; and the fear of being replaced reflects lack of knowledge of the capabilities of the computers (educational roots).

CHAPTER 4

METHODOLOGY

To understand computer anxiety, it is necessary to measure it. Psychologists have identified two approaches to measuring anxiety:

* objective measurement
* subjective measurement

Objective measurement techniques measure anxiety independently of a person's feelings and perceptions, and include physiological measures such as sweating, blood pressure, and heart-rate. On the other hand, subjective measurement techniques for measuring anxiety rely totally on self-reports.

Caplan and Jones (1975) have argued that the subjective measures are better yardsticks of actual anxiety. They argue that anxiety has psychological origins, and that psychological symptoms of anxiety are often present when the physical, objective symptioms are not always present. It is how frightened one really is that is important. Fear is a highly personal and subjective phenomenon.

There is a precedent for the self-reporting method of measuring computer anxiety. **Raub (1981)** surveyed college students in the Philadelphia area. He measured computer anxiety with an **"Attitudes Towards Computers"** questionnaire. According to Brod, the questionnaire proved to be an effective measure of the phenomenon, as confirmed by the principal-components factor analysis of the results. Raub's questionnaire confirmed the usefulness of the self-report method of measurement of computer anxiety.

The use of subjective measures has a basis in the literature and are used in this research. A questionnaire toward this end was developed and distributed among potential microcomputer users.

The questionnaire measures the user's perceptions about productivity and efficiency gains in their organizations since the advent of microcomputers; identifies the presence of user fears in their organizations; and finds the existence of any programs in the organizations to help users in resolving their computer anxieties.

Sample

The University Center at Tulsa offers an MBA program for individuals employed in the Tulsa area business and industry. The individuals who take classes through this program come from a variety of businesses and have a wide diversity of backgrounds. Because of this diversity, the University Center at Tulsa was selected for use in this research.

The questionnaire was distributed to students currently in this program. It was administered in two stages -- once in the Fall of 1987, and once in the Spring of 1988.

Software

The results from the questionnaire were obtained in part by using the SAS software package. The output from the program is included in the appendix.

CHAPTER 5

QUESTIONNAIRE

The questionnaire was divided into six parts:

* Demographics
* Microcomputer use
* Impact of the Microcomputer use
* Reasons for this adaptation to microcomputers
* Users' perspectives
* Comments

Demographics

Demographic information about the respondents was collected. Information included the respondent's age, sex, educational background, and work experience.

Microcomputer Use

The respondents' levels of experience with microcomputers were assessed. There was a question to see if there were microcomputers in the organizations where the respondents were working. If there were microcomputers, the respondents were asked to specify the approximate number of microcomputers and also the approximate time when the first microcomputer was installed in the organization.

Impact of the Microcomputer Use

If the respondents have had any experience with microcomputers, they were asked to fill in the third section of the questionnaire. This section collected information about the impact of microcomputers on the organization's overall productivity and efficiency. There was another question which asked whether the microcomputer usage had indeed expanded the respondents' capabilities.

Reasons for this Adaptation

The respondent was asked to indicate why he or she had begun to use microcomputers. A partial list of such reasons was provided: peer pressure, supervisor pressure, competition, personal achievement, and professional development. The respondents could choose more than one response for this question. There was also another category included in the list -- other -- any other reasons which the respondents thought were important for this adaptation.

User's Perspectives

This section dealt with user perspectives about microcomputer use in their organizations. Specifically, the question sought to identify whether the repondents had identified fears (computer anxieties) in the users of the organization. If the answer to the above question was yes, the respondents were asked the list the primary reasons for these fears. The users' perceptions about the percentage of the people in their organizations who are positively motivated to resolve these fears and the percentage of the people who are successful in resolving these fears were also sought. The percentage of the people who give up using microcomputers was also requested.

There was another question as to whether there were any special programs in the respondents' organizations to alleviate the employees' computer fears and anxieties. If the respondents had answered yes to the above question, they were asked to list these special programs.

There was also a question to identify the cost/benefit to the users of using a microcomputer. Specifically, this question sought to determine if the microcomputer usage has resulted in the users performing their organizational duties much more quickly and effectively than they would otherwise have if they had not used microcomputers.

Comments

This section was included so that the respondents could include their comments about the subject (Microcomputer use in their organizations) and also about the questionnaire.

A copy of the questionnaire is attached in the appendix.

CHAPTER 6

ANALYSIS

Answers to the following questions were analyzed:

* Is there any relation between the age of the respondent and the organization's productivity and efficiency?

* Does the sex of the respondent have any impact on the organization's productivity and efficiency?

* Does the educational background of the respondent affect the organization's productivity and efficiency?

* Does the use of microcomputer have any impact on the organization's productivity and efficiency?

* Has microcomputer usage expanded user capabilities?

* What motivates people to adopt microcomputers?

* Have the respondents identified computer anxieties or fears in the users in the organization?

* What are the reasons for these fears?

* Are there any programs in the organizations to help employees deal with their computer anxieties?

* If yes, what are they?

* In general, what percentage of the people in the organization successfully overcome their fears or computer anxieties and what percentage does not?

* How do users perceive the costs/benefits of microcomputer usage?

CHAPTER 7

RESULTS

Age, Sex, and Educational Background and Organizations' Productivity and Efficiency

Age does not seem to have any significant relation to user perceptions of the organizations' productivity and efficiency. The correlation coefficients are given in table 1.

TABLE 1

AGE AND ORGANIZATION'S PRODUCTIVITY & EFFICIENCY

Correlation Coefficients and P-Values

	Age	
	Corr. Coeff.	P-Value
PRODUCTIVITY	-0.19	0.0609
EFFICIENCY	-0.086	0.3978

As can be seen from the table, the Pearson product-moment correlation coefficients between age and productivity and efficiency are respectively -0.19 and -0.08. This is very low and not statistically significant. The respective P-Values of the two variables are 0.0609 and 0.3978. The P-Value is the probability of making a Type-I error -- the error of rejecting a null hypothesis when it should actually be accepted. At a 95% confidence level both these coefficients are not statistically significant. (The P-Values are greater than 0.05 which is the safety margin).

The sex of the users is somewhat related to his or her perception of the organization's productivity and efficiency. Correlation coefficients between sex and the organization's productivity and efficiency are given in table 2.

TABLE 2

SEX AND ORGANIZATION'S PRODUCTIVITY & EFFICIENCY

Correlation Coefficients and P-Values

	Sex	
	Corr. Coeff.	P-Value
PRODUCTIVITY	0.22	0.026
EFFICIENCY	0.38	0.0001

The Pearson product-moment correlation coefficients between sex and the organizations' productivity and efficiency are respectively 0.22 and 0.38. Even though these correlation coefficients are not high, these values are statistically significant at the 95% confidence level. The respective P-Values are 0.026 and 0.0001 which are significant at the required confidence level. These values are lower than the 0.05 safety level. Women are more likely to perceive an increase in productivity and efficiency than men.

The educational backgrounds of the users does not have any significant relationship with that of the user perceptions of the organizations' productivity and efficiency. Table 3 gives the Pearson product-moment correlation coefficients and P-Values between the educational background of the respondents and these variables. The correlation coefficients are respectively -0.12 and -0.11 which are very low. These correlation coefficients are also not statistically significant at the 95% confidence level. The P-Values are respectively 0.22 and 0.24 which are higher than the 0.05 safety margin.

TABLE 3

EDUCATIONAL BACKGROUNDS AND ORGANIZATION'S PRODUCTIVITY & EFFICIENCY

Correlation Coefficients and P-Values

	Education	
	Corr. Coeff.	P-Value
PRODUCTIVITY	-0.12	0.22
EFFICIENCY	-0.11	0.24

The experience that the users have on microcomputers seems to have no relation to their perception of the organizations' productivity and efficiency. Table 4 gives the correlation coefficients and the P-Values between the microcomputer experience and the organizations' productivity and efficiency:

TABLE 4

MICROCOMPUTER EXPERIENCE AND ORGANIZATION'S PRODUCTIVITY & EFFICIENCY

Correlation Coefficients and P-Values

	Experience	
	Corr. Coeff.	P-Value
PRODUCTIVITY	0.21	0.03
EFFICIENCY	0.05	0.58

While the correlation coefficients between microcomputer experience and these variables are not high (0.21 abd 0.05 respectively), the P-Value for the correlation coefficient between microcomputer experience and the organizations' productivity is 0.03 which is lower than the 0.05 safety level. Thus, this value is statistically significant at the 95% confidence level. On the other hand, the P-Value of the correlation coefficient between the

microcomputer experience of the respondents and the organizations' efficiency is 0.058 which is higher than the 0.05 safety margin. Thus, this result is not statistically significant at the 95% confidence level. Users with more experience are more likely to perceive an increase in productivity due to microcomputers than are those inexperienced users.

There also seems to be some correlation between the microcomputer experience and the capabilities of the respondents. Microcomputer experience does seem to expand the capabilities of the users. The correlation coefficient and the P-Value between these two variables are given in table 5.

TABLE 5

MICROCOMPUTUER EXPERIENCE AND EXPANDED CAPABILITIES

Correlation Coefficient and the P-Value

	Experience	
	Corr. Coeff.	P-Value
Expanded Capabilities	0.203	0.04

Even though the correlation coefficient is only 0.20, this is statistically significant at the 95% confidence level as the P-Value is smaller than the 0.05 safety margin. Users with more experience are more likely to perceive an increase in their capabilities than the more inexperienced user.

Apart from the correlation analysis, various other statistical techniques were also used. Specifically, the data were subjected to a multiple regression analysis and also to factor analysis.

Regression analysis is a statistical technique that identifies a linear relation between the independent and dependent variables. To illustrate, if a linear relation is expected between two variables `X' and `y';

i.e. If it is expected that $Y = A + BX$,

then, regression analysis provides the estimates of the parameters A and B. A regression line is than a method of organizing the data into a more simplified form in order to obtain an estimate of the relation between the the dependent variable and the independent variable.

The t-statistic provides a way to measure the statistical significance of the estimated paramaters. This estimated t-value is compared to a critical value obtained from a t-table. If the value of the t-statistic exceeds the critical t-value, the parameters are statistically significant at the specified level.

Two statistics are frequently used to evaluate the regression equation. The first of these is called the Coefficient of Determination, normally called as R^2. This statistic reflect the percentage of total variation in (dispersion of) the dependent variable (about its mean) that is explained by the independent variables. A high R^2 would indicate that the variability in the dependent variable is well explained by the selected independent variables. Similarly, a low R^2 would indicate that the selected independent variables do not properly account for the variability in the dependent variable.

Although the R^2 is a widely used statistic, it is subjective in the sense of how much explained variation is enough.

The second statistic used to evaluate the model is the F-statistic. This statistic provides a measure of the ratio of the explained variation (in the dependent variable) to the unexplained variation. To test whether the overall equation is significant, this statistic is compared to a critical F-value from an F-table. If the value of the F-statistic exceeds the critical F-value,

then the regression equation is statistically significant at the specified level.

Multiple regression is a statistical technique which gives the equation of a regression line with a dependent variable and more than one independent variable.

Dependent Variable: Organizations' Productivity

The organizations' productivity was examined as a function of the existence of training programs. The R^2 between these two variables was 0.1413, indicating that the existence of training programs explained 14% of the variability in productivity. Apart from the existence of training programs in organizations, the age of the respondents also significantly affected the productivity of the organizations. The regression equation between the dependent variable - organizations' productivity - and the independent variables - existence of training programs and the age of the respondents is given below:

PRODUCTIVITY = 5.38 - 0.25 * AGE - 0.66 * TRAINING PROGRAMS

This equation was obtained from the information in Table 6.

TABLE 6

STEPWISE REGRESSION PROCEDURE FOR THE DEPENDENT VARIABLE "PRODUCTIVITY"

	B-Value	Prob>F
Intercept	+5.38	
Age	-0.25	0.03
Training Programs	-0.66	0.0001

With increasing age, the users perceive that the productivity gains of the organizations would decrease. Also, the analysis shows that fewer the number of training programs available to the employees, lower is the user

perceptions about gains in the organizations' productivity. The Prob>F column gives the probability of making a Type-I error (rejecting the value of the estimated parameters falsely). These probabilities are respectively 0.0391 and 0.0001. These are less than the 0.05 safety margin. So, the parameter estimates are statistically significant at the 95% confidence level.

Table 7 gives the relevant R^2 and F-values for this regression equation.

TABLE 7

STEPWISE REGRESSION PROCEDURE FOR THE DEPENDENT VARIABLE "PRODUCTIVITY"

VARIABLE ENTERED	PARTIAL R^2	MODEL R^2	F-VALUE	PROB>F
TRAINING PROGRAMS	0.14	0.14	15.79	0.0001
AGE	0.03	0.17	4.37	0.0391

When the variable, training programs, is introduced into the model, the regression equation explains about 14% (R^2 value) variation in the dependent variable. When another variable, age, is entered into the model, about 17% variation in dependent variable is explained. These values are very low. Hence, it can be concluded that special programs and age of the user have a low correlation to the organizations' productivity. The significance of these results can be tested by the F-value. The Prob>F column gives the probability of making a Type 1 error (rejecting the model falsely). These probabilities are respectively 0.0001 and 0.0391. This is less than the 0.05 safety margin. So the results in this section are statistically significant at the 95% confidence level.

Dependent Variable: Efficiency

The existence of special training programs in organizations has a significant relation with the organizations' efficiency. Also, the sex of the respondents had the next strong relation with the efficiency of the organization. Table 8 gives information about the parameter estimates in the regression equation.

TABLE 8

STEPWISE REGRESSION PROCEDURE FOR THE DEPENDENT VARIABLE "EFFICIENCY"

	B-Value	Prob>F
Intercept	+4.09	
Sex	+0.55	0.0013
Training Programs	-0.64	0.0001

The regression equation between the dependent variable - efficiency - and the indpendent variables - training programs and the sex of the respondents - is given below:

EFFICIENCY = 4.09 + 0.55 * SEX - 0.64 * TRAINING PROGRAMS

This shows that men are more likely to perceive an increase in the organizations' efficiency. Also, fewer the number of training programs available to the employees, lower is their perceptions about efficiency gains in their organizations. The Prob>F column gives the probability of making a Type-I error. These probabilities are respectively 0.0013 and 0.0001. These values are less than the 0.05 safety margin. Thus, the parameter estimates are statistically significant at the 95% confidence level.

Table 9 gives the relevant R^2 and F-values for this regression equation.

When the variable - training programs - is introduced into the model, the regression equation explains about 19% of the variation in the dependent variable - efficiency. When the variable sex is also introduced into the model, the regression equation explains about 27% (model R^2 value) of the variation in the dependent variable. These values are low indicating low

TABLE 9

STEPWISE REGRESSION PROCEDURE FOR THE DEPENDENT VARIABLE "EFFICIENCY"

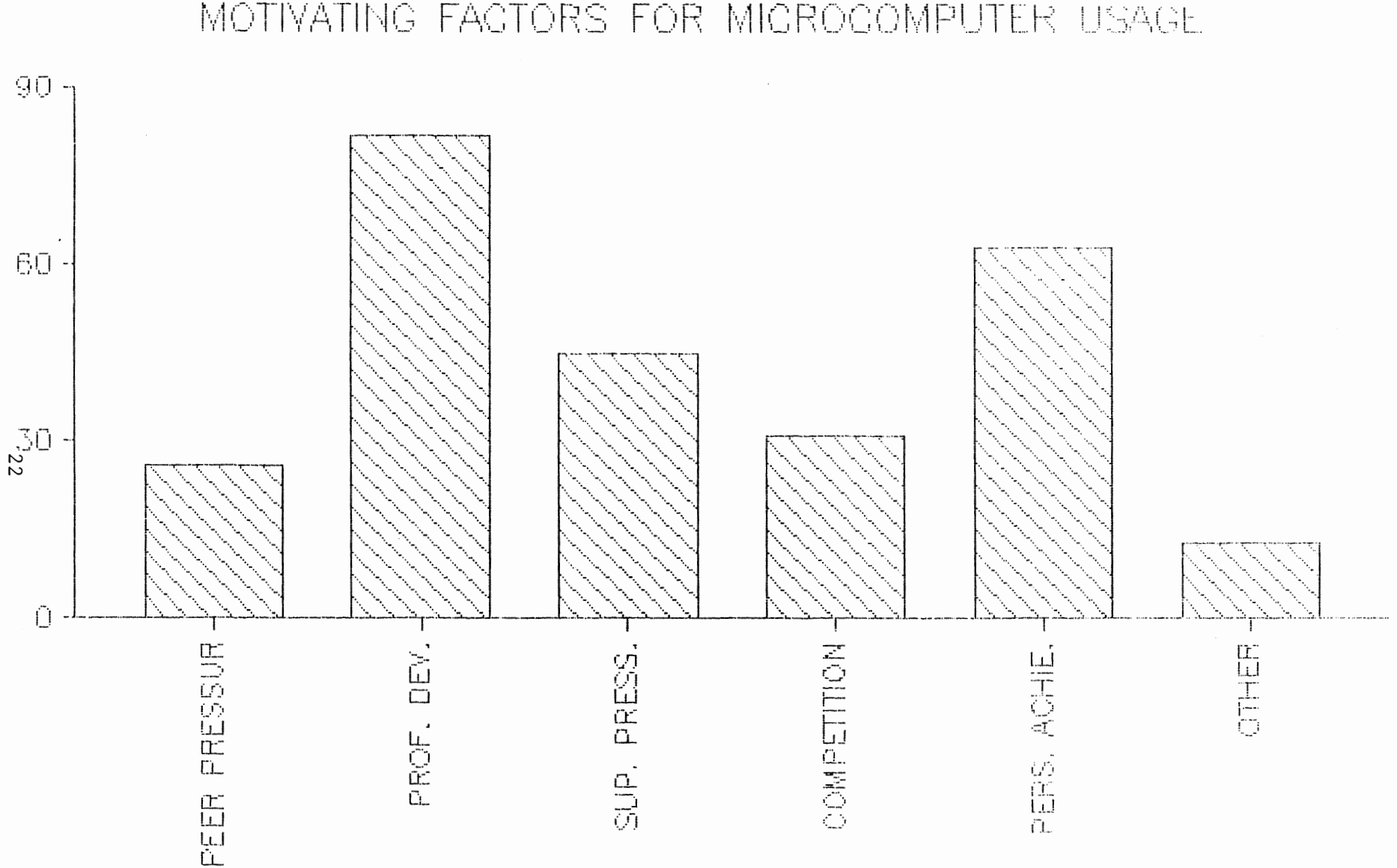
VARIABLE ENTERED	PARTIAL R^2	MODEL R^2	F-VALUE	PROB>F
TRAINING PROGRAMS	0.19	0.19	22.274	0.0001
SEX	0.08	0.27	10.926	0.0013

correlation between the dependent and the independent variables.

The F-test tests the significance of these results. The Prob>F value for the two independent variables are respectively 0.0001 and 0.0013 which are lower than 0.05 - the safety margin. So the results are statistically significant at the 95% confidence level.

As regards the reasons for the people adapting to microcomputers, professional development seems to be the major reason. This is clearly illustrated in figure 1.

The other reasons for the people adapting to microcomputers can be prioritized in the following order: Other reasons, Personal achievement, Competition, Supervisor pressure, and finally Peer pressure. The other reasons mentioned by the respondents include to increase their efficiency, because of being unable to obtain some turn around on main frame computers via


MOTIVATING FACTORS FOR MICROCOMPUTER USAGE
90
60
30
0
22
PEER PRESSUR
PROF. DEV.
SUP. PRESS.
COMPETITION
PERS. ACHIE.
OTHER

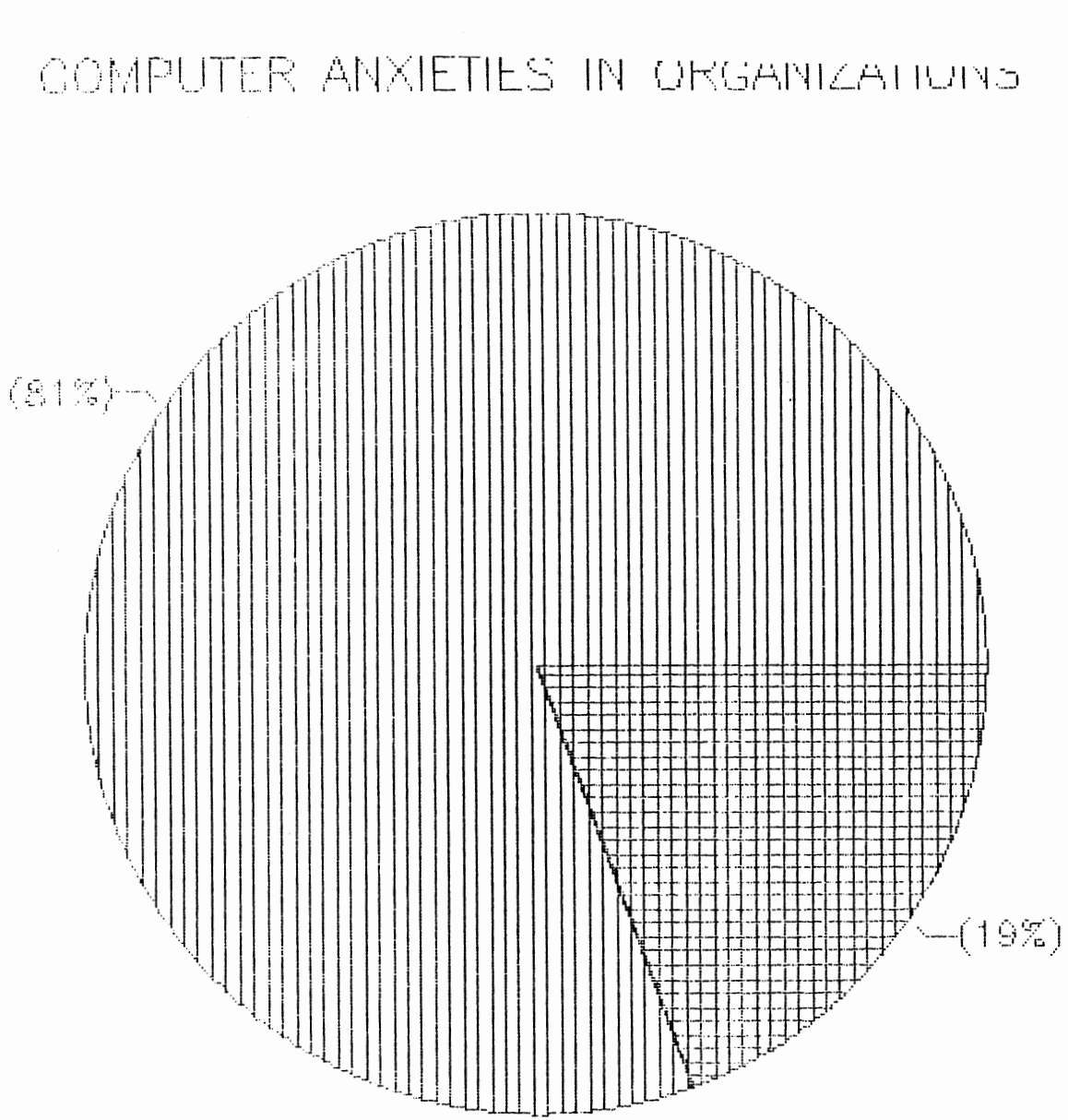
IIS programming, to improve personal productivity, to gain more information ıbout computers, to satisfy curiosity, necessity, and for the fear of being left behind technologically in their organizations.

A majority of the respondents have identified the presence of computer ınxieties in their organizations -- about 85%. On the other hand, only about 50% of the respondents said that there were any special programs in their organizations to help solve this problem. This can be seen in figure 2.

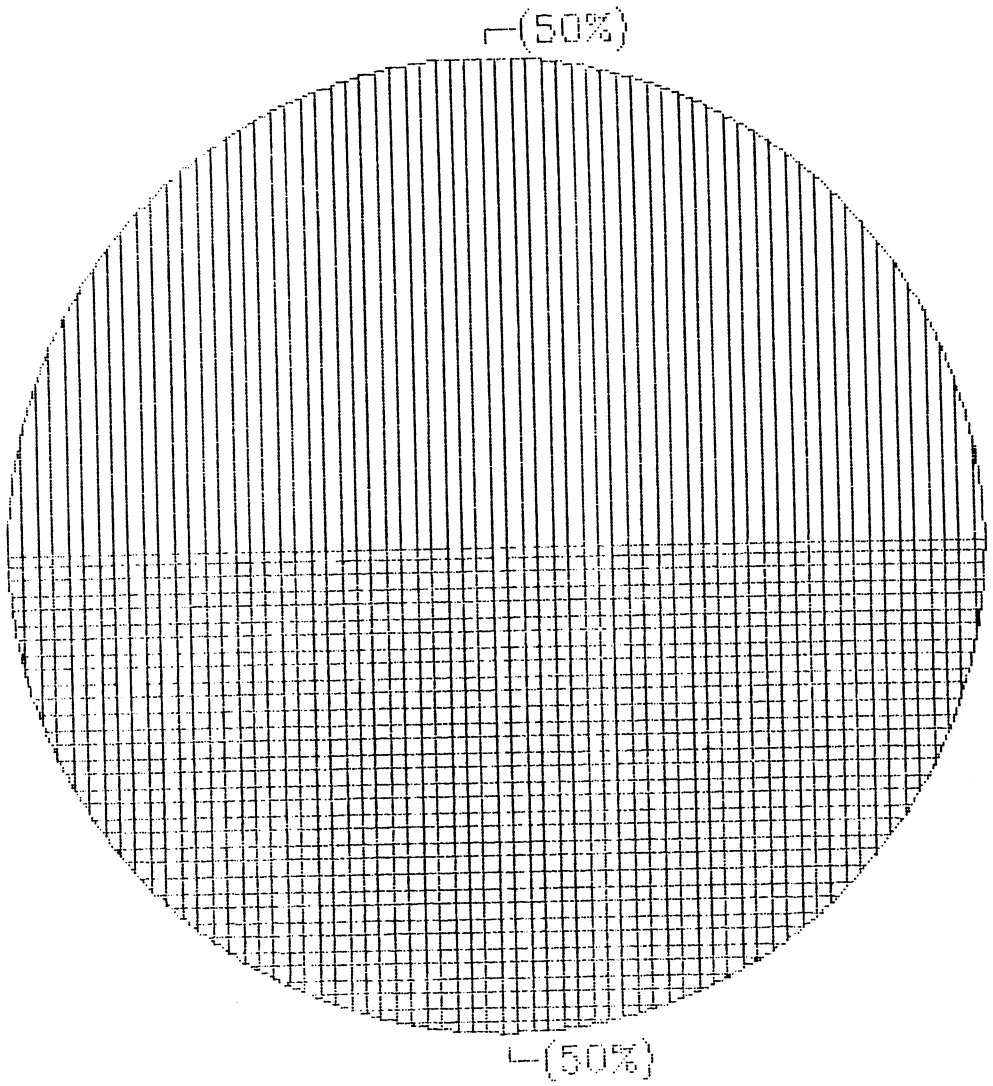
A variety of reasons were cited for the existence of computer anxieties in organizations. These include unfamiliarity, lack of experience, the fear of unknown, lack of knowledge, uncertainty about how to use a computer, fear of failure caused directly by a lack of knowledge, psychological fears that they cannot use personal computers, operational fears like the inability to type, psychological fears of losing valuble data, and that of causing a machine failure.

Other reasons cited include lack of support or training in the organizations where they work, lack of education in the field of microcomputers, fear of learning something new, fear of starting out low in the learning curve, fear of new technology, their general resistance to change, and the fear of looking stupid in front of others.

About 37% of the respondents said that about 50 to 75% of the users in organizations were positively motivated to begin using microcomputers. But 33% of the respondents said that fewer than 25% of the respondents had this positive motivation. About 17% of the respondents thought that 25 to 50% of the respondents are positively motivated to begin using microcomputers, about 14% of them felt that more than 75% of the users in their organizations are positively motivated. This can be clearly seenin figure 3.


COMPUTER ANXIETIES IN ORGANIZATIONS
(81%)
(19%)

SUPPORT PROGRAMS IN ORGANIZATIONS

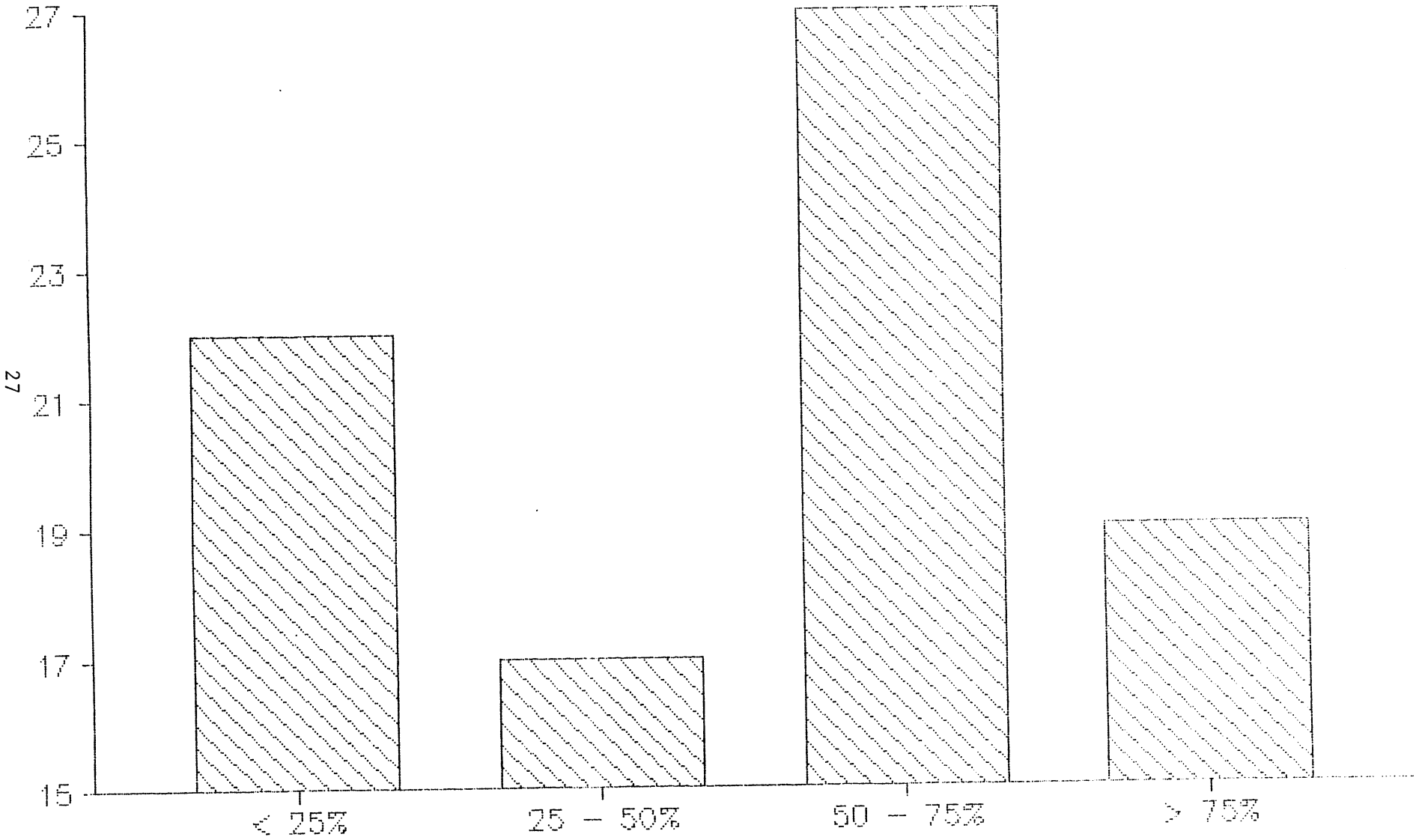


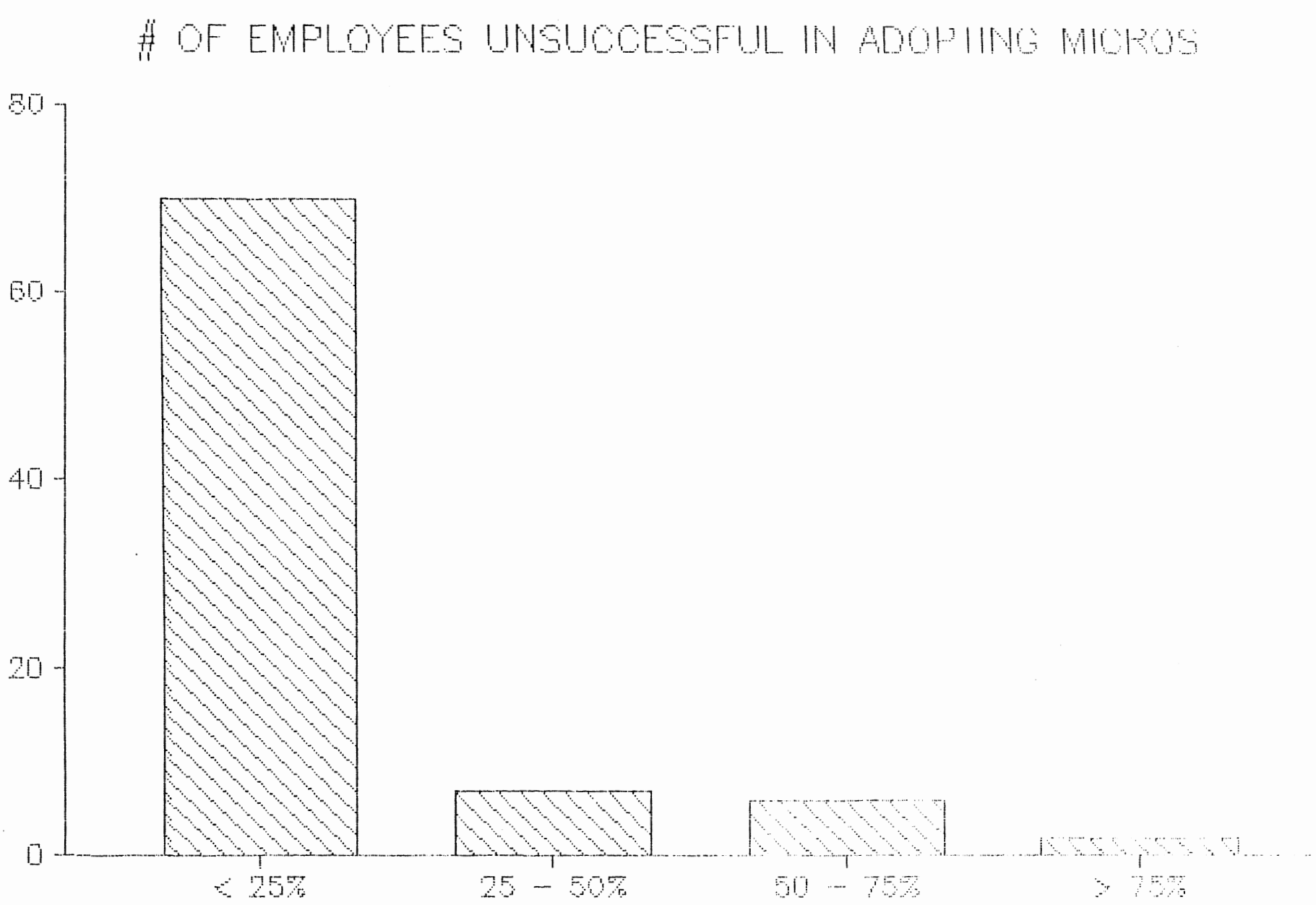
About 32% of the respondents said that about 50 to 75% of the people in their organizations use microcomputers successfully. On the other hand, about 26% of the respondents said that fewer than 25% of the people in their organizations reach the point where they are able to use microcomputers in their workplace. Twenty percent of the respondents thought that between 25 to 50% of the respondents successfully use microcomputers, while about 22% felt that more than 75% of the respondents successfully them. This can be seen in figure 4.

This report also analyzes the percentage of people who become discouraged and give up using microcomputers. An interesting finding is that an overwhelming 82% of the respondents felt that fewer than 25% of the users in their organizations give up using microcomputers. Only 2% of the respondents felt that more than 75% of the users give up using microcomputers. About 8% felt that between 25 to 50% of the users in their organizations give up using microcomputers while about 7% felt that between 50 to 75% of the respondents give up using the microcomputers in their work place. This can be seen in figure 5.

A variety of training and support programs are in existence in the various organizations represented in the sample. The most common include classes on PC, DOS, LOTUS, etc.; extensive training in fundamentals and concepts; allowing ample time for adjustments like setting proper expectation levels; seminars and classes on various software systems; classes on microcomputers; hands-on training; up-to-date manuals; PC trouble shooters; staff development workshops; user training; PC specialists; MIS support groups; help desk; short courses; peer support; `how-to' classes; tutorial programs; and company funded college classes.

OF EMPLOYEES SUCCESSFULLY ADOPTING MICROS.




OF EMPLOYEES UNSUCCESSFUL IN ADOPTING MICROS
80
60
40
20
0
< 25%
25 - 50%
50 - 75%
> 75%

As was mentioned in the earlier chapter, the questionnaire also sought to measure the cost/benefit accruing to the users through microcomputer usage. A majority of the respondents said that microcomputers saved them more than 4 hours per week, while very few people said that the microcomputer costs more time than it saves. This can be clearly seen in figure 6.

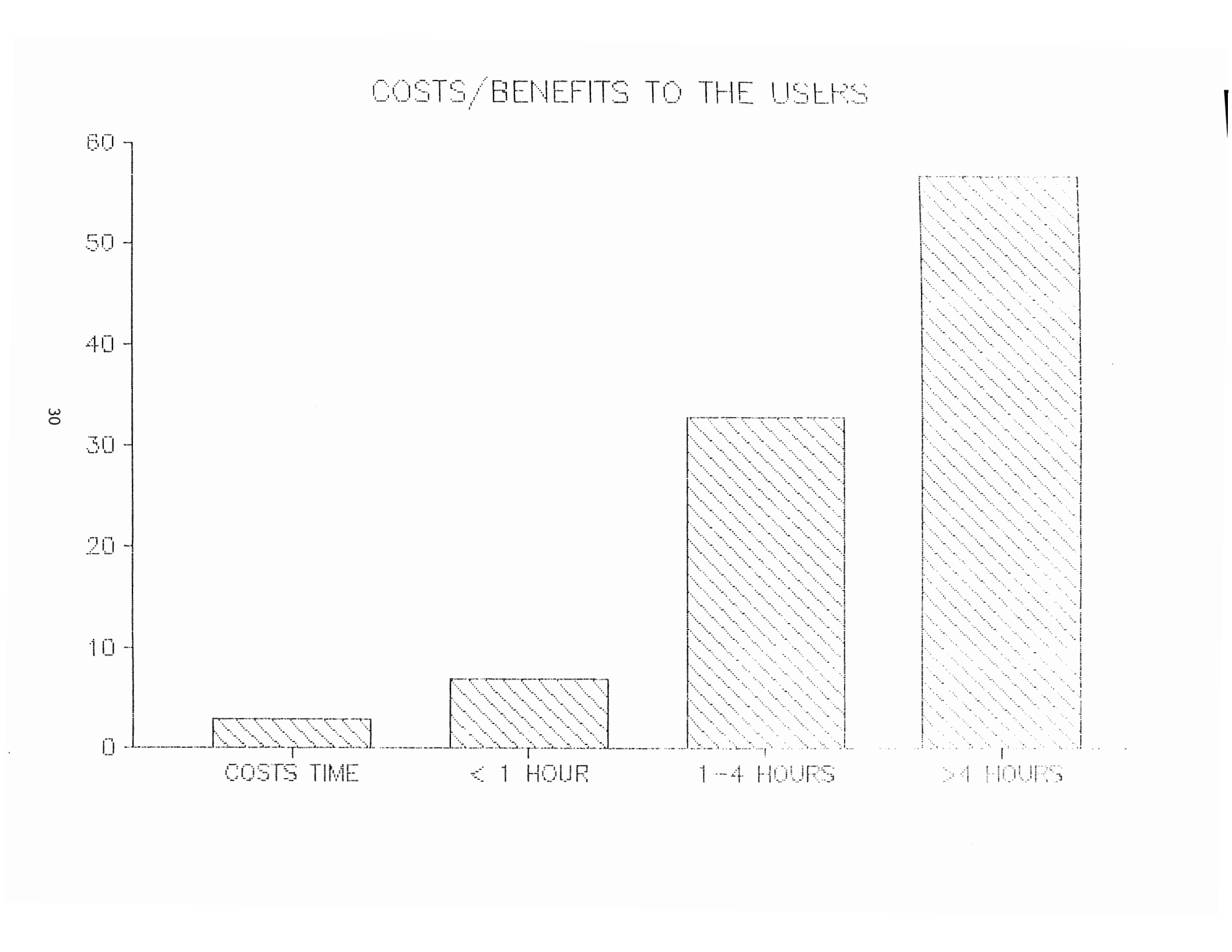
The data were subjected to a factor analysis. The essential purpose of factor analysis is to describe, if possible, the covariance relationships among many variables in terms of few underlying, but unobservable, random quantities called factors. Basically, the factor model is motivated by the following argument. Suppose all variables within a particular group are highly correlated among themselves, but have relatively small correlations with variables in a different group. It is conceivable that each group of variables represents a single underlying construct, or factor, that is responsible for the observed correlations **(Johnson, A.R. and Wichern, D.W., 1982).**

When the data were subjected to a factor analysis, the following facor pattern was obtained:

TABLE 10

FACTOR PATTERN

VARIABLES	FACTOR 1	FACTOR 2	FACTOR 3
AGE	-0.31	+0.79	-0.001
SEX	+0.44	+0.06	-0.55
EDUCATION	-0.19	+0.39	+0.65
WORK EXPERIENCE	-0.23	+0.75	-0.26
PRODUCTIVITY	+0.86	+0.09	+0.11
EFFICIENCY	+0.86	+0.21	-0.05
EXPANDED CAPABILITIES	+0.68	+0.06	+0.52
TRAINING	-0.56	-0.29	+0.17


COSTS/BENEFITS TO THE USERS
60
50
40
30
20
10
0
COSTS TIME
< 1 HOUR
1-4 HOURS
>4 HOURS

It is clear from the above table that the variables productivity, efficiency, expanded capabilities, and training, are governed by a common factor. Thus, these variables may represent a single construct that represents the observed correlations.

CHAPTER 8

CONCLUSIONS

The analysis shows that most organizations have identified the existence of computer anxiety in their users. Many organizations have taken some positive steps towards addressing this problem. They have established many training programs to help their employees deal with this problem.

While age, sex, and educational background have no impact on the user perceptions of the organizations' productivity and efficiency, the users' experience with microcomputers does have an effect on their perceptions of productivity of the organizations. Professional development seems to be the major reason why most people begin using microcomputers. Eighty percent of the organizations in the sample have identified the presence of computer anxieties in their organizations, but only a few of them (about 50%) have any special training or support programs in their organizations to help alleviate this problem. This research shows that at least 50 to 75% of the users in organizations are positively motivated to alleviate and also successfully resolve their computer anxieties. Fewer than 25% of the users give up using microcomputers. Many people feel that the microcomputer saves them at least more than 4 hours each week. This research reveals that the existence of training/support programs in organizations have a direct bearing on the productivity and efficiency of the organizations.

CHAPTER 9

RECOMMENDATIONS FOR FURTHER RESEARCH

1. As this is an exploratory study, this analysis was performed on a small sample. It is recommended that further research be conducted on a large sample.

2. Although many articles refer to increased productivity savings by using microcomputers, not many studies address this question. A further study should be developed to determine if microcomputers do save time and increase productivity for businesses. Research efforts should address the measurement of productivity increases due to microcomputer usage.

3. Although many organizations have identified the existence of computer anxieties in their users, only a few have any training programs to help solve this problem. It is recommended that further research be conducted to identify the reasons for this behavior of organizations, and to determine the composition of effective training methodologies for use in organizations.

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APPENDICES

APPENDIX 1

QUESTIONNAIRE USED FOR THE SURVEY

QUESTIONNAIRE - MICROCOMPUTER USE IN ORGANIZATIONS
SPRING 1988

Questionnaire # _____

ANSWERS TO QUESTIONS "1" THROUGH "6" ARE FOR STATISTICAL PURPOSES ONLY:

1. Your age:
_____ 1) 30 years or less
_____ 2) Between 31 and 40 years
_____ 3) Between 41 and 50 years
_____ 4) More than 50 years

2. Sex:
_____ 1) Male
_____ 2) Female

3. Highest degree earned:
_____ 1) High School
_____ 2) Baccalaureate
_____ 3) Masters
_____ 4) Doctorate
_____ 5) Other (Please Specify)

_____

_____

4. How long have you been employed in the organization where you are currently working?
_____ 1) Less than 1 year
_____ 2) Between 1 and 3 years
_____ 3) Between 4 and 6 years
_____ 4) Between 7 and 10 years
_____ 5) More than 10 years

5. What position do you hold in this organization?

_____

6. How long have you held this current position?
_____ 1) Less than 1 year
_____ 2) Between 1 and 3 years
_____ 3) Between 4 and 6 years
_____ 4) Between 7 and 10 years
_____ 5) More than 10 years

7. Do you have microcomputers in your organization?
_____ 1) Yes
_____ 2) No
_____ 3) Don't know

(IF THE ANSWER TO THE ABOVE QUESTION IS "NO" OR "DON'T KNOW", PLEASE GO TO QUESTION # 23 ON PAGE 4)

- OVER -

8. How many microcomputers are there in your organization?
_____ 1) 5 or less
_____ 2) Between 6 and 10
_____ 3) Between 11 and 15
_____ 4) More than 15

9. When was the first microcomputer installed in your organization?
_____ 1) More than five years ago
_____ 2) Five years or less
_____ 3) Don't know

10. Have you personally ever used microcomputers in your organization?
_____ 1) Yes
_____ 2) No

(IF THE ANSWER TO THE ABOVE QUESTION IS "NO", PLEASE GO TO QUESTION # 15 ON PAGE 3)

11. If you regularly use microcomputers, how long have you been using them?
_____ 1) Less than 1 year
_____ 2) Between 1 and 3 years
_____ 3) Between 4 and 6 years
_____ 4) Between 7 and 10 years
_____ 5) More than 10 years

12. To what degree do you think the microcomputer has increased the productivity in your organization?
_____ 1) Has decreased productivity
_____ 2) Has increased it very little
_____ 3) Has increased it some
_____ 4) Has increased it noticeably
_____ 5) Has increased it significantly

13. To what degree do you think has the microcomputer increased your organization's overall efficiency?
_____ 1) Has decreased efficiency
_____ 2) Has increased it very little
_____ 3) Has increased it some
_____ 4) Has increased it noticeably
_____ 5) Has increased it significantly

14. To what degree has the microcomputer affected your capabilities?
_____ 1) Greatly decreased
_____ 2) Decreased
_____ 3) No change
_____ 4) Increased
_____ 5) Greatly increased

15. What do you think motivates people to adapt to microcomputers?

(YOU CAN CHECK MORE THAN ONE RESPONSE TO THIS QUESTION)

____ 1) Peer pressure
____ 2) Supervisor presssure
____ 3) Competition
____ 4) Personal achievement
____ 5) Professional development
____ 6) Other (Please specify)

_____

_____

_____

16. Have you noticed any fears (computer anxieties) in the users in your organization?

____ 1) Yes
____ 2) No

(IF THE ANSWER TO THE ABOVE QUESTION IS "NO", PLEASE GO TO QUESTION # 21)

17. What do you think is the primary reason(s) for these fears?

_____

_____

18. How many people do you think are positively motivated to resolve these fears?

____ 1) 25% or less
____ 2) Between 26 and 50%
____ 3) Between 51 and 75%
____ 4) More than 75%

19. What percentage of the people in your firm do you think are successful in resolving their computer fears and anxieties?

____ 1) 25% or less
____ 2) Between 26 and 50%
____ 3) Between 51 and 75%
____ 4) More than 75%

20. What percentage of the people in your firm give up using microcomputers?

____ 1) 25% or less
____ 2) Between 26 and 50%
____ 3) Between 51 and 75%
____ 4) More than 75%

- OVER -

21. Are there any special programs in your organization to help alleviate employees' computer fears and anxieties?

____ 1) Yes
____ 2) No

(IF THE ANSWER TO THE ABOVE QUESTION IS "YES", PLEASE LIST THEM:)

_____

_____

_____

22. What is the cost/benefit to you of using a computer?

____ 1) Costs more time than it saves
____ 2) Saves less than 1 hour per week
____ 2) Saves between 1 and 4 hours per week
____ 4) Saves more than 4 hours per week

23. Comments:
(WE APPRECIATE YOUR COMMENTS REGARDING THIS QUESTIONNAIRE. IF THERE ARE ANY OTHER THINGS YOU WISH TO MENTION, PLEASE SPECIFY THEM IN THE SPACE GIVEN BELOW:)

_____

_____

_____

_____

_____

_____

THANK YOU

APPENDIX 2

SAS PROGRAM AND OUTPUT

```
1          SAS(R) LOG   OS SAS 5.16           MVS/XA JOB U12983DA STEP SAS                                    13:14 FRIDAY, MAY 6, 1988

NOTE: COPYRIGHT (C) 1984,1986 SAS INSTITUTE INC., CARY, N.C.  27511, U.S.A.
NOTE: THE JOB U12983DA HAS BEEN RUN UNDER RELEASE 5.16 OF SAS AT OKLAHOMA STATE UNIVERSITY (01354001).

NOTE: CPUID    VERSION = FF  SERIAL = 021194  MODEL = 3081 .
      CPUID    VERSION = FF  SERIAL = 021194  MODEL = 3081 .

NOTE: SAS OPTIONS SPECIFIED ARE:
       SORT=4

1           DATA REPORT;
2           INPUT Q V1-V25;
3           IF V25=1 THEN V26='1';
4           IF V25=2 THEN V26='2';
5           IF V25=3 THEN V26='3';
6           IF V25=4 THEN V26='4';
7           IF V14=1 THEN V27='1';
8           IF V15=2 THEN V27='2';
9           IF V16=3 THEN V27='3';
10          IF V17=4 THEN V27='4';
11          IF V18=5 THEN V27='5';
12          IF V19=6 THEN V27='6';
13          IF V20=1 THEN V28='1';
14          IF V20=2 THEN V28='2';
15          IF V24=1 THEN V29='1';
16          IF V24=2 THEN V29='2';
17          IF V21=1 THEN V30='1';
18          IF V21=2 THEN V30='2';
19          IF V21=3 THEN V30='3';
20          IF V21=4 THEN V30='4';
21          IF V22=1 THEN V31='1';
22          IF V22=2 THEN V31='2';
23          IF V22=3 THEN V31='3';
24          IF V22=4 THEN V31='4';
25          IF V23=1 THEN V32='1';
26          IF V23=2 THEN V32='2';
27          IF V23=3 THEN V32='3';
28          IF V23=4 THEN V32='4';
29          CARDS;

NOTE: DATA SET WORK.REPORT HAS 118 OBSERVATIONS AND 33 VARIABLES. 214 OBS/TRK.
NOTE: THE DATA STATEMENT USED 0.17 SECONDS AND 108K.

148         PROC PRINT;
149         TITLE 'COMPUTER USE IN ORGANIZATIONS';
NOTE: THE PROCEDURE PRINT USED 0.29 SECONDS AND 232K AND PRINTED PAGES 1 TO 3.

150         PROC CORR;
151           VAR  V1 V2 V3 V4 V7 V8 V9 V10 V11 V12 V13 V24;
NOTE: THE PROCEDURE CORR USED 0.16 SECONDS AND 204K AND PRINTED PAGES 4 TO 5.

152         PROC CHART;
153            VBAR V26;
NOTE: THE PROCEDURE CHART USED 0.12 SECONDS AND 228K AND PRINTED PAGE 6.

154         PROC CHART;
155              VBAR V27;
NOTE: THE PROCEDURE CHART USED 0.12 SECONDS AND 228K AND PRINTED PAGE 7.
```

```
156         PROC CHART;
157              PIE V28;
NOTE: THE PROCEDURE CHART USED 0.14 SECONDS AND 228K AND PRINTED PAGE 8.

158         PROC CHART;
159              PIE V29 V30 V31 V32;
NOTE: THE PROCEDURE CHART USED 0.23 SECONDS AND 228K AND PRINTED PAGES 9 TO 12.

160         PROC STEPWISE;
161              MODEL V10=V1 V2 V3 V24;
162              MODEL V11=V1 V2 V3 V24;
163              MODEL V12=V1 V2 V3 V24;
164              MODEL V13=V1 V2 V3 V24;
NOTE: THE PROCEDURE STEPWISE USED 0.18 SECONDS AND 284K AND PRINTED PAGES 13 TO 16.

165         PROC FACTOR;
166              VAR V1 V2 V3 V4 V11 V12 V13 V24;
WARNING: 20 OF 118 OBSERVATIONS OMITTED DUE TO MISSING VALUES.
NOTE: THE PROCEDURE FACTOR USED 0.16 SECONDS AND 324K AND PRINTED PAGE 17.

167         PROC CLUSTER METHOD=COMPLETE;
168              VAR V1 V2 V3 V4 V11 V12 V13 V24;
NOTE: 20 OBSERVATIONS OMITTED DUE TO MISSING VALUES.
NOTE: THE DATA SET WORK.DATA1 HAS 215 OBSERVATIONS AND 22 VARIABLES. 260 OBS/TRK.
NOTE: THE PROCEDURE CLUSTER USED 0.61 SECONDS AND 264K AND PRINTED PAGES 18 TO 20.
NOTE: SAS USED 324K MEMORY.

NOTE: SAS INSTITUTE INC.
      SAS CIRCLE
      PO BOX 8000
      CARY, N.C. 27511-8000
```

OBS	Q	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29	V30	V31	V32
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51	50	1	2	2	3	1	1	4	2	1	2	4	4	4	1	2	3	4	.	.	1	3	3	1	1	4	4	4	1	1	3	3	1
52	51	1	1	2	2	2	1	4	1	1	2	5	3	4	.	2	3	4	5	.	1	3	2	1	2	4	4	5	1	2	3	2	1
53	52	2	2	3	4	4	1	4	2	1	3	3	3	4	.	2	.	4	5	.	1	1	1	4	2	2	2	5	1	2	1	1	4
54	53	1	2	2	1	1	1	4	3	1	1	4	4	4	.	.	.	4	5	.	1	1	2	1	2	3	3	5	1	2	1	2	1
55	54	1	1	2	2	1	1	4	1	1	2	5	4	4	.	.	.	4	5	.	1	2	3	1	1	4	4	5	1	1	2	3	1

OBS	Q	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29	V30	V31	V32
56	55	2	1	3	2	1	1	4	1	1	3	4	3	4	.	.	.	.	5	.	1	2	2	1	2	3	3	5	1	2	2	2	1
57	56	1	1	3	2	2	1	1	3	1	2	4	3	4	.	.	.	.	5	.	2	.	.	.	2	.		5	2	2			
58	57	3	1	3	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.							
59	58	3	1	2	3	3	1	1	2	1	4	5	4	5	.	.	.	.	.	6	1	1	2	1	2	4	4	6	1	2	1	2	1
60	59	2	2	2	5	2	1	4	3	1	2	4	4	4	1	2	.	4	5	.	1	4	4	1	1	.		5	1	1	4	4	1
61	60	1	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.							
62	61	2	1	2	2	2	1	4	1	1	3	3	4	4	.	.	.	4	5	.	1	.	.	.	1	3	3	5	1	1			
63	62	1	1	2	3	3	1	2	3	1	3	4	3	4	.	2	.	4	5	.	1	2	3	1	2	4	4	5	1	2	2	3	1
64	63	2	1	2	2	2	1	4	3	1	1	4	4	4	.	.	.	.	5	.	2	.	.	.	2	3	3	5	2	2			
65	64	2	1	2	3	2	1	4	2	1	2	2	2	3	.	.	.	.	5	.	1	1	3	1	2	.		5	1	2	1	3	1
66	65	2	1	2	4	4	1	4	1	1	2	5	5	5	1	2	3	4	.	.	1	2	3	1	1	4	4	4	1	1	2	3	1
67	66	1	1	2	3	3	1	4	2	1	2	3	3	4	1	2	.	.	.	.	1	3	3	1	2	4	4	2	1	2	3	3	1
68	67	2	1	2	5	1	1	4	3	1	2	3	3	3	.	.	.	4	5	.	1	1	1	4	2	3	3	5	1	2	1	1	4
69	68	1	1	3	2	2	1	2	3	1	2	3	3	4	.	2	.	4	.	.	2	.	.	.	2	3	3	4	2	2			
70	69	2	1	2	3	3	1	4	3	1	1	3	3	3	1	.	.	.	.	.	1	2	3	1	2	2	2	1	1	2	2	3	1
71	70	1	1	3	2	1	2	.	.	.	1	.	.	.	1	2	.	.	.	.	.	.	.	.	.	2	2	2					
72	71	2	1	2	3	3	1	1	2	2	.	.	.	.	.	2	3	.	5	.	2	.	.	.	2	.		5	2	2			
73	72	3	1	2	3	2	1	3	2	1	2	4	3	4	.	2	.	4	5	.	2	.	.	.	2	3	3	5	2	2			
74	73	2	1	2	2	2	1	4	1	1	2	3	3	5	1	.	3	4	.	.	1	2	1	2	2	3	3	4	1	2	2	1	2
75	74	1	1	2	2	2	1	4	1	1	2	4	3	4	.	.	.	4	5	.	1	3	3	1	1	3	3	5	1	1	3	3	1
76	75	1	2	2	3	2	1	4	1	1	2	4	4	4	.	.	.	4	5	.	1	1	3	1	2	4	4	5	1	2	1	3	1
77	76	3	1	3	4	4	1	2	1	1	1	3	3	3	1	.	.	4	5	6	1	1	1	1	1	3	3	6	1	1	1	1	1
78	77	2	2	2	3	2	1	2	2	1	3	5	5	5	1	2	.	4	5	.	2	.	.	.	2	4	4	5	2	2			
79	78	2	2	3	4	2	1	1	2	1	1	2	3	4	1	2	.	4	.	.	1	3	3	1	2	3	3	4	1	2	3	3	1
80	79	2	1	2	1	1	1	4	3	2	.	.	.	.	.	2	3	4	5	.	2	.	.	.	1	4	4	5	2	1			
81	80	1	2	2	3	3	1	2	1	1	2	5	5	5	.	.	3	4	5	6	2	.	.	.	2	4	4	6	2	2			
82	81	2	2	2	4	2	1	4	2	1	2	4	4	4	.	2	.	.	5	.	1	2	1	1	1	4	4	5	1	1	2	1	1
83	82	1	2	1	2	2	1	4	2	2	.	.	.	.	.	.	3	4	5	.	1	3	2	2	1	2	2	5	1	1	3	2	2
84	83	2	2	2	4	4	1	4	1	1	3	4	4	4	.	.	.	4	5	.	1	3	3	1	1	4	4	5	1	1	3	3	1
85	84	2	2	2	1	2	1	4	1	1	2	5	5	4	1	.	3	.	5	.	1	3	3	1	1	4	4	5	1	1	3	3	1
86	85	1	2	2	2	2	1	1	3	1	2	4	5	4	1	2	.	.	5	.	2	.	.	.	1	4	4	5	2	1			
87	86	1	2	2	2	2	1	4	2	1	2	5	5	5	.	2	.	.	5	.	1	3	2	1	1	4	4	5	1	1	3	2	1
88	87	1	1	3	2	2	1	4	1	1	2	5	5	5	1	2	.	4	5	.	1	.	.	.	1	4	4	5	1	1			
89	88	2	1	3	3	2	1	1	1	1	3	4	3	5	1	.	3	4	5	.	1	3	4	1	1	3	3	5	1	1	3	4	1
90	89	2	2	2	5	1	1	4	3	1	1	4	4	4	.	.	.	4	5	.	1	3	3	1	1	4	4	5	1	1	3	3	1
91	90	1	1	2	2	2	1	4	1	1	2	4	3	5	.	.	.	.	5	.	1	2	1	2	1	3	3	5	1	1	2	1	2
92	91	2	1	2	5	1	1	4	2	1	2	4	3	4	.	2	3	.	5	.	1	3	3	1	1	3	3	5	1	1	3	3	1
93	92	1	1	2	2	2	1	4	1	1	2	5	4	5	.	2	3	.	.	.	1	4	4	1	1	4	4	3	1	1	4	4	1
94	93	2	1	3	5	5	1	3	1	1	2	4	4	5	.	.	.	.	.	6	2	.	.	.	2	3	3	6	2	2			
95	94	1	2	2	3	1	1	4	3	1	4	5	3	4	.	.	.	4	.	.	1	2	2	1	2	3	3	4	1	2	2	2	1
96	95	1	1	2	2	2	1	4	3	1	2	3	3	4	.	.	.	4	5	.	1	3	2	1	1	3	3	5	1	1	3	2	1
97	96	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.							
98	97	2	1	2	4	3	1	1	3	1	5	3	3	4	.	2	.	4	5	.	1	3	1	1	2	4	4	5	1	2	3	1	1
99	98	1	2	2	2	2	1	4	3	1	2	5	4	5	.	2	.	4	.	.	1	1	2	2	1	4	4	4	1	1	1	2	2
100	99	1	1	2	2	2	1	3	3	1	2	4	4	5	.	.	3	4	.	.	1	3	3	1	2	4	4	4	1	2	3	3	1
101	100	1	1	2	2	2	1	4	1	1	2	5	4	4	.	2	.	4	5	.	1	4	4	1	1	4	4	5	1	1	4	4	1
102	101	1	1	2	4	1	1	4	1	1	3	5	5	5	.	2	.	.	5	6	1	1	3	1	2	4	4	6	1	2	1	3	1
103	102	1	2	2	1	1	1	2	2	1	1	3	4	5	.	2	.	4	5	.	1	4	3	1	2	3	3	5	1	2	4	3	1
104	103	3	2	2	3	3	1	4	2	2	.	.	.	.	.	.	.	.	5	.	2	.	.	.	2	.		5	2	2			
105	104	1	1	2	2	2	1	1	2	1	2	5	5	5	1	2	.	4	5	.	1	.	3	1	1	4	4	5	1	1		3	1
106	105	2	1	2	2	2	1	4	3	1	2	4	4	5	.	.	.	.	5	.	1	3	3	1	1	3	3	5	1	1	3	3	1
107	106	3	2	2	5	2	1	4	3	1	1	5	5	5	.	.	3	4	5	.	1	3	4	1	1	4	4	5	1	1	3	4	1
108	107	1	2	2	3	1	1	4	1	1	3	5	5	4	.	2	3	4	5	.	2	.	.	.	1	4	4	5	2	1			
109	108	2	1	2	2	2	1	4	2	1	2	5	5	5	.	.	.	.	5	.	1	4	4	1	1	4	4	5	1	1	4	4	1
110	109	2	1	2	3	1	1	4	3	1	3	3	3	3	1	2	.	.	5	.	2	.	.	.	2	4	4	5	2	2			

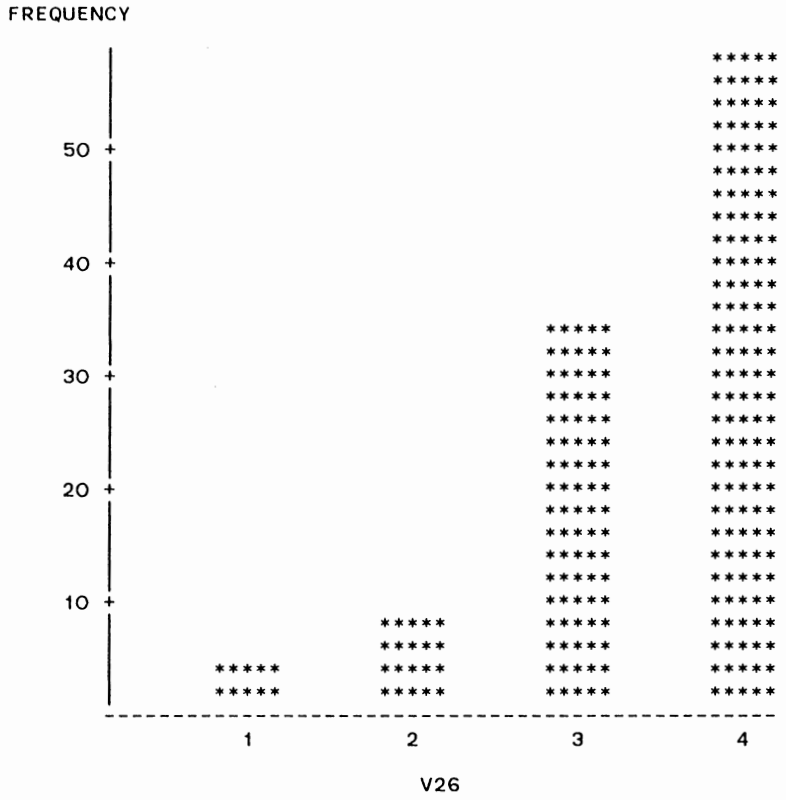
OBS	Q	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29	V30	V31	V32
111	110	2	1	4	3	3	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.							
112	111	2	1	2	3	3	1	1	2	1	1	4	4	4	.	.	3	.	5	.	2	.	.	.	2	3	3	5	2	2			
113	112	1	2	2	2	2	1	4	3	2	.	.	.	.	.	.	.	4	5	.	2	.	.	.	2	.		5	2	2			
114	113	2	1	2	4	4	1	2	2	1	2	3	2	4	.	.	.	4	5	6	.	.	3	1	2	4	4	6		2		3	1
115	114	1	2	2	1	1	1	1	2	1	2	5	5	5	.	.	.	4	5	.	1	4	4	1	2	4	4	5	1	2	4	4	1
116	115	1	2	2	3	2	1	4	3	1	2	4	5	4	.	.	.	4	5	6	2	.	.	.	1	4	4	6	2	1			
117	116	3	1	3	1	1	1	4	3	1	5	4	4	5	.	.	.	4	5	.	1	3	3	1	2	4	4	5	1	2	3	3	1
118	117	2	2	2	2	2	1	4	3	1	2	3	4	5	.	.	.	4	5	6	1	1	1	3	1	1	1	6	1	1	1	1	3

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
V1	118	1.61864407	0.67835260	191.00000000	1.00000000	4.00000000
V2	118	1.34745763	0.47819316	159.00000000	1.00000000	2.00000000
V3	118	2.22881356	0.57603147	263.00000000	1.00000000	5.00000000
V4	114	2.73684211	1.12927756	312.00000000	1.00000000	5.00000000
V7	107	3.08411215	1.25984048	330.00000000	1.00000000	4.00000000
V8	108	2.01851852	0.82009210	218.00000000	1.00000000	3.00000000
V9	108	1.08333333	0.27767392	117.00000000	1.00000000	2.00000000
V10	100	2.22000000	0.83581449	222.00000000	1.00000000	5.00000000
V11	98	4.00000000	0.87343380	392.00000000	2.00000000	5.00000000
V12	98	3.86734694	0.88092916	379.00000000	2.00000000	5.00000000
V13	98	4.25510204	0.61445180	417.00000000	3.00000000	5.00000000
V24	108	1.50000000	0.50233101	162.00000000	1.00000000	2.00000000

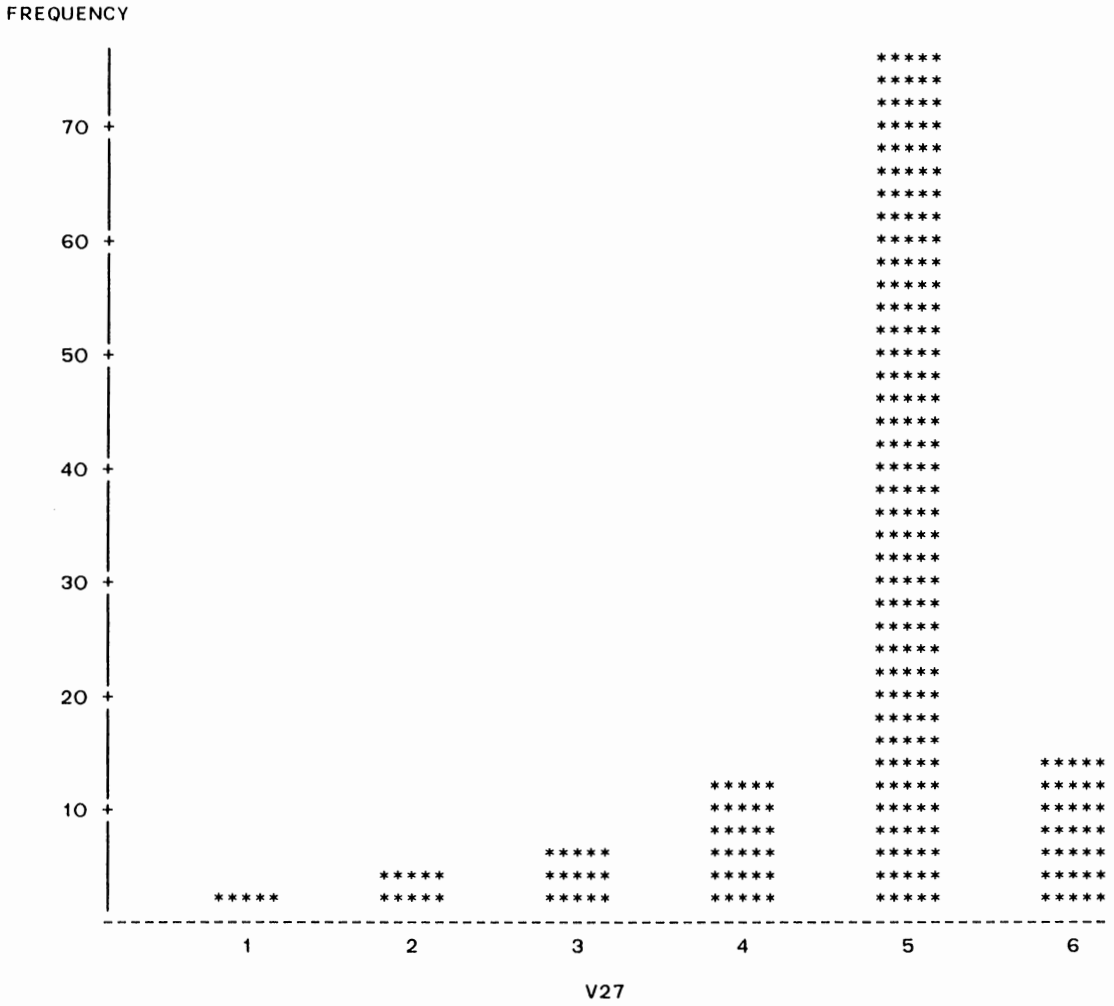
PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	V1	V2	V3	V4	V7	V8	V9	V10	V11	V12	V13	V24
V1	1.00000	-0.08865	0.24709	0.39770	0.06062	-0.12024	-0.02054	0.19148	-0.19006	-0.08636	-0.13032	0.02731
	0.0000	0.3398	0.0070	0.0001	0.5351	0.2152	0.8329	0.0563	0.0609	0.3978	0.2009	0.7791
	118	118	118	114	107	108	108	100	98	98	98	108
V2	-0.08865	1.00000	-0.16698	-0.01655	0.18628	0.12703	0.06471	0.01892	0.22363	0.37884	0.05586	-0.21462
	0.3398	0.0000	0.0707	0.8613	0.0547	0.1902	0.5058	0.8518	0.0269	0.0001	0.5848	0.0257
	118	118	118	114	107	108	108	100	98	98	98	108
V3	0.24709	-0.16698	1.00000	0.06845	-0.22372	-0.19027	-0.17389	0.03152	-0.12306	-0.11828	0.08390	0.04943
	0.0070	0.0707	0.0000	0.4693	0.0205	0.0486	0.0719	0.7556	0.2273	0.2461	0.4115	0.6114
	118	118	118	114	107	108	108	100	98	98	98	108
V4	0.39770	-0.01655	0.06845	1.00000	0.12392	-0.15449	-0.13524	0.03256	-0.09467	-0.03321	-0.16265	-0.01640
	0.0001	0.8613	0.4693	0.0000	0.2035	0.1104	0.1628	0.7478	0.3538	0.7455	0.1096	0.8662
	114	114	114	114	107	108	108	100	98	98	98	108
V7	0.06062	0.18628	-0.22372	0.12392	1.00000	-0.11972	-0.10089	-0.03834	0.17286	0.17702	-0.02814	-0.38697
	0.5351	0.0547	0.0205	0.2035	0.0000	0.2193	0.3012	0.7078	0.0887	0.0812	0.7833	0.0001
	107	107	107	107	107	107	107	98	98	98	98	106
V8	-0.12024	0.12703	-0.19027	-0.15449	-0.11972	1.00000	0.11628	-0.06978	-0.22562	-0.15750	-0.15013	0.19517
	0.2152	0.1902	0.0486	0.1104	0.2193	0.0000	0.2307	0.4925	0.0255	0.1214	0.1401	0.0440
	108	108	108	108	107	108	108	99	98	98	98	107
V9	-0.02054	0.06471	-0.17389	-0.13524	-0.10089	0.11628	1.00000	0.00000	0.00000	0.00000	0.00000	0.07373
	0.8329	0.5058	0.0719	0.1628	0.3012	0.2307	0.0000	1.0000	1.0000	1.0000	1.0000	0.4504
	108	108	108	108	107	108	108	99	98	98	98	107
V10	0.19148	0.01892	0.03152	0.03256	-0.03834	-0.06978	0.00000	1.00000	0.21208	0.05679	0.20364	-0.00370
	0.0563	0.8518	0.7556	0.7478	0.7078	0.4925	1.0000	0.0000	0.0360	0.5786	0.0443	0.9710
	100	100	100	100	98	99	99	100	98	98	98	99
V11	-0.19006	0.22363	-0.12306	-0.09467	0.17286	-0.22562	0.00000	0.21208	1.00000	0.73692	0.57628	-0.37585
	0.0609	0.0269	0.2273	0.3538	0.0887	0.0255	1.0000	0.0360	0.0000	0.0001	0.0001	0.0001
	98	98	98	98	98	98	98	98	98	98	98	98
V12	-0.08636	0.37884	-0.11828	-0.03321	0.17702	-0.15750	0.00000	0.05679	0.73692	1.00000	0.50122	-0.43397
	0.3978	0.0001	0.2461	0.7455	0.0812	0.1214	1.0000	0.5786	0.0001	0.0000	0.0001	0.0001
	98	98	98	98	98	98	98	98	98	98	98	98
V13	-0.13032	0.05586	0.08390	-0.16265	-0.02814	-0.15013	0.00000	0.20364	0.57628	0.50122	1.00000	-0.20853
	0.2009	0.5848	0.4115	0.1096	0.7833	0.1401	1.0000	0.0443	0.0001	0.0001	0.0000	0.0393
	98	98	98	98	98	98	98	98	98	98	98	98
V24	0.02731	-0.21462	0.04943	-0.01640	-0.38697	0.19517	0.07373	-0.00370	-0.37585	-0.43397	-0.20853	1.00000
	0.7791	0.0257	0.6114	0.8662	0.0001	0.0440	0.4504	0.9710	0.0001	0.0001	0.0393	0.0000
	108	108	108	108	106	107	107	99	98	98	98	108

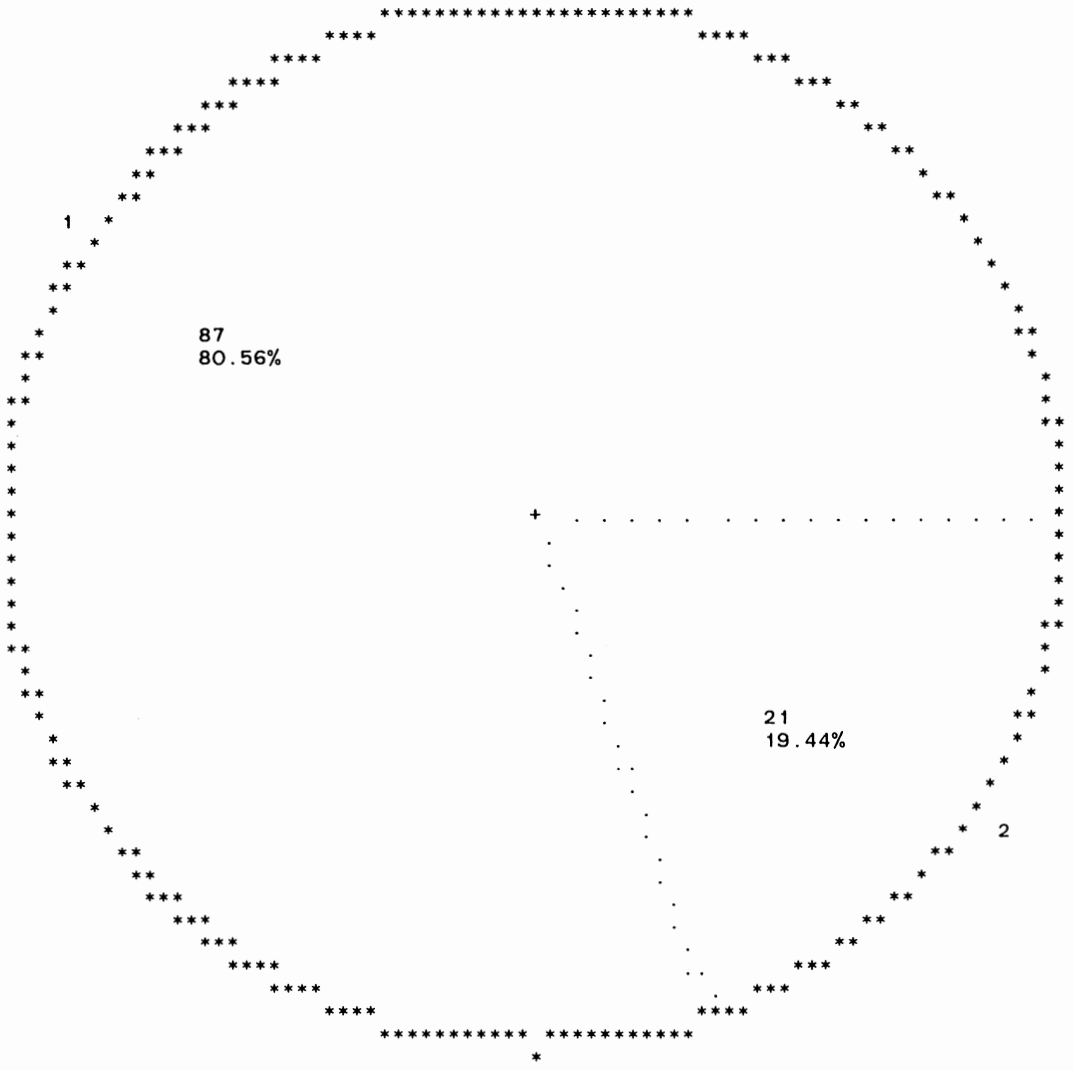
FREQUENCY BAR CHART



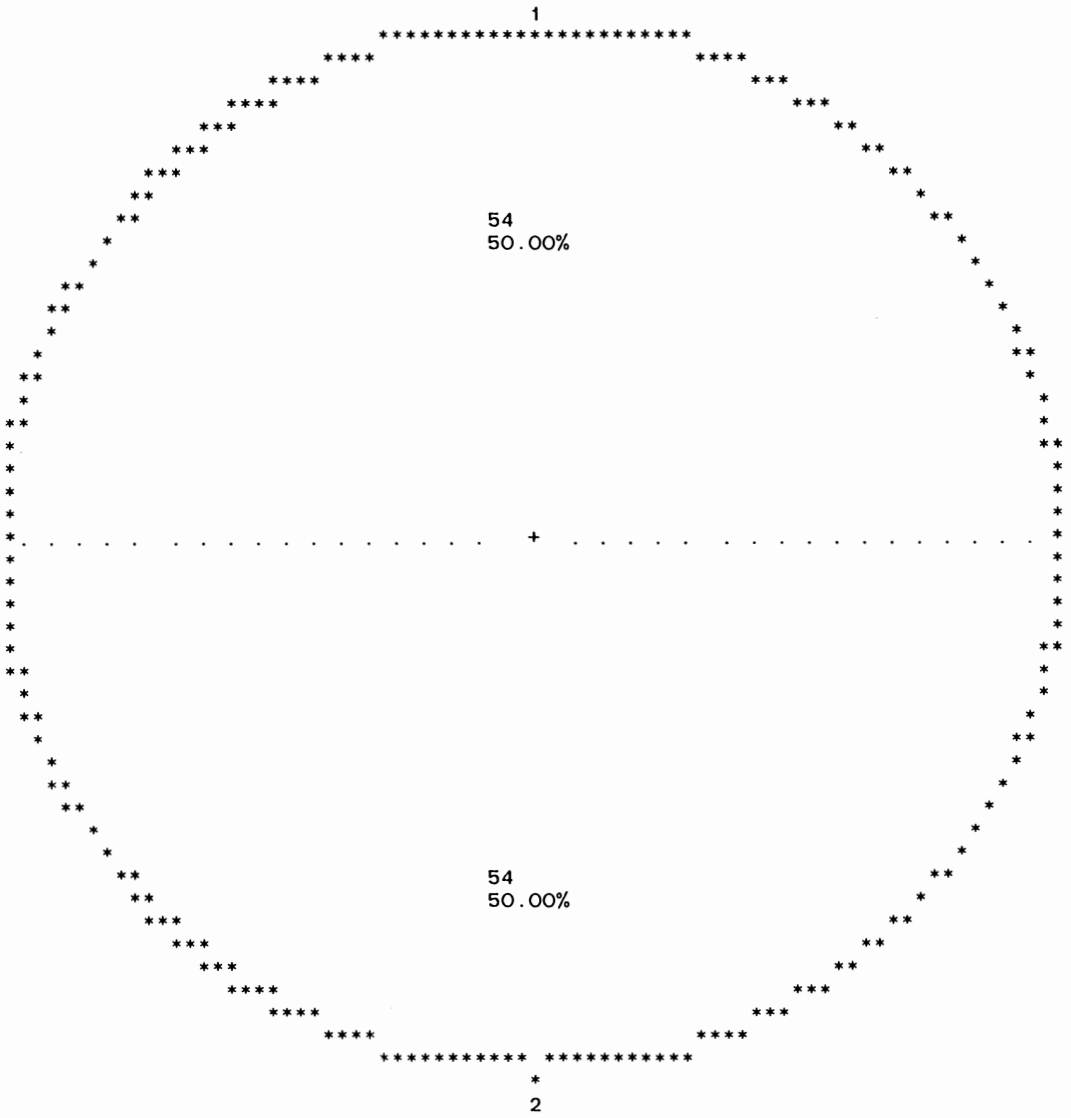
FREQUENCY BAR CHART



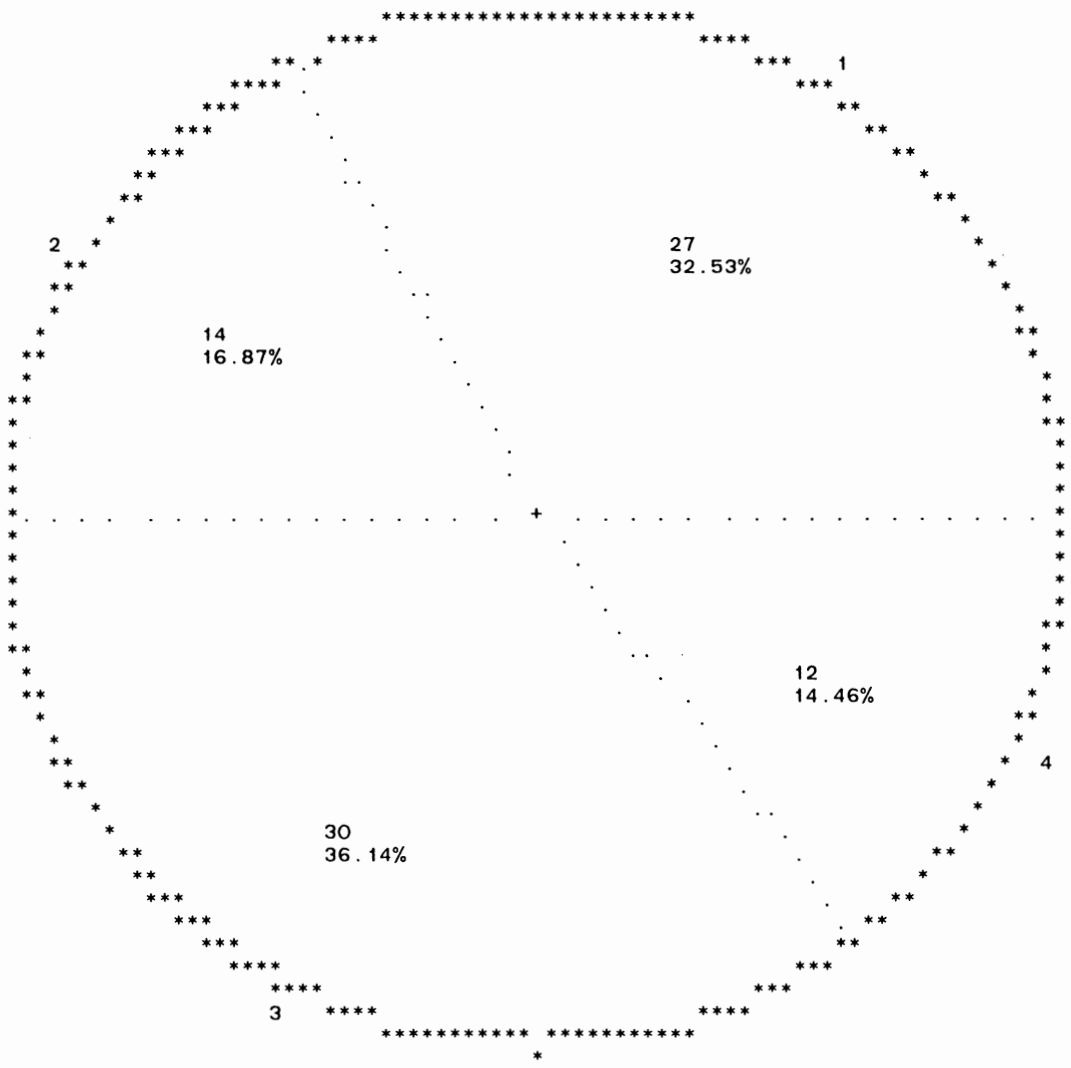
FREQ PIE CHART OF V28



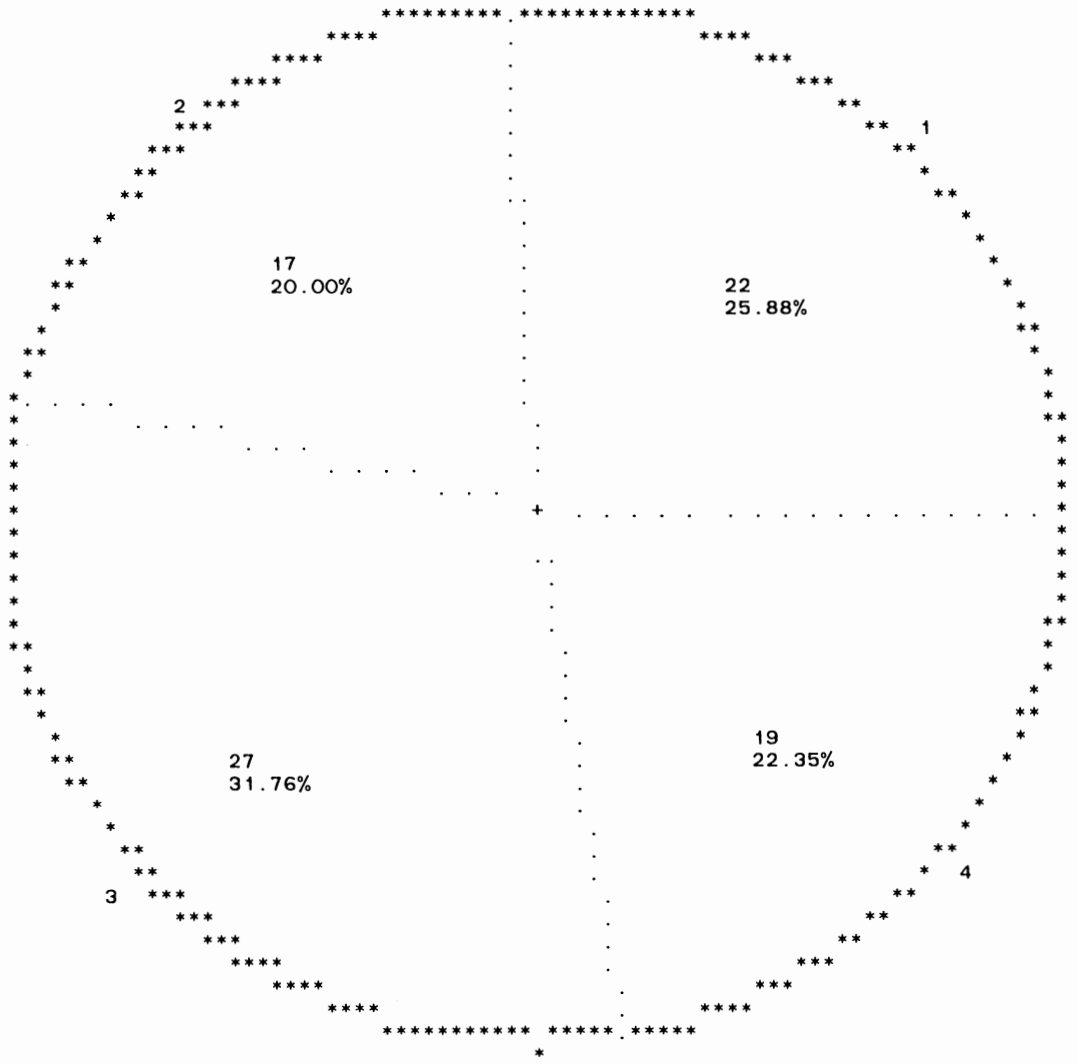
FREQ PIE CHART OF V29



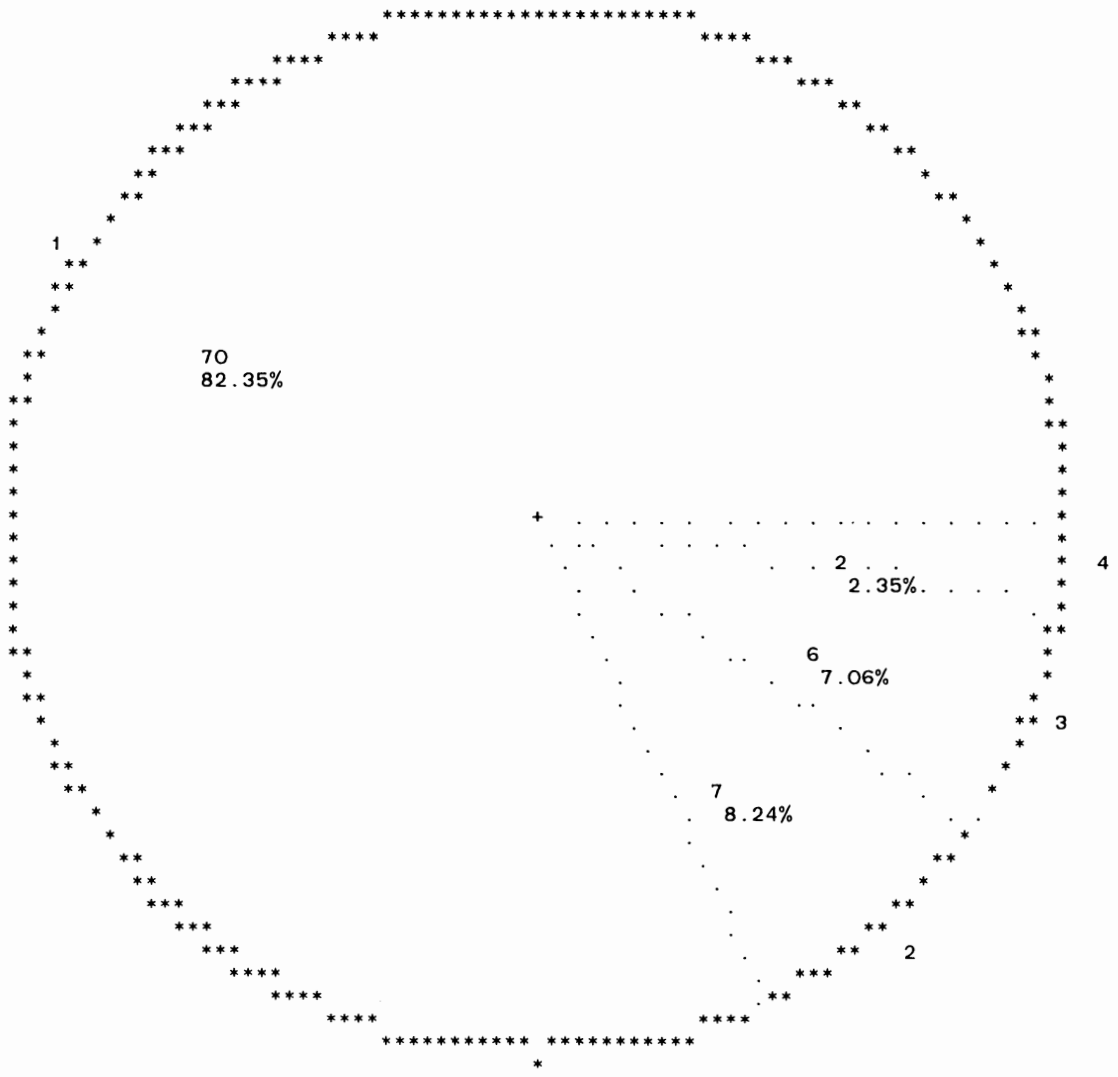
FREQ PIE CHART OF V30



FREQ PIE CHART OF V31



FREQ PIE CHART OF V32



STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V10

WARNING: 19 OBSERVATIONS DELETED DUE TO MISSING VALUES.

NOTE: SLENTRY AND SLSTAY HAVE BEEN SET TO .15 FOR THE STEPWISE TECHNIQUE.

STEP 1 VARIABLE V1 ENTERED R SQUARE = 0.03278139 C(P) = -0.92467669

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	2.21787597	2.21787597	3.29	0.0729
ERROR	97	65.43868969	0.67462567		
TOTAL	98	67.65656566			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.87826472				
V1	0.22045153	0.12158386	2.21787597	3.29	0.0729

BOUNDS ON CONDITION NUMBER: 1, 1

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

SUMMARY OF STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V10

STEP	VARIABLE ENTERED	VARIABLE REMOVED	NUMBER IN	PARTIAL R**2	MODEL R**2	C(P)	F	PROB>F
1	V1		1	0.0328	0.0328	-0.92468	3.2876	0.0729

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V11

WARNING: 20 OBSERVATIONS DELETED DUE TO MISSING VALUES.

NOTE: SLENTRY AND SLSTAY HAVE BEEN SET TO .15 FOR THE STEPWISE TECHNIQUE.

STEP 1 VARIABLE V24 ENTERED R SQUARE = 0.14126126 C(P) = 5.43157570

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	10.45333333	10.45333333	15.79	0.0001
ERROR	96	63.54666667	0.66194444		
TOTAL	97	74.00000000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	4.97333333				
V24	-0.65333333	0.16440620	10.45333333	15.79	0.0001

BOUNDS ON CONDITION NUMBER: 1, 1

STEP 2 VARIABLE V1 ENTERED R SQUARE = 0.17907278 C(P) = 3.05345873

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	13.25138554	6.62569277	10.36	0.0001
ERROR	95	60.74861446	0.63945910		
TOTAL	97	74.00000000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	5.38007034				
V1	-0.24864208	0.11886476	2.79805221	4.38	0.0391
V24	-0.65727017	0.16160071	10.57825659	16.54	0.0001

BOUNDS ON CONDITION NUMBER: 1.000136, 4.000543

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

SUMMARY OF STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V11

STEP	VARIABLE ENTERED	VARIABLE REMOVED	NUMBER IN	PARTIAL R**2	MODEL R**2	C(P)	F	PROB>F
1	V24		1	0.1413	0.1413	5.43158	15.7919	0.0001
2	V1		2	0.0378	0.1791	3.05346	4.3757	0.0391

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V12

WARNING: 20 OBSERVATIONS DELETED DUE TO MISSING VALUES.

NOTE: SLENTRY AND SLSTAY HAVE BEEN SET TO .15 FOR THE STEPWISE TECHNIQUE.

STEP 1 VARIABLE V24 ENTERED R SQUARE = 0.18832610 C(P) = 10.66467438

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	14.17634354	14.17634354	22.27	0.0001
ERROR	96	61.09916667	0.63644965		
TOTAL	97	75.27551020			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	5.00083333				
V24	-0.76083333	0.16120906	14.17634354	22.27	0.0001

BOUNDS ON CONDITION NUMBER: 1, 1

STEP 2 VARIABLE V2 ENTERED R SQUARE = 0.27204975 C(P) = 1.86858032

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	20.47868341	10.23934170	17.75	0.0001
ERROR	95	54.79682680	0.57680870		
TOTAL	97	75.27551020			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	4.09211106				
V2	0.55046276	0.16653017	6.30233987	10.93	0.0013
V24	-0.64477743	0.15743488	9.67496808	16.77	0.0001

BOUNDS ON CONDITION NUMBER: 1.052338, 4.209352

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

SUMMARY OF STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V12

STEP	VARIABLE ENTERED	VARIABLE REMOVED	NUMBER IN	PARTIAL R**2	MODEL R**2	C(P)	F	PROB>F
1	V24		1	0.1883	0.1883	10.6647	22.2741	0.0001
2	V2		2	0.0837	0.2720	1.8686	10.9262	0.0013

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V13

WARNING: 20 OBSERVATIONS DELETED DUE TO MISSING VALUES.

NOTE: SLENTRY AND SLSTAY HAVE BEEN SET TO .15 FOR THE STEPWISE TECHNIQUE.

STEP 1 VARIABLE V24 ENTERED R SQUARE = 0.04348286 C(P) = 2.47869263

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	1.59244898	1.59244898	4.36	0.0393
ERROR	96	35.03000000	0.36489583		
TOTAL	97	36.62244898			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	4.63500000				
V24	-0.25500000	0.12206520	1.59244898	4.36	0.0393

BOUNDS ON CONDITION NUMBER: 1, 1

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

SUMMARY OF STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE V13

STEP	VARIABLE ENTERED	VARIABLE REMOVED	NUMBER IN	PARTIAL R**2	MODEL R**2	C(P)	F	PROB>F
1	V24		1	0.0435	0.0435	2.47869	4.3641	0.0393

INITIAL FACTOR METHOD: PRINCIPAL COMPONENTS

PRIOR COMMUNALITY ESTIMATES: ONE

EIGENVALUES OF THE CORRELATION MATRIX: TOTAL = 8 AVERAGE = 1

	1	2	3	4	5	6	7	8
EIGENVALUE	2.673758	1.514059	1.134682	0.836252	0.725955	0.487769	0.394339	0.233186
DIFFERENCE	1.159699	0.379377	0.298430	0.110297	0.238186	0.093430	0.161153	
PROPORTION	0.3342	0.1893	0.1418	0.1045	0.0907	0.0610	0.0493	0.0291
CUMULATIVE	0.3342	0.5235	0.6653	0.7698	0.8606	0.9216	0.9709	1.0000

3 FACTORS WILL BE RETAINED BY THE MINEIGEN CRITERION

FACTOR PATTERN

	FACTOR1	FACTOR2	FACTOR3
V1	-0.31472	0.79959	-0.00167
V2	0.44503	0.06099	-0.55984
V3	-0.19351	0.39319	0.65178
V4	-0.23479	0.75536	-0.26620
V11	0.86572	0.09365	0.11851
V12	0.86691	0.21595	-0.05383
V13	0.68060	0.06384	0.52575
V24	-0.56557	-0.29387	0.17950

VARIANCE EXPLAINED BY EACH FACTOR

FACTOR1	FACTOR2	FACTOR3
2.673758	1.514059	1.134682

FINAL COMMUNALITY ESTIMATES: TOTAL = 5.322500

V1	V2	V3	V4	V11	V12	V13	V24
0.738390	0.515189	0.616860	0.696551	0.772286	0.801057	0.743714	0.438454

VITA

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