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VALIDATION AND JUSTIFICATION OF THE USE OF A SALES-APTITUDE TEST FOR US ARMY RECRUITER SELECTION

By

Todd A. Buchs

June 1994

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In this thesis, statistical and cost/benefit analyses are used to validate and justify the use of a sales-aptitude test for selection of successful recruiters. Using samples of experienced recruiters, with historical records of mission achievement, a recruiter's successfulness/unsuccessfulness was evaluated by pre-determined Measures of Recruiter Effectiveness. After grouping recruiters based on time served as a recruiter, several statistical hypothesis tests were performed to determine the effectiveness of the sales-aptitude test in predicting, and distinguishing between, successful and unsuccessful recruiters. Additionally, sales-aptitude test score data was obtained on a control group of non-recruiters. Using this data, in conjunction with that of experienced recruiters, several more statistical hypothesis tests were used to determine if the test can be used to screen those candidate recruiters who can successfully complete the Army Recruiter Course. Based on findings that the selected sales-aptitude test could only be used as a screening device in the recruiter selection process, and not to predict recruiter success in the field, a nonexhaustive cost/benefit analysis was performed to justify the use of the test in a screening role. The cost/benefit analysis indicated that the selected sales-aptitude test, used in a screening role, could save the US Army Recruiting Command and the US Army anywhere from an approximate minimum of $500,000 to an approximate maximum of $5,000,000, annually.

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VALIDATION AND JUSTIFICATION OF THE USE OF A SALES-APTITUDE TEST FOR US ARMY RECRUITER SELECTION

by

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Captain, US Army
BS, United States Military Academy, 1984

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ABSTRACT

In this thesis, statistical and cost/benefit analyses are used to validate and justify the use of a sales-aptitude test for selection of successful recruiters. Using samples of experienced recruiters, with historical records of mission achievement, a recruiter's successfulness/unsuccessfulness was evaluated by pre-determined Measures of Recruiter Effectiveness. After grouping recruiters based on time served as a recruiter, several statistical hypothesis tests were performed to determine the effectiveness of the sales-aptitude test in predicting, and distinguishing between, successful and unsuccessful recruiters. Additionally, sales-aptitude test score data was obtained on a control group of non-recruiters. Using this data, in conjunction with that of experienced recruiters, several more statistical hypothesis tests were used to determine if the test can be used to screen those candidate recruiters who can successfully complete the Army Recruiter Course. Based on findings that the selected sales-aptitude test could only be used as a screening device in the recruiter selection process, and not to predict recruiter success in the field, a nonexhaustive cost/benefit analysis was performed to justify the use of the test in a screening role. The cost/benefit analysis indicated that the selected sales-aptitude test, used in a screening role, could save the US Army Recruiting Command and the US Army anywhere from an approximate minimum of $500,000 to an approximate maximum of $5,000,000, annually.

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in this study, the Baltimore and Santa Ana Recruiting Battalions, in providing timely effectiveness and administrative data on tested recruiters. Finally, I acknowledge the assistance of personnel in the USAREC PA&E Directorate in providing recruiter effectiveness and cost data for this study.

EXECUTIVE SUMMARY

Current United States Army Recruiting Command (USAREC) records show that an unacceptably high percentage of recruiters is being lost each year for their inability to meet a mission quota of recruits on a monthly, quarterly and/or annual basis. Additionally, the Army Recruiter Course (ARC) is experiencing an unacceptably high level of candidate recruiter losses each year due to course failures. The annual losses of recruiters and recruiter candidates are costing USAREC and the US Army approximately seven million dollars each year. Therefore, a requirement exists to determine if there are any "instruments" available to USAREC to aid in the selection of future (successful) recruiters, thus providing a substantial cost savings to USAREC and the US Army.

The Commander, USAREC, is responsible for proposing necessary changes to selection criteria for assignment of personnel to USAREC. Although current selection criteria ensure that personnel assigned to USAREC have high moral character, emotional and financial stability, outstanding personal appearance and bearing, and a favorable record of service in previous assignments, they do not ensure that USAREC personnel possess any degree of sales ability. Therefore, a decision was made to initiate a pilot study concerning sales-aptitude testing and to validate/justify its use in selection of successful recruiters.

The primary question this pilot study intended to answer was, "Can a selected sales-aptitude test be used to select future (successful) recruiters, thus aiding in reducing the number of failures USAREC is experiencing among its Transitional Training and Evaluation (TTE) and field force recruiters?". A second question was, "Can a selected sales-aptitude test be used to decrease the number of failures USAREC is experiencing at the ARC?". A final question was, "Are there any roles in which a selected sales aptitude test could be used to save USAREC and the US Army money?".

This study used statistical and cost/benefit analyses to validate/justify the use of a selected sales-aptitude test for selection of successful recruiters. Using samples of experienced recruiters, with historical records of mission achievement, a recruiter's successfulness/unsuccessfulness was evaluated by pre-determined Measures of Recruiter Effectiveness (MOREs). The two MOREs used in this study were developed on the basis of a recruiter's mission. One MORE used a recruiter's cumulative mission assigned and mission achieved data to compute a cumulative-percent-success figure, while the second MORE used monthly mission assigned and mission achieved data to compute an average-percent-success figure. Both MOREs took quality of recruits into account, as well as Delayed Entry Program (DEP) losses. After placing recruiters into groupings, based on time served as a recruiter, several statistical hypothesis tests were performed using the success/nonsuccess and sales-aptitude test score data. Both parametric and nonparametric methods were used to determine the effectiveness of the sales-aptitude test in predicting, and distinguishing between, successful and unsuccessful recruiters.

Additionally, sales-aptitude test score data was obtained on a control group of non-recruiters. Using this data, in conjunction with that of experienced recruiters, several more statistical hypothesis tests were used to determine the screening capability of the selected sales-aptitude test.

Results obtained from the statistical tests indicated that the sales-aptitude test is incapable of distinguishing (by itself) between successful and unsuccessful recruiters when measuring success/nonsuccess by either of the two MOREs developed in this pilot study. Additionally, results also indicated that the sales-aptitude test cannot be empirically validated to function as a predictor of successful/unsuccessful recruiters (by itself) when using the method of validation employed in this study. As a result of these findings, the selected sales-aptitude test is not seen (by itself) as an effective aid in the selection of successful recruiters, nor in reducing the number of failures USAREC is experiencing among its TTE and field force recruiters each year.

The selected sales-aptitude test has, however, been partially validated, by the method employed in this pilot study, to function as a screening device in the recruiter selection process. Functioning in this capacity, the sales-aptitude test can reduce the risk of ARC failures by ensuring that only those recruiter candidates possessing a minimum degree of sales aptitude are selected to attend the ARC. Additionally, functioning as a screening device, the selected sales-aptitude test can be used to identify those recruiter candidates with a level of sales aptitude equal to, or greater than that of a trained recruiter, thus earmarking them as candidates not requiring the instruction given at the

ARC. These recruiter candidates would be sent directly to a recruiting battalion where they would be taught those recruiter specific tasks missed at the ARC, prior to starting the TTE program.

Based on findings that the selected sales-aptitude test could only be used by as a screening device in the recruiter selection process, a nonexhaustive cost/benefit analysis was performed to justify the use of the test in a screening role. The cost/benefit analysis indicated that the selected sales-aptitude test, used in a screening role, could create approximate savings to the US Army Recruiting Command and the US Army in the range of $500,000 to $5,000,000. Additional avenues of research were suggested by these results and are discussed.

I. INTRODUCTION

The Commander, United States Army Recruiting Command (USAREC), is responsible for proposing necessary changes to selection criteria used to select personnel for assignment to USAREC. The selection criteria are intended to ensure that all USAREC personnel have high moral character, emotional and financial stability, outstanding personal appearance and bearing, and a favorable record of service in previous assignments [Ref. 1, p. 3]. The selection criteria do not, however, ensure that USAREC personnel possess any degree of salesmanship ability. In this study, statistical and cost/benefit analyses are used to validate and justify the use of a sales-aptitude test for US Army recruiter selection.

A. BACKGROUND

1. General

Current USAREC records show that recruiters are "washing out" at a rate of 300-800, or five to ten percent of the recruiting force, each year [Ref. 2, p. 1]. Of this group, 65 to 76 percent, or 200-600 recruiters, are being separated due to their inability to meet a mission quota of recruits on a monthly, quarterly, and/or annual basis [Ref. 2, p. 1]. Additionally, the Army Recruiter Course (ARC) loses approximately 150 recruiter candidates, or approximately ten percent of its students, each year due to course failures

[Ref. 2, p. 1]. These exceedingly high relief rates and ARC failure rates are costing USAREC and the US Army approximately seven million dollars each year. Therefore, a requirement exists to determine if there are any "instruments" available to USAREC which could aid in the selection of future (successful) recruiters, thus providing a substantial cost savings to USAREC and the US Army.

2. Study

The Commander, USAREC, recommends to the Commanding General, US Total Army Personnel Command (PERSCOM), proposed changes to selection criteria for personnel assigned to USAREC [Ref. 1, p. 3]. The current selection criteria are outlined in Army Regulation (AR) 601-1, Assignment of Enlisted Personnel to the US Army Recruiting Command, and can be found in Appendix A. Procedures for volunteering or being nominated for recruiting duty are outlined in AR 601-1, and include the selection criteria found in Appendix A. A summary of these procedures for a volunteer or nominee and the associated forms can be found in Appendix B.

To help understand where recruiting failures occur, it is useful to create a "road map" of a recruiter's progression from recruiter candidate to field force recruiter [Ref. 2, pp. 3-4]. The following diagrams trace a recruiter's path, both prior to and after obtaining the recruiter badge.

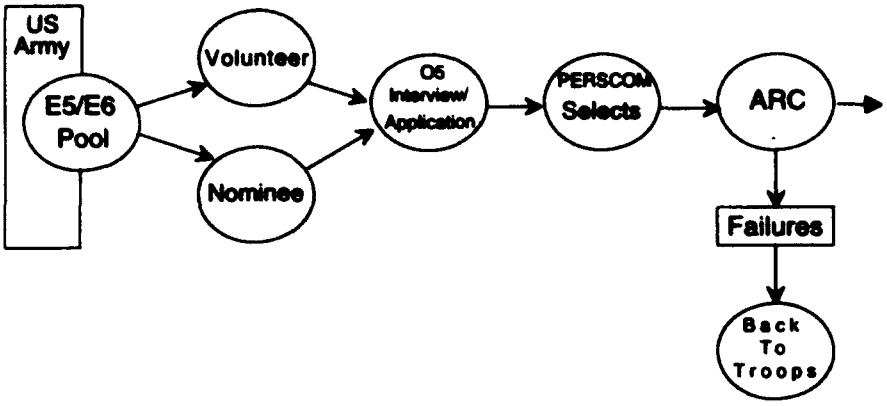

Figure 1. Recruiter Pre-Badge Path .

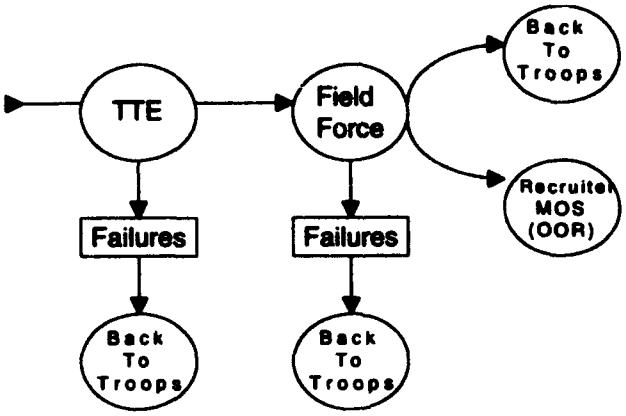

Figure 2. Recruiter Post-Badge Path .

Success, as defined by USAREC Manual 100-5, is a recruiter's ability to make his, or her assigned mission quota every month and, if possible, to go beyond the assigned mission [Ref. 4, p. 5]. Furthermore, the manual identifies those traits which USAREC believes a successful recruiter must possess: salesmanship ability, energy and

enthusiasm, communication skills, planning/organizational skills, integrity and leadership [Ref. 4, p. 71-131].

USAREC Regulation 350-4 defines a recruiter who fails to net 100 percent of his or her mission quota as a low producer, or unsuccessful recruiter. A low producer can be classified as ineffective if he, or she fails to demonstrate satisfactory progress in the Transitional, Training, and Evaluation (TTE) program, or while on an Individual Training Plan (ITP) [Ref. 1, pp. 13-14]. The TTE program is for new recruiters with less than nine months as a recruiter, and an ITP is for recruiters with greater than nine months of recruiting duty [Ref. 5, p. 1]. Both programs provide hands-on training and reassessments for low producing recruiters. Those recruiters classified as ineffective are recommended for involuntary reclassification and/or reassignment in accordance with AR 601-1.

A major shortfall was discovered while examining existing data relevant to predicting recruiter success: the available data was only administrative in nature. Other existing data, not made available for review due to its sensitive nature, included information on all previously listed traits except salesmanship ability. This unavailable information was contained in the packets prepared on volunteer and nominee recruiter applicants during the recruiter selection process. No data concerning sales aptitude of recruiters existed. In fact, it was discovered that the recruiting military occupational specialty (MOS) was the only technical MOS in the Army that did not require a screening

aptitude test.[1] Therefore, a decision was made to initiate a pilot study concerning sales aptitude testing and validate/justify its use in (successful) recruiter selection.

B. PROBLEM STATEMENT

The primary question this pilot study intends to answer is, "Can a selected sales-aptitude test be used to select future (successful) recruiters, thus aiding in reducing the number of failures USAREC is experiencing among its TTE and field force recruiters?". A second, equally important question is, "Can a selected sales-aptitude test be used to decrease the number of failures USAREC is experiencing at the ARC?". A final question to be answered is, "Are there any roles in which a selected sales-aptitude test could be used to save USAREC and the US Army money?"

C. WORKING HYPOTHESES

The following four working hypotheses, generated at the start of this study, form the basis of the data analysis for validation of the sales-aptitude test:

1. The sales-aptitude test distinguishes between those possessing some degree of sales comprehension and those with little or no sales aptitude, and thus functions as a screening device.
2. The test distinguishes between those who are recruiters and those who are not.
3. The test distinguishes between successful and unsuccessful recruiters (success/nonsuccess being determined by a Measure of Recruiter Effectiveness (MORE)).
4. There is a positive correlation between varying degrees of success/nonsuccess and test scores.

[1] Major Al Poikonen, USAREC PA&E spokesman, communicated this in a meeting in April, 1994.

D. SOLUTION APPROACH

In samples of experienced recruiters, with historical records of mission achievement, success or nonsuccess was determined by pre-determined Measures of Recruiter Effectiveness (MORE). Once recruiters have been evaluated as successful/unsuccessful according to a certain MORE, statistical hypothesis testing, consisting of correlation tests and t-tests, can establish an initial validation of the test. Specifically, the statistical hypothesis tests can act as gates, providing a necessary condition for validating the overall working hypotheses stated in paragraph E above. However, the hypothesis tests will not provide a sufficient condition to validate the sales-aptitude test. That condition can only be met with further testing and tracking, over time, of prospective recruiters as they pass through recruiter school, the subsequent TTE period, and then production on the job as recruiters.

Data for the above mentioned statistical hypothesis testing was obtained from both recruiters and a control group of non-recruiters. Hypotheses tests were conducted both solely within the group of non-recruiters and between recruiters and non-recruiters, again acting as gates to the initial validation of the sales-aptitude test.

After validation, one must justify the use of the sales-aptitude test for recruiter selection. This was accomplished through a cost/benefit analysis. Costs, both tangible and intangible, were used to develop a cost model for the replacement of a failed/ineffective recruiter. These costs, in turn, become the justification for using the test to assist in the selection of (successful) recruiters.

E. THESIS OUTLINE

This thesis uses statistical and cost/benefit analyses to validate and justify the use of a sales-aptitude test for (successful) recruiter selection. Chapter II describes the selected sales-aptitude test, why it was selected, and discusses why, where, how, when and to whom it was administered. Additionally, this chapter describes the establishment of the database used in the analysis. The development of MOREs, why they are appropriate, actual analysis of MORE's data, and hypothesis testing are the subjects of Chapter III. Chapter IV describes the results of the analysis and how they relate to the sales-aptitude test being used as a screening device in the recruiter selection process. Additionally, this chapter focuses on the cost-effectiveness of the test. The last chapter consists of a summary, tentative conclusions, and recommendations resulting from this research.

II. SALES-APTITUDE TEST SELECTION, VALIDATION AND SAMPLING METHODS, AND DATABASE DEVELOPMENT

This chapter describes the Sales Comprehension Test and discusses briefly why it was chosen for this study. The test validation method, as well as the sampling procedures used to collect the data needed to validate the test, are also outlined. Finally, the development of the database used as a basis for all analysis conducted in this study is briefly discussed.

A. SALES-APTITUDE TEST SELECTION

In the early stages of analysis, it was discovered that existing data relevant to predicting recruiter success only existed in the form of non-test predictors, specifically an interview and application. The interview format and application forms can be found in Appendix B. Informal interviews with actual recruiters and an initial literature review of recruiting manuals revealed that sales aptitude was a skill required of recruiters, but not one measured prior to selecting a soldier for recruiting duty. Therefore, a decision was made to initiate a pilot study concerning sales aptitude testing and validate/justify its use in (successful) recruiter selection.

In selecting a sales-aptitude test to be used as a predictor variable, several considerations were made. These considerations are consistent with those recommended by McKenna [Ref. 6, pp. 24-60]. They are:

1. The test needed to measure one's sales ability and potential, since it would be used as a predictor of successful recruiters.

2. It needed to be designed as an individual test since individual recruiters would be the independent sample members used in the analysis.

3. The test needed to be self-administering and require less than one hour to complete, so as not to present a burden to the recruiter taking the test.

4. The test results needed to be expressed quantitatively for purposes of analysis.

5. The test used in the pilot study would have to be commercially available since time constraints placed on the study and limited knowledge of sales did not allow for the design and validation of a new test.

6. The commercially available test would have to be relatively inexpensive and readily available because of budget and time constraints placed on the study.

7. The selected test would have to appear to measure sales aptitude and potential, thus possessing face validity with regards to this study.

8. The chosen test would have to be reliable so as to give consistent results from one time to another.

Four commercially available tests were considered for the pilot study. They were:

1. The Sales-Aptitude Test: ETSA Test 7A by Employer's Test and Services Associates, Inc.

2. The Sales Aptitude Check List by Science Research Associates, Inc.

3. The Sales Motivation Inventory, Revised by Martin M. Bruce. Ph.D., Publishers.

4. The Sales Comprehension Test, Form M, Revised by Martin M. Bruce, Ph.D., Publishers.

With time-to-complete and cost considerations being the primary eliminating factors for three of the four tests, the 30 question Sales Comprehension Test (Form M, Revised) published by Martin M. Bruce, PhD, was selected[2] as the pilot-study predictor

[2] Professor Ronald A. Weitzman, a member of the Recruiter Selection Support System Project, was the member of the project team tasked to select the proper test for the pilot study because of his extensive background in psychological testing.

variable. The test was commercially and readily available, and found to be used in markets selling such products as: cosmetics, electronics equipment, urban and rural petroleum, office equipment, insurance, pharmaceutical supplies, perfumes, paint, hardware, and encyclopedias [Ref. 7, pp. 9-11]. The Sales Comprehension Test was designed to aid in the appraisal of an individual's sales ability and potential, and to provide an objective (quantitative) measure of one's sales aptitude [Ref. 7, p. 2]. The selected test was designed to be self-administering and have no time limit for completion. However, the examinee is encouraged to work quickly and not spend much time on any one question. Historical data on the test showed that most subjects only required 15 to 20 minutes to complete the test [Ref. 7, p. 2], and the experience gained from this study supported this data.

Existing validation data made available in the Sales Comprehension Test Examiner's Manual revealed that the test was an effective instrument in distinguishing between groups of sales and non-sales personnel. Findings from historical statistical hypothesis testing suggested that there was less than one chance in 100 that means of these different samples were not significantly different. In three cross-validation studies since the test's original validation, the same findings were found. In addition to this empirical validity, the test also possessed face validity for the purposes of the pilot study [Ref. 7, pp. 3-4].

A predictor variable, a test in this case, is more likely to be reliable if the directions are specific and if scoring does not require subjective judgment [Ref. 6, pp. 35-36]. The

Sales Comprehension Test is self-administering; therefore, its instructions are very specific. The test provided an objective measure of one's sales ability, thus containing no subjectivity. Also, it is suggested that the test have a known reliability coefficient of at least 0.75 [Ref. 6, p. 35]. One way of determining the reliability of a test is to administer it to the same group of people on two different occasions and correlate the two sets of scores [Ref. 6, p. 33]. This is known as the test-retest method. If the person scoring highest on the original test scored highest on the retest, and the second highest on the original was second highest on the retest, and so on, the coefficient of reliability would be one. If no relationship existed, the reliability coefficient would be close to zero. The equation used to calculate the reliability coefficient is the same as that used to calculate Pearson's product moment correlation coefficient. It is, as defined by Conover [Ref 8, p. 251]:

$$r = \frac{\sum_{i=1}^{n} (X_i - \bar{X})(Y_i - \bar{Y})}{\left[\sum_{i=1}^{n} (X_i - \bar{X})^2 \sum_{i=1}^{n} (Y_i - \bar{Y})^2 \right]^{\frac{1}{2}}}$$

Existing reliability data made available in the Sales Comprehension Test Examiner's Manual showed that four tests of reliability, using the test-retest method of verifying reliability, produced reliability coefficients of 0.71 (0.79 when corrected for homogeneity), 0.88, 0.81, and 0.73 (uncorrected for homogeneity) [Ref. 7, pp. 7-8]. These reliability coefficients were sufficiently high to warrant confidence in consistency of measurement in group situations.

Even though the Sales Comprehension Test had demonstrated its value within several sales organizations as a predictor of successful salesmen [Ref. 7, pp. 4-9], it needed to be empirically validated within the USAREC organization in order to guarantee its validity as a predictor of recruiter success. A copy of the Sales Comprehension Test can be found in Appendix C.

B. VALIDATION AND SAMPLING METHODS

1. Validation Method

There are two methods in which to empirically validate a predictor variable. One method is known as the follow-up method. This method's name is derived from the fact that the predictor is administered at the time of application, and then, after the employees (recruiters) have been on the job long enough for effectiveness measures to be obtained, a determination is made on whether or not a sufficiently high correlation, or relationship, exists between the predictor scores and effectiveness scores. The second method is the present-employee method. Here, predictor data is collected on current employees (recruiters) who have been working long enough for effectiveness data to be available. [Ref. 6, pp. 96-97]

The follow-up method has the following advantages and disadvantages. They are consistent with those outlined in McKenna [Ref. 6, p. 99].

a. Follow-up Method Advantages

(1) The range of predictor scores is broader since this method would include those who have failed the ARC and TTE program.

(2) The predictor score is not influenced by factors such as training, job experience, attitude, and special motivation since it would be obtained prior to a soldier's entry into the ARC.

(3) This method provides for a more thorough validation of the predictor variable.

b. Follow-up Method Disadvantages

(1) This method requires sufficient time to collect effectiveness data on individuals tested prior to training, so that a correlation coefficient can be computed between predictor and effectiveness measures.

(2) Resource requirements have to be extended to cover the entire data tracking/collection period, thus increasing research costs.

The present-employee method has the following advantages and disadvantages. Like the follow-up method, these advantages and disadvantages are consistent with those outlined in McKenna [Ref. 6, p. 99].

c. Present-Employee Method Advantages

(1) Effectivenes data is readily available on individuals tested, thus involving minimal or no time delays for data collection.

(2) Resource requirements are minimal as a consequence of less time spent in data tracking/collection effort.

d. Present-Employee Method Disadvantages

(1) The range of predictor scores is narrower since this method does not include those who have failed the ARC and TTE program.

(2) It is possible that factors such as training and job experience could cause an improvement in a recruiter's score on the predictor variable (test).

Because time and money resources were somewhat limited in this study and because this study was only designed to be an initial validation test, the present-employee method of validation was chosen. Further, only one test was selected to administer. Now that a method of validation had been chosen, a method of sampling current recruiters needed to be selected.

2. Assumptions and Rationale for the Sampling Method

The decision was made to sample from two locations, rather than one, and to compare the results from the different sites. Two locations was felt to be adequate for this initial validation effort.

A combination of three forms of sampling was used to collect the data. They were: convenience, judgment, and exhaustive (random) sampling [Ref. 9, pp. 240-241]. Convenience and judgment sampling were used to select the two recruiting battalions from which recruiters would be tested.

The locations from which to select the two battalions to test, the North-East and West coasts, were chosen not only for convenience but also to assure quality control. Specifically, quality-control personnel would be available at these two locations during the time period allocated for testing and data collection.

The two battalions selected for the testing, one on the North-East coast and the other on the West coast, were selected as a result of judgment sampling. Selection was based on the battalions' overall standing in USAREC's Smart Book, and how long its recruiter zones had been stabilized. The Smart Book facilitated the selection of battalions which were felt to be representative of the entire recruiting battalion population, based on their standing amongst other recruiting battalions. By ensuring that recruiting zones had been stabilized in the battalions selected, one would be ensuring that recruiters within those battalions were given an adequate share of the recruiting market from which to recruit. Therefore, the recruiters selected to test and collect effectiveness data on all had an equal opportunity to succeed. The two recruiting battalions selected for the study were the Baltimore and Santa Ana Recruiting Battalions.

To ensure the sample size was large enough to be representative of not only the selected battalions, but also the entire active-duty recruiter population, exhaustive sampling was conducted in each of the two recruiting battalions. Because the population being studied consisted of only active-duty recruiters currently assigned a monthly recruiting mission (full-production recruiters), reserve recruiters and recruiters not assigned missions (limited-production recruiters) were excluded from the sampling. All

active-duty recruiters assigned a mission were selected, and each was considered an independent random sample.

When the sampling was complete, data on 131 individuals had been collected from the Baltimore Battalion, for 78 percent of its total active duty recruiter (with mission) population, and 145 from the Santa Ana Battalion, for 80 percent of its total active duty recruiter (with mission) population. In total, 276 individuals in two independent samples were available for the data-analysis portion of the study. This sample size represented approximately five percent of the entire active-duty recruiter (with mission) population.

Additionally, data was obtained from a control group of non-recruiters. The individuals making up this control group of data were students at the Army's Basic Non-commissioned Officer Course (BNCOC) located in Fort Knox, Kentucky. This sample consisted of 54 individuals in which 31 had no prior sales experience and 23, to include six prior recruiters, did have prior sales experience.

C. DATABASE DEVELOPMENT

The information contained in the database was provided by the Sales Comprehension Test (Appendix C), Respondent Data Form (Appendix D), and administrative and performance data provided by both the tested battalions and USAREC, PA&E Directorate.

In general, two primary databases were developed, one containing data on recruiters and the other containing essential data on non-recruiters (BNCOC personnel). Supporting spreadsheets were used to make necessary calculations for inputs into the recruiter database. The non-recruiter database required no supporting spreadsheets.

The recruiter database contained 14 variables used in this study. Each is listed and defined in Table I. Variable numbers two thru seven were used to calculate data for MORE 1 and variable numbers 10 and 11 and those to be discussed in the supporting spreadsheets were used to calculate data for MORE 2 and MORE 2 (0-9 mo).

The recruiter database required two supporting spreadsheets to calculate data for MORE 2 and MORE 2 (0-9 mo). One spreadsheet calculated percent figures for the variable GRADUATE OR SENIOR CATEGORY I-IIIA AVERAGE PERCENT SUCCESS (GSA AVG PCT SUC) and the other calculated percent figures for the variable VOLUME-AVERAGE PERCENT SUCCESS (VOL(-) AVG PCT SUC).

The supporting spreadsheet used to calculate GSA AVG PCT SUC contains six variables, each of which is listed and defined in Table II.

The second supporting spreadsheet was used to calculate VOL(-) AVG PCT SUC. It also contains six variables, each of which is listed and defined in Table III.

TABLE I. RECRUITER DATABASE VARIABLES.	
MO MSN	Months a recruiter is assigned a positive mission of any kind (used to time group recruiters).
GSA MSN	Graduate or senior category I-IIIA missions a recruiter is assigned over a specified period of time.
GSA ACH	Graduate or senior category I-IIIA missions a recruiter achieved over a specified period of time.
GSA CUM PCT SUC	The result of dividing a recruiter' s total GSA mission achieved (GSA ACH) by his or her total GSA mission assigned (GSA MSN) and multiplying by 100 to get a recruiter' s cumulative percent success for GSA missions.
VOL(-) MSN	All missions, excluding GSA missions, a recruiter is assigned over a specified time period.
VOL(-) ACH	All missions, excluding GSA missions, a recruiter achieved over a specified time period.
VOL(-) CUM PCT SUC	The result of dividing a recruiter' s total VOL(-) mission achieved (VOL(-) ACH) by his or her total VOL(-) mission assigned (VOL(-) MSN) and multiplying by 100 to get a recruiter' s cumulative percent success for VOL(-) missions.
TST SCR	The test score a recruiter obtained on the Sales Comprehension Test.
UNIT	The recruiter' s unit (0 for Baltimore and 1 for the Santa Ana Battalion).
GSA AVG PCT SUC	A recruiter' s average monthly success in achieving his or her GSA mission over a specified period of time (monthly success is defined as the recruiter meeting or exceeding the GSA mission for that month).
VOL(-) AVG PCT SUC	A recruiter' s average monthly success in achieving his or her VOL(-) mission over a specified period of time (monthly success is defined as a recruiter meeting or exceeding the VOL(-) mission for that month).
MORE 1	Measure of Recruiter Effectiveness One (Fully developed in Chapter III).
MORE 2	Measure of Recruiter Effectiveness Two (Fully developed in Chapter III).
MORE 2 (0-9 mo)	Measure of Recruiter Effectiveness Two data resulting from increased sample size for 0-9 month time group (Explained in more detail in Chapter III).

TABLE II. SUPPORTING SPREADSHEET VARIABLES.	
GSA ASGD	Graduate or senior category I-IIIA missions a recruiter is assigned in a one month time period.
GSA ACHD	Graduate or senior category I-IIIA missions a recruiter achieved in a one month time period.
DEP LOSS	An Army candidate, GSA category, who contracts to join the Army under the Delayed Entry Program (DEP), but fails to enter the Army at the prescribed time, thus being subtracted from a recruiter' s GSA mission achieved.
TOT GSA ACHD	The result of subtracting DEP LOSS from a recruiter' s GSA ACHD, thus becoming the total GSA mission a recruiter achieved in a one month time period.
GSA SUC	If a recruiter meets or exceeds his GSA mission for a month, after DEP LOSS, then he or she is considered a success and assigned a one, and if not, the recruiter is assigned a zero and considered a nonsuccess for that month in regards to GSA mission.
GSA AVG PCT SUC	Previously defined.

TABLE III. SECOND SUPPORTING SPREADSHEET VARIABLES	
VOL(-) ASGD	All missions, excluding GSA missions, a recruiter is assigned in a one month time period.
VOL(-) ACHD	All missions, excluding GSA missions, a recruiter achieved in a one month time period.
DEP LOSS	An Army candidate, VOL(-) category, who contracts to join the Army under the DEP, but fails to enter the Army at the prescribed time, thus being subtracted from a recruiter' s VOL(-) mission achieved.
TOT VOL(-) ACHD	The result of subtracting DEP LOSS from a recruiter' s VOL(-) ACHD, thus becoming the total VOL(-) mission a recruiter achieved in a one month time period.
VOL(-) SUC	If a recruiter meets or exceeds his or her VOL(-) mission for a month, after DEP LOSS, then he or she is considered a success and assigned a one, and if not, the recruiter is assigned a zero and considered a nonsuccess for that month in regards to VOL mission.
VOL(-) AVG PCT SUC	Previously defined.

The other primary database developed for this study contained data on non-recruiters (BNCOC personnel). This database contains three variables, each of which is listed and defined in Table IV.

TABLE IV. BNCOC DATABASE VARIABLES.	
TEST SCORE	The test score a non-recruiter obtained on the Sales Comprehension Test.
DONE CIV SALES	If a non-recruiter had prior sales experience, including prior recruiting, than he or she was assigned a "yes", and if not, the person was assigned a "no".
PRIOR RECR	If a non-recruiter was previously assigned as a recruiter then he or she was assigned a "yes", and if not, the person was assigned a "no".

A sample portion of the two primary databases and two supporting spreadsheets containing data used in this study can be found in Appendix E.

III. DEVELOPMENT OF MEASURES OF RECRUITER EFFECTIVENESS AND ANALYSIS USING STATISTICAL HYPOTHESIS TESTING

This chapter describes the Measures of Recruiter Effectiveness (MOREs) chosen to quantify a recruiter's effectiveness, and why they were appropriate for this study. The primary focus of this chapter is the analysis of the data generated on the selected MOREs by administration of the Sales Comprehension Test. The data are analyzed using statistical hypothesis testing so as to investigate the four working hypotheses, and to ensure that the first category of tests are appropriate measures of the collected data.

A. DEVELOPMENT OF MEASURES OF RECRUITER EFFECTIVENESS

In order to empirically validate a predictor variable, the Sales Comprehension Test in this case, one must evaluate the effectiveness of the predictor variable using some index of a recruiter's job success or effectiveness. This measure of job success or effectiveness is frequently called a performance criterion [Ref. 6, p. 2]. A term synonymous to performance criterion and used extensively in military operations research is Measure of Effectiveness (MOE). Since this study focuses on an individual recruiter's effectiveness, the term used throughout this study to represent to what extent a recruiter has accomplished his, or her goals/mission is Measure of Recruiter Effectiveness (MORE).[3]

[3] The term, Measure of Recruiter Effectiveness, was developed by Professor James G. Taylor, Principal Investigator for the Recruiter Selection Support System Project.

In selecting a MORE in which to evaluate the effectiveness of the Sales Comprehension Test, several considerations were made. These considerations are consistent with those outlined in McKenna [Ref. 6, pp. 1-22]. They are:

- The MORE must be relevant in that it must be related to the important aspects of job success.
- The MORE must be practical in terms of time, effort, and costs required to collect MORE data.
- The MORE should be objective rather than subjective so as to avoid any biased or prejudiced judgments.
- The MORE data must be quantifiable for purposes of analysis.
- The MORE data must be reliable and not vary from one period to another because of chance factors.
- The MORE must be unbiased so that every recruiter being sampled has an equal opportunity to succeed.

Based on information from the leadership in both recruiting battalions tested, and adherence to the considerations above, an initial MORE was selected. A recruiter's effectiveness can be measured by the percent of mission he, or she achieved over a selected time period. A mission is the number of personnel a recruiter is tasked to bring into the Army during a specified time period. Percent of mission achieved, for a given time period, is the result of dividing the number of personnel a recruiter brought into the Army by the number of personnel he, or she was tasked to bring into the Army, and multiplying by 100.

However, a mission is broken down into two major categories, Graduate or Senior Category I-IIIA (GSA) and Volume (VOL). The first category, GSA, includes those

personnel who are high school graduates, or have had more education, or who are currently seniors in high school with a valid graduation date. Those who are seniors in high school must possess a letter from their high school verifying that they will graduate on time, with the appropriate amount of credits. Additionally, those personnel being categorized as a GSA must be non-prior service and must have scored 50 or higher on the Armed Forces Qualification Test (AFQT). The other category, VOL, includes all categories of personnel who may qualify to enter the Army, including GSA. [Ref. 10, pp. 22-27]

For the purposes of this study, the two mission categories are categorized as GSA and VOL(-). The definition of GSA remains the same as stated above, but the category VOL(-) is defined as all categories of personnel who may qualify to enter the Army, excluding GSA. Simply restated, the GSA category represents quality and the VOL(-) category represents other than quality.

The current Department of the Army policy governing the use of our recruiting resources states that the standard for recruiting is 67 percent quality, or GSA, and 33 percent other than quality, or VOL(-). [Ref. 11, p. 2]

Therefore, the initial MORE was modified to take into account quality. Percent of mission achieved was now weighted and became percent of GSA mission achieved multiplied by 67 percent plus percent of VOL(-) mission achieved multiplied by 33 percent. This combined total of percent of mission achieved was renamed <u>combined percent success</u>.

The time period selected from which to base effectiveness on was three years. This time period was felt to be appropriate since it would allow for the collection of effectiveness data on essentially three different time groups of recruiters:

1. Transitional, Training and Evaluation Recruiters -- those recruiters with 0-9 months of recruiting time.
2. Field Force Recruiters-- those recruiters with 10-24 months of recruiting time.
3. Field Force and Career Recruiters -- those recruiters with greater than 24 months of recruiting time.

In general, a detailed recruiter who chooses not to obtain the recruiter MOS, OOR, after 24 months of recruiting duty, remains a detailed recruiter until the completion of his or her recruiting duty. One who does change his, or her MOS to OOR after 24 months of recruiting duty is known as a career recruiter, and remains as such until the end of his, or her military career.

Therefore, having taken into account quality and time factors, a recruiter's combined cumulative percent success can be expressed quantitatively as:

$$\left(\frac{\text{TotalGSAMissionAchievedinThreeYears}}{\text{TotalGSAMissionAssignedinThreeYears}} \times .67 + \frac{\text{TotalVOL(-)MissionAchievedinThreeYears}}{\text{TotalVOL(-)MissionAssignedinThreeYears}} \times .33\right) \times 100$$

This combined-cumulative-percent-success expression is referred to throughout this study as MORE 1. The data resulting from this expression are in the form of percentages.

In selecting MORE 1, the most important factor considered was the relevancy of the MORE. Specifically, was the MORE related to the most important aspects of a recruiter's job success? Informal interviews with the leadership in both battalions and

informal discussions with USAREC Headquarters personnel, indicated that a recruiter's mission achievement was the most important aspect of a recruiter's job success.

The second factor considered was the practicality of the MORE data. Since the present-employee method of validation was being used to validate the predictor variable because of time limitations, the MORE data being collected had to be readily available. Therefore, instead of selecting an ultimate MORE, such as a recruiter's efficiency report upon completion of his, or her recruiting assignment, an intermediate, or surrogate, MORE was chosen. This choice ensured that the MORE data would be more readily available, and thus more practical for this study.

Because MORE 1 data is expressed numerically and requires no subjective judgments, it is both quantifiable and objective. As a result of meeting these two criteria, the MORE 1 data can be used for purposes of analysis, and the data is considered as being unbiased and unprejudiced.

In general, a MORE is more reliable if it is based on effectiveness over a relatively long period of time, and if there is a large range of individual differences in the MORE data [Ref. 6, p. 17]. Using MORE 1, effectiveness data is collected on a recruiter for the length of time he or she has been a recruiter. Therefore, the stability of the MORE is based on which time group the recruiter falls into. The effectiveness data for a recruiter in the 0-9 month time group will be less stable than the effectiveness data for a recruiter in the 10-24 month, or the greater-than-24-month time group. All time groups displayed

a large range of individual differences in MORE 1 data, thus sufficiently satisfying the requirement for reliability.

Finally, MORE 1 was considered to be unbiased, thus allowing every recruiter sampled to have an equal opportunity to succeed. Very rarely is a MORE completely "pure," but when it is relatively free from extraneous influences, it is considered to be unbiased [Ref. 6, pp. 13-14]. Because the recruiters sampled all had very similar sales territories, and because their recruiter zones had been stabilized over the period of time in which effectiveness data had been collected, MORE 1 was determined to be relatively free from extraneous variables, and thus unbiased.

After an initial analysis of MORE 1 data, a decision was made to develop a second MORE from which to measure a recruiter's effectiveness. It was felt that MORE 1 was concealing monthly success/nonsuccess data since it was based on a cumulative percentage of mission success and did not consider a recruiter's monthly success rate. Therefore, MORE 2 was developed.

The development of MORE 2 also resulted in a combined-percent-success figure as did MORE 1, but MORE 2 differed in that its calculations resulted in a figure representing a recruiter's combined-average-percent-success, as opposed to a combined-cumulative-percent-success figure. Measure of Recruiter Effectiveness 2's development started with a look at a recruiter's monthly mission assigned/mission achieved data for both GSA and VOL(-) missions. Each month that a recruiter was assigned a mission, he, or she was evaluated for success based on mission achievement

for that month. If the recruiter met or exceeded his, or her entire mission for that month, then he, or she was considered a success and given a one. If not, then the recruiter was given a zero and considered a nonsuccess in regards to that specific mission category. An average of these monthly binary figures, over the recruiter's current length of time as a recruiter, resulted in an average percent success figure for both GSA and VOL(-) categories. Consideration for quality recruits was applied in the same fashion as MORE 1 (67 percent quality and 33 percent other than quality). The resulting figure represented a recruiter's combined-average-percent success. Like data resulting from MORE 1, the data resulting from MORE 2 was also in the form of a percentage.

The previously mentioned considerations for selecting a MORE were used to select MORE 2 (just as they were used to select MORE 1). Measure of Recruiter Effectiveness 2 was relevant, practical, objective, quantifiable, reliable and unbiased in a manner relatively similar to MORE 1.

It is important to note here that both MOREs' data included Delayed Entry Program (DEP) losses when considering a recruiter's mission achievement in both GSA and VOL(-) categories. Delayed Entry Program losses result when an Army candidate contracts to join the Army, but does not meet his, or her obligation, and thus fails to enter the Army at his, or her prescribed time.

Now that two different methods to measure a recruiter's success have been developed, statistical hypothesis testing is used to analyze the data generated from the two MOREs and the Sales Comprehension Test.

B. ANALYSIS USING STATISTICAL HYPOTHESIS TESTING

The statistical procedures used to provide a basis for the empirical validation of the ›ales Comprehension Test involve the use of statistical tests, specifically correlation and t-tests. As mentioned in Chapter I, these statistical hypothesis tests can, at most, serve only as a necessary condition for empirically validating the Sales Comprehension Test and working hypotheses discussed in Chapter I.

1. General

In order to reject, or fail to reject the four working hypotheses discussed in Chapter I, the analysis required that six statistical hypothesis tests be performed. The null hypotheses are:

- The mean Sales Comprehension Test scores of the two tested battalions are equal (used to determine whether the data from the two battalions could be joined for the remainder of the analysis, thus increasing the sample sizes within time groups).
- There is no linear relationship between a recruiter's effectiveness, measured by MORE 1 or MORE 2, and his, or her obtained test score (used to determine the predictive capability of the Sales Comprehension Test).
- The mean Sales Comprehension Test score of the top 30 performers in a time group, measured by MORE 1 or MORE 2, is equal to the mean test score of the bottom 30 performers in the same time group (used to determine whether the test was distinguishing between successful/unsuccessful recruiters based on success measured by MORE 1 or MORE 2).
- The mean Sales Comprehension Test score of the top 30/bottom 30 performers in a time group, measured by MORE 1, is equal to the mean test score of the top 30/bottom 30 performers in the same time group, measured by MORE 2 (used do determine whether the two MOREs were measuring success/nonsuccess equivalently).
- The mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of non-recruiters with no sales experience (used to determine whether the test was distinguishing between those with sales experience and those without).

- The mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of TTE recruiters (used to determine whether the test was distinguishing between TTE recruiters and non-recruiters with sales experience).

Because there are three distinctive time groups of recruiters (0-9 mo., 10-24 mo., and greater than 24 mo.), the second, third and fourth hypothesis tests above were performed separately within each time group so as to keep the results consistent with the natural time groupings of recruiters. Therefore, 21 primary hypothesis tests were conducted in this study.

2. Methodology and Explanation of Statistical Tests

The general methodology for conducting each of the statistical hypothesis tests was the same, regardless of whether the statistical test being used was a correlation test or t-test. The methodology was designed to first evaluate the appropriateness of the statistical test to be used in the hypothesis test, and then to actually conduct the statistical test to reject, or fail to reject the null hypothesis.

The first step in each hypothesis test was to produce descriptive statistics on each set of data in order to conduct a quick screen of each data set. The next step was to visually examine the distribution of values for each data set, and perform normality tests on each, to verify assumptions concerning the use of the selected statistical test. Histograms, with normal curves, were used to graphically depict whether or not each data set was normally distributed. Additionally, another graphical test of normality used was the Normal Quantile-Quantile plot. Using this graphical tool, if the sample was from a normal distribution, the points would fall more or less on a straight line. Although

normal probability plots provide a visual basis for checking normality, it is desirable to compute a statistical test of the hypothesis that the data are from a normal distribution. Two commonly used tests, and those used in this study, are the Lilliefors and Shapiro-Wilks tests of normality.

The Lilliefors test of normality, a non-parametric test, is a modified version of the Kolmogorov test. The modifications allow it to be used in several situations where parameters are estimated from the data. That is, the null hypothesis states that the population is one of the family of normal distributions without specifying the mean or variance of the normal distribution [Ref. 8, p. 357]. Acceptance of the null hypothesis does not mean the parent population is normal, but it does say the normal distribution does not seem to be an unreasonable approximation of the true unknown distribution [Ref. 8, p. 360]. Therefore, either nonparametric or parametric statistical tests that assume a normal parent distribution may be appropriate for testing with these data.

Another well-known goodness-of-fit test for normality that may be used in conjunction with or instead of the Lilliefors test is the Shapiro-Wilks test for normality. Some empirical studies indicate that this test has good power in many situations when compared with many other tests of the composite hypothesis of normality [Ref. 8, p. 363]. The Shapiro-Wilks test is only used to test the normality of data sets with less than 51 data points, since existing tables can only support data sets of this size.

Now that the appropriateness of the statistical test to be used has been evaluated, the proper test can be used to reject, or fail to reject the null hypothesis in each test.

a. Correlation Tests

In each correlation test to test the null hypothesis that no correlation exists between two random variables, a scatterplot was used to provide a preliminary graphical representation of the relationship between the two variables being studied. After examining the scatterplot, one or more of three different correlation tests were used to determine the strength of the linear relationship, if any, between the two variables. They are: Pearson's product-moment correlation coefficient, Spearman's rank correlation coefficient and Kendall's tau-b rank-order correlation coefficient. The difference between them lies in the assumptions required to use them. Normality must be assumed when testing hypotheses about the Pearson correlation coefficient, and, when normality cannot be assumed, Spearman's rho and/or Kendall's tau-b can be used since these coefficients make limited assumptions about the underlying distribution of the variables [Ref. 12, pp. 287-288].

Pearson's correlation coefficient, r, as defined by Norusis [Ref. 12, p. 284], is

$$r = \frac{\sum_{i=1}^{N} (X_i - \overline{X})(Y_i - \overline{Y})}{(N-1)\, S_X\, S_Y}$$

where $\overline{X}$ and $\overline{Y}$ are the sample means, N is the number of cases, and S_X and S_Y are the sample standard deviations of the two variables. The absolute value of r indicates the strength of the linear relationship. A value of one indicates a perfect linear relationship, and a value of zero indicates no linear relationship. When the value of r is positive, a

positive linear relationship between two variables exists, and when the value of r is negative, a negative linear relationship of some magnitude exists.

Although the correlation coefficient provides an observed strength of association between measurements on two variables being tested, the primary goal of Pearson's correlation coefficient, in this study, is to test hypotheses about the unknown population correlation coefficient, denoted as ρ, based on its estimate, the sample correlation coefficient, r. The hypothesis test that the population coefficient is zero is based on the appropriate test statistic described by Norusis [Ref. 12, p. 287]:

$$t = r\sqrt{\frac{N-2}{1-r^2}}$$

where N is the number of cases and r is the sample (Pearson's) correlation coefficient.

If the assumption of bivariate normality appears unreasonable, nonparametric tests, such as Spearman's rho and Kendall's tau-b, can be used to calculate the correlation coefficient. Both are functions of only the ranks assigned to the observations in each sample.

Spearman's rank correlation coefficient, ρ, as defined by Conover [Ref. 8, p. 252] is

$$\rho = \frac{\sum_{i=1}^{N}\left[R(X_i) - \frac{N+1}{2}\right]\left[R(Y_i) - \frac{N+1}{2}\right]}{N(N^2-1)/12}$$

if there are only a moderate number of ties present in the data. Otherwise, ρ is calculated using the equation

$$\rho = \frac{\sum_{i=1}^{N} R(X_i)\,R(Y_i) - N(\frac{N+1}{2})^2}{\left(\sum_{i=1}^{N} R(X_i)^2 - N(\frac{N+1}{2})^2\right)^{\frac{1}{2}}\left(\sum_{i=1}^{N} R(Y_i)^2 - N(\frac{N+1}{2})^2\right)^{\frac{1}{2}}}$$

which is nothing more than Pearson's r computed on the ranks and average ranks of the data [Ref. 8, p. 252]. In both equations, N is the bivariate random sample size and $R(X_i)$ and $R(Y_i)$ are the ranks of X_i as compared with the other X values and the ranks of Y_i as compared with the other Y values, respectively. Like the Pearson correlation coefficient, the rank correlation ranges between -1 and +1, where -1 and +1 indicate a perfect linear relationship between the ranks of the two variables. Therefore, the interpretation is the same except that the relationship between ranks, and not values, is examined.

In this study, Spearman's ρ is used directly as a test statistic to test for a correlation between two random variables. A two-tailed test was used to test the null hypothesis that no correlation exits between the two variables being tested, versus an alternative hypothesis that a correlation does exist.

Kendall's correlation coefficient, τ, resembles Spearman's rho in that it is based on the order (ranks) of the observations rather than the numbers themselves. It is defined by Conover [Ref. 8, p. 256] as

$$\tau = \frac{N_c - N_d}{N(N-1)/2}$$

where N_c and N_d are described as the number of concordant pairs and number of discordant pairs, respectively, and $N(N-1) / 2$ is the total number of pairs.

Like Spearman's rho, Kendall's tau can be used directly as a test statistic to test the null hypothesis of no correlation between two variables. It is used as such in this study.

b. t-tests

When using a t-test to test the null hypothesis that two population means are equal, the independent samples t-test was used since the samples gathered in this study were independent random samples. However, if the distribution of populations tested did not appear to be normal, the Mann-Whitney test, a nonparametric counterpart, was used instead, to test the null hypothesis that two independent samples come from populations having the same distribution. If the assumptions needed for the t-test are met, the t-test is more powerful than the Mann-Whitney test since it uses more information from the data [Ref. 12, pp. 361-362]. However, if one uses the t-test when normality assumptions are violated, it may result in an erroneous observed significance level [Ref. 12, p. 362].

If the t-test is chosen as the statistical test of choice, one must first test the hypothesis that the two population variances are equal. In this study, this was accomplished by using Levene's homogeneity-of-variance test. This test is less dependent on the assumption of normality than most tests of equality of variance, and thus is particularly useful with analysis of variance [Ref. 12, p. 179]. It is obtained by

computing, for each case, the absolute difference from its group mean, and then performing a one-way analysis of variance on these differences [Ref. 12, p. 247].

If the two population variances are not found to be equal, then the test statistic used to test the hypothesis that the two population means are equal is, as defined by Norusis [Ref. 12, p. 246],

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

where $\bar{X}_1$ and $\bar{X}_2$ are the samples' means, S_1^2 and S_2^2 are each sample's variances, and N_1 and N_2 are the samples' sizes.

If the two population variances are found to be equal, than a pooled-variance t-test is used. The test statistic is identical to the equation for t given above except that the group variances are now each replaced by a pooled estimate, S_p^2, which is, as defined by Norusis [Ref. 12, p. 247]

$$S_p^2 = \frac{(N_1 - 1)\, S_1^2 + (N_2 - 1)\, S_2^2}{N_1 + N_2 - 2}$$

where N_1, N_2, S_1^2, and S_2^2 are as defined above.

If the distribution of populations being tested did not appear to be normal, the Mann-Whitney test was used to test the hypothesis that two independent samples come from populations having the same distribution. The test statistic for testing the above hypothesis as defined by Conover [Ref. 8, p. 217] is

$$T = \sum_{i=1}^{N} R(X_i) \text{ or } T = \sum_{i=1}^{N} R(Y_i)$$

where the first statistic is the sum of the ranks assigned to the sample from the first population, and the second statistic is the sum of the ranks assigned to the sample from the second population. Either test statistic can be used to test the hypothesis when there are no ties or just a few ties in the ranked data [Ref. 8, p. 217]. If there are many ties, than Conover [Ref. 8, p. 217] suggests to subtract the mean from T and divide by the standard deviation to get

$$T_1 = \frac{T - n\frac{N+1}{2}}{\sqrt{\frac{nm}{N(N-1)}\sum_{i=1}^{N} R_i^2 - \frac{nm(N+1)^2}{4(N-1)}}}$$

as the test statistic where n and m are the sample sizes of populations one and two, N = n+m, and $\sum_{i=1}^{N} R_i^2$ refers to the sum of the squares of all N of the ranks, or average ranks actually used in both samples.

If the groups have the same distribution, their sample distributions of ranks should be similar. If one of the groups has sufficiently more than its share of small or large ranks, there is reason to believe that the two underlying distributions are different, thus rejecting the null hypothesis. [Ref. 12, p. 360]

3. Statistical Hypothesis Tests and Their Results

The first statistical test conducted is that of rejecting, or failing to reject the null hypothesis that the mean Sales Comprehension Test scores of the two tested battalions are equal. If the null hypothesis is rejected, the independent samples' data cannot be

combined; however, if the null hypothesis is not rejected, the independent samples' data are considered to be from the same population, and thus combined for the remaining analysis.

By looking at the histograms, with superimposed normal curves, and at the normal quantile-quantile plots in Appendix F, in addition to the large observed significance levels, or p-values, obtained from Lilliefors test of normality (Appendix F), one can see that the hypothesis of normality for both samples is not rejected. Therefore, the assumption that both samples are independent random samples from a normal distribution is not unreasonable.

Because the assumption of normality is valid in this particular hypothesis test, the independent-samples t-test is used to test the null hypothesis that the two population means are equal. Since Levene's test for equality of variances displayed an observed significance level of 0.21, the null hypothesis that the population variances are equal is not rejected, and the pooled-variance t-test is used. The results of the t-test show a two-tailed p-value of 0.61 (Appendix F). Since this probability is much larger than 0.05, the null hypothesis that the mean Sales Comprehension Test scores of the two tested battalions are equal is not rejected. An α value of 0.05 is used throughout this study as the level of significance at which the rejection of the null hypothesis occurs. The purpose of choosing this value of α is to minimize any Type I errors in this study.

The results of this test made it possible to combine the two independent samples, resulting in a single sample of size 276 on which to conduct the remaining analysis.

The second statistical test performed is that of determining the predictive capability of the Sales Comprehension Test. Specifically, this test is used to test the null hypothesis that no linear relationship exists between a recruiter's effectiveness, measured by MORE 1 or MORE 2, and his, or her obtained test score. If the null hypothesis is rejected, a linear relationship exists, and a simple linear regression can be used to determine the predictive model. However, if the null hypothesis is not rejected, no significant relationship exists between the two variables, thus implying that the test has no predictive capability in regards to a recruiter's measure of effectiveness.

Because this test must be performed within each time group, and for each MORE, a total of six independent tests were conducted using the same null hypothesis. The results of both the normality and correlation tests are presented in Tables 1 and 2 with a discussion of the results following each table.

To determine which correlation test to use, the hypothesis of normality was tested using Lilliefors and Shapiro-Wilks (if sample size is less than 50) tests of normality. Additionally, histograms, with normal curves, and normal quantile-quantile plots, which can be found in Appendix G, were used as graphical tests of normality. The results of the Lilliefors and Shapiro-Wilks normality tests are summarized in Table V.

TABLE V. NORMALITY TEST RESULTS FOR CORRELATION TESTS

Variable	MORE Used	Time Group	Sample Size	Lilliefor's p-value	Shapiro-Wilks p-value	Normal Distribution
Pct. Success	1	0-9	28	0.00	<0.01	no
Test Score	1	0-9	28	>0.20	0.49	yes
Pct. Success	1	10-24	116	0.01	-	no
Test Score	1	10-24	116	>0.20	-	yes
Pct. Success	1	>25	132	0.00	-	no
Test Score	1	>25	132	>0.20	-	yes
Pct. Success	2	0-9	103	0.03	-	no
Test Score	2	0-9	103	>0.20	-	yes
Pct. Success	2	10-24	113	>0.20	-	yes
Test Score	2	10-24	113	>0.20	-	yes
Pct. Success	2	>25	131	>0.20	-	yes
Test Score	2	>25	131	>0.20	-	yes

Before discussing the results of the normality tests, which can also be found in Appendix G, a short discussion on sample size is needed. As one can see, the sample size of a time group using the first MORE is different from the sample size of the same time group using the second MORE. The reason for the large difference in sample sizes within time group 0-9 months is that valid monthly success figures (using MORE 2) were available on several recruiters, regardless of time group, thus allowing their first nine months of performance data to be included in the 0-9 month time group. This same data was not available on all recruiters using MORE 1 since it was a cumulative percent success figure that could not be broken down into monthly segments. The difference in sample sizes within the other two time groups was due to missing percent-success data on recruiters when using MORE 2 as the measure of a recruiter's effectiveness.

The results in Table V show that although all the test-score samples appear to be from normally distributed parent populations (observed significance levels greater than 0.05), only two of the six percent-success samples were found to be from normal distributions. For those time groups in which both populations were found to be normally distributed, the test statistic used to test the null hypothesis of no linear relationship was Pearson's product-moment correlation coefficient. If the assumption of normality could not be assumed in both populations, the test statistics used were Spearman's rho and Kendall's tau-b rank correlation coefficients.

Before each of the six separate correlation tests was performed, a scatterplot was prepared to present a graphical representation of the relationship, if any, that existed between the two variables. As one can see from the six scatterplots, which can be found in Appendix G, little relationship, if any, can be found between the two variables in any time group. The results of the applicable correlation tests, which can be found in Appendix G, are summarized in Table VI.

TABLE VI. RESULTS OF CORRELATION TESTS

Time Group	MORE Used	Pearson's Correlation Coefficient	Pearson's 2-tailed p-value	Spearman's Correlation Coefficient	Spearman's 2-tailed p-value	Kendall's Correlation Coefficient	Kendall's 2-tailed p-value
0-9	1	-	-	-0.27	0.17	-0.16	0.22
10-24	1	-	-	0.16	0.09	0.10	0.11
>25	1	-	-	0.02	0.80	0.02	0.73
0-9	2	-	-	0.11	0.26	0.07	0.29
10-24	2	-0.01	0.91	-	-	-	-
>25	2	-0.06	0.47	-	-	-	-

From the test results shown in Table VI, one can see that the strengths of the linear relationships between a recruiter's percent success (measured by MORE 1 or MORE 2) and his, or her test score are near zero in most cases. Additionally, the two-tailed observed significance levels are all above 0.05, thus indicating not to reject the null hypothesis that no correlation exists between the two variables. In fact, the only case in which the null hypothesis was close to being rejected was in the 10-24 month time group, using MORE 1 as the measure of recruiter effectiveness. Even here, the correlation coefficient was found to be only 0.16. This is considerably less than the value of 0.25, which is considered to be the minimum value for a correlation coefficient in which the predictor variable is of any practical value [Ref. 6, p. 29]. Therefore, the results of the six correlation tests suggest that in a present-employee study, the Sales Comprehension Test has little or no predictive capability in regards to a recruiter's measure of effectiveness or success.

The third statistical test is one of determining whether the Sales Comprehension Test distinguishes between successful and unsuccessful recruiters, with success being measured by MORE 1 or MORE 2. The hypothesis being tested is whether the mean Sales Comprehension Test score of the top 30 performers in a time group, measured by MORE 1 or MORE 2, is equal to the mean test score of the bottom 30 performers in the same time group. If the null hypothesis is rejected, the results of this test would suggest that the Sales Comprehension Test does distinguish between successful and unsuccessful recruiters as measured by MORE 1 or MORE 2. However, if the null hypothesis is not

rejected, these results would suggest that the two populations' mean test scores are the same, thus providing evidence that the test cannot distinguish between successful and unsuccessful recruiters within a specified time group.

Sample sizes of 30 are used in the top and bottom performer samples in order to achieve robustness against the assumption of normality, while maintaining two distinguishable groups of recruiters in regards to successfulness. The only exception to this sample-size condition occurs in the 0-9 month time group where MORE 1 is used to measure a recruiter's success. Because this time group only has a total population of 28 recruiters, only the top 11 and bottom 11 performers were used for this particular hypothesis test.

Just as in the correlation test, this test must be performed within each time group, and for each MORE. Therefore, a total of six independent statistical tests were conducted using the same null hypothesis that the mean Sales Comprehension Test scores for the top 30/bottom 30 performers in a time group are equal.

The graphical tests of normality for each of the samples used in the six statistical tests can be found in Appendix H. The results of the Lilliefors and Shapiro-Wilks normality tests for each of the samples, which can also be found in Appendix H, are summarized in Table VII below.

TABLE VII. NORMALITY TEST RESULTS FOR TOP 30/BOTTOM 30 t-TESTS

Variable	MORE Used	Time Group	Sample Size	Lilliefor's p-value	Shapiro-Wilks p-value	Normal Distribution
Test Score (Top 11)	1	0-9	11	>0.20	0.96	yes
Test Score (Bot 11)	1	0-9	11	>0.20	0.45	yes
Test Score (Top 30)	1	10-24	30	>0.20	0.08	yes
Test Score (Bot 30)	1	10-24	30	>0.20	0.62	yes
Test Score (Top 30)	1	>25	30	>0.20	0.28	yes
Test Score (Bot 30)	1	>25	30	>0.20	0.65	yes
Test Score (Top 30)	2	0-9	30	>0.20	0.48	yes
Test Score (Bot 30)	2	0-9	29	>0.20	0.82	yes
Test Score (Top 30)	2	10-24	30	>0.20	0.09	yes
Test Score (Bot 30)	2	10-24	30	>0.20	0.13	yes
Test Score (Top 30)	2	>25	31	>0.20	0.49	yes
Test Score (Bot 30)	2	>25	31	>0.20	0.92	yes

The results of the normality tests suggest that each of the samples is drawn from a parent normal population. Nonetheless, because several of the samples appear to be other than normally distributed in the graphical tests of normality, mostly due to sample size, both the t-test and its nonparametric counterpart, the Mann-Whitney test, were calculated for each hypothesis test. Since the assumption of normality was statistically (numerically) validated for each sample, the results obtained from the independent-samples t-test will be the basis on which all conclusions are made. However, the results of the Mann-Whitney test will serve as a safety check for the tests in which the samples did not graphically appear to be normally distributed.

Before the independent-samples t-test can be calculated, Levene's test for equality of variances must be performed to test the null hypothesis that the two population variances are equal. If the two population variances are found to be equal, the

pooled-variance t-test can be used. The results of Levene's test and of the six statistical hypothesis tests, using both the independent-samples two-tailed t-test and the Mann-Whitney two-tailed test, can be found in Appendix H and are summarized in Table VIII below.

TABLE VIII. RESULTS OF TOP 30/ BOTTOM 30 t-TESTS AND MANN-WHITNEY TESTS

Time Group	MORE Used	Levene's p-value	t-test 2-tailed p-value	Mann-Whitney 2-tailed p-value
0-9	1	0.27	0.22	0.22
10-24	1	0.76	0.45	0.23
>25	1	0.80	0.64	0.63
0-9	2	0.48	0.72	0.50
10-24	2	0.21	0.83	0.94
>25	2	0.29	0.26	0.30

Since all the observed significance levels obtained from Levene's homogeneity-of-variance test are large, the null hypothesis of equal variance is not rejected, and the pooled-variance test statistic was calculated for each of the six mean tests. The results displayed in Table VIII indicate that the null hypothesis of equal population means is not rejected, thus suggesting that the mean Sales Comprehension Test scores for the top 30/bottom 30 performers in each time group (using MORE 1 or MORE 2) are equal. The large p-values obtained from the safer Mann-Whitney test also support the results of the independent samples t-test. One might also note that where the previously presented correlation tests showed negative correlation values in three separate time groups, the mean test scores of the top 30 and bottom 30 performers are reversed

from what would be expected if the test distinguished between successful and unsuccessful recruiters. Therefore, the results of the six individual hypothesis tests of means suggest that the Sales Comprehension Test does not distinguish between successful and unsuccessful recruiters when measuring success by MORE 1 or MORE 2.

The fourth statistical test is one of determining whether the two MOREs are measuring success/unsuccess equivalently. Although this test is not critical to rejecting, or failing to reject, the study's four working hypotheses, its importance lies in determining if the two MOREs are measuring success/unsuccess equivalently. If so, are the results from the other statistical tests consistent within time groups when using either MORE?

The hypothesis being tested is whether the mean Sales Comprehension Test score of the top 30 performers in a time group, measured by MORE 1, is equal to the mean test score of the top 30 performers in the same time group, measured by MORE 2. This same test is applied to the bottom 30 performers of each time group, thus resulting in a total of six statistical tests of this nature. If the null hypothesis is rejected, this suggests that the population means are not equal, and that the two MOREs are not measuring either success, or nonsuccess, or both, equivalently. Conversely, if the null hypothesis is not rejected, the population means are equal, and the two MOREs are measuring success, or nonsuccess, or both, equivalently.

Because the tests of normality have already been performed on all samples of data except the top and bottom 11 performers in time group 0-9 months (using MORE 2),

the only new normality tests performed are for those samples used in the first two hypothesis tests. The results of all the statistical normality tests for each of the six hypothesis tests can be found in Appendices H and I, and are summarized in Table IX for the reader's benefit.

TABLE IX. NORMALITY TEST RESULTS FOR TOP 30/BOTTOM 30 (MORE 1) AND TOP 30/BOTTOM 30 (MORE 2) t-TESTS

Variable	MORE Used	Time Group	Sample Size	Lilliefor's p-value	Shapiro-Wilks' p-value	Normal Distribution
Test Score (Top 11)	1	0-9	11	>0.20	0.96	yes
Test Score (Top 11)	2	0-9	11	>0.20	0.95	yes
Test Score (Bot 11)	1	0-9	11	>0.20	0.45	yes
Test Score (Bot 11)	2	0-9	11	>0.20	0.37	yes
Test Score (Top 30)	1	10-24	30	>0.20	0.08	yes
Test Score (Top 30)	2	10-24	30	>0.20	0.09	yes
Test Score (Bot 30)	1	10-24	30	>0.20	0.62	yes
Test Score (Bot 30)	2	10-24	30	>0.20	0.13	yes
Test Score (Top 30)	1	>25	30	>0.20	0.28	yes
Test Score (Top 30)	2	>25	31	>0.20	0.49	yes
Test Score (Bot 30)	1	>25	30	>0.20	0.65	yes
Test Score (Bot 30)	2	>25	31	>0.20	0.92	yes

Since each of the normality test's p-value is greater than 0.05, and most are substantially large, the results of the normality tests shown in Table IX suggest that each of the samples are from parent populations that are normally distributed. Therefore, the independent-samples two-tailed t-test was computed for each of the six statistical tests of means. Again, the Mann-Whitney two-tailed test was calculated as a safety check.

The results of Levene's test of equal variance and of the six statistical tests can be found in Appendix I and are summarized in Table X below.

TABLE X. TOP 30/BOTTOM 30 (MORE 1), TOP 30/BOTTOM 30 (MORE 2) t-TESTS, AND MANN-WHITNEY TESTS

Time Group	Top or Bottom 30	Levene's p-value	t-test 2-tailed p-value	Mann-Whitney 2-tailed p-value
0-9	Top 11	0.92	0.83	0.75
0-9	Bot 11	0.85	0.95	0.85
10-24	Top 30	0.84	0.59	0.54
10-24	Bot 30	0.15	0.66	0.49
>25	Top 30	0.89	0.18	0.21
>25	Bot 30	0.58	0.85	0.99

Because of the large observed significance levels obtained in Levene's equality-of-variance tests, the pooled-variance test statistic was used to calculate the observed significance level for each of the statistical tests of means. The results clearly show that the null hypothesis is not rejected in each of the tests, thus suggesting that the two MOREs are measuring success/nonsuccess equivalently. Therefore, consistency in results would be expected in the previous two statistical tests, where one set of results was obtained using MORE 1 and the other using MORE 2. As the figures have shown in the two previous sets of tests, the results have been consistent between the two MOREs.

The final two statistical tests use data from a control group of non-recruiters. The first test is to determine if the Sales Comprehension Test distinguishes between those with sales experience and those without. Specifically, the null hypothesis states that the mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of non-recruiters with no sales experience.

The results of both the graphical and numerical tests of normality, which can be found in Appendix J, show that, although the test scores of those with sales experience appear to come from a normal distribution, the test scores of those with no sales experience do not. Therefore, the Mann-Whitney two-tailed hypothesis test was performed, and an observed significance level of 0.0025 was obtained. This extremely small p-value calls for a rejection of the null hypothesis, thus leading to the conclusion that there is a difference in the population means, and suggesting that the two samples do not belong to the same population. This test result, which can be found in Appendix J, suggests that the Sales Comprehension Test does distinguish between those with sales experience and those without.

The final statistical test is to determine if the test distinguishes between sales aptitude of TTE recruiters and non-recruiters with sales experience. The null hypothesis states that the mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of TTE recruiters.

Both samples involved in this hypothesis test were previously shown to have normally distributed parent populations; therefore, the independent-samples t-test was used to perform this particular hypothesis test. After determining from Levene's equality-of-variance test that both samples had equal variances (Appendix K), the two-tailed pooled-variance test statistic was calculated, resulting in an observed significance level of 0.07. Although this is a somewhat small p-value, it is greater that 0.05, thus not supporting a rejection of the null hypothesis. The results of this test, which

can be found in Appendix K, suggest that the mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of TTE recruiters, thus showing the two groups as indistinguishable in regards to sales-aptitude test scores.

Several results have been obtained from the 21 separate statistical hypothesis tests performed in this chapter. It is one of the objectives of the next chapter to expand on these results, and explain how they may be used to reject, or fail to reject, the four working hypotheses presented earlier in this study.

IV. VALIDATION OF THE FOUR WORKING HYPOTHESES AND A COST/BENEFIT ANALYSIS

This chapter uses the results obtained from the statistical tests performed in Chapter III as a basis to reject, or not reject, the four working hypotheses presented in Chapter I. Based on the rejection, or acceptance, of the four working hypotheses, a cost/benefit analysis is performed to justify the use of the Sales Comprehension Test in the capacity for which it was validated.

A. VALIDATION OF THE FOUR WORKING HYPOTHESES

The first working hypothesis stated that the sales-aptitude test distinguishes between those possessing some degree of sales comprehension and those with little or no sales aptitude, thus functioning as a screening device. Statistical test results from Chapter III suggested that the test does distinguish between those with sales experience and those without. In fact, descriptive statistics on the two groups contained in the non-recruiter sample, which can be found in Appendix J, support these statistical findings in that the mean test score for non-recruiters with sales experience is 9.30 (standard deviation of 20.77) and that for non-recruiters without sales experience is -12.39 (standard deviation of 26.73). The scoring was based on a possible high of 93 and a low of -145. Therefore, these results suggest that the Sales Comprehension Test could be used to screen out those possessing some degree of sales aptitude from those who do not.

The second working hypothesis stated that the test distinguishes between those who are recruiters and those who are not. The statistical test chosen to determine the validity of this working hypothesis was one of determining whether the test distinguishes between sales aptitude of TTE recruiters and non-recruiters with sales experience.

The sample of non-recruiters with sales experience was chosen to represent the population of non-recruiters in this particular test since it has already been shown that two samples from different populations exist in the non-recruiter control group. Therefore, the group having the greatest chance of having a mean test score statistically equal to that of recruiters is the non-recruiters with sales experience.

An important discovery was made when trying to determine a representative sample from the recruiter population to test against the sample of non-recruiters in this statistical hypothesis test. A quick glance at the descriptive statistics of each time group's test score data revealed that the means and standard deviations of each group's test scores were almost numerically equal. These statistics are summarized in Table XI below

TABLE XI. TEST SCORE STATISTICS FROM RECRUITER POPULATION

Time Group	Sample Size	Mean Test Score	Standard Deviation	Min	Max
0-9	28	20.59	22.54	-32	63
10-24	116	20.48	18.75	-38	64
>25	132	20.81	18.35	-26	63

This observation prompted a One-Way Analysis of Variance (ANOVA) statistical test to test the null hypothesis that each time group's mean test score is no different from the others. Assumptions required for using this test are: each of the groups is an

independent random sample from a normal population, and the variances of the groups are equal [Ref. 12, p. 262]. It was statistically shown in Chapter III and Appendix G that each of the groups could represent independent random samples from normal populations. Levene's test for homogeneity of variances was used to test the null hypothesis that the groups come from populations with the same variance. A two-tailed p-value of 0.54 was obtained, thus indicating that the null hypothesis could not be rejected and that there was not sufficient evidence to suspect that the variances were unequal.

The statistical test for the null hypothesis that all groups have the same mean in the population is based on an F-ratio in which the between-group variability is divided by the within-group variability, resulting in an F-statistic [Ref. 12, p. 264]. This statistical test resulted in an observed significance level of 0.99, thus indicating that the null hypothesis could not be rejected and that there was not sufficient evidence to suggest that the test score means were unequal.

The results of the one-way ANOVA, which can be found in Appendix L, revealed that, in regards to the Sales Comprehension Test score, all time groups of recruiters formed an extremely homogeneous group in which test scores did not vary with time as a recruiter. Therefore, since any of the time groups could be used as a representative sample of the recruiter population, the TTE group was chosen because of its equivalent sample size to that of non-recruiters with sales experience.

Results from this statistical hypothesis test revealed that the null hypothesis, stating that the mean Sales Comprehension Test score of non-recruiters with sales experience is equal to the mean test score of TTE recruiters, was not rejected at an, α level equal to 0.05.

A comparison of the test score means obtained on these two groups does not seem to support the results obtained by the statistical test. The descriptive statistics on these two samples, which can be found in Appendix K, show the TTE-recruiter sample having a mean test score of 20.59 (standard deviation of 22.54) and the non-recruiter-with-sales-experience sample having a mean test score of 9.30 (standard deviation of 20.77). These statistics may explain why the statistical test resulted in a p-value of only 0.07, an observed significance level barely large enough for one to make a decision to fail to reject the null hypothesis. However, it is important that one realizes that the sample of non-recruiters with sales experience used in this statistical test includes non-recruiters who have already had some recruiting experience (prior recruiters). In fact, this sample includes seven prior recruiters, one a TTE failure, and the other six recruiters' effectiveness unknown.

When the prior recruiters were eliminated from the sample, another statistical test of this nature was performed.

Having already shown that the sample of TTE recruiters was drawn from a normal population (Appendix G), the results of the graphical and numerical tests of normality, for the more refined non-recruiter-with-sales-experience sample, indicate that it too was

drawn from a normal population (Appendix M). Therefore, the independent-samples t-test for equal variances is calculated, and an observed significance value of .24 is obtained. These results, which can be found in Appendix M, provide more of an indication that the mean Sales Comprehension Test score of non-recruiters with sales experience is statistically equal to the score of TTE recruiters. However, it is important to note that this result is based on a statistical test in which one of the samples being tested was relatively small in size.

Since it has been shown that the mean test scores of all time groups of recruiters are statistically equal, one might conclude that the mean Sales Comprehension Test score of non-recruiters with sales experience is statistically equal to the mean test score of all recruiters, thus showing the two groups as indistinguishable in regards to sales-aptitude test scores.

The third working hypothesis stated that the sales-aptitude test distinguishes between successful and unsuccessful recruiters (success/nonsuccess determined by a Measure of Recruiter Effectiveness). Statistical hypothesis test results from Chapter III disclosed that the top 30/bottom 30 performers (measured by MORE 1 or MORE 2) in each time group had statistically equal mean sales-aptitude test scores.

The descriptive statistics obtained on each of the samples used in the six hypothesis tests can be found in Appendix H and are summarized in Table XII for purposes of discussion.

TABLE XII. TEST SCORE STATISTICS FROM TOP 30/BOTTOM 30 PERFORMERS IN EACH TIME GROUP

Variable	Time Group	MORE Used	Test Score Mean	Standard Deviation
Test Score (Top 11)	0-9	1	13.55	20.24
Test Score (Bot 11)	0-9	1	26.73	27.88
Test Score (Top 30)	10-24	1	21.30	18.52
Test Score (Bot 30)	10-24	1	17.60	19.24
Test Score (Top 30)	>25	1	24.12	18.37
Test Score (Bot 30)	>25	1	21.87	18.26
Test Score (Top 30)	0-9	2	21.52	17.47
Test Score (Bot 30)	0-9	2	20.00	14.91
Test Score (Top 30)	10-24	2	18.62	19.82
Test Score (Bot 30)	10-24	2	19.57	14.43
Test Score (Top 30)	>25	2	17.77	18.08
Test Score (Bot 30)	>25	2	22.71	16.08

In addition to the results showing that the mean test scores of the top and bottom performers in each time group are equal, Table XII statistics also provide evidence that the Sales Comprehension Test does not distinguish between successful and unsuccessful recruiters when measuring success/nonsuccess by MORE 1 or MORE 2. Specifically, within the three time groups outlined above, one can see that the mean test scores of the top 30(11) and bottom 30(11) performers are reversed from what would be expected if the test distinguished between successful and unsuccessful recruiters. Therefore, sufficient evidence has been provided to reject this particular working hypothesis.

The fourth and final working hypothesis stated that the test linearly correlates with varying degrees of success/nonsuccess, in that, as success increases, so does the test score, and, as success decreases, so does the test score. With most correlation

coefficients near zero, Chapter III statistical test results indicate that the Sales Comprehension Test has little or no predictive capability (by itself) in regards to a recruiter's measure of effectiveness or success when using the present-employee method of validation.

The descriptive statistics obtained on the two tested battalions, in regards to percent-success and test-score data, can be found in Appendix N, and are summarized in Table XIII below. Like the previous table, this too, is for purposes of discussion.

TABLE XIII. PERCENT-SUCCESS AND TEST-SCORE DATA ON TWO TESTED BATTALIONS

Variable	Battalion	MORE Used	Battalion Mean	Battalion Standard Deviation
PCT Success	Baltimore	1	133.19	70.30
PCT Success	Santa Ana	1	111.50	43.79
PCT Success	Baltimore	2	73.77	13.55
PCT Success	Santa Ana	2	68.15	14.16
Test Score	Baltimore	-	21.27	19.91
Test Score	Santa Ana	-	20.10	18.00

As was shown in Chapter III analysis, the mean Sales Comprehension Test scores of the two tested battalions were shown to be statistically equal. This is also evident from the descriptive statistics shown in Table XIII, where the means and standard deviations of the two battalions' test scores seem to be almost identical. However, Table XIII shows that the percent-success figures for both battalions may not be equal, using both MORE 1 and MORE 2 to measure a recruiter's effectiveness or success. Therefore, a hypothesis

test is required to determine whether the mean percent-success figures from the two tested battalions are statistically equal or unequal.

Results of the graphical and numerical tests of normality, which can be found in Appendix N, show only one of the four samples being drawn from a normal population. Therefore, the Mann-Whitney two-tailed test was used, and observed significance values of .0001 and .0020 were obtained. These extremely low p-values called for a rejection of the null hypothesis in both tests, thus concluding that there is a difference in population means. These results, which can be found in Appendix N, suggest that the mean percent-success figures from the two battalions do not represent the same population, and therefore, are statistically unequal.

These results support those obtained from the correlation tests discussed previously, in that the Sales Comprehension Test has little, or no predictive capability (by itself) in regards to a recruiter's measure of effectiveness or success. Although the two battalions' mean test scores are statistically equal, the percent-success figures are not, thus suggesting that factors unique to individual recruiting battalions such as leadership, morale, and organizational effectiveness may have a very important role in determining a recruiter's success/nonsuccess as measured by MORE 1 or MORE 2.

The next few paragraphs in this section summarize the validation results of the four working hypotheses.

The following table, Table XIV, summarizes the test scores obtained from the different sample groups used in this study.

TABLE XIV. TEST-SCORE STATISTICS FROM DIFFERENT GROUPS

Sample Group	Mean Test Score	Standard Deviation	MIN Test Score	MAX Test Score
Non-recruiters (All)	-3.15	26.41	-90	47
Non-recruiters w/ no sales experience	-12.39	26.73	-90	27
Non-recruiters w/ sales experience	9.30	20.77	-24	47
Non-recruiters w/ sales experience (minus prior recruiters)	12.56	19.57	-16	47
Recruiters (0-9 mo.)	20.59	22.54	-32	63
Recruiters (10-24 mo.)	20.48	18.75	-38	64
Recruiters (>25 mo.)	20.82	18.35	-26	63

The descriptive statistics in Table XIV, in conjunction with the statistical test results already discussed, reveal that although the Sales Comprehension Test is an effective screening device for screening out those possessing some degree of sales aptitude from those who do not, it is not an effective tool (by itself) for predicting recruiter success/nonsuccess when using the present-employee method of validation. The primary reason for this is that a recruiter's sales aptitude, or understanding and appreciation of basic principles of selling, is indoctrinated at the Army Recruiting Course (ARC) and/or from prior sales experience, and, in general, does not vary with time as a recruiter. The consistency of test scores among all three time groups of recruiters resulted in an extremely homogeneous group, from which the Sales Comprehension Test could not distinguish between successful and unsuccessful recruiters (as measured by MORE 1 or MORE 2). Therefore, it is believed that factors, other than sales aptitude and unique to

individual recruiting battalions, play a very important role in determining the success of a recruiter as measured by MORE 1 or MORE 2.

The Sales Comprehension Test does distinguish between recruiters and non-recruiters, but only those non-recruiters with no sales experience. In regards to sales-aptitude test scores, recruiters are virtually indistinguishable from non-recruiters with sales experience. This statistical result suggests that recruiters and non-recruiters with sales experience are at an equal level in regards to the understanding and appreciation of basic principles of selling. Therefore, the test does have the capability of identifying non-recruiters who most likely have had some or much sales experience, and whose sales aptitude is equal to or better than that of a recruiter.

Now that the Sales Comprehension Test has been partially validated to function as a screening device in the recruiter selection process, a cost/benefit analysis is needed to justify it use.

B. COST/BENEFIT ANALYSIS

As a screening instrument for new recruiters, the Sales Comprehension Test could be used effectively in two roles. First, a pre-determined cut-off score on the test could be useful in selecting recruiters to attend the ARC. Secondly, its role could be to identify those recruiter candidates with a level of sales aptitude equal to, or greater than that of a trained recruiter, thus earmarking them as not needing additional instruction on the basic

principles of selling. These roles, and the cost savings associated with each, are the topics of discussion in the following paragraphs.

To use the test as a screening device to select recruiter candidates for attendance at the ARC, a cut-off, or minimum score on the Sales Comprehension Test would have to be met (or exceeded) by the recruiter candidate to be eligible to attend the ARC, and ultimately, to become a recruiter. This requirement, to meet or exceed a pre-determined minimum score, would help ensure that recruiter candidates attending the ARC have some previous knowledge of basic selling principles and, thus, are less likely to fail out of the ARC. Although follow-up testing with a fairly large sample of recruiter candidates would be needed to determine the statistically most effective cut-off score, a conservative estimate of this score can be obtained using the different group test scores listed in Table XIV. Since becoming a recruiter requires that one successfully complete the ARC, a logical start point for determining a conservative cut-off score is the mean Sales Comprehension Test score of a recruiter. From Table XIV, one can see that this score is approximately 21. However, keep in mind that this test score is the mean test score of a population that has already been indoctrinated in the basic principles of selling, one should look one standard deviation to the left of the mean to find a more realistic cut-off test score. This test score would ensure a recruiter candidate has some degree of sales aptitude, but most likely not equal to that of a recruiter. With an average recruiter-test-score standard deviation of 20, a conservative estimate for the cut-off score is one. Therefore, to be qualified to attend the ARC and, ultimately, to become a

recruiter, a recruiter candidate would need to obtain a one, or better, on the Sales Comprehension Test, in addition to meeting the other selection criteria outlined in AR601-1 and listed in Appendices A and B.

In order to determine the cost savings to be obtained by using the Sales Comprehension Test in this role, estimated costs of sending a recruiter candidate to the ARC are needed. These costs, provided by USAREC Headquarters, PA&E Directorate [Ref. 13, p. 2], are listed in Table XV.

TABLE XV. ARC AVERAGE COSTS PER STUDENT

Item	Cost
Travel, Per Diem for ARC Period	$2250
ARC Training -- Four Weeks	$1425
Total	**$3675**

As mentioned in Chapter I, USAREC Headquarters anticipates the ARC losing approximately 150 recruiter candidates during Fiscal Year 1994 due to failures.

Therefore, the savings to be gained from decreasing the failure rate at the ARC by some percentage is:

At 100 percent:	(150 recruiter candidates)	$3,675 x 150 = $551,250
At 80 percent:	(120 recruiter candidates)	$3,675 x 120 = $441,000
At 60 percent:	(90 recruiter candidates)	$3,675 x 90 = $330,750
At 40 percent:	(60 recruiter candidates)	$3,675 x 60 = $220,500
At 20 percent:	(30 recruiter candidates)	$3,675 x 30 = $110,250
At 10 percent:	(15 recruiter candidates)	$3,675 x 15 = $ 55,125

USAREC Headquarters, PA&E Directorate projects that approximately 1700 recruiter candidates will attend the ARC in Fiscal Year 1994. If the Sales Comprehension Test were given to each of these candidates prior to attending the ARC,

the cost of testing, at $2.38 per test, would sum to $4046.00. Therefore, an approximate minimum savings to USAREC and the Army, if applying the Sales Comprehension Test in this role, would be $51,079.00. However, an approximate maximum savings would be $547,204.00. Furthermore, depending on the effectiveness of the test in screening out possible ARC failures, fewer candidates would have to be sent, and less money would have to be allocated to the ARC because of reduced failure risk for those chosen to attend. For example, if the test were able to screen out 80 percent of the failures, funds for only 1580 recruiter candidates would have to be allocated, rather than funds for 1700 candidates. This money could be allocated to other projects requiring the additional funds.

The second screening role for the Sales Comprehension Test is to identify those recruiter candidates with a level of sales aptitude equal to, or greater than that of a recruiter. The recruiter candidates identified in this process would be earmarked as not requiring any additional instruction on the basic principles of selling. Since a majority of the ARC's course instruction focuses on the understanding and appreciation of the basic principles of selling necessary to become successful [Ref. 4, p. 140], a recruiter candidate identified as already understanding these basic principles should have no requirement to attend the ARC. Instead, he or she should be sent directly to a recruiting battalion where the recruiter candidate is taught only those recruiter specific tasks missed at the ARC, prior to starting the TTE program. These subject areas, not related to selling principles, could be taught at the battalion level during the recruiter candidate's in-processing period.

Here again, follow-up testing with fairly large samples of recruiter candidates and recruiters would be needed to determine the statistically most accurate test score at which a recruiter candidate either meets or exceeds an average recruiter's test score, and thus has a level of sales aptitude equal to or greater than that of an average recruiter. Using results obtained from this study, a conservative test score would be the mean test score for the recruiter population. Since it has been shown in this study that Sales Comprehension Test scores do not vary with time as a recruiter, a recruiter candidate scoring 21, or better, on the test has already obtained a level of understanding of basic selling principles equal to, or greater then that of the average scoring recruiter. Therefore, to validate the ARC and move directly to a recruiting battalion, a recruiter candidate would need to obtain a 21 or better on the Sales Comprehension Test, while also meeting the other selection criteria outlined in AR 601-1 and listed in Appendices A and B. In addition, a requirement would exist for the recruiter candidate to be given instruction on those recruiter-specific tasks missed at the ARC prior to starting the TTE program.

Using the estimated costs to send a recruiter to the ARC, and the USAREC Fiscal Year 1994 projection of recruiter candidates to attend the ARC, the cost savings to be gained from not having to send a percentage of recruiter candidates to the ARC is:

At 80 percent: (1370 recruiter candidates)	$3,675 x 1370 = $5,034,750
At 60 percent: (1027 recruiter candidates)	$3,675 x 1027 = $3,774,225
At 40 percent: (685 recruiter candidates)	$3,675 x 685 = $2,517,375
At 20 percent: (342 recruiter candidates)	$3,675 x 342 = $1,256,850
At 10 percent: (171 recruiter candidates)	$3,675 x 171 = $ 628,425

It is important to note that these cost savings assume that the average cost per student does not increase as a result of x number of students not attending the ARC, thus creating a surplus capacity. To prevent this from happening, USAREC would have to plan its class sizes in advance, based on the number of students selected not to attend the ARC as a result of their high test score on the Sales Comprehension Test. Knowing the total number of recruiter candidates needed, in addition to the number being sent directly to recruiting battalions, USAREC could plan, in advance, each class size, and thus, allocate funds and resources accordingly.

There would be no deductions from the above savings other than what it would cost a battalion trainer to train a recruiter candidate in those recruiter specific tasks missed at the ARC. Conservatively estimating, a battalion trainer spending two hours per day for two weeks per recruiter candidate, the cost savings for each percentage listed above is revised as shown below:

At 80 percent: $5,034750 - ($19.91(E7 pay per hour) x 28 hours x 1370 recruiter candidates) = $4,271,002
At 60 percent: $3,774,225 - ($19.91 x 28 x 1027) = $3,201,693
At 40 percent: $2,517,375 - ($19.91 x 28 x 685) = $2,135,501
At 20 percent: $1,256,850 - ($19.91 x 28 x 342) = $1,066,192
At 10 percent: $ 628,425 - ($19.91 x 28 x 171) = $ 533,096

Using the Sales Comprehension Test in the two roles discussed above, the approximate maximum and minimum savings to be achieved are:

Maximum savings when used in 1st role:	$ 547,204
Maximum savings when used in 2nd role:	$4,271,002
Total Maximum Savings:	$4,818,206

Minimum savings when used in 1st role:	$ 51,079
Minimum savings when used in 2nd role:	$533,096
Total Minimum Savings:	$584,175

This, by no means, is an exhaustive cost analysis. It was only intended to provide the reader with some direct costs and cost savings to justify the use of the Sales Comprehension Test as a screening tool to select future recruiters. A more refined analysis would consider quantifying those intangibles such as the uneccessary break-up of a cohesive unit from which the recruiter candidate departed, or the negative publicity the Recruiting Command receives when a recruiter candidate fails to complete the ARC. Adding these intangible costs into the analysis would substantially increase the cost savings to USAREC and the US Army. On the other hand, administrative costs associated with administering the test, and recording its results for future use, also need to be considered in a more refined and accurate cost/benefit analysis.

Although it has been statistically shown that the Sales Comprehension Test cannot be used to predict recruiter success/nonsuccess (by itself) using the present-employee method of validation, by selecting only those recruiter candidates who already possess some degree of sales aptitude, one can only help those future recruiters become successful. Furthermore, money spent on ARC failures and on recruiter candidates not requiring the instruction provided at the ARC could be saved and used more effectively by both USAREC and the US Army.

V. CONCLUSIONS AND RECOMMENDATIONS

In this thesis, statistical and cost/benefit analyses were used to validate and justify the use of a selected sales-aptitude test for (successful) recruiter selection. The specific questions that were to be answered from this study are:

- Can a selected sales-aptitude test be used to select future (successful) recruiters, thus aiding in reducing the number of failures USAREC is experiencing among its TTE and field-force recruiters?
- Can a selected sales-aptitude test be used to decrease the number of failures USAREC is experiencing at the ARC?
- Are there any roles in which a selected sales-aptitude test could be used to save USAREC and the US Army money?

More speculative questions for future thought and investigation that were raised from this study include:

- What can one learn about the dynamics of the US Army's recruiting system from the results obtained from this sales-aptitude test and study? How can this knowledge be exploited to reduce the number of USAREC recruiter failures?
- How well defined is USAREC's measure of a recruiter's effectiveness? Is the current data collected on recruiters useful in measuring a recruiter's effectiveness? How accurate is the data?
- How much influence does a recruiter have on his own success? How much influence does a recruiting battalion have on a recruiter's success?

It is the focus of this chapter to answer the first three questions and to provide recommendations for this study and future studies of this nature.

A. CONCLUSIONS

Results obtained from the statistical tests used in this study indicate that the Sales Comprehension Test, by itself, is incapable of distinguishing between successful and unsuccessful recruiters when measuring success/nonsuccess by either of the two Measures of Recruiter Effectiveness developed in this study. Results also indicate that the Sales Comprehension Test cannot be empirically validated to function as a predictor of successful/unsuccessful recruiters (by itself) when using the "present-employee" method of validation. As a result of these findings, the Sales Comprehension Test is not seen as an effective aid in selecting future (successful) recruiters, nor in reducing the number of failures USAREC is experiencing among its TTE and field force recruiters each year.

The Sales Comprehension Test has, however, been partially validated, using only the "present-employee" method of validation, to function as a screening device in the recruiter selection process. Functioning in this capacity, the Sales Comprehension Test can reduce the risk of ARC failures by ensuring that only those recruiter candidates possessing a minimum degree of sales aptitude are selected to attend the ARC. Additionally, functioning as a screening device, the Sales Comprehension Test can be used to identify those recruiter candidates with a level of sales aptitude equal to, or greater than that of a trained recruiter, thus earmarking them as candidates not requiring the instruction given at the ARC. These recruiter candidates would be sent directly to a

recruiting battalion where they would be taught those recruiter specific tasks missed at the ARC, prior to starting the TTE program.

A cost/benefit analysis indicated that the Sales Comprehension Test, used in a screening role, could save USAREC and the US Army anywhere from an approximate minimum of $584,175 to an approximate maximum of $4,818,206. Although this was not an exhaustive cost/benefit analysis, it does provide the reader with some idea of the cost savings to be gained by using the Sales Comprehension Test in a screening role.

B. RECOMMENDATIONS

Recommend that a follow-up test, using a relatively large sample of non-recruiters, be conducted using the Sales Comprehension Test in a screening role. The purpose of the *screening is twofold:*

- **Screening for ARC attendance**. The test should be given to recruiter candidates sometime prior to starting the ARC, and then again immediately upon completion of the ARC. Although the sales-aptitude test score would not prevent any recruiter candidates from attending the ARC, during the follow-up testing, test scores and failures should be monitored closely (across several ARC classes) to determine the most effective cut-off score, in terms of reducing failures at the ARC. This cut-off score should be made available for future use by USAREC.

- **Screening for nonattendance at the ARC**. The test results obtained from the testing discussed above should be used to determine at what point (test score) a recruiter candidate with sales experience no longer gains anything from the ARC in regards to enhancing his, or her understanding and appreciation of basic principles of selling. This can be determined by examining the before and after scores to decide at what point the least change between test scores occurs. The results from this study indicate that this point (test score) is 21; however, results from a larger sample might prove this point to be inaccurate.

If this follow-up investigation shows positive results regarding the use of the Sales Comprehension Test as a screening device, and it is believed that effective and accurate cut-off scores have been obtained, the test should be implemented immediately in the roles discussed in Chapter IV. Furthermore, a more detailed cost/benefit analysis should be performed, to obtain a more accurate cost savings estimate to be achieved by USAREC and the US Army.

Using the Sales Comprehension Test in a screening role would require that the test be administered to a recruiter candidate, and the score be recorded in his or her performance records, prior to the candidate's selection for attendance at the ARC. Although the selection of test locations and time windows for testing are beyond the scope of this paper, possible locations and time windows include: a soldier's Basic Training post during his, or her initial entry into the Army, a soldiers post at which he or she attends the Primary Leadership Development Course (PLDC), or the soldier's post at which he, or she attends the Basic Non-commissioned Officer Course (BNCOC). Each of these locations and time windows provide opportunities, since all soldiers must pass through these gates to attain the rank of Sergeant and above, which are the required ranks to become a recruiter. Therefore, it is recommended that an independent study examine:

1. Test locations and time windows for testing.
2. The administrative support required to record and/or update test scores in a soldier's performance records.
3. How to optimize the testing and costing relationships.

Because the Sales Comprehension Test is a commercial test, it is recommended that a tailor-made test, using the same principles as was used to develop the Sales Comprehension Test, be developed solely for use by USAREC. The development of a tailor-made test would decrease the long-run costs of testing, and would enable USAREC to include its specific ideas on selling principles in the test.

A final recommendation concerns the focus of future studies. The results of this study indicate that the Sales Comprehension Test is not an effective tool (by itself) for predicting recruiter success/nonsuccess. Specifically, statistical tests revealed that the two battalions tested had statistically equal mean test scores; however, one battalion's mean percent success figures (using MORE 1 or MORE 2) were much higher than the other battalion's. These statistical results provide some basis for believing that factors unique to individual recruiting battalions such as leadership, morale and organizational effectiveness, to name only a few, may have an extremely important role in determining a recruiter's success/nonsuccess. Thus, **attributes of both the individual and the organization**, in which the recruiter operates, may be important for predicting the future success of candidate recruiters. Therefore, recommend that future studies be aimed at examining those variables to be used in a model that represents a successful recruiting battalion, since a successful recruiting battalion will have few, if any, unsuccessful recruiters, but will have several, if not all, successful recruiters. Additionally, recommend that recruiter failures, for ineffectiveness, be catalogued by unit (recruiting battalion) and examined to see what trends are present in this data. Of particular interest

would be any relationship observed between organizational characteristics and the number of recruiter failures.

APPENDIX A. RECRUITER SELECTION CRITERIA

To qualify for selection as a US Army recruiter, either as a volunteer or as a DA selected recruiter, a soldier must:

1. Be a citizen of the United States.

2. Be a high school graduate with diploma or have 1 year of college with a high school General Education Development (GED) (no waiver). College Level Entrance Program (CLEP), Department of the Army Non-Resident Testing Education System (DANTES) and military service credit do not apply.

3. Have a minimum GT score of 110 waivable to 100 with an ST score of 100.

4. Be at least 21 years old, but not more than 35 years old at time of selection.

5. Be a SGT, SSG, or SFC. (A SFC may not have more than 2 years time in grade at the time of selection.) SSG(P) or SFC must be an Advanced Noncommissioned Officer Course (NCO) graduate (No waiver).) (A SSG must be a BNCOC graduate.) (A SGT must be a Primary Leadership Development Course (PLDC) graduate (No waiver).)

6. Have no less than 4 years time in service and no more than 8 years time in service if a SGT; no more than 12 years time in service if a SSG, or no more than 14 years time in service if a SFC.

7. Have completed 1 year of service since reclassification per AR 600-200.

8. Not be currently assigned to the Military Entrance Processing Command (MEPCOM).

9. Meet the height and weight standards of AR 600-9 or possess a medical determination of acceptable body fat limits (no waiver).

10. Have a minimum physical profile of 13221. (No shaving profile).

11. Have no lost time during the current enlistment or in the past 3 years, whichever is longer (no waiver).

12. Possess or be able to obtain a valid driver's license. Assignment as a recruiter involves an extensive amount of automobile driving. Individual must have no record of careless, reckless, or unsafe driving.

13. Possess excellent military appearance and bearing, and have no obvious distracting physical abnormalities or mannerisms. Must not have any lewd or offensive indelible marks or figures (tattoos) visible upon the exposed arm while wearing the prescribed duty uniform, to include the physical training uniform.

14. If married to another soldier, have a spouse who will concurrently apply and be qualified for assignment with USAREC.

15. Not currently nor have been previously enrolled in the past 12 months in a drug or alcohol dependency intervention program of any type. (No waiver is authorized.)

16. Not be pregnant at time of selection or prior to attendance at the ARC.

17. Have completed the period of stabilization in the current assignment.

18. Have favorable civilian and military disciplinary records. Have no unfavorable alcohol related incidents within the past 5 years upon attendance at the ARC. Examples of such disqualifying conduct are driving under the influence (DUI), driving while intoxicated (DWI), or charged with drunk and disorderly conduct.

19. Never have been convicted by civilian court or military courts-martial.

20. Never have had action taken (including proceedings under the provisions of Article 15, Uniform Code ofMilitary Justice (UCMJ) by any authority for: (a) An offense which the maximum penalty under the UCMJ is death or confinement for 6 months or more (No waiver authorized.); (b) Any offense that involves moral turpitude, regardless of sentence received. (No waiver authorized.)

21. Be in receipt of EDAS assignment instruction to USAREC with TDY enroute to the Army Recruiting Course constitutes authority for eligible personnel to extend or reenlist under AR 601-280, paragraph 3-1. Approval to delete or defer a soldier from these AI is reserved for the Cdr, PERSCOM, ATTN: TAPC-EPM-A.

22. Have no marital, emotional, or major medical problems (to include immediate family) that would hamper performance on recruiting duty. Recruiting duty involves assignment to geographic areas that are away from military medical facilities. Soldiers enrolled in the Exceptional Family Member Program may serve as a recruiter. Every effort will be made to assign them near a military installation or in a civilian community where definitive medical care for their family member is available.

23. Not be a sole parent (no waiver).

24. Not have more than two dependents (to include spouse) if a SGT, three dependents (to include spouse) if a SGT(P), four dependents (to include spouse) if a SSG, or five dependents (to include spouse) if a SFC.

25. Be financially stable. Have not filed a petition claiming bankruptcy within 5 years and not currently responsible for making any payments as a result of any such action. The financial situation of soldiers being considered for selection will be closely scrutinized for those soldiers who submit a DA Form 5425-R (Applicant/Nominee Personal Financial Statement). In determining financial suitability, consideration should include income versus expenditures, savings and investment programs, and costs associated with separation from military installations. Also considered will be the payment of SDAP, once the recruiter qualifies for it.

26. If a volunteer is serving a dependent restricted tour, the soldier must waive his entitlement to the home base/advance assigment program.

27. Have a minimum TIS remaining of 3 years following the completion of the Army Recruiting Course.

APPENDIX B. PROCEDURES FOR VOLUNTEERING OR BEING NOMINATED FOR RECRUITING DUTY

Procedures for volunteering or being nominated for recruiting duty are outlined in AR 601-1 and include the selection criteria contained in Appendix A. A summary of these procedures for a volunteer include:

1. Volunteers will submit requests for recruiting duty on DA Form 4187 (Personnel Action) to the first commander in the grade of Lieutenant Colonel (LTC) or higher in the chain of command.

2. The first commander in the grade of LTC or higher in the volunteers chain of command will complete a DA Form 5426-R (Commander's Evaluation) on the potential recruiter.

3. The individual will complete a DA Form 5425-R, Financial Statement.

4. The commander will determine the volunteer's qualifications for recruiting duty according to the selection criteria found in Appendix A.

5. The battalion Commander or first LTC supervisor in the soldier's chain of command will personally interview the selectee (this may not be delegated), complete DA Form 5427-R (Commander's Assessment of Recruiter Candidate), and attach a copy of the individual's DA Form 2A (Personnel Qualification Record, Part I), and DA Form 2-1 (Personnel Qualification Record, Part II).

6. The completed packet of forms will be sent to PERSCOM for final selection.

The procedures for nominees (nonvolunteers) are similar to that of the volunteers except that the DA Form 4187 and DA Form 5426-R are not required. The information provided by these two forms is not required by PERSCOM for nominees.

This Appendix also contains a copy of each of the forms listed above except for the DA Form 2A and DA Form 2-1.

PERSONNEL ACTION

For use of this form, see DA PAM 600-8 and AR 600-1. the proponent agency is MILPERCEN

DATA REQUIRED BY THE PRIVACY ACT

Authority: Title 5, section 3013, Title 10, U.S.C. E.O. 9397. Principal Purpose: Use by service member in accordance with DA Pamphlet 600-8 when requesting a personnel action on his/her own behalf (Section III). Routine Uses: To initiate the processing of a personnel action being requested by the service member. Disclosure: Voluntary. Failure to provide Social Security Number may result in a delay or error in processing of the request for personnel action.

THRU: (Include ZIP Code)	TO: (Include ZIP Code)	FROM: (Include ZIP Code)

SECTION I - PERSONAL IDENTIFICATION

NAME (Last, First, MI)	GRADE OF RANK/PMOS (Enl only)	SOCIAL SECURITY NUMBER

SECTION II - DUTY STATUS CHANGE (Proc 9-1, DA Pam 600-8)

The above member's duty status is changed from _____

_____ to _____

_____ effective _____ hours, _____ 19 ____

SECTION III - REQUEST FOR PERSONNEL ACTION

I request the following action:

	TYPE OF ACTION	Procedure		TYPE OF ACTION	Procedure
	Service School (Enl only)			Reassignment Married Army Couples	
	ROTC or Reserve Component Duty			Reclassification	
	Volunteering For Overseas Service			Officer Candidate School	
	Ranger Training			Assgmt of Fam with Exceptional Family Members	
	Request Extreme Family Problems			Identification Card	
	Exchange Reassignment (Enl only)			Identification Tags	
	Airborne Training			Separate Rations	
	Special Forces Training/Assignment			Leave - Excess/Advance/Outside CONUS	
	On-the-Job Training (Enl only)			Change of Name/SSN/DOB	
	Retesting in Army Personnel Tests			Other (Specify)	

SIGNATURE OF MEMBER (When required)	DATE

SECTION IV - REMARKS (Applies to Sections II, III and V) (Continue on separate sheet)

SECTION V - CERTIFICATION/APPROVAL/DISAPPROVAL

I certify that the duty status change (Section II) or that the request for personnel action (Section III) contained herein -

☐ HAS BEEN VERIFIED ☐ RECOMMEND APPROVAL ☐ RECOMMEND DISAPPROVAL

☐ IS APPROVED ☐ IS DISAPPROVED

COMMANDER/AUTHORIZED REPRESENTATIVE	SIGNATURE	DATE

DA FORM DEC 82 4187 EDITION OF FEB 81 WILL BE USED COPY 1

COMMANDER'S EVALUATION

For use of this form, see AR 601-1; the proponent agency is DCSPER.

***INSTRUCTION:** To be Completed by Battalion Commander or First Commander in Chain of Command in the Grade of LTC or higher.*

PART I – QUALIFIED

After interviewing:

NAME *(Last, First, Middle)* GRADE SSN

I consider the soldier qualified to perform a three-year tour as a recruiter. The following have been verified:
(All statements must be completed/verified. In first column, use "X" for verification or "NA" for not applicable.)

	Soldier has both a valid military and state driver's license or a valid state driver's license and is qualified to obtain a military driver's license.
	Soldier's current _____ Height; _____ Weight
	Soldier currently has _____ dependents *(to include spouse)*.
	Soldier _____ is _____ is Not a sole parent.
	Soldier is not currently enrolled in the Army's drug and alcohol abuse program.
	Soldier has no family or emotional problems which could hamper his/her performance.
	Soldier possesses excellent military bearing and appearance and has no obvious distracting physical abnormalities or mannerisms. Soldier is reflective of the NCO Corps and is able to represent the United States Army in a civilian environment.
	Soldier is not pregnant *(female)*.
	Soldier is not married to another service member.
	Soldier is married to the following service member:
	NAME *(Last, First, Middle)* GRADE SSN

PART II – UNQUALIFIED

After interviewing:

NAME *(Last, First, Middle)* GRADE SSN

I consider the soldier unqualified for recruiting duty for the following reasons: *(Be specific. Use reverse if more space is necessary.)*

NAME OF PSNCO/POC	TYPED OR PRINTED NAME AND RANK OF INTERVIEWING OFFICER
AUTOVON TELEPHONE NUMBER OF PSNCO/POC	SIGNATURE OF INTERVIEWING OFFICER DATE

DA FORM 5428-R, May 85

COMMANDER'S ASSESSMENT OF RECRUITER CANDIDATE

For use of this form, see AR 601-1; the proponent agency is DCSPER.

NAME OF CANDIDATE *(Last, First, Middle)* GRADE SSN LENGTH OF TIME COMMANDER HAS KNOWN CANDIDATE *(Months)*

In items 1 through 12 below there is a brief narrative describing environmental factors of recruiting duty followed by a related question. Considering these factors, for each item indicate the degree of agreement with the following questions as being descriptive of the assessed candidate.	*("X" Appropriate block)*				
	LOW DEGREE			HIGH DEGREE	
	1	2	3	4	5
1. A recruiter is normally assigned to a station consisting of two to five recruiters. Recruiting requires that an individual perform many tasks with minimum direct supervision. Each station has an overall recruiting mission to be successful and requires a combined team effort to accomplish this mission. Is the candidate reliable, loyal, cooperative, and a team player?					
2. A recruiter has a great deal of independence of action. The recruiter must be capable of working with minimum supervision and must motivate himself/herself to prospect on a daily basis. Is the candidate an independent worker, a self-starter? Does he/she seek responsibility?					
3. Recruiters must interact and communicate with people of various educational levels. They must be capable of speaking to small and large groups as well as individuals. Could the candidate maintain a conversational dialogue with school officials, civic leaders, etc.?					
4. Recruiting is similar to selling in that it requires personnel who can present the Army story in a convincing and innovative manner, and be able to close sales. The basic tools are provided; however, each recruiter must develop a technique for using them. Is the candidate industrious, aggressive, imaginative, and organized?					
5. Recruiters should represent the best the Army has to offer in terms of past performance and potential future contributions to the Army. Does the candidate demonstrate promotion and school potential?					
6. The average duty day for a recruiter is a minimum of 10 hours. Recruiters routinely work in the evenings and on Saturdays. Although he/she may presently be an outstanding NCO, without a solid family life at home, duty performance could rapidly decline. A soldier's family is the cornerstone of his/her morale. Does the candidate have a stable family home life?					
7. The recruiter is the Army in the community. First impressions are lasting impressions. Does the candidate present an above average appearance? Pride in uniform? Physical condition?					
8. Recruiters are viewed within the community as leaders. They must present themselves in such a manner as to always inspire confidence in our Army. They must lead by setting the example. Does the candidate demonstrate leadership appropriate to grade?					
9. Because they live in the civilian community, recruiters are constantly under scrutiny. Recruiter standards of conduct must be exemplary. Does the candidate demonstrate professional and personal maturity on and off duty?					
10. Due to the wide-spread geographic assignments within USAREC, recruiters do not always have access to the normal benefits of military life. Recruiters must be capable of overcoming this separation from normal support and performing the mission despite it. Positive attitude must be influential on others. Does the candidate display a positive attitude? Is he/she motivated and enthusiastic?					

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(See Instructions on first page.)	("X" Appropriate block)				
	LOW DEGREE				HIGH DEGREE
	1	2	3	4	5
11. One of the keys to success in recruiting is community involvement. Does the candidate participate in civic activities? Of duty education?					
12. Recruiting personnel must interact with the public. Recruiters must recruit the best possible applicant to man our Army. Recruiters must not allow personnel preferences or biases to influence their recruiting activities. Does the candidate support the Equal Opportunity Program?					

13a. CANDIDATE'S HEIGHT b. WEIGHT	14a. DATE OF LAST PT TEST
15a. DATE OF LAST PHYSICAL	b. SCORE OF LAST PT TEST
b. PROFILE PULHES: _____	_____ _____ Push Ups _____ Sit Ups _____ Run

	YES	NO
16. Does the candidate or his/her family have medical problems? *(If yes, explain in Remarks section below.)*		

REMARKS

NAME OF COMMANDER *(Last, First, Middle)*	GRADE
UNIT OF ASSIGNMENT	DATE *(Day, Month, Year)*
TELEPHONE NUMBER *(AUTOVON)*	*(Commercial)*
SIGNATURE OF COMMANDER	DATE

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APPENDIX C

SALES COMPREHENSION TEST

Form M
Revised

Name_____ Date_____
Last First Middle

Organization_____

Years of sales experience_____

Types of selling you have done_____

INSTRUCTIONS

On the following pages there are a number of questions about selling. Each question is followed by four possible answers. You are to select the one answer which, in your opinion, is the best of the four. It may be that you will not agree completely with any of the answers offered, or more than one answer may *appear to you to be correct. However, you are* to select the ONE answer which you consider the BEST of those offered, and mark an X beside that answer. If you are not sure of an answer, guess. Do not leave any questions unanswered.

(In this form all references to HE/HIM/HIS should be interpreted also to mean SHE/HER/HERS.
All references to SHE/HER/HERS should be interpreted also to mean HE/HIM/HIS).

Score_____ Percentile_____ Group_____

Percentile_____ Group_____

Percentile_____ Group_____

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LARCHMONT, NEW YORK 10538

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1. Which one of the following will generally best aid a sales representative in making a sale?
   ___ demonstrate and otherwise explain the full use of the product
   ___ determine if the potential customers need the product
   ___ offer the product on time payments
   ___ allow the potential customers to use the product on trial

2. A heavy machinery sales representative has been told during the course of a conversation with the production manager that the company cannot afford to buy the product. The sales representative's best move is to
   ___ point out to the manager that in the long run the cost of the machinery will be returned in new profits.
   ___ explain to the manager that time payments can be made on the machine.
   ___ explain to the manager that such a matter is worthy of more consideration than he has given it.
   ___ leave and later send material illustrating the virtues of the product to the production manager.

3. A woman has requested a furniture reupholstery firm to send one of their salespeople. When the representative arrives she says she has changed her mind. What is the best thing for the sales representative to do?
   ___ Politely explain that she is obligated to see the samples.
   ___ Ask her, "Have you purchased some already?"
   ___ Tell her she is making a serious mistake.
   ___ Say to her, "As long as I am here, I may as well show you the samples."

4. You are a job lot dealer who has brought up a large number of secondhand cameras, with the hope of getting rid of them quickly, but at a decent profit. Which one of the following groups will probably be the best market?
   ___ camera shops selling secondhand equipment
   ___ schools offering art courses
   ___ newspaper photography departments
   ___ student camera clubs

5. Which one of the following items sells better in rural districts than in cities?
   ___ overalls
   ___ sporting goods
   ___ books on animal husbandry
   ___ building materials

6. A prospective customer comes to the stationery department of a store in search of desk accessories advertised in newspapers. After seeing the items as well as others not advertised, the person leaves without having purchased anything. What is the most probable reason for this?
   ___ The salesperson failed to make the items appear as attractive as the ad presented them.
   ___ The items were poorly displayed, making them unattractive.
   ___ The potential customer could not decide just what to buy.
   ___ The prospective customer was not asked by the salesperson to make a purchase.

7. Most of those on the sales staff of a particular soap company are doing better than ever before; but one is doing worse. This sales representative can probably improve MOST by
   ___ finding out more about the product.
   ___ requesting a change in territory.
   ___ developing pleasant personality traits.
   ___ studying the methods of successful sales people.

8. The same book will probably sell best under which one of the following titles?
   ___ "Sing for Your Supper"
   ___ "How to Sing for Money"
   ___ "Dollar Serenade"
   ___ "Manual of Voice Training"

9. Which one of the following will best serve to improve a sales representative's business?
   ___ invite prospective customers to dinner
   ___ read recent sales publications
   ___ take courses in psychology
   ___ read up on economic theories

10. During the discussion between a company's buyer and a sales representative, the buyer has to leave to meet a scheduled appointment. In this instance, which one of the following should the sales representative do?
   ___ Wait for the buyer to return.
   ___ Leave and call later for an appointment.
   ___ Ask to go along with the buyer so as to continue the talk.
   ___ Request another interview.

11. In trying to persuade a client to increase home fire insurance coverage, which one of the following sales demonstrations will generally serve best?
___ Show the client that fire insurance today is cheaper than it ever was before.
___ Point out that the insurance does not cover the current value of the house.
___ Point out that millions of dollars were collected last year by fire victims.
___ Point out similar homes in the neighborhood that are insured for more.

12. Illustrative material is frequently an aid in selling a product. At an initial interview it will best serve its intended purpose if used in which one of the following ways?
___ given to the client at the start of the interview
___ held by the sales representative and shown to the buyer occasionally
___ relied on to clinch the sale
___ given to the buyer at the end of the interview to scan at leisure

13. Which one of the following population selection methods best serves the door-to-door sales representative of encyclopedias?
___ visit people listed in the telephone directory
___ visit "Book of the Month Club" members
___ visit homes indiscriminately
___ visit homes of college students

14. The sales representative who takes orders from retailers usually has another task. Which one of the following is it?
___ familiarizing the retailer with discount policies
___ providing free samples for distribution to customers
___ rearranging stock to make it more presentable
___ setting up advertising displays

15. Which one of the following attributes is MOST important in selling brushes door-to-door?
___ congeniality
___ appearance
___ persistence
___ personality

16. The most frequent objection to purchasing life insurance is
___ "I don't need it."
___ "My work isn't dangerous."
___ "I need time to think it over."
___ "I can't afford it."

17. The best group to canvass when selling office equipment is
___ offices with expanding credit ratings.
___ all offices in an office building.
___ previous purchasers.
___ offices suggested by purchasers.

18. Which one of the following is the best single sales argument in favor of purchasing a home?
___ It is a step towards financial independence.
___ A good real estate value is better than a savings account.
___ The home owner has a credit rating in the business world.
___ A home is an investment.

19. You are selling a service which, if adopted by your prospect, would mean a change in long established policies. A company executive is favorably impressed, but tells you it must be discussed with the other executives. What would be your next step?
___ Ask that you be told what happens, then leave.
___ Press for a commitment since the initial reaction has been favorable.
___ Go through your sales talk again briefly so the executive will know how to present it properly.
___ Ask to see the executive's colleagues so that you can present the plan to them personally.

20. All of the following motivate people to enter the field of selling. Which one is the strongest?
___ opportunity to earn more money
___ desire to be one's own boss
___ desire to meet people
___ dislike of desk jobs

21. Your supervisor points out that your sales have been falling off. You should
___ convince him you are doing your best.
___ point out that you have been given the poorest customers.
___ ask for some tips on how to improve.
___ explain that you hadn't been well, but will do better soon.

22. What is the sales engineer's most important requisite?
___ knowledge of the product
___ a pleasant personality
___ inventive ability
___ ability to solve industrial problems

23. Many factors are involved in the price of property. Which one of the following is th[illegible] important?

___ closeness of recreational f[illegible]
___ availability of transportatio[illegible]es
___ restrictions which offer protection
___ number of people who want to buy the property

24. There are many reasons people resist buying additional securities recommended by a broker. The most common one is

___ the current status of the market.
___ previous experience with recommendations.
___ lack of faith in the broker.
___ professionals' economic predictions.

25. Which one of the following approaches is best for the sales representative to use when seeing for the first time a purchasing agent who is known to be a tough customer?

___ Tell the purchasing agent some good jokes.
___ Discuss the product as if the P.A. were a good customer.
___ Tell the P.A. that services are available even if there is no purchase.
___ Discuss the merits and faults of competitors' products.

26. Your firm makes all kinds of paper containers. Mr. Roberts, owner of a small soft drink plant, has asked for a representative of your company to call. What would you do when you enter his office?

___ Introduce yourself, and wait for him to tell you why he asked a representative to call.
___ Tell him that containers will cut his shipping costs because they weigh less and are more compact than bottles.
___ Say, "We make containers for all purposes. We have the type that will be perfect for your needs."
___ Say, "Before we start, Mr. Roberts, I'd like to look over your plant. Then I will know how we can best serve you."

27. You are visiting a prospect who voices strong views regarding labor unions. He then asks for your opinion. His views do not agree with yours. What would you do?

___ Agree with him, and give additional reasons for his viewpoint.
___ Tell him firmly but politely that you disagree; then change the subject.
___ Try to point out the flaws in his argument.
___ Tell him you hadn't thought much about it.

28. You are trying to sell a public address system for use in a factory. After you have used all your sales arguments, the prospect is receptive but not quite convinced. What would you do?

___ Leave and send some literature on the product as soon as possible.
___ Leave and return as soon as possible with a "specialist" to try to further convince the prospect.
___ Remain and go over the arguments once again.
___ Remain and tell the prospect you cannot understand why she is not convinced of the product's value.

29. You are a new sales representative having your first interview with Joan Carson, a skilled and experienced buyer. She asks a question about your product which you are totally unprepared to answer. What would you do?

___ Guess at an answer so that she will not think you do not know your product.
___ Evade the question by trying a new line of approach.
___ Say that you don't know since you are new, but you can get the information by contacting the home office.
___ Tell her that it isn't too important, and continue on to some other information about the product.

30. Which one of the following BEST describes good salesmanship?

___ calling on people who are logical prospects
___ persuading people to buy your product
___ knowing how to get along with people
___ convincing people they need your product

APPENDIX D

The data that you provide on this form and on the following test will help the US Army Recruiting Command improve its "Recruit the Recruiter" program.

Completion of this form and the test, which begins on the next page, should take no longer than twenty or thirty minutes, but please use whatever time you need.

When you have finished, return this material to the person who gave it to you.

THANK YOU.

1. Name_____
   last first middle initial
2. Social Security Number_____
3. Current Rank_____
4. Current MOS_____
5. Gender (check one) ☐ Male ☐ Female
6. Current length of service (in months) _____
7. Did you volunteer to be a recruiter? ☐ Yes ☐ No
8. Do you plan to obtain a recruiter MOS? ☐ Yes ☐ No
9. Have you ever done civilian sales work? ☐ Yes ☐ No
10. Do you plan to do civilian sales work? ☐ Yes ☐ No
11. What is your home state (print full name)?_____
12. In what state are you serving as a recruiter? _____
13. How many months do you have left as a recruiter? _____

APPENDIX E

Included in this appendix are samples of the following databases and spreadsheets used in collating data for analysis:

- Pilot Study Database for Recruiters
- Pilot Study Database for Non-Recruiters
- Spreadsheet for Calculating GSA Average Percent Success
- Spreadsheet for Calculating VOL(-) Average Percent Success

SAMPLE PORTION OF PILOT-STUDY DATABASE FOR RECRUITERS

MO MSN	GSA MSN	GSA ACH	GSA CUM PCT SUC	VOL(-) MSN	VOL(-) ACH	VOL(-) CUM PCT SUC	TST SCR	UNIT	GSA AVG PCT SUC	VOL(-) AVG PCT SUC	MORE 1	MORE 2	MORE 2 (0-9 MO)
28	25	24	96	42	39	92.86	4	0	0.73	0.53	94.96	66.33	78
28	28	23	82.14	42	51	121.43	35	1	0.78	1	95.11	85.11	85
40	30	21	70	53	44	83.02	18	0	0.53	0.58	74.3	54.72	
10	2	2	100	3	3	100	-1	1	0.75	0.75	100	75	
23	15	24	160	27	45	166.67	34	0	0.77	0.67	162.2	73.54	74
51	41	47	114.63	77	80	103.9	19	1	0.67	0.67	111.09	66.67	
40	35	38	108.57	68	61	89.71	14	0	0.72	0.42	102.35	62.35	
45	33	23	69.7	73	72	98.63	27	1	0.67	0.83	79.24	72.17	
40	31	22	70.97	57	66	115.79	60	0	0.66	0.8	85.76	70.43	
6	1	1	100	1	2	200	20	0	1	1	133	100	
10	4	7	175	8	16	200	33	1	1	1	183.25	100	
37	7	8	114.29	13	19	146.15	16	0	0.5	0.33	124.8	44.5	
36	4	7	175	15	14	93.33	28	0	0.75	0.17	148.05	55.75	
38	29	39	134.48	45	64	142.22	7	0	0.78	0.75	137.04	76.86	
12	5	7	140	11	20	181.82	2	0	0.5	1	153.8	66.5	
3	1	2	200	1	2	200	1	0	1	1	200	100	
4	1	2	200	2	3	150	20	1	1	0.6	183.5	86.8	
9	8	3	37.5	13	14	107.69	44	1	0.5	0.5	60.66	50	
18	17	13	76.47	29	35	120.69	20	1	0.58	0.75	91.06	63.83	55
13	11	12	109.09	18	19	105.56	4	1	0.8	0.8	107.92	80	
23	20	26	130	34	54	158.82	42	0	0.92	0.78	139.51	87.08	85
40	30	49	163.33	57	83	145.61	35	0	0.89	0.67	157.49	81.56	
24	26	21	80.77	39	36	92.31	-7	1	0.5	0.75	84.58	58.25	59

SAMPLE PORTION OF PILOT-STUDY DATABASE FOR NON-RECRUITERS
(BNCOC PERSONNEL)

TEST SCORE	DONE CIV SALES	PRIOR RECR
-8	NO	NO
-7	YES	NO
-78	NO	NO
22	NO	YES
-90	NO	NO
-28	NO	NO
-22	NO	YES
-1	NO	NO
-37	NO	NO
-38	NO	NO
16	NO	YES
-14	YES	NO
-10	NO	NO
-15	NO	NO
12	NO	NO
-30	NO	NO
-22	NO	YES (TTE FAIL.)
40	YES	NO
47	YES	NO
23	NO	YES
-24	NO	YES
20	NO	YES
-2	NO	NO
17	NO	NO
14	NO	NO
27	NO	NO

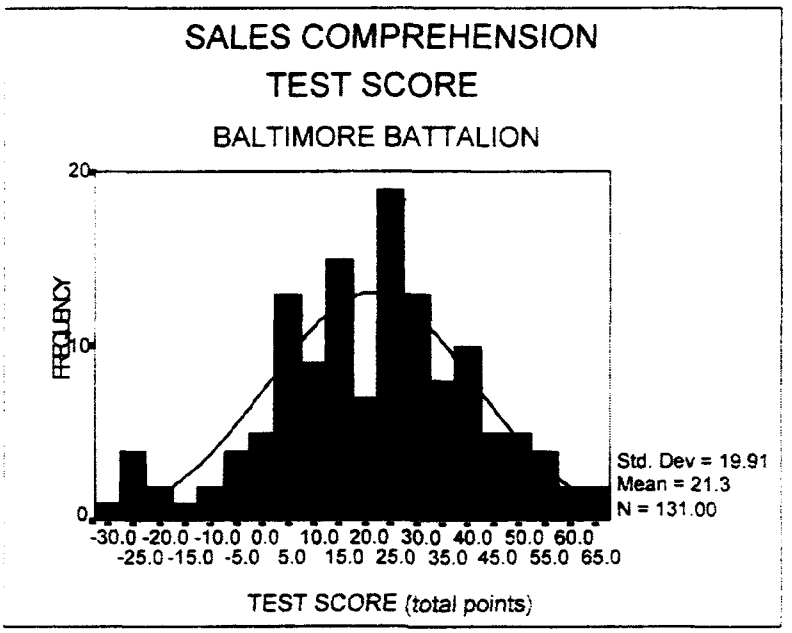
SUPPORTING SPREADSHEET SAMPLE (CALCULATING GSA AVG PCT SUCCESS)

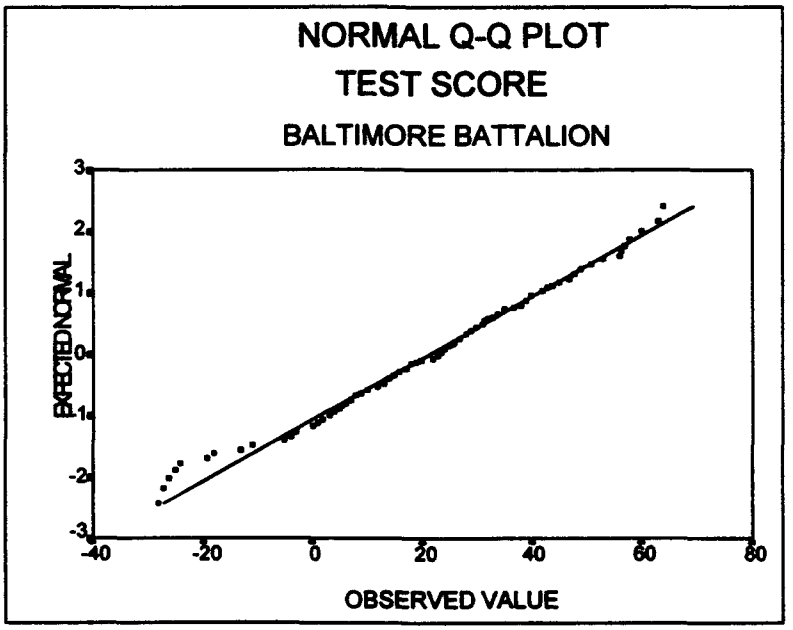
GSA ASGD	GSA ACHD	DEP LOSS	TOTAL GSA ACHD	GSA SUC
0	2	0	2	1
0	1	0	1	1
1	0	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	0	1	1
1	1	0	1	1
1	2	0	2	1
1	1	0	1	1
2	0	0	0	0
1	1	0	1	1
2	1	0	1	0
1	1	0	1	1
2	1	0	1	0
0	3	0	3	1
1	2	0	2	1
1	0	0	0	0
1	1	0	1	1
2	2	0	2	1
1	1	0	1	1
2	3	0	3	1
1	2	0	2	1
			GSA AVG PCT SUC	0.73
0	1	0	1	1
1	1	0	1	1
2	2	0	2	1
1	1	0	1	1
1	1	0	1	1
0	1	0	1	1
1	3	0	3	1
2	2	1	1	0
2	0	0	0	0
			GSA AVG PCT SUC	0.78
1	0	0	0	0
1	0	0	0	0
1	0	1	-1	0

SUPPORTING SPREADSHEET SAMPLE (CALCULATES VOL(-) AVG PCT SUCCESS)

VOL(-)ASGD	VOL(-)ACHD	DEP LOSS	TOT VOL(-) ACHD	VOL(-) SUC
0	1	0	1	1
1	1	0	1	1
1	2	0	2	1
1	0	0	0	0
0	0	0	0	1
1	1	0	1	1
1	0	0	0	0
1	1	0	1	1
1	1	0	1	1
1	0	0	0	0
1	0	0	0	0
0	1	0	1	1
1	0	0	0	0
1	0	0	0	0
1	0	0	0	0
			VOL(-) AVG PCT SUC	0.53
0	1	0	1	1
1	2	0	2	1
0	1	0	1	1
0	3	0	3	1
0	0	0	0	1
1	0	1	-1	0
1	2	0	2	1
1	0	0	0	0
1	0	0	0	0
0	1	0	1	1
0	1	0	1	1
1	0	0	0	0
1	0	0	0	0
1	1	0	1	1
0	1	0	1	1
1	1	0	1	1
1	0	0	0	0
0	1	0	1	1

APPENDIX F

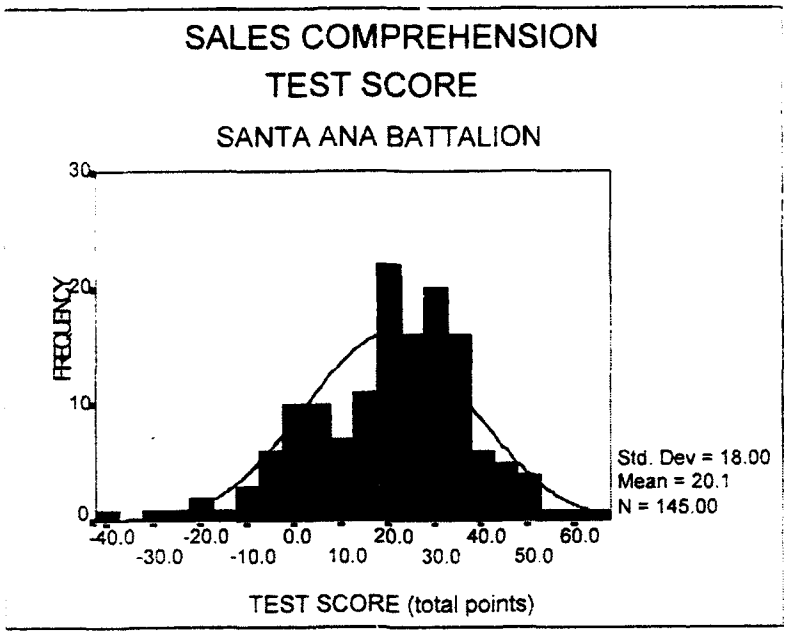

SALES COMPREHENSION
TEST SCORE
BALTIMORE BATTALION
FREQUENCY
20
10
0
Std. Dev = 19.91
Mean = 21.3
N = 131.00
-30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
-25.0 -15.0 -5.0 5.0 15.0 25.0 35.0 45.0 55.0 65.0
TEST SCORE (total points)

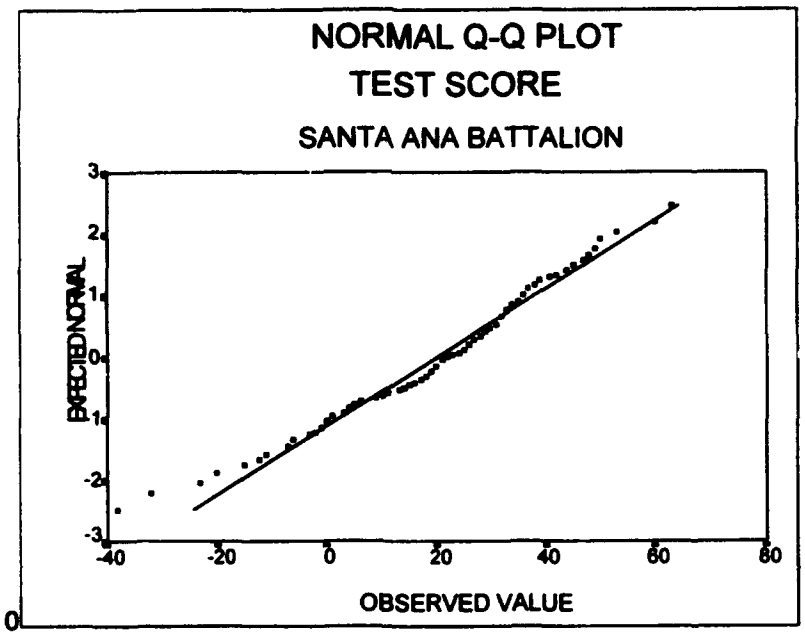

NORMAL Q-Q PLOT
TEST SCORE
BALTIMORE BATTALION
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

Random Variable:								Test Score (Baltimore Bn)	
Valid Cases:		131.0		Missing Cases:		0		Percent Missing:	0
Mean	21.2710	Std Err	1.7396	Min	-28.0000	Skewness			-.2431
Median	23.0000	Variance	396.4279	Max	64.0000	S E Skew			.2116
5% Trim	21.6802	Std Dev	19.9105	Range	92.0000	Kurtosis			-.0092
95% CI for Mean (17.8294, 24.7126)				IQR	26.0000	S E Kurt			.4202

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0337	131	> .2000


SALES COMPREHENSION
TEST SCORE
SANTA ANA BATTALION
FREQUENCY
30
20
10
0
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Std. Dev = 18.00
Mean = 20.1
N = 145.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
SANTA ANA BATTALION
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

Random Variable:					Test Score (Santa Ana Bn)		
Valid Cases:	145.0	Missing Cases:			0	Percent Missing:	0
Mean	20.0966	Std Err	1.4945	Min	-38.0000	Skewness	-.5362
Median	22.0000	Variance	323.8795	Max	63.0000	S E Skew	.2014
5% Trim	20.6360	Std Dev	17.9967	Range	101.0000	Kurtosis	.4593
95% CI for Mean (17.1425, 23.0506)				IQR	23.0000	S E Kurt	.4001

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0662	145	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
Baltimore Battalion	131	21.2710	19.910	1.740
Santa Ana Battalion	145	20.0966	17.997	1.495

Mean Difference = 1.1744

Levene' s Test for Equality of Variances: F = 1.560 P = .213

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.51	274	.607	2.282	(-3.318, 5.667)
Unequal	.51	263.25	.609	2.293	(-3.342, 5.691)

Mann-Whitney U - Wilcoxon Rank Sum W Test

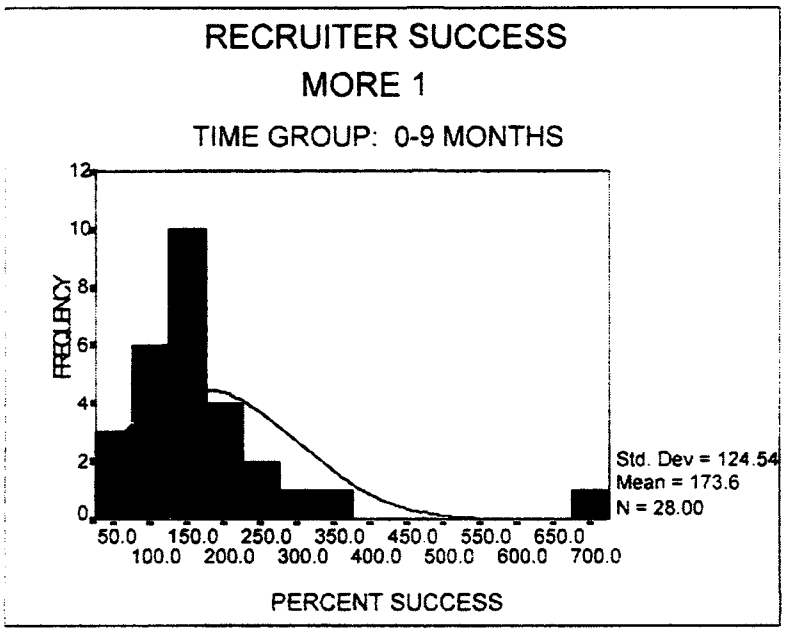
Test Score by Unit

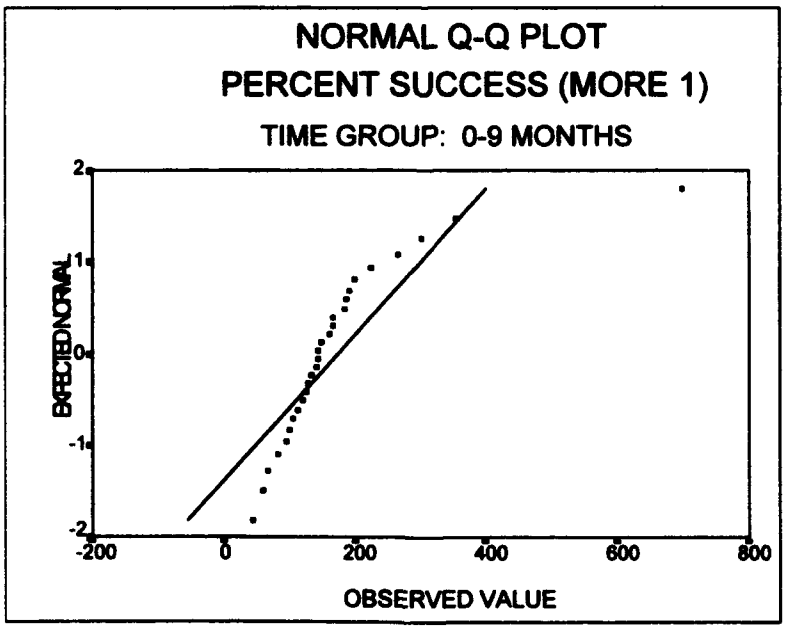
Mean Rank	Cases
140.06	131 UNIT = Baltimore Bn
137.09	145 UNIT = Santa Ana Bn
	276 Total

Corrected for Ties

U	W	Z	2-Tailed P
9292.5	18348.5	-.3096	.7568

APPENDIX G

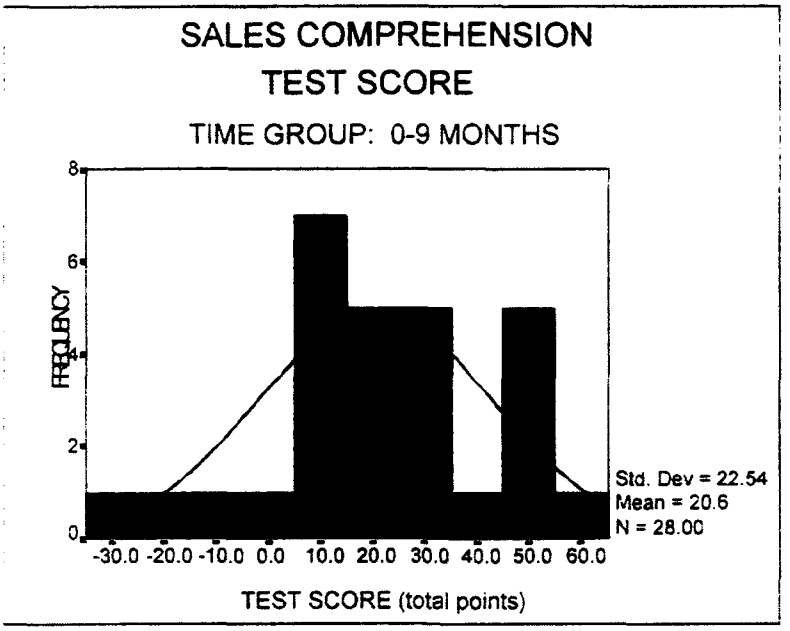

RECRUITER SUCCESS
MORE 1
TIME GROUP: 0-9 MONTHS
FREQUENCY
12
10
8
6
4
2
0
50.0 150.0 250.0 350.0 450.0 550.0 650.0
100.0 200.0 300.0 400.0 500.0 600.0 700.0
PERCENT SUCCESS
Std. Dev = 124.54
Mean = 173.6
N = 28.00

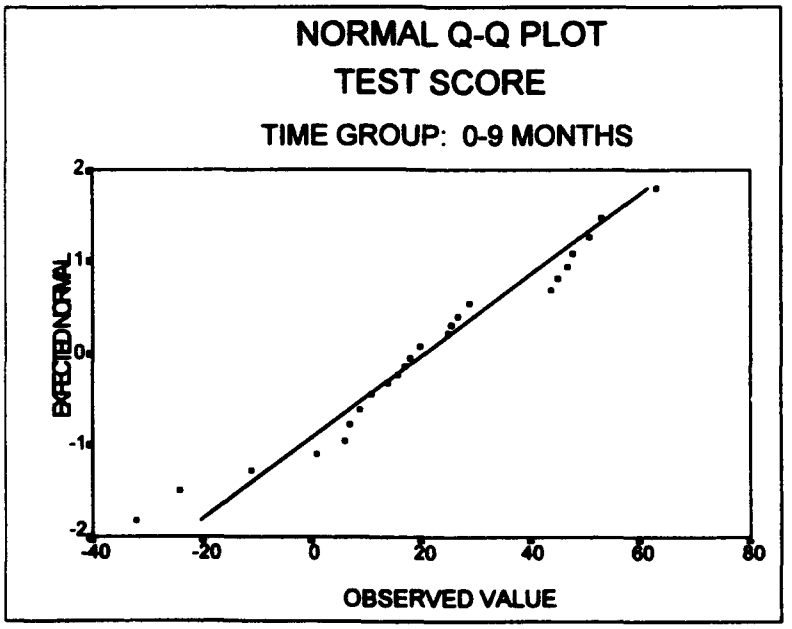

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 1)
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-200 0 200 400 600 800
OBSERVED VALUE

Random Variable:							
			Percent Success (MORE1)				
Valid Cases:	28.0	Missing Cases:		0		Percent Missing:	0
Mean	173.5884	Std Err	23.5357	Min	44.3333	Skewness	3.0241
Median	144.1500	Variance	15510.01	Max	699.0000	S E Skew	.440
5% Trim	156.7999	Std Dev	124.5392	Range	654.6667	Kurtosis	11.7095
95% CI for Mean (125.2971, 221.8797)				IQR	82.6625	S E Kurt	.8583

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.7042	28	< .0100
K-S (Lilliefors)	.2375	28	.0003


SALES COMPREHENSION
TEST SCORE
TIME GROUP: 0-9 MONTHS
FREQUENCY
8
6
4
2
0
-30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 22.54
Mean = 20.6
N = 28.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-40
-20
0
20
40
60
80
OBSERVED VALUE

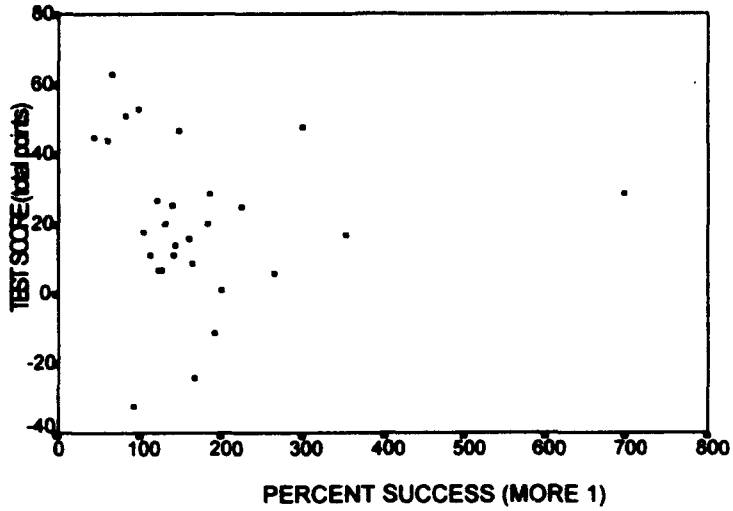
Random Variable:					Test Score		
Valid Cases:	28.0	Missing Cases:		.0		Percent Missing:	0
Mean	20.5893	Std Err	4.2591	Min	-32.0000	Skewness	-.2736
Median	19.0000	Variance	507.9084	Max	63.0000	S E Skew	.4405
5% Trim	21.1865	Std Dev	22.5368	Range	95.0000	Kurtosis	.1882
95% CI for Mean (125.2971, 221.8797)				IQR	32.7500	S E Kurt	.8583

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9655	28	.4932
K-S (Lilliefors)	.1045	28	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: 0-9 MONTHS

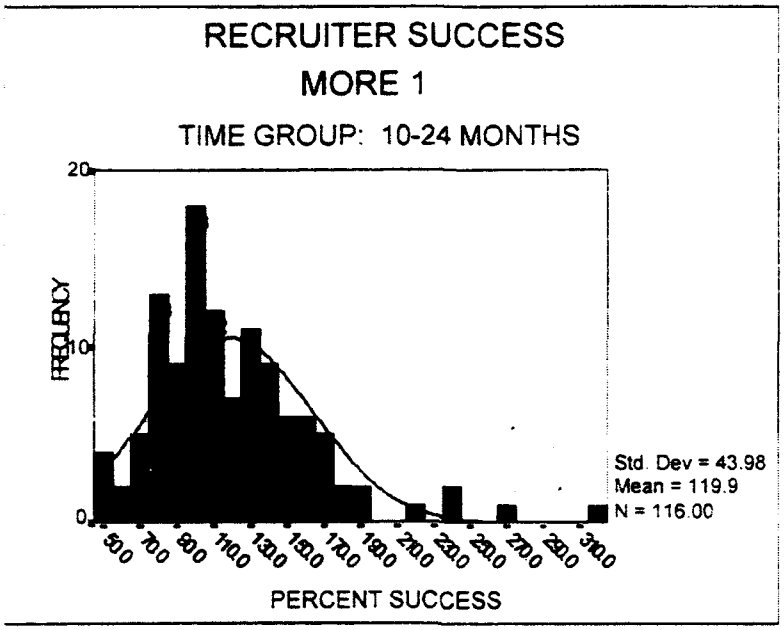


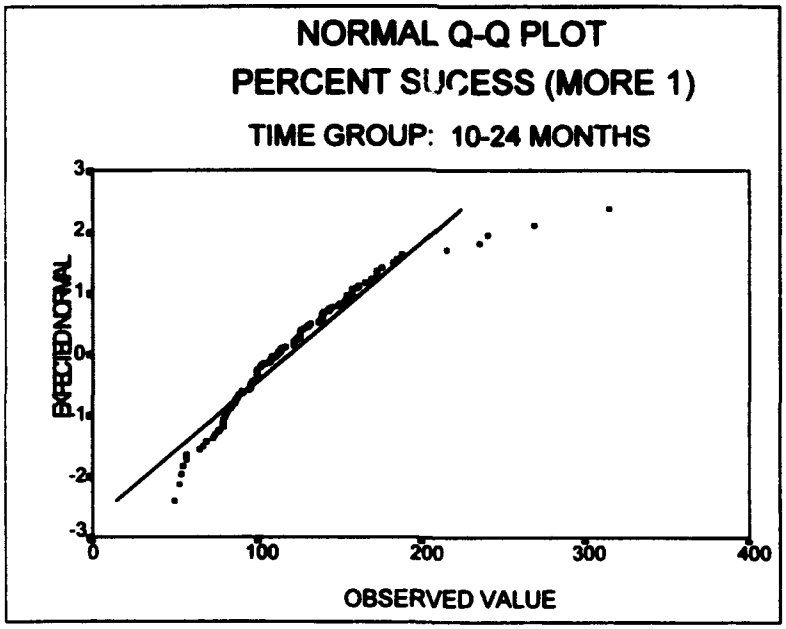
Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (28) P = .	-.0572 (28) P = .773	
Test Score	-.0572 (28) P = .773	1.0000 (28) P = .	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

Kendall Correlation Coefficients		
Test Score	-.1649 N (28) SIG .220	
	Percent Success	
(Coefficient / (Cases) / 2-Tailed Significance) " . " is printed if a coefficient cannot be computed		

Spearman Correlation Coefficients		
Test Score	-.2678 N (28) SIG .168	
	Percent Success	
(Coefficient / (Cases) / 2-Tailed Significance) " . " is printed if a coefficient cannot be computed		

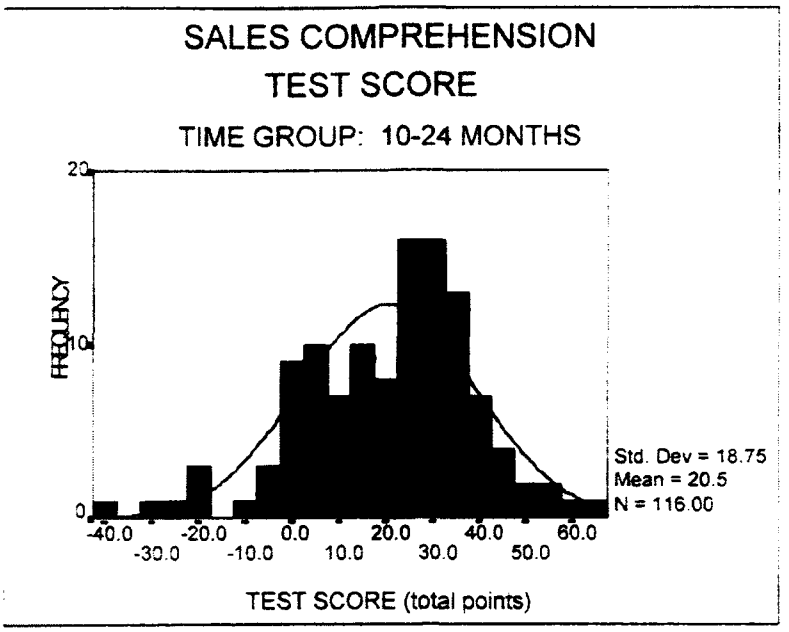

RECRUITER SUCCESS
MORE 1
TIME GROUP: 10-24 MONTHS
FREQUENCY
20
10
0
Std. Dev = 43.98
Mean = 119.9
N = 116.00
50.0
70.0
90.0
110.0
130.0
150.0
170.0
190.0
210.0
230.0
250.0
270.0
290.0
310.0
PERCENT SUCCESS

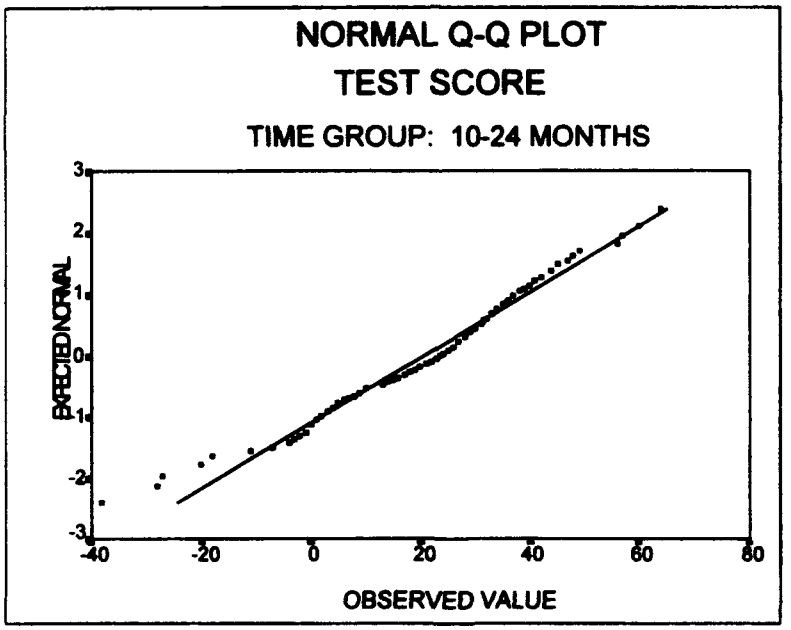

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 1)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
0
100
200
300
400
OBSERVED VALUE

Random Variable:							
			Percent Success (MORE1)				
Valid Cases:	116.0	Missing Cases:		0		Percent Missing:	0
Mean	119.8831	Std Err	4.0833	Min	50.1605	Skewness	1.4444
Median	112.8947	Variance	1934.116	Max	315.0000	S E Skew	.2246
5% Trim	116.4901	Std Dev	43.9786	Range	264.8395	Kurtosis	3.6617
95% CI for Mean (111.7949, 127.9714)				IQR	51.2815	S E Kurt	.4455

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0958	116	.0108


SALES COMPREHENSION
TEST SCORE
TIME GROUP: 10-24 MONTHS
FREQUENCY
20
10
0
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Std. Dev = 18.75
Mean = 20.5
N = 116.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

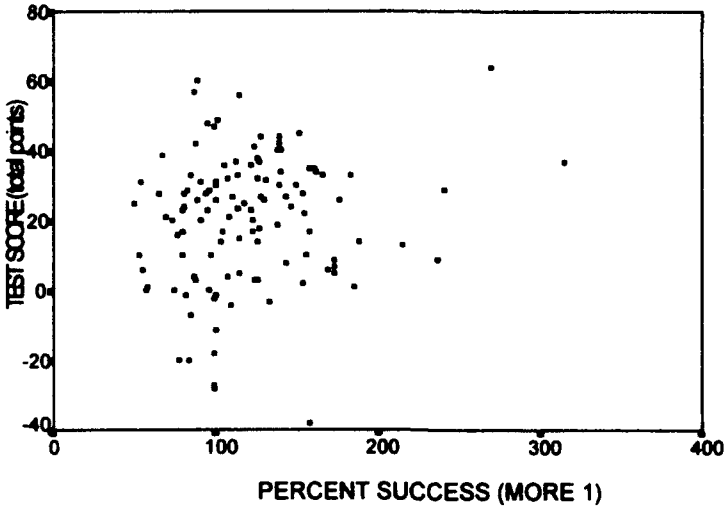
Random Variable:					Test Score		
Valid Cases:	116.0	Missing Cases:			0	Percent Missing:	0
Mean	20.4828	Std Err	1.7413	Min	-38.0000	Skewness	-.4944
Median	23.2500	Variance	351.7258	Max	64.0000	S E Skew	.2246
5% Trim	21.0632	Std Dev	18.7544	Range	102.0000	Kurtosis	.5067
95% CI for Mean (17.0336, 23.9319)				IQR	25.7500	S E Kurt	.4455

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0667	116	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: 10-24 MONTHS



Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (116) P = .	.1526 (116) P = .102	
Test Score	.1526 (116) P = .102	1.0000 (116) P = .	

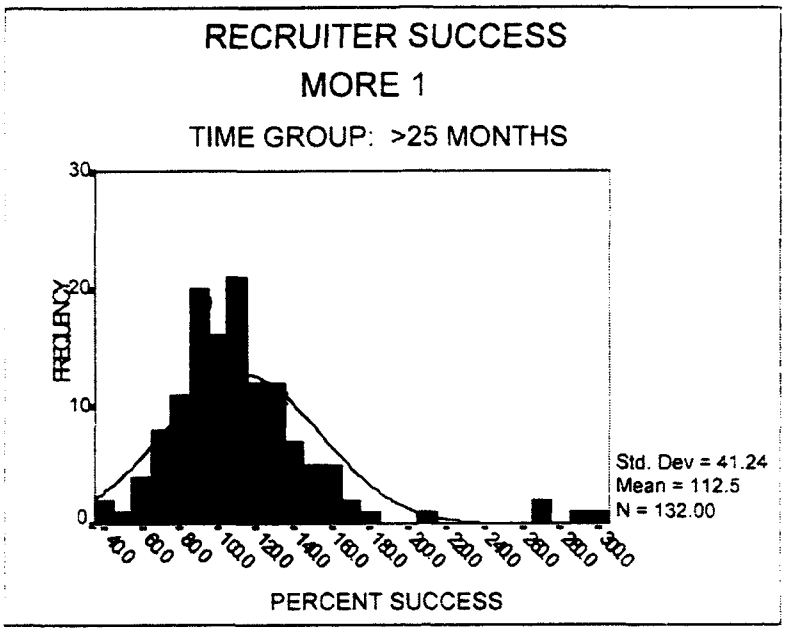
(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

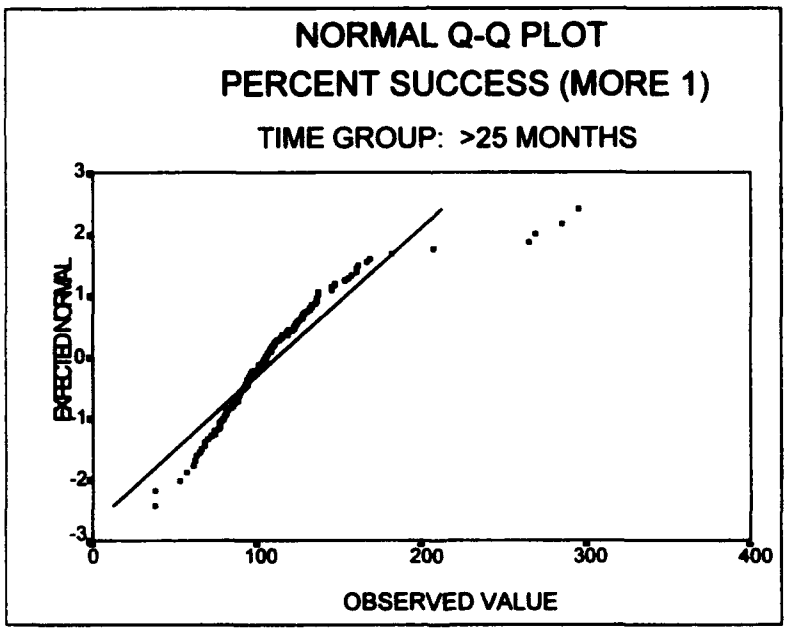
Kendall Correlation Coefficients		
Test Score	.1023 N (116) SIG .106	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

Spearman Correlation Coefficients		
Test Score	.1577 N (116) SIG .091	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

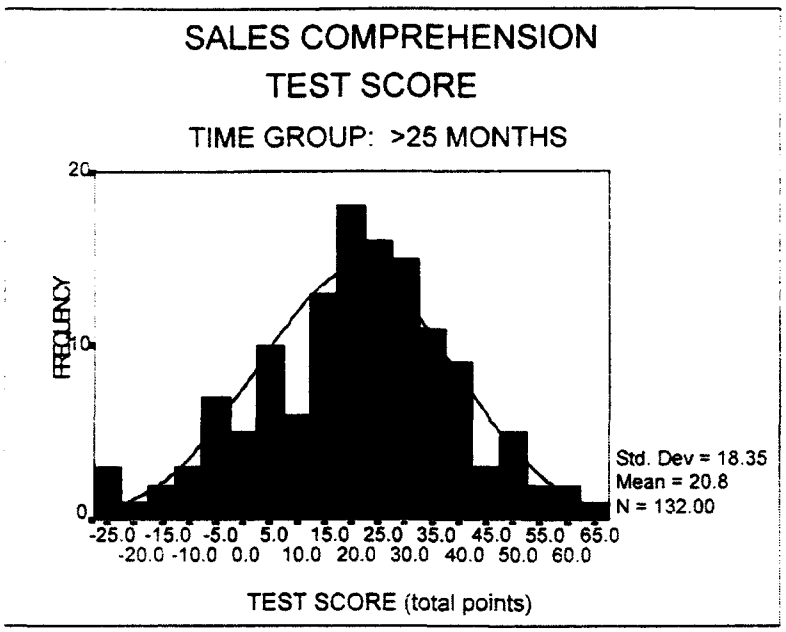

RECRUITER SUCCESS
MORE 1
TIME GROUP: >25 MONTHS
FREQUENCY
30
20
10
0
Std. Dev = 41.24
Mean = 112.5
N = 132.00
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
PERCENT SUCCESS

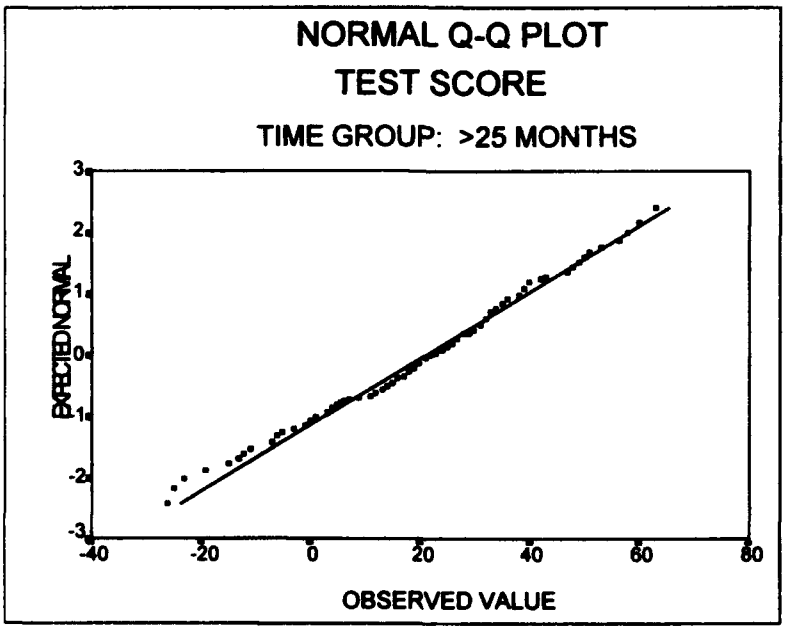

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 1)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
0
100
200
300
400
OBSERVED VALUE

Random Variable:					Percent Success (MORE1)		
Valid Cases:	132.0	Missing Cases:			0	Percent Missing:	0
Mean	112.4840	Std Err	3.5891	Min	37.7737	Skewness	2.0338
Median	106.2355	Variance	1700.379	Max	295.6000	S E Skew	.2108
5% Trim	108.5130	Std Dev	41.2356	Range	257.8263	Kurtosis	6.5699
95% CI for Mean (105.3839, 119.5841)				IQR	40.1071	S E Kurt	.4187

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.1367	132	.0000


SALES COMPREHENSION
TEST SCORE
TIME GROUP: >25 MONTHS
FREQUENCY
20
10
0
Std. Dev = 18.35
Mean = 20.8
N = 132.00
-25.0 -15.0 -5.0 5.0 15.0 25.0 35.0 45.0 55.0 65.0
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

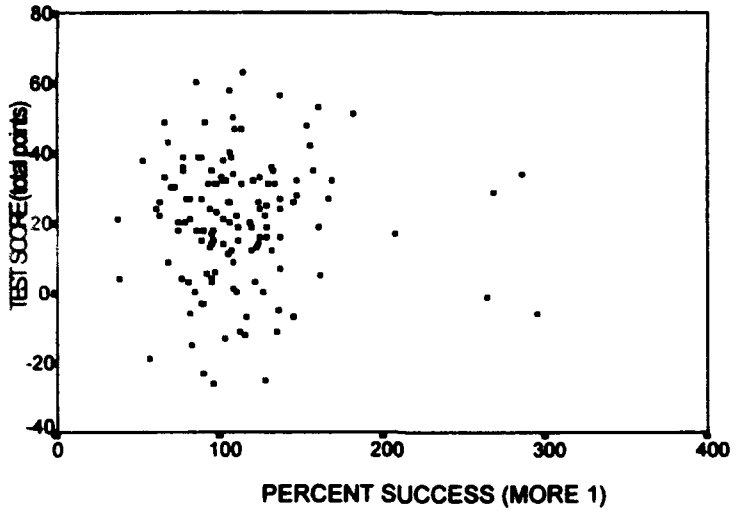
Random Variable:					Test Score		
Valid Cases:	132.0	Missing Cases:			0	Percent Missing:	0
Mean	20.8182	Std Err	1.5970	Min	-26.0000	Skewness	-.2801
Median	22.0000	Variance	336.6423	Max	63.0000	S E Skew	.2108
5% Trim	21.0833	Std Dev	18.3478	Range	89.0000	Kurtosis	-.0398
95% CI for Mean (17.6590, 23.9774)				IQR	23.2500	S E Kurt	.4187

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0472	132	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: >25 MONTHS



Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (132) P = .	.0087 (132) P = .921	
Test Score	.0087 (132) P = .921	1.0000 (132) P = .	

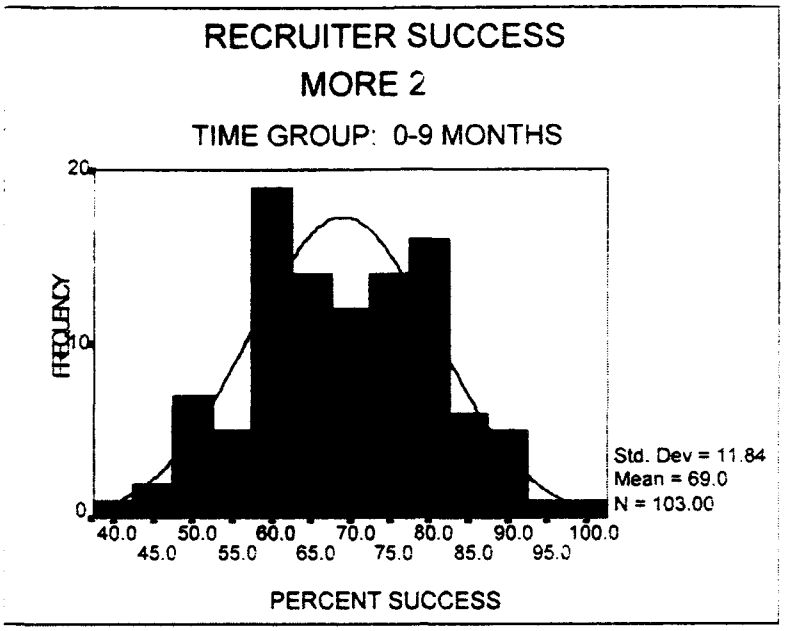
(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

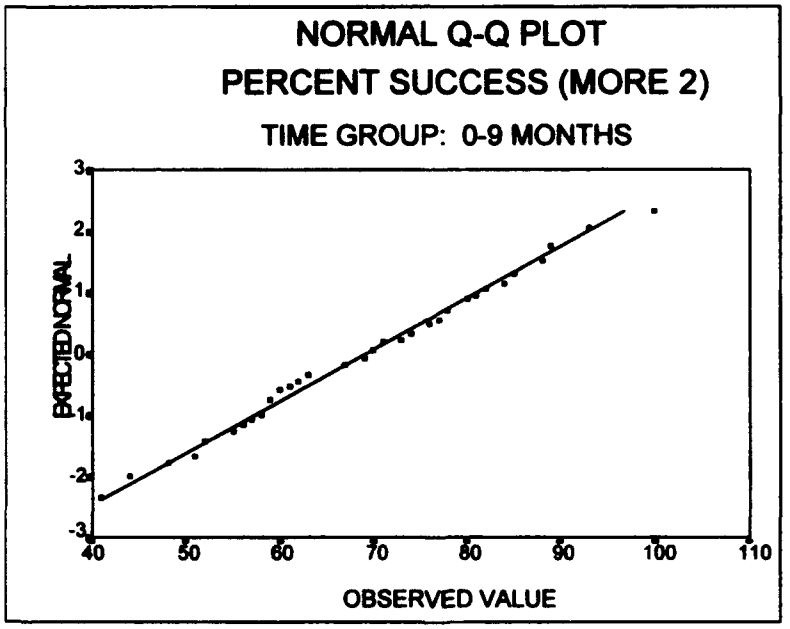
Kendall Correlation Coefficients		
Test Score	.0203 N (132) SIG .732	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

Spearman Correlation Coefficients		
Test Score	.0224 N (132) SIG .799	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

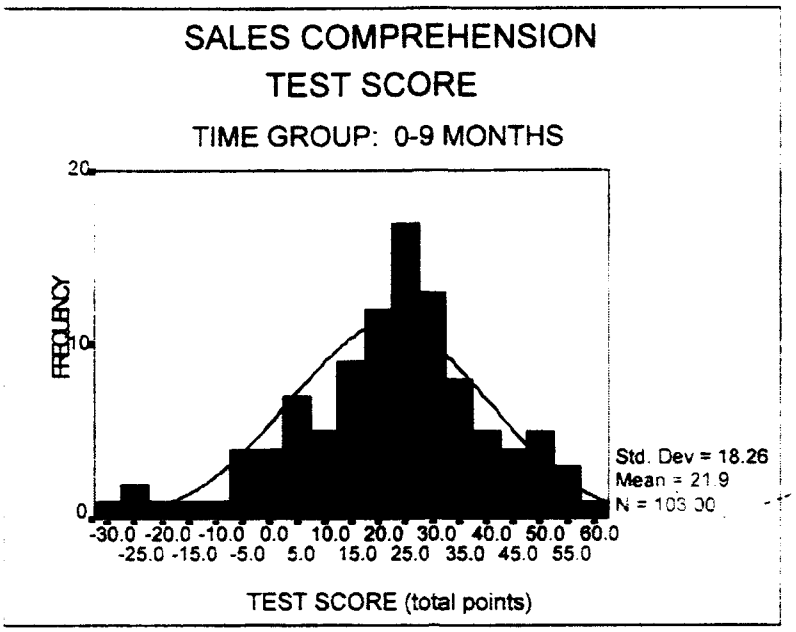

RECRUITER SUCCESS
MORE 2
TIME GROUP: 0-9 MONTHS
FREQUENCY
20
10
0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
95.0
100.0
Std. Dev = 11.84
Mean = 69.0
N = 103.00
PERCENT SUCCESS

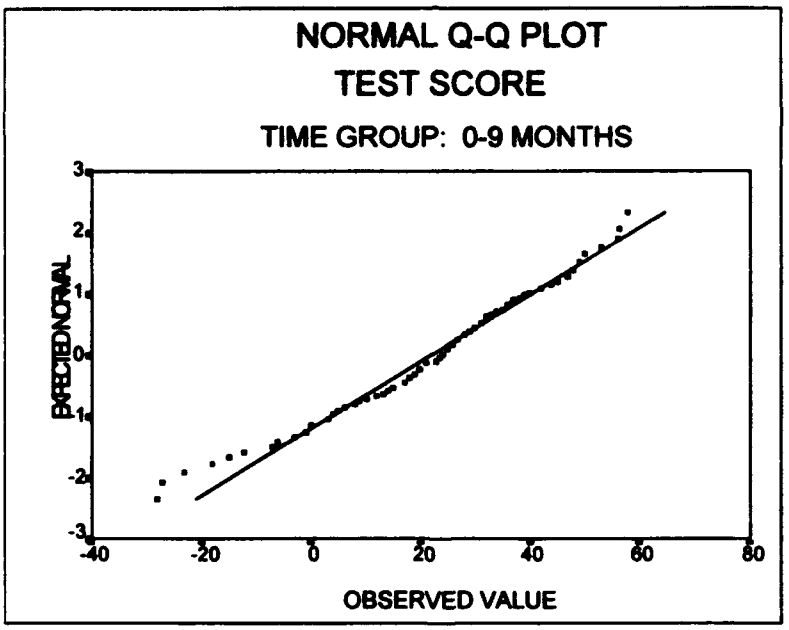

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 2)
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
40
50
60
70
80
90
100
110
OBSERVED VALUE

Random Variable:							
			Percent Success (MORE2)				
Valid Cases:	103.0		Missing Cases:		0	Percent Missing:	0
Mean	68.9903	Std Err	1.1663	Min	41.0000	Skewness	.0276
Median	70.0000	Variance	140.1077	Max	100.0000	S E Skew	.2379
5% Trim	69.0076	Std Dev	11.8367	Range	59.0000	Kurtosis	-.4224
95% CI for Mean (66.6769, 71.3037)				IQR	19.0000	S E Kurt	.4716

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0917	103	.0328


SALES COMPREHENSION
TEST SCORE
TIME GROUP: 0-9 MONTHS
FREQUENCY
20
10
0
Std. Dev = 18.26
Mean = 21.9
N = 103.00
-30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
-25.0 -15.0 -5.0 5.0 15.0 25.0 35.0 45.0 55.0
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

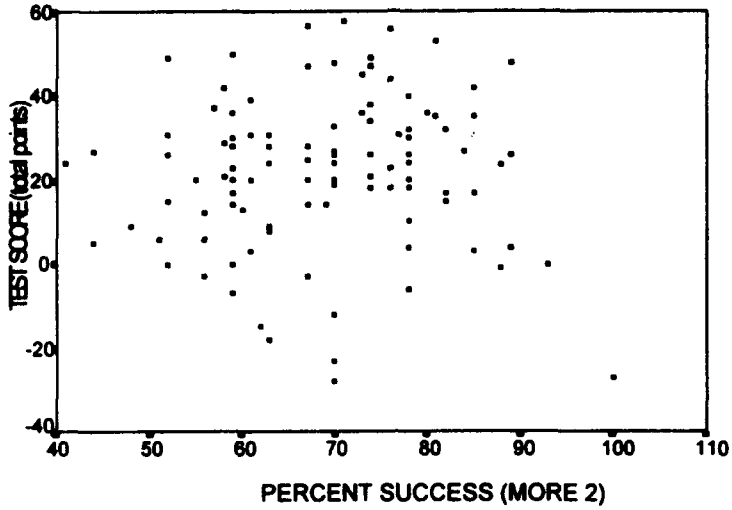
Random Variable:							
			Test Score				
Valid Cases:	103.0	Missing Cases:			0	Percent Missing:	0
Mean	21.9223	Std Err	1.7992	Min	-28.0000	Skewness	-.4726
Median	24.0000	Variance	333.4106	Max	58.0000	S E Skew	.2379
5% Trim	22.5453	Std Dev	18.2595	Range	86.0000	Kurtosis	.2645
95% CI for Mean (18.3537, 25.4910)				IQR	21.0000	S E Kurt	.4716

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0578	103	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: 0-9 MONTHS



Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (103) P = .	.0468 (103) P = .639	
Test Score	.0468 (103) P = .639	1.0000 (103) P = .	

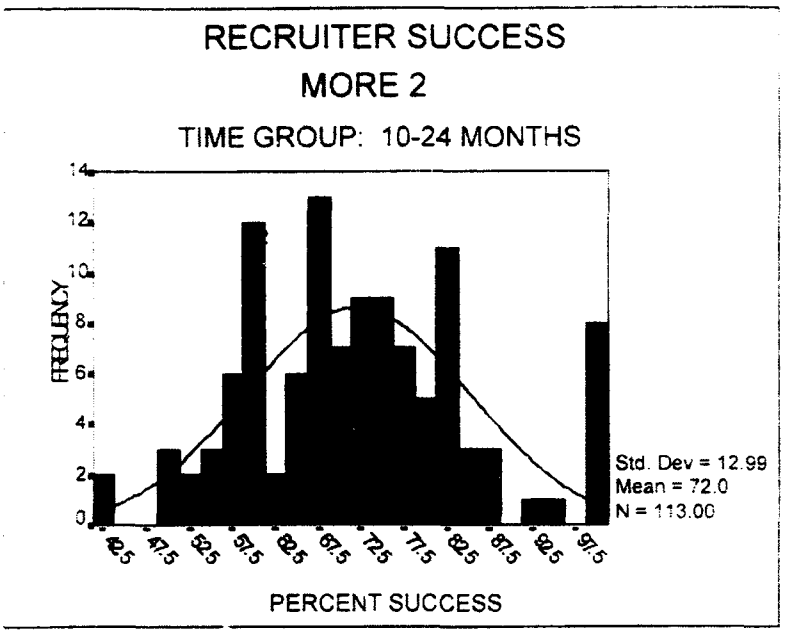
(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

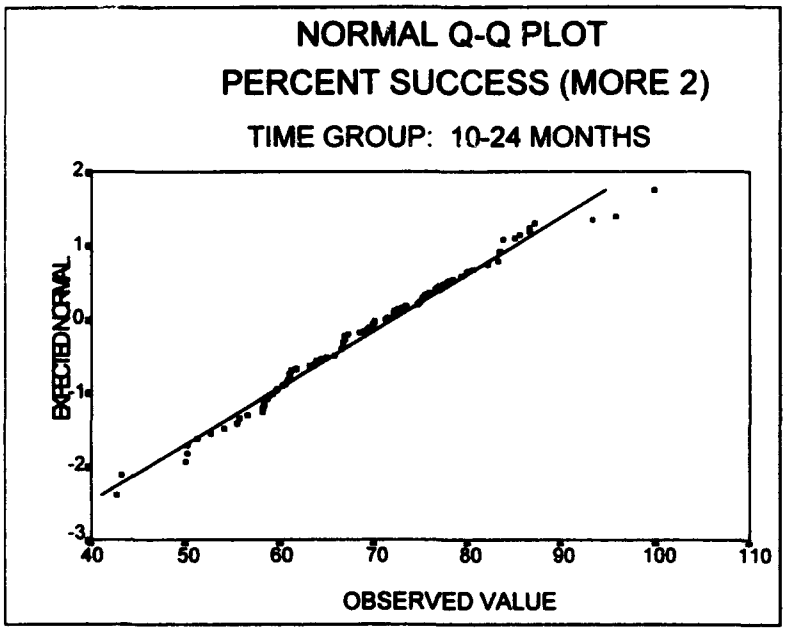
Kendall Correlation Coefficients		
Test Score	.0725 N (103) SIG .292	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

Spearman Correlation Coefficients		
Test Score	.1113 N (103) SIG .263	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

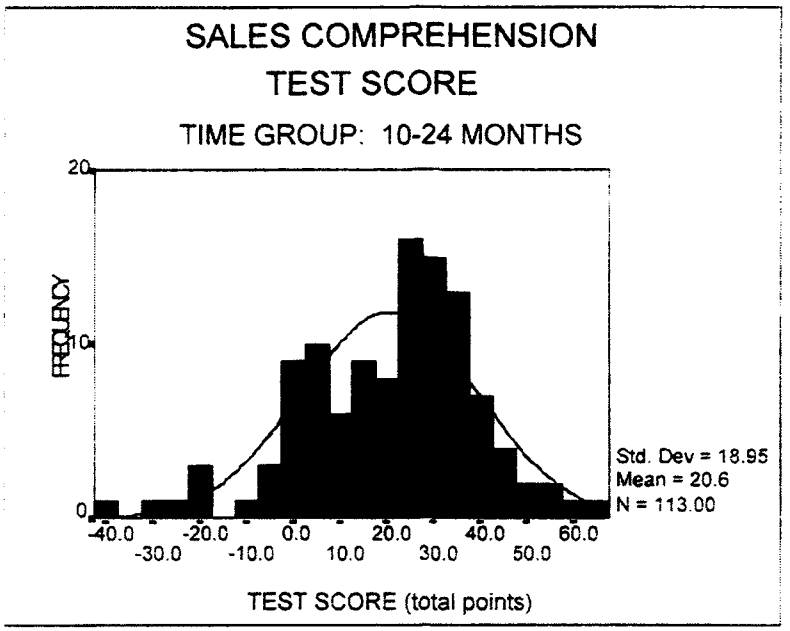

RECRUITER SUCCESS
MORE 2
TIME GROUP: 10-24 MONTHS
FREQUENCY
14
12
10
8
6
4
2
0
42.5
47.5
52.5
57.5
62.5
67.5
72.5
77.5
82.5
87.5
92.5
97.5
Std. Dev = 12.99
Mean = 72.0
N = 113.00
PERCENT SUCCESS

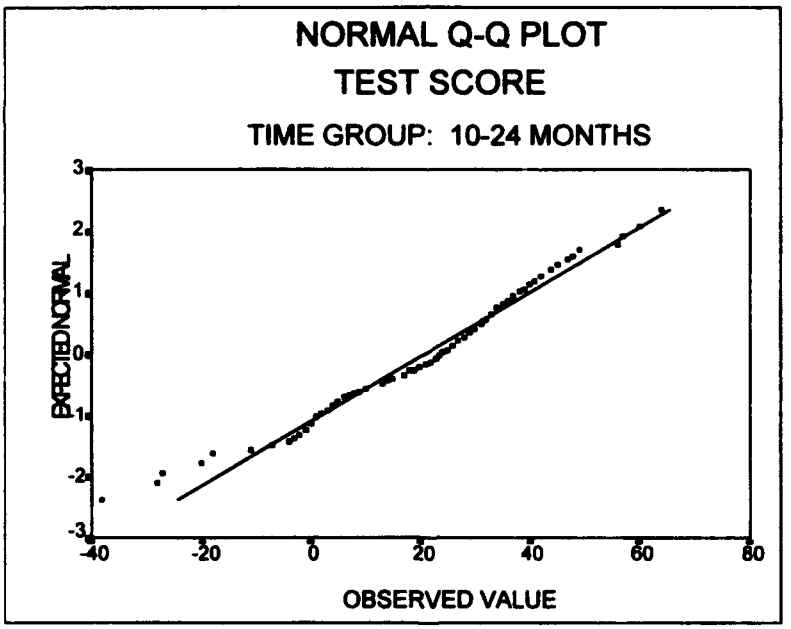

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 2)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-3
40
50
60
70
80
90
100
110
OBSERVED VALUE

Random Variable:							
			Percent Success (MORE2)				
Valid Cases:	113.0	Missing Cases:		0		Percent Missing:	0
Mean	72.0118	Std Err	1.2221	Min	42.7333	Skewness	.3384
Median	71.3182	Variance	169.7688	Max	100.0000	S E Skew	.2274
5% Trim	71.8034	Std Dev	12.9911	Range	57.2667	Kurtosis	-.0958
95% CI for Mean (69.5904, 74.4332)				IQR	18.8068	S E Kurt	.4512

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0661	113	> .2000


SALES COMPREHENSION
TEST SCORE
TIME GROUP: 10-24 MONTHS
FREQUENCY
20
10
0
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Std. Dev = 18.95
Mean = 20.6
N = 113.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

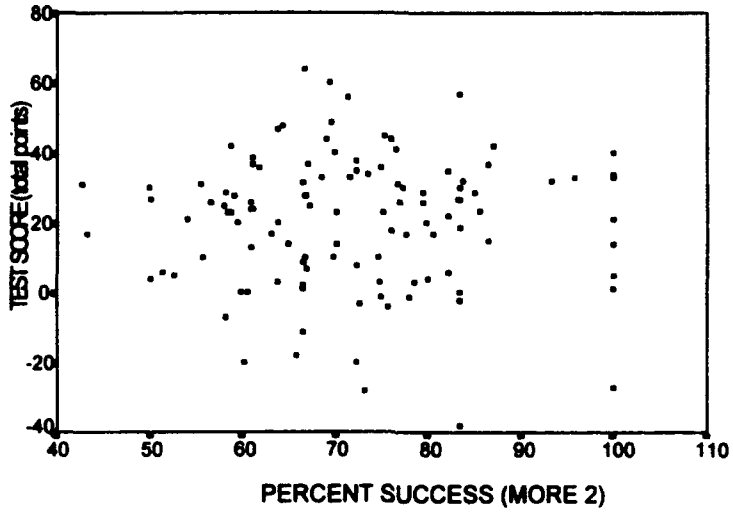
Random Variable:					Test Score		
Valid Cases:	113.0	Missing Cases:			0	Percent Missing:	0
Mean	20.5575	Std Err	1.7831	Min	-38.0000	Skewness	-.5024
Median	23.5000	Variance	359.2801	Max	64.0000	S E Skew	.2274
5% Trim	21.1455	Std Dev	18.9547	Range	102.0000	Kurtosis	.4589
95% CI for Mean (17.0245, 24.0905)				IQR	26.5000	S E Kurt	.4512

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0702	113	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: 10-24 MONTHS

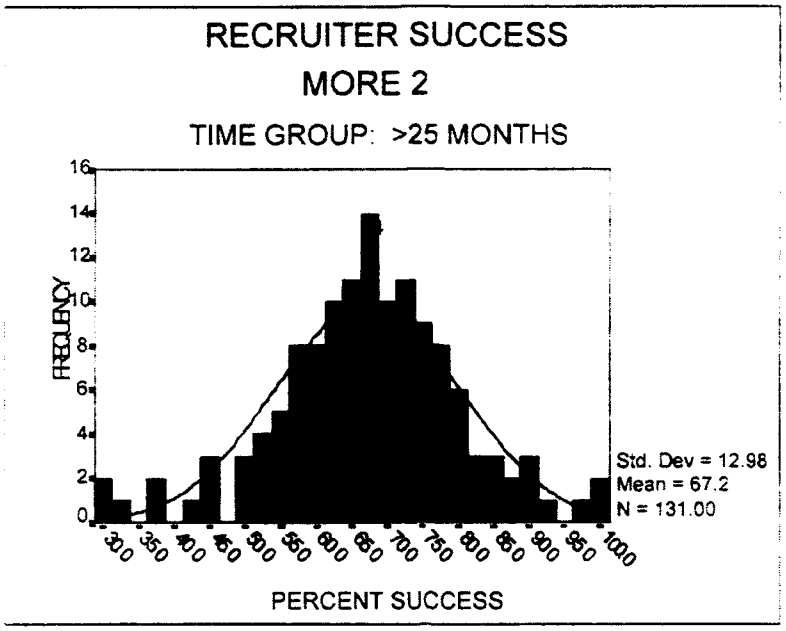


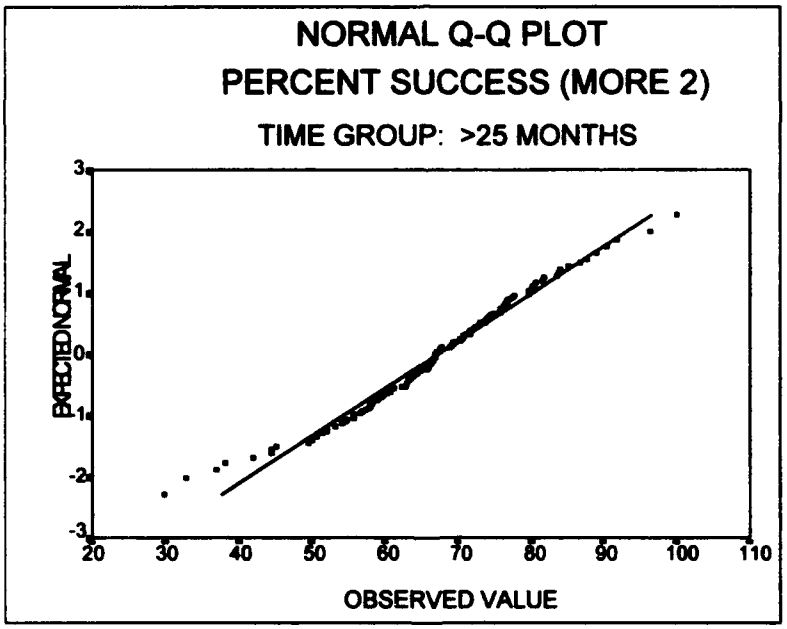
Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (113) P = .	-.0111 (113) P = .907	
Test Score	-.0111 (113) P = .907	1.0000 (113) P = .	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

Kendall Correlation Coefficients		
Test Score	.0288 N (113) SIG .655	
	Percent Success	
(Coefficient / (Cases) / 2-Tailed Significance) " . " is printed if a coefficient cannot be computed		

Spearman Correlation Coefficients		
Test Score	.0470 N (113) SIG .621	
	Percent Success	
(Coefficient / (Cases) / 2-Tailed Significance) " . " is printed if a coefficient cannot be computed		

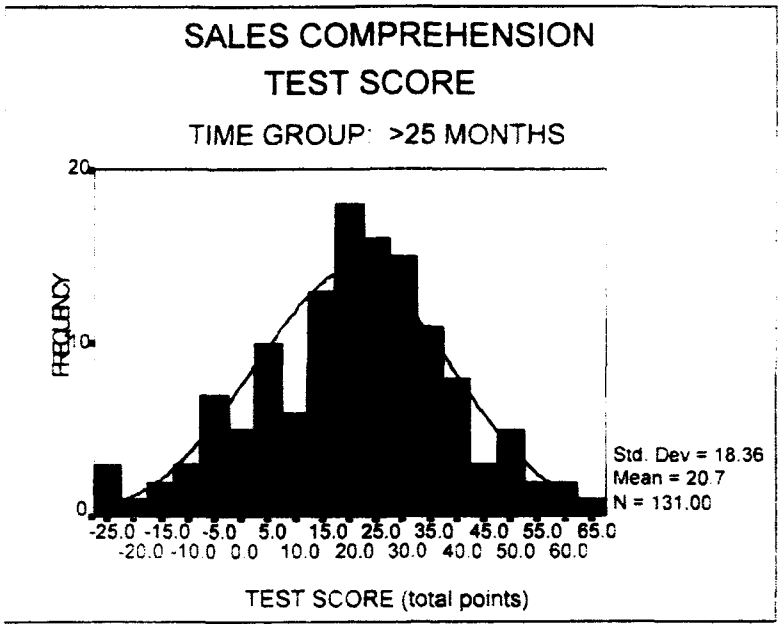

RECRUITER SUCCESS
MORE 2
TIME GROUP: >25 MONTHS
FREQUENCY
Std. Dev = 12.98
Mean = 67.2
N = 131.00
PERCENT SUCCESS

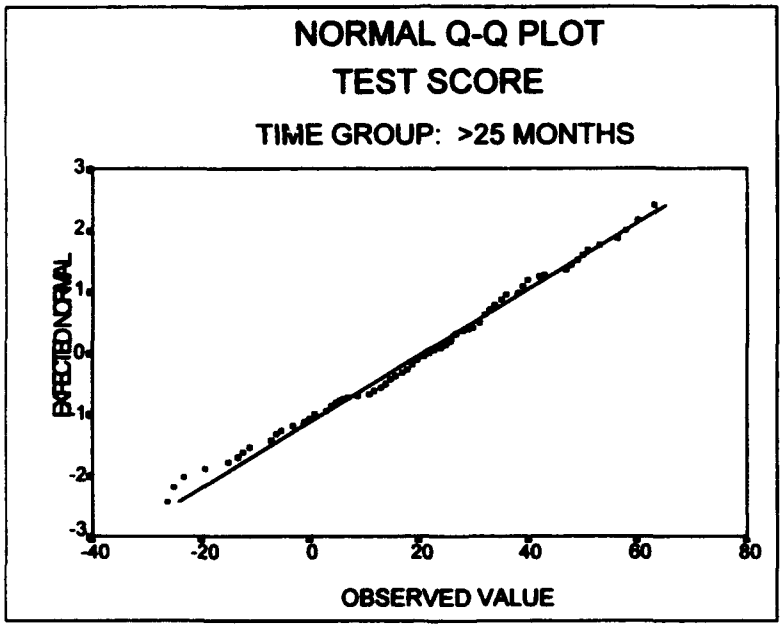

NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 2)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
OBSERVED VALUE

Random Variable:							Percent Success (MORE2)
Valid Cases:	131.0	Missing Cases:			0	Percent Missing:	0
Mean	67.1744	Std Err	1.1344	Min	29.9000	Skewness	-.2881
Median	67.0000	Variance	168.5672	Max	100.0000	S E Skew	.2116
5% Trim	67.4184	Std Dev	12.9833	Range	70.1000	Kurtosis	.8353
95% CI for Mean (64.9302, 69.4186)				IQR	15.4167	S E Kurt	.4202

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0669	131	> .2000


SALES COMPREHENSION
TEST SCORE
TIME GROUP: >25 MONTHS
FREQUENCY
20
10
0
Std. Dev = 18.36
Mean = 20.7
N = 131.00
-25.0 -15.0 -5.0 5.0 15.0 25.0 35.0 45.0 55.0 65.0
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
TEST SCORE (total points)


NORMAL Q-Q PLOT
TEST SCORE
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-40
-20
0
20
40
60
80
OBSERVED VALUE

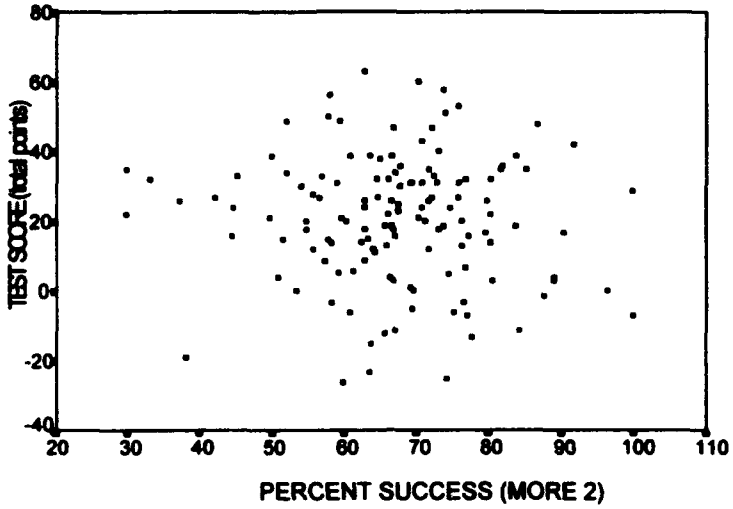
Random Variable:							Test Score	
Valid Cases:		131.0	Missing Cases:		0	Percent Missing:		0
Mean	20.6870	Std Err	1.6038	Min	-26.0000	Skewness		-.2665
Median	22.0000	Variance	336.9436	Max	63.0000	S E Skew		.2116
5% Trim	20.9381	Std Dev	18.3560	Range	89.0000	Kurtosis		-.0358
95% CI for Mean (17.5141, 23.8599)				IQR	23.0000	S E Kurt		.4202

Normality Test:

	Statistic	df	Significance
K-S (Lilliefors)	.0447	131	> .2000

PERCENT SUCCESS VS TEST SCORE

TIME GROUP: >25 MONTHS



Pearson Correlation Coefficients			
	Percent Success	Test Score	
Percent Success	1.0000 (131) P = .	-.0642 (131) P = .467	
Test Score	-.0642 (131) P = .467	1.0000 (131) P = .	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

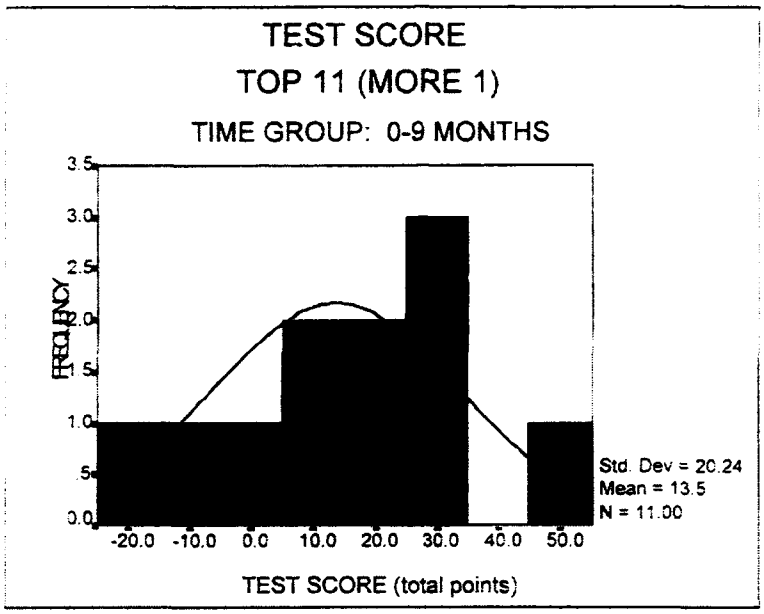
Kendall Correlation Coefficients		
Test Score	-.0264 N (131) SIG .657	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

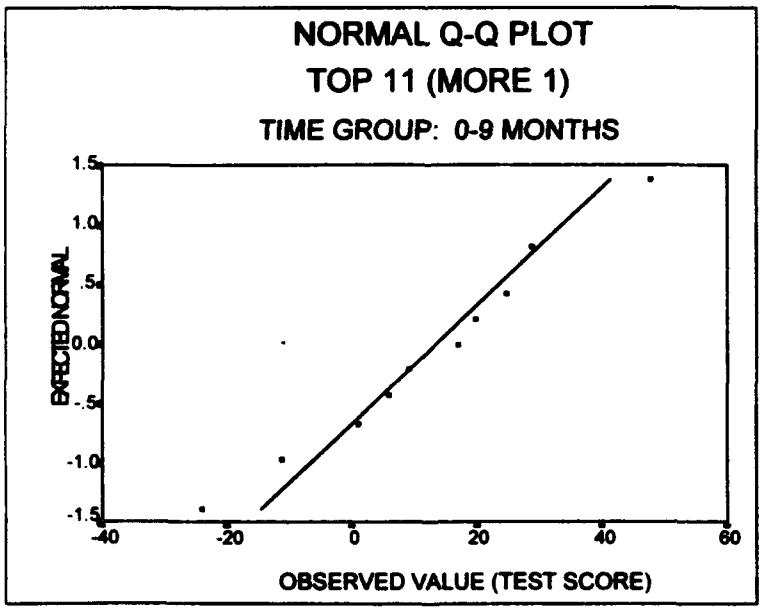
Spearman Correlation Coefficients		
Test Score	-.0437 N (131) SIG .620	
	Percent Success	

(Coefficient / (Cases) / 2-Tailed Significance)
" . " is printed if a coefficient cannot be computed

APPENDIX H



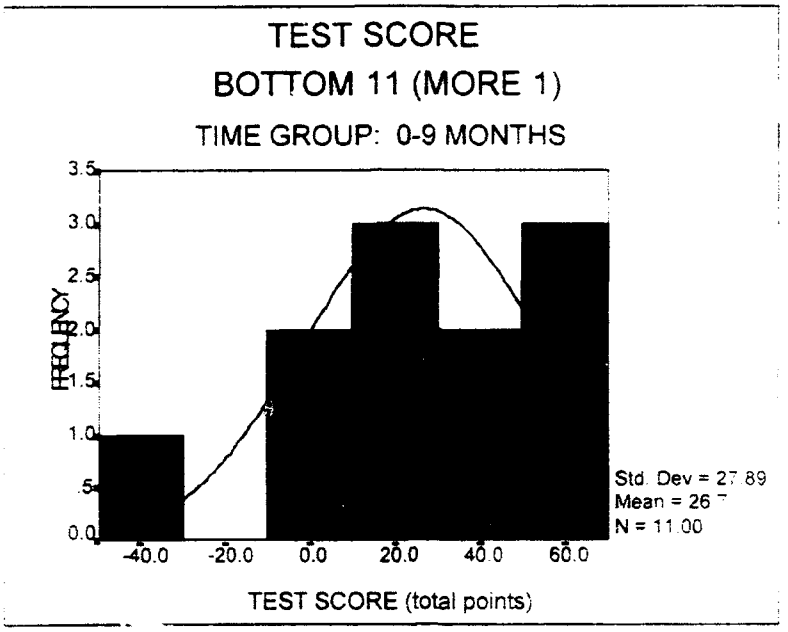
Note: Although this sample has statistically been shown to be drawn from a parent normal population, the small sample size, N, makes it appear to be non-normal.



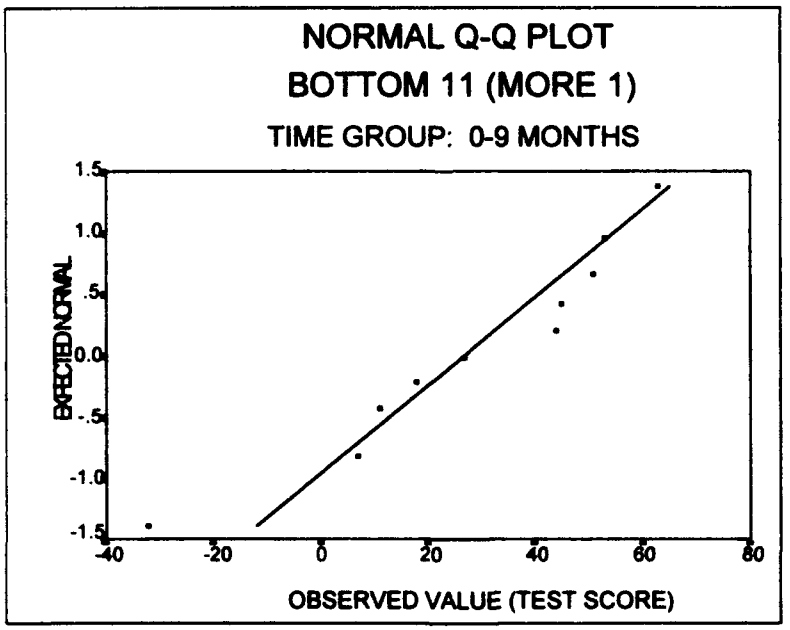
Random Variable:						Test Score (Top 11 (MORE 1))	
Valid Cases:	11.0	Missing Cases:			0	Percent Missing:	0
Mean	13.5455	Std Err	6.1027	Min	-24.0000	Skewness	-.2965
Median	17.0000	Variance	409.6726	Max	48.0000	S E Skew	.6607
5% Trim	13.7172	Std Dev	20.2404	Range	72.0000	Kurtosis	.1165
95% CI for Mean (-.0522, 27.1431)				IQR	28.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9807	11	.9605
K-S (Lilliefors)	.1317	11	> .2000



Note: Although this sample has statistically been shown to be drawn from a parent normal population, the small sample size, N, makes it appear to be non-normal.



Random Variable:						Test Score (Bottom 11 (MORE 1))	
Valid Cases:	11.0	Missing Cases:		0		Percent Missing:	0
Mean	26.7273	Std Err	8.4090	Min	-32.0000	Skewness	-.7383
Median	27.0000	Variance	777.8182	Max	63.0000	S E Skew	.6607
5% Trim	27.9747	Std Dev	27.8894	Range	95.0000	Kurtosis	.3848
95% CI for Mean (7.9909, 45.4636)				IQR	44.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9312	11	.4450
K-S (Lilliefors)	.0967	11	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 11	11	13.5455	20.24	6.103
BOT 11	11	26.7273	27.889	8.409

Mean Difference = -13.1818

Levene' s Test for Equality of Variances: F = 1.277 P = .272

t-Test for Equality of Means

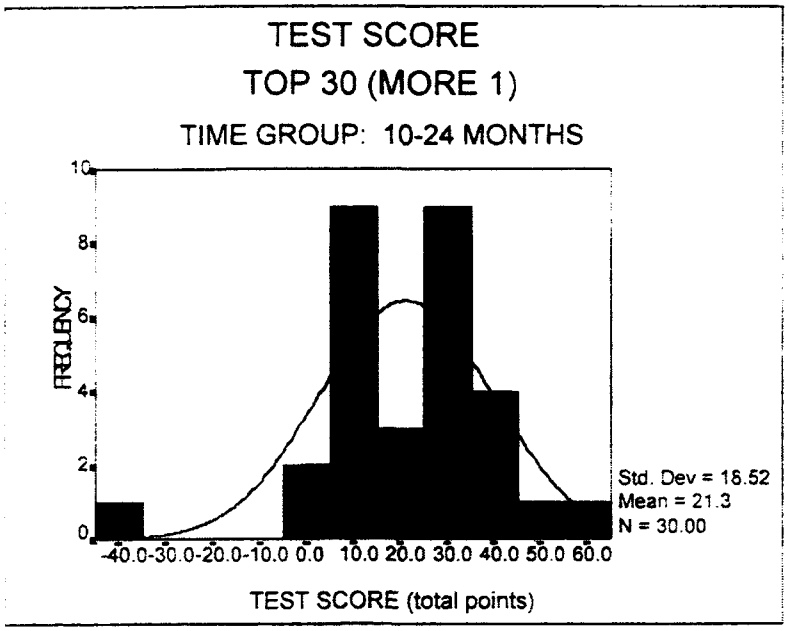
Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-1.27	20	.219	10.390	(-34.860, 8.497)
Unequal	-1.27	18.25	.220	10.390	(-35.016, 8.652)

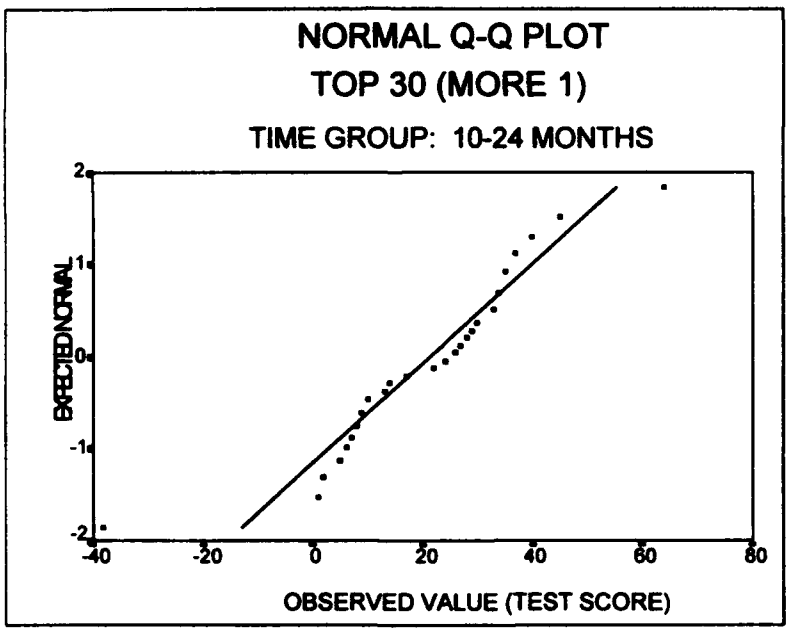
Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Scores by TOP 11/BOT 11 (MORE 1)

Mean Rank	Cases
9.73	11 TOP 11
13.27	11 BOT 11
	22 Total

U	W	Exact 2-Tailed P	Z	Corrected for Ties 2-Tailed P
41.0	107.0	.2169	-1.2812	.2001

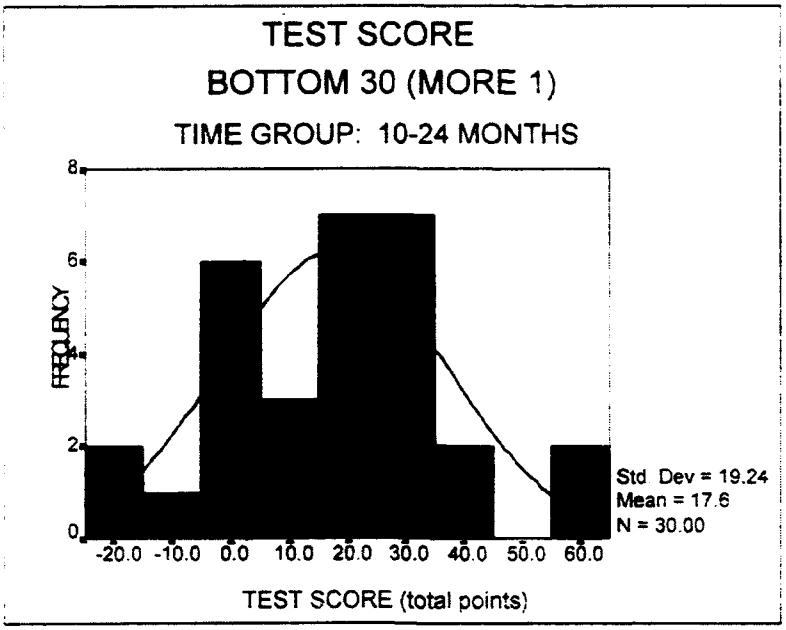

TEST SCORE
TOP 30 (MORE 1)
TIME GROUP: 10-24 MONTHS
FREQUENCY
10
8
6
4
2
0
-40.0 -30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 16.52
Mean = 21.3
N = 30.00
TEST SCORE (total points)

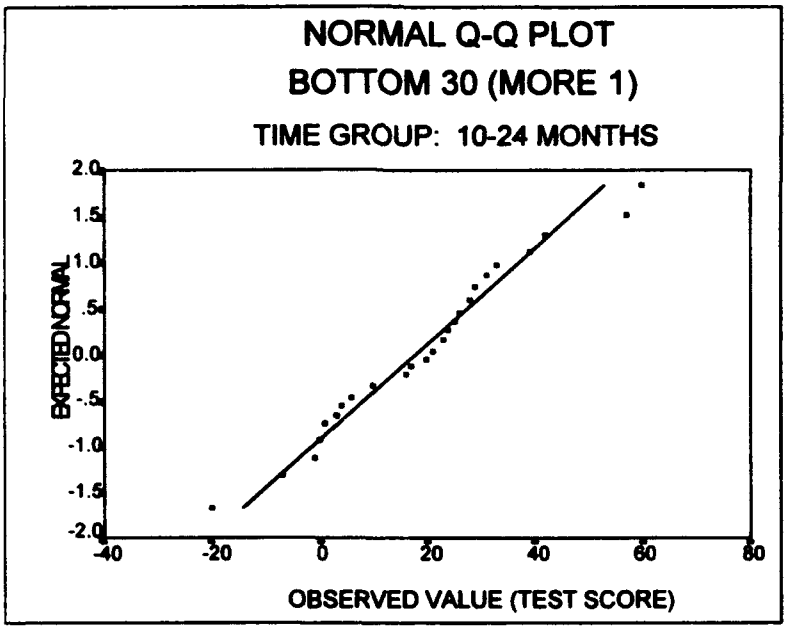

NORMAL Q-Q PLOT
TOP 30 (MORE 1)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-40
-20
0
20
40
60
80
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Top 30 (MORE 1))	
Valid Cases:	30.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	21.3000	Std Err	3.3815	Min	-38.0000	Skewness	-.7428
Median	25.0000	Variance	343.0448	Max	64.0000	S E Skew	.4269
5% Trim	21.8519	Std Dev	18.5215	Range	102.0000	Kurtosis	2.7684
95% CI for Mean (14.3840, 28.2160)				IQR	25.2500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9341	30	.0796
K-S (Lilliefors)	.0983	30	> .2000


TEST SCORE
BOTTOM 30 (MORE 1)
TIME GROUP: 10-24 MONTHS
FREQUENCY
8
6
4
2
0
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 19.24
Mean = 17.6
N = 30.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
BOTTOM 30 (MORE 1)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
2.0
1.5
1.0
.5
0.0
-.5
-1.0
-1.5
-2.0
-40 -20 0 20 40 60 80
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Bottom 30 (MORE 1))	
Valid Cases:	30.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	17.6000	Std Err	3.5124	Min	-20.0000	Skewness	.1139
Median	20.5000	Variance	370.1103	Max	60.0000	S E Skew	.4269
5% Trim	17.3889	Std Dev	19.2383	Range	80.0000	Kurtosis	.1316
95% CI for Mean (10.4163, 24.7837)				IQR	25.7500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9718	30	.6197
K-S (Lilliefors)	.0784	30	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30	30	21.3000	18.521	3.382
BOT 30	30	17.6000	19.238	3.512

Mean Difference = 3.7000

Levene' s Test for Equality of Variances: F = .092 P = .763

t-Test for Equality of Means

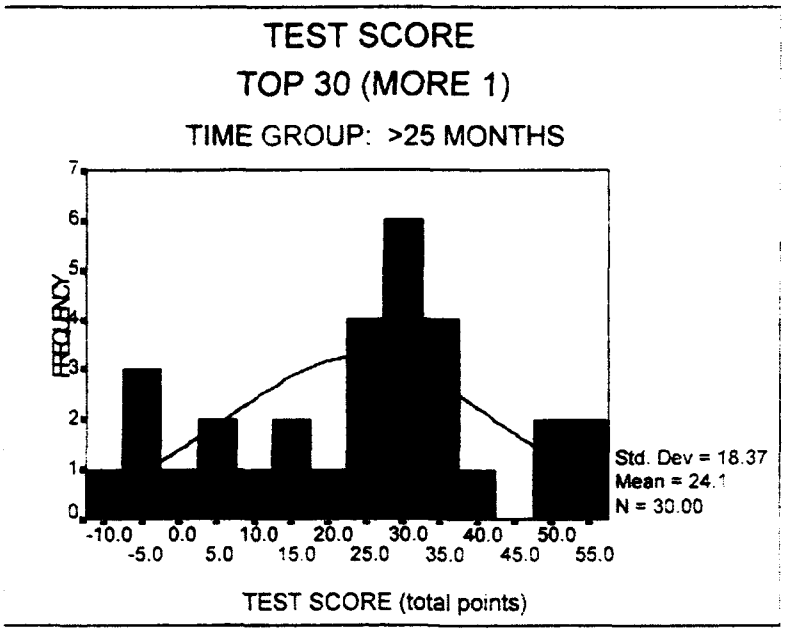
Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.76	58	.451	4.876	(-6.062, 13.462)
Unequal	.76	57.92	.451	4.876	(-6.062, 13.462)

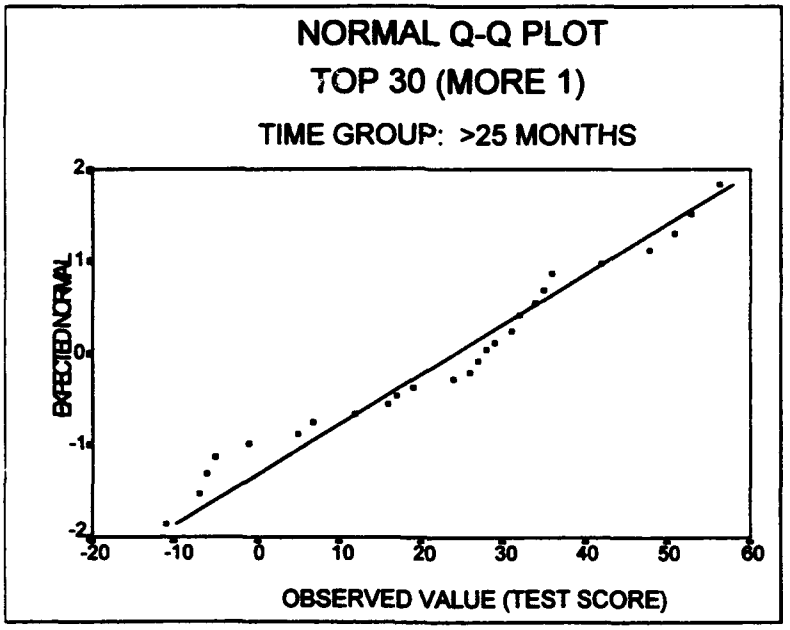
Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP 30/BOT 30 (MORE 1)

Mean Rank	Cases
33.23	30 TOP 30
27.77	30 BOT 30
	60 Total

			Corrected for Ties
U	W	Z	2-Tailed P
368.0	997.0	-1.2127	.2252

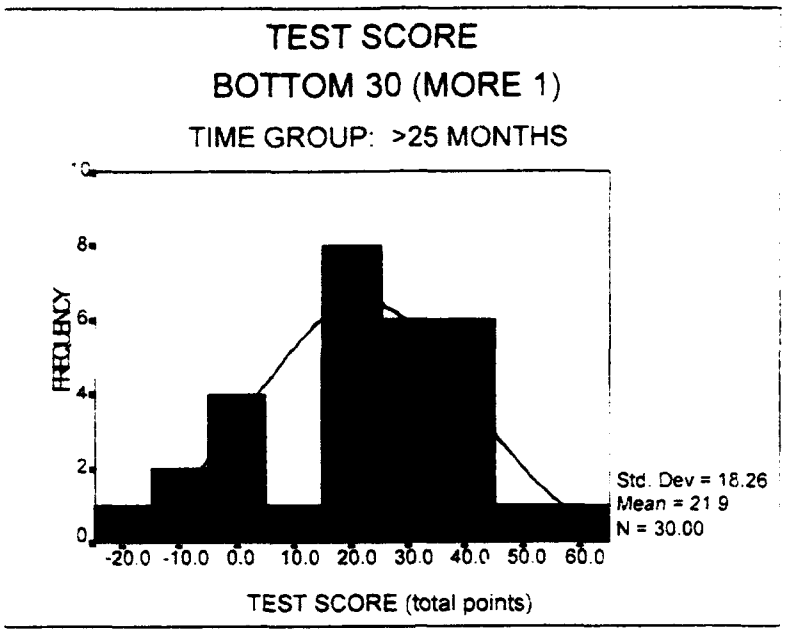

TEST SCORE
TOP 30 (MORE 1)
TIME GROUP: >25 MONTHS
FREQUENCY
Std. Dev = 18.37
Mean = 24.1
N = 30.00
TEST SCORE (total points)

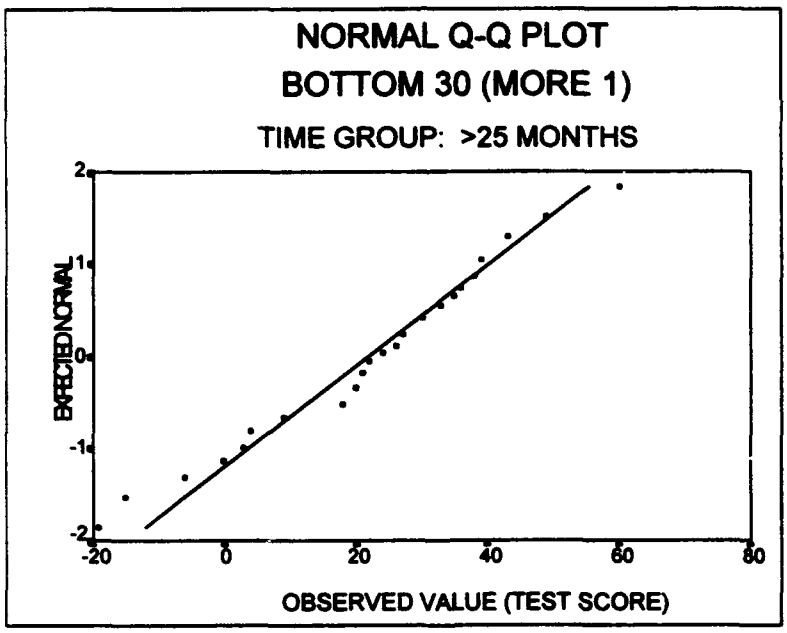

NORMAL Q-Q PLOT
TOP 30 (MORE 1)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Top 30 (MORE 1))	
Valid Cases:	30.0	Missing Cases:		0.0		Percent Missing:	0.0
Mean	24.1167	Std Err	3.3536	Min	-11.0000	Skewness	-.3110
Median	27.5000	Variance	337.4083	Max	56.5000	S E Skew	.4269
5% Trim	24.2593	Std Dev	18.3687	Range	67.5000	Kurtosis	-.5567
95% CI for Mean (17.2577, 30.9756)				IQR	24.2500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9513	30	.2758
K-S (Lilliefors)	.1075	30	> .2000


TEST SCORE
BOTTOM 30 (MORE 1)
TIME GROUP: >25 MONTHS
FREQUENCY
8
6
4
2
0
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 18.26
Mean = 21.9
N = 30.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
BOTTOM 30 (MORE 1)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-20
0
20
40
60
80
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Bottom 30 (MORE 1))	
Valid Cases:	30.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	21.8667	Std Err	3.3338	Min	-19.0000	Skewness	-.3872
Median	23.0000	Variance	333.4299	Max	60.0000	S E Skew	.4269
5% Trim	22.1481	Std Dev	18.2601	Range	79.0000	Kurtosis	.1036
95% CI for Mean (15.0482, 28.6851)				IQR	27.5000	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9713	30	.6525
K-S (Lilliefors)	.0828	30	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30	30	24.1167	18.369	3.354
BOT 30	30	21.8667	18.260	3.334

Mean Difference = 2.2500

Levene' s Test for Equality of Variances: F = .068 P = .796

t-Test for Equality of Means

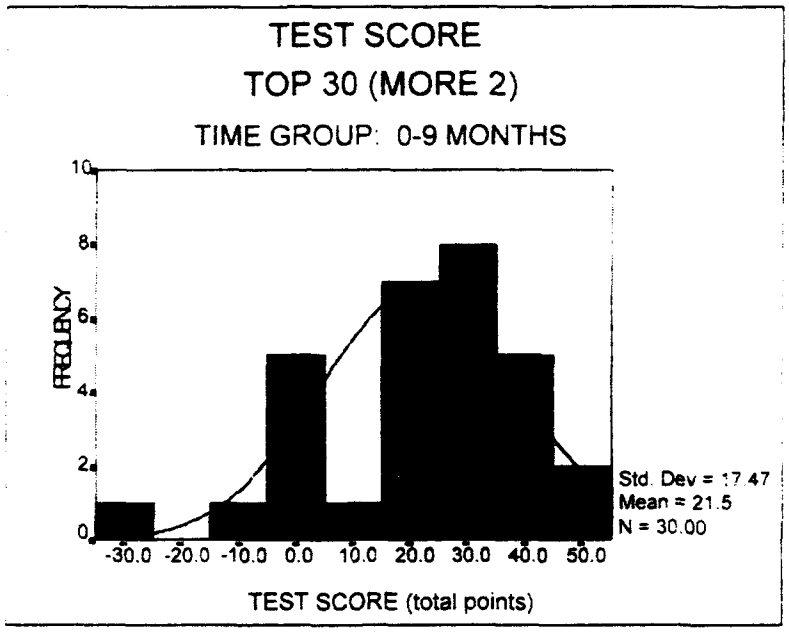
Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.48	58	.636	4.729	(-7.218, 11.718)
Unequal	.48	58.00	.636	4.729	(-7.218, 11.718)

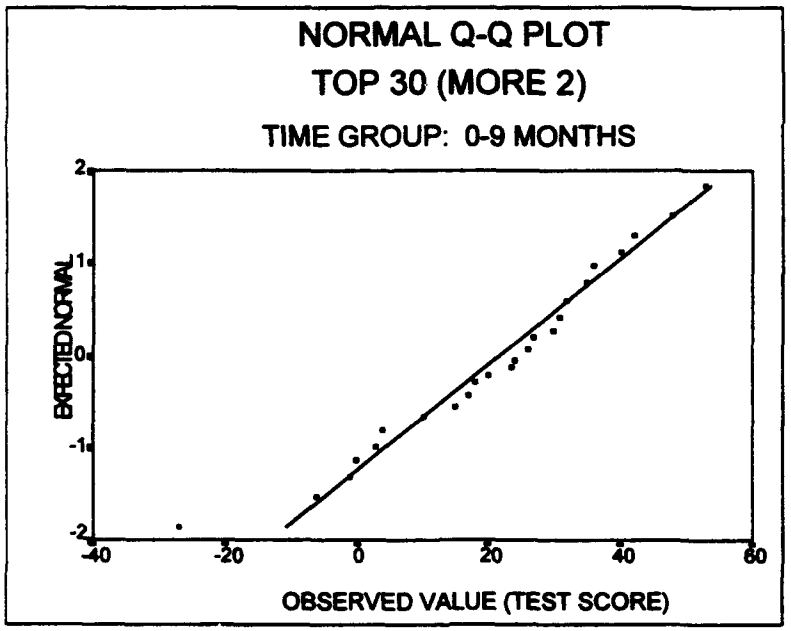
Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP 30/BOT 30 (MORE 1)

Mean Rank	Cases
31.60	30 TOP 30
29.40	30 BOT 30
	60 Total

			Corrected for Ties
U	W	Z	2-Tailed P
417.0	948.0	-.4881	.6255

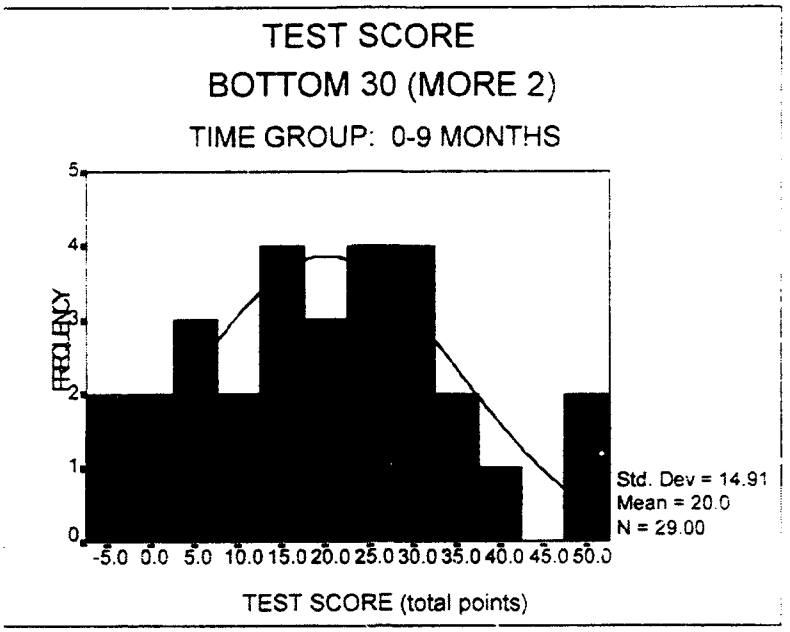

TEST SCORE
TOP 30 (MORE 2)
TIME GROUP: 0-9 MONTHS
FREQUENCY
10
8
6
4
2
0
-30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0
Std. Dev = 17.47
Mean = 21.5
N = 30.00
TEST SCORE (total points)

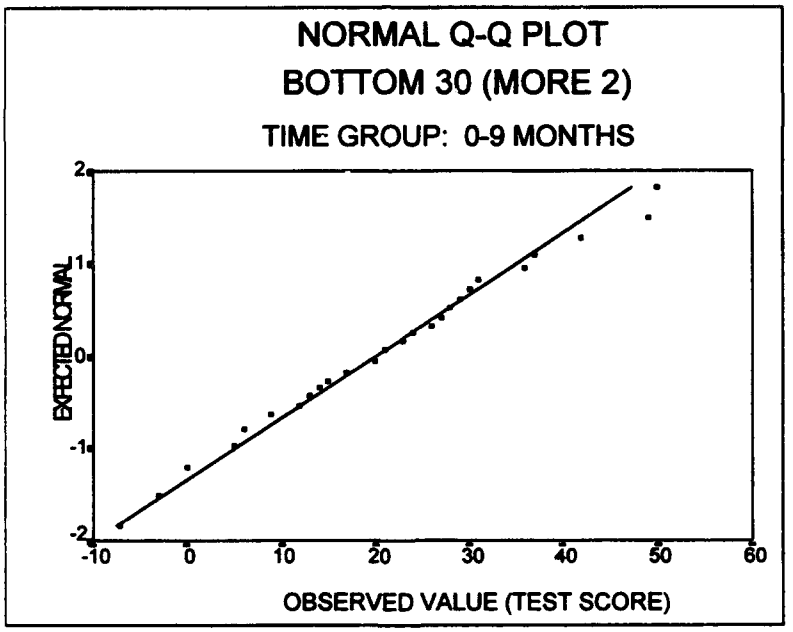

NORMAL Q-Q PLOT
TOP 30 (MORE 2)
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-40
-20
0
20
40
60
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Top 30 (MORE 2))	
Valid Cases:	30.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	21.5167	Std Err	3.1889	Min	-27.0000	Skewness	-.6790
Median	25.0000	Variance	305.0773	Max	53.0000	S E Skew	.4269
5% Trim	22.1667	Std Dev	17.4665	Range	80.0000	Kurtosis	.6899
95% CI for Mean (14.9446, 28.0388)				IQR	24.2500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9658	30	.4829
K-S (Lilliefors)	.0785	30	> .2000


TEST SCORE
BOTTOM 30 (MORE 2)
TIME GROUP: 0-9 MONTHS
FREQUENCY
5
4
3
2
1
0
-5.0 0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0
Std. Dev = 14.91
Mean = 20.0
N = 29.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
BOTTOM 30 (MORE 2)
TIME GROUP: 0-9 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-10 0 10 20 30 40 50 60
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Bottom 30 (MORE 2))	
Valid Cases:	29.0	Missing Cases:		0.0		Percent Missing:	0.0
Mean	20.0000	Std Err	2.7690	Min	-7.0000	Skewness	.1851
Median	20.0000	Variance	222.3571	Max	50.0000	S E Skew	.4335
5% Trim	19.7816	Std Dev	14.9116	Range	57.0000	Kurtosis	-.4663
95% CI for Mean (14.3279, 25.6721)				IQR	22.0000	S E Kurt	.8452

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9788	29	.8208
K-S (Lilliefors)	.0675	29	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30	30	[illegible]7	17.466	3.189
BOT 30	29	20.0000	14.912	2.769

Mean Difference = 1.5167

Levene' s Test for Equality of Variances: F = .504 P = .481

t-Test for Equality of Means

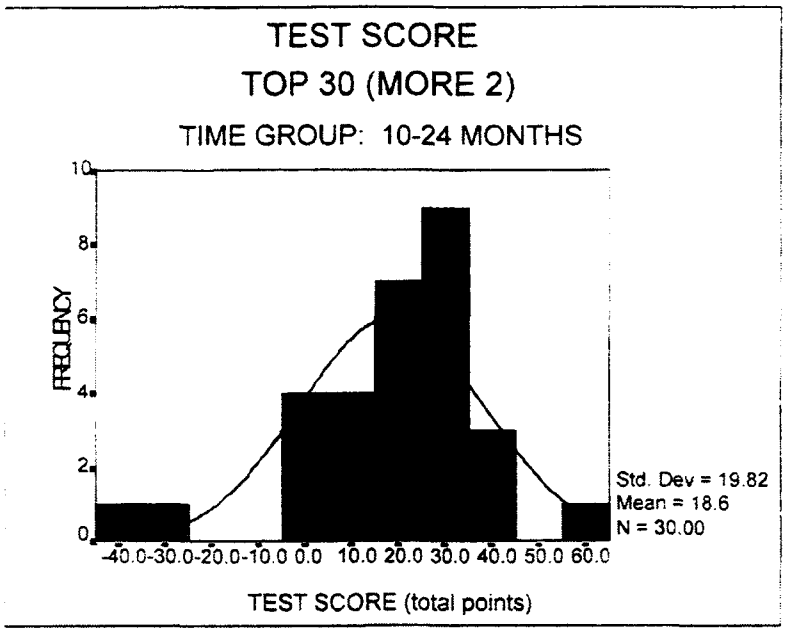
Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.36	57	.722	4.235	(-6.965, 9.999)
Unequal	.36	56.15	.721	4.223	(-6.946, 9.979)

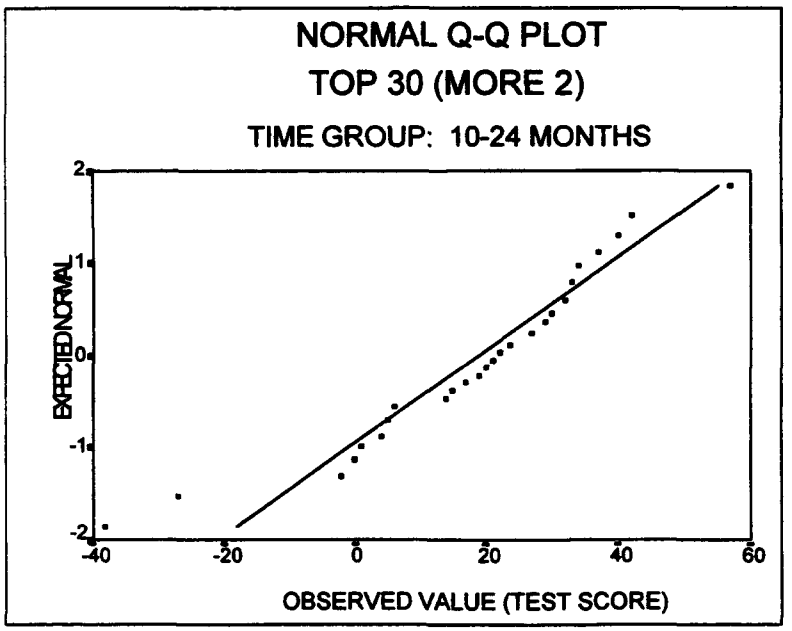
Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP 30/BOT 30 (MORE 2)

Mean Rank	Cases
31.47	30 TOP 30
28.48	29 BOT 30
	59 Total

			Corrected for Ties
U	W	Z	2-Tailed P
391.0	826.0	-.6674	.5045

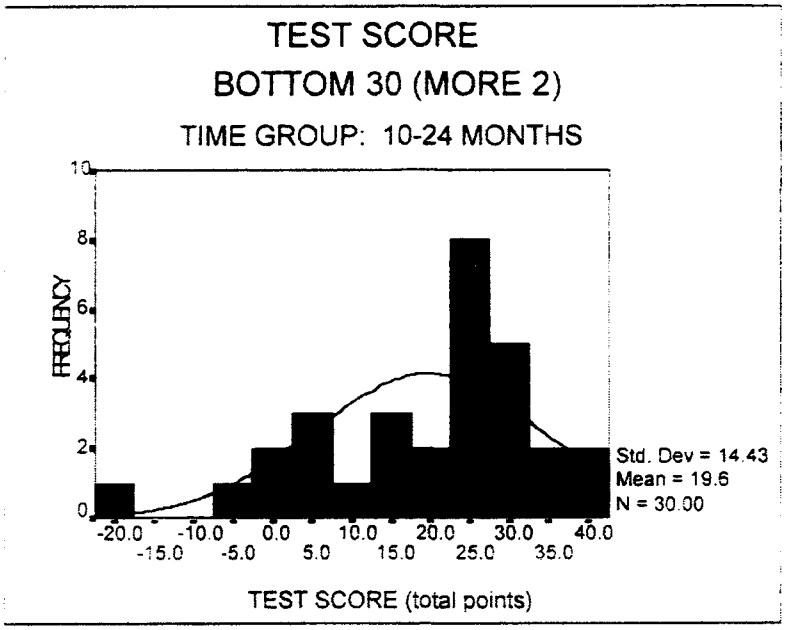

TEST SCORE
TOP 30 (MORE 2)
TIME GROUP: 10-24 MONTHS
FREQUENCY
10
8
6
4
2
0
-40.0 -30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 19.82
Mean = 18.6
N = 30.00
TEST SCORE (total points)

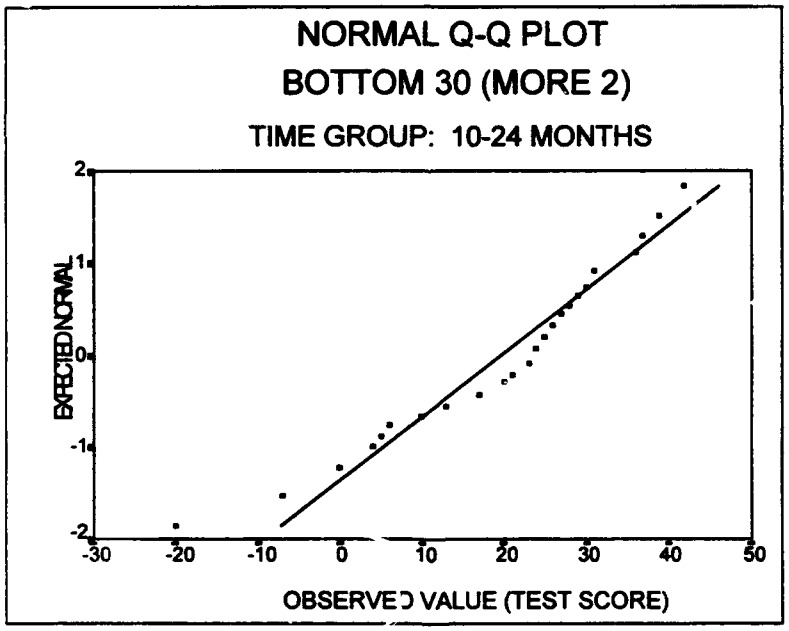

NORMAL Q-Q PLOT
TOP 30 (MORE 2)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-40
-20
0
20
40
60
OBSERVED VALUE (TEST SCORE)

Random Variable:							Test Score (Top 30 (MORE 2))
Valid Cases:	30.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	18.6167	Std Err	3.6189	Min	-38.0000	Skewness	-.9667
Median	21.5000	Variance	392.8911	Max	57.0000	S E Skew	.4269
5% Trim	19.7037	Std Dev	19.8215	Range	95.0000	Kurtosis	1.6586
95% CI for Mean (11.2152, 26.0181)				IQR	27.2500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9357	30	.0860
K-S (Lilliefors)	.0857	30	> .2000


TEST SCORE
BOTTOM 30 (MORE 2)
TIME GROUP: 10-24 MONTHS
FREQUENCY
10
8
6
4
2
0
-20.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Std. Dev = 14.43
Mean = 19.6
N = 30.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
BOTTOM 30 (MORE 2)
TIME GROUP: 10-24 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-30
-20
-10
0
10
20
30
40
50
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Bottom 30 (MORE 2))	
Valid Cases:	30.0	Missing Cases:		0.0		Percent Missing:	0.0
Mean	19.5667	Std Err	2.6352	Min	-20.0000	Skewness	-.8716
Median	23.5000	Variance	208.3230	Max	42.0000	S E Skew	.4269
5% Trim	20.3333	Std Dev	14.4334	Range	62.0000	Kurtosis	.5907
95% CI for Mean (14.1771, 24.9562)				IQR	20.2500	S E Kurt	.8327

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9410	30	.1291
K-S (Lilliefors)	.1120	30	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30	30	18.6167	19.821	3.619
BOT 30	30	19.5667	14.433	2.635

Mean Difference = -.9500

Levene' s Test for Equality of Variances: F = 1.580 P = .214

t-Test for Equality of Means

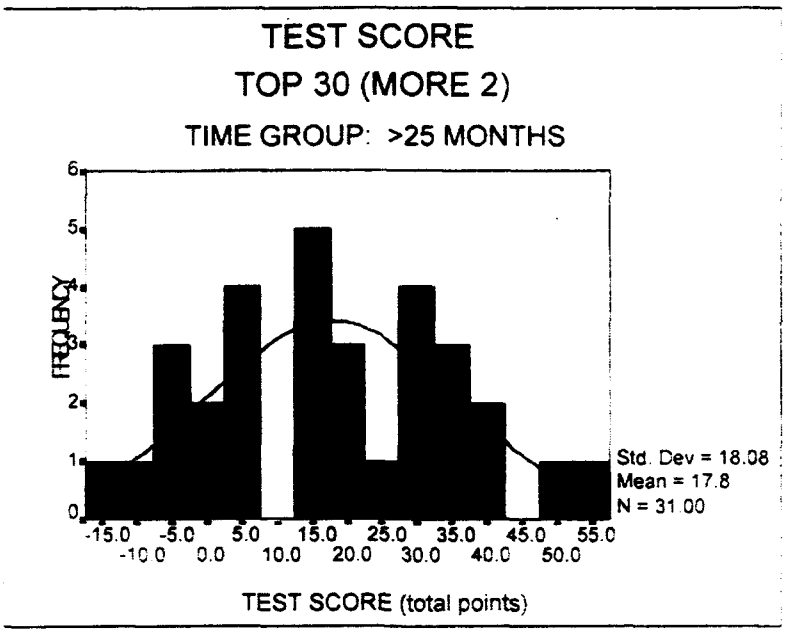
Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-.21	58	.833	4.477	(-9.913, 8.013)
Unequal	-.21	53.00	.833	4.477	(-9.931, 8.031)

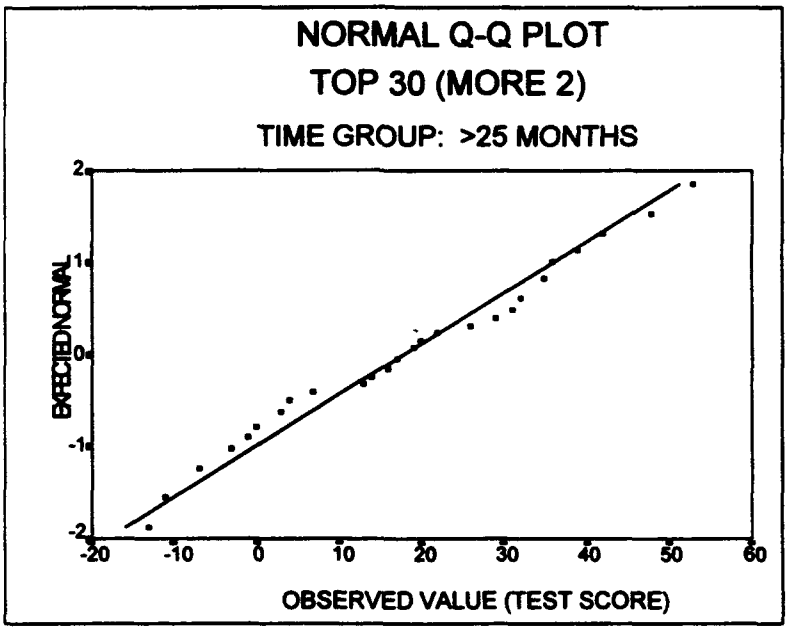
Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP 30/BOT 30 (MORE 2)

Mean Rank	Cases
30.67	30 TOP 30
30.33	30 BOT 30
	60 Total

			Corrected for Ties
U	W	Z	2-Tailed P
445.0	920.0	-.0740	.9410

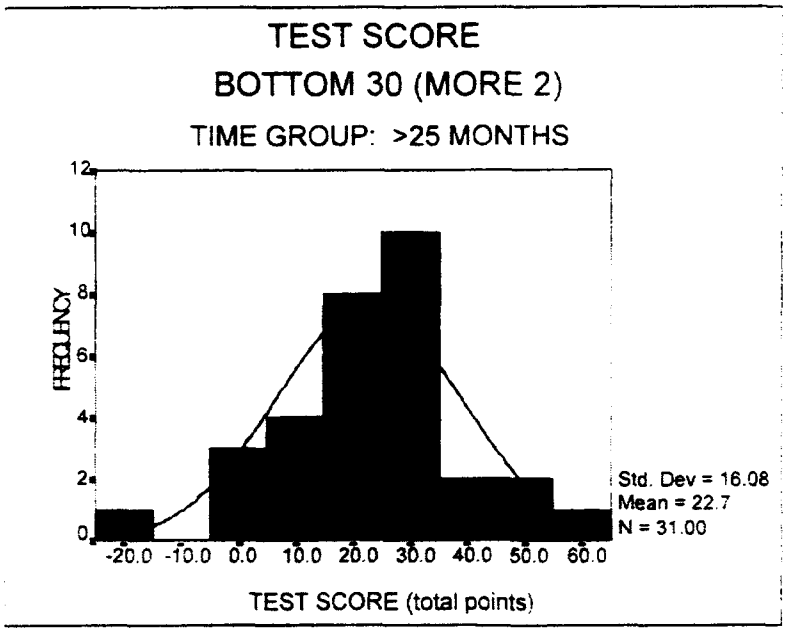

TEST SCORE
TOP 30 (MORE 2)
TIME GROUP: >25 MONTHS
FREQUENCY
Std. Dev = 18.08
Mean = 17.8
N = 31.00
TEST SCORE (total points)

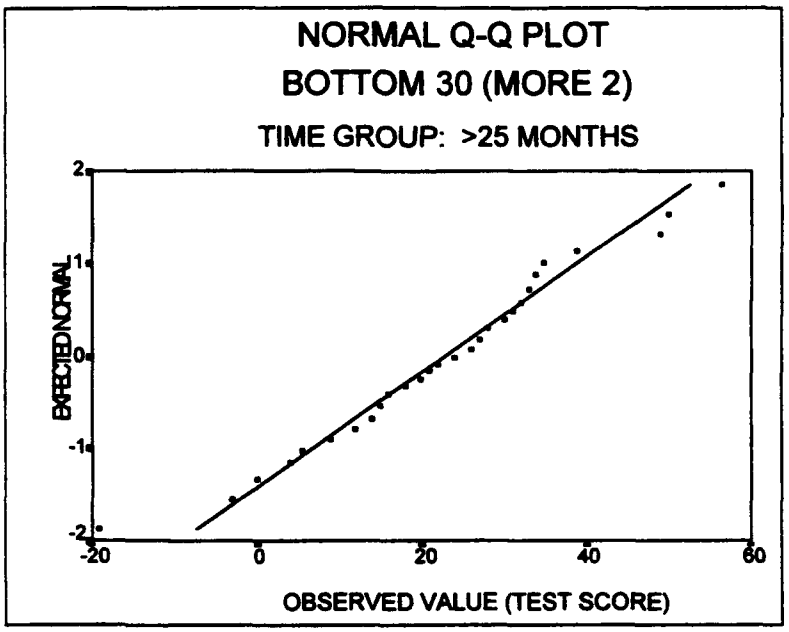

NORMAL Q-Q PLOT
TOP 30 (MORE 2)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Top 30 (MORE 2))	
Valid Cases:	31.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	17.7742	Std Err	3.2464	Min	-13.0000	Skewness	.0389
Median	17.0000	Variance	326.7140	Max	53.0000	S E Skew	.4205
5% Trim	17.5860	Std Dev	18.0752	Range	66.0000	Kurtosis	-.9471
95% CI for Mean (11.1441, 24.4042)				IQR	29.0000	S E Kurt	.8208

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9663	31	.4893
K-S (Lilliefors)	.0996	31	> .2000


TEST SCORE
BOTTOM 30 (MORE 2)
TIME GROUP: >25 MONTHS
FREQUENCY
12
10
8
6
4
2
0
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0
Std. Dev = 16.08
Mean = 22.7
N = 31.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
BOTTOM 30 (MORE 2)
TIME GROUP: >25 MONTHS
EXPECTED NORMAL
2
1
0
-1
-2
-20
0
20
40
60
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Bottom 30 (MORE 2))	
Valid Cases:	31.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	22.7097	Std Err	2.8880	Min	-19.0000	Skewness	-.2550
Median	24.0000	Variance	258.5629	Max	56.5000	S E Skew	.4205
5% Trim	22.9624	Std Dev	16.0799	Range	75.5000	Kurtosis	.6269
95% CI for Mean (16.8115, 28.6078)				IQR	19.0000	S E Kurt	.8208

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9844	31	.9240
K-S (Lilliefors)	.0933	31	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30	31	17.7742	18.075	3.246
BOT 30	31	22.7097	16.080	2.888

Mean Difference = -4.9355

Levene' s Test for Equality of Variances: F = 1.121 P = .294

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-1.14	60	.261	4.345	(-13.629, 3.758)
Unequal	-1.14	59.20	.261	4.345	(-13.632, 3.761)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP 30/BOT 30 (MORE 2)

Mean Rank	Cases
29.13	31 TOP 30
33.87	31 BOT 30
	62 Total

		Corrected for Ties
U	W	Z	2-Tailed P
407.0	903.0	-1.0351	.3006

APPENDIX I

Random Variable:						Test Score (Top 11 (MORE 1))	
						Time Group: 0-9 Months	
Valid Cases:		11.0	Missing Cases:		0.0	Percent Missing:	0.0
Mean	13.5455	Std Err	6.1027	Min	-24.0000	Skewness	-.2965
Median	17.0000	Variance	409.6727	Max	48.0000	S E Skew	.6607
5% Trim	13.7172	Std Dev	20.2404	Range	72.0000	Kurtosis	.1165
95% CI for Mean (-.0522, 27.1431)				IQR	28.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9807	11	.9605
K-S (Lilliefors)	.1317	11	> .2000

Random Variable:						Test Score (Top 11 (MORE 2))	
						Time Group: 0-9 Months	
Valid Cases:		11.0	Missing Cases:		0.0	Percent Missing:	0.0
Mean	11.6364	Std Err	6.1041	Min	-24.0000	Skewness	.1608
Median	7.0000	Variance	409.8545	Max	51.0000	S E Skew	.6607
5% Trim	11.4293	Std Dev	20.2449	Range	75.0000	Kurtosis	.6568
95% CI for Mean (-1.9643, 25.2370)				IQR	24.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9786	11	.9468
K-S (Lilliefors)	.1360	11	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 11 (MORE1)	11	13.5455	20.240	6.103
BOT 11 (MORE2)	11	11.6364	20.245	6.104

Mean Difference = 1.9091

Levene' s Test for Equality of Variances: F = .011 P = .919

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.22	20	.827	8.631	(-16.100, 19.918)
Unequal	.22	20.00	.827	8.631	(-16.100, 19.918)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP11 (MORE1)/TOP11 (MORE2)

Mean Rank	Cases
11.95	11 TOP 11 (MORE1)
11.05	11 BOT 11 (MORE2)
	22 Total

U	W	Exact 2-Tailed P	Z	Corrected for Ties 2-Tailed P
55.5	131.5	0.7477	-.3294	0.7418

Random Variable:					Test Score (Bottom 11 (MORE 1))		
					Time Group: 0-9 Months		
Valid Cases:	11.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	26.7273	Std Err	8.4090	Min	-32.0000	Skewness	-.7383
Median	27.0000	Variance	777.8182	Max	63.0000	S E Skew	.6607
5% Trim	27.9747	Std Dev	27.8894	Range	95.0000	Kurtosis	.3848
95% CI for Mean (7.9909, 45.4636)				IQR	44.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9312	11	.4450
K-S (Lilliefors)	.0967	11	> .2000

Random Variable:					Test Score (Bottom 11 (MORE 2))		
					Time Group: 0-9 Months		
Valid Cases:	11.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	27.5455	Std Err	8.1065	Min	-32.0000	Skewness	-.9140
Median	29.0000	Variance	722.8727	Max	63.0000	S E Skew	.6607
5% Trim	28.8838	Std Dev	26.8863	Range	95.0000	Kurtosis	1.1216
95% CI for Mean (9.4830, 45.6079)				IQR	36.0000	S E Kurt	1.2794

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9186	11	.3661
K-S (Lilliefors)	.0936	11	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
BOT 11 (MORE1)	11	26.7273	27.889	8.409
BOT 11 (MORE2)	11	27.5455	26.886	8.107

Mean Difference = -.8182

Levene' s Test for Equality of Variances: F = .037 P = .849

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-.07	20	.945	11.680	(-25.188, 23.552)
Unequal	-.07	19.97	.945	11.680	(-25.188, 23.552)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by BOT11 (MORE1)/BOT11 (MORE2)

Mean Rank	Cases
11.18	11 BOT 11 (MORE1)
11.82	11 BOT 11 (MORE2)
	22 Total

U	W	Exact 2-Tailed P	Z	Corrected for Ties 2-Tailed P
57.0	123.0	.8470	-.2305	0.8177

Comparison

Time Group: 10-24 Months

Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30 (MORE1)	30	21.3000	18.521	3.382
TOP 30 (MORE2)	30	18.6167	19.821	3.619

Mean Difference = 2.6833

Levene' s Test for Equality of Variances: F = .041 P = .841

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	.54	58	.590	4.953	(-7.233, 12.600)
Unequal	.54	57.74	.590	4.953	(-7.233, 12.600)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP30 (MORE1)/TOP30 (MORE2)

Mean Rank	Cases
31.87	30 TOP 30 (MORE1)
29.13	30 TOP 30 (MORE2)
	60 Total

			Corrected for Ties
U	W	Z	2-Tailed P
409.0	956.0	-.6065	.5442

Comparison

Time Group: 10-24 Months

Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
BOT 30 (MORE1)	30	17.6000	19.238	3.512
BOT 30 (MORE2)	30	19.5667	14.433	2.635

Mean Difference = -1.9667

Levene' s Test for Equality of Variances: F = 2.101 P = .153

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-.45	58	.656	4.391	(-10.758, 6.825)
Unequal	-.45	53.79	.656	4.391	(-10.772, 6.839)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by BOT30 (MORE1)/BOT30 (MORE2)

Mean Rank	Cases
28.92	30 BOT 30 (MORE1)
32.08	30 BOT 30 (MORE2)
	60 Total

Corrected for Ties

U	W	Z	2-Tailed P
402.5	867.5	-.7028	.4822

Comparison

Time Group: >25 Months

Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
TOP 30 (MORE1)	30	24.1167	18.369	3.354
TOP 30 (MORE2)	31	17.7742	18.075	3.246

Mean Difference = 6.3425

Levene' s Test for Equality of Variances: F = .019 P = .890

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	1.36	59	.179	4.666	(-2.997, 15.682)
Unequal	1.36	58.86	.179	4.668	(-2.997, 15.684)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by TOP30 (MORE1)/TOP30 (MORE2)

Mean Rank	Cases
33.92	30 TOP 30 (MORE1)
28.18	31 TOP 30 (MORE2)
	61 Total

Corrected for Ties

U	W	Z	2-Tailed P
377.5	1017.5	-1.2630	.2066

Comparison

Time Group: >25 Months

Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
BOT 30 (MORE1)	30	21.8667	18.260	3.334
BOT 30 (MORE2)	31	22.7097	16.080	2.888

Mean Difference = -.8430

Levene' s Test for Equality of Variances: F = .309 P = .580

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-.19	59	.849	4.401	(-9.652, 7.966)
Unequal	-.19	57.54	.849	4.411	(-9.674, 7.988)

Mann-Whitney U - Wilcoxon Rank Sum W Test

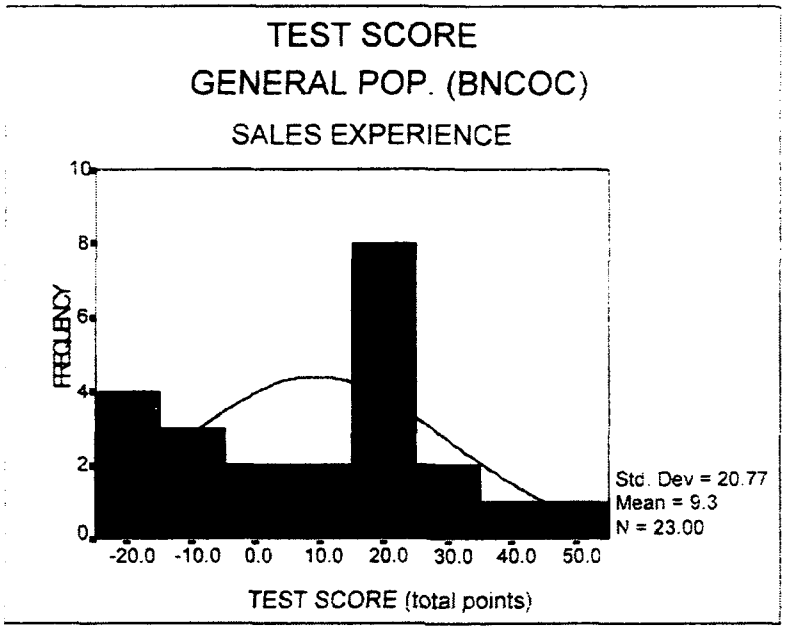
Test Score by BOT30 (MORE1)/BOT30 (MORE2)

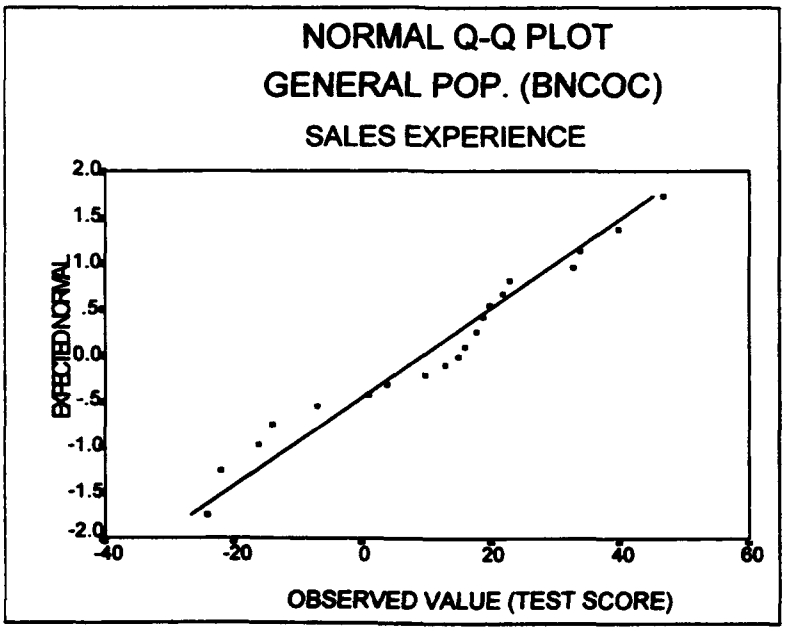
Mean Rank	Cases
31.03	30 BOT 30 (MORE1)
30.97	31 BOT 30 (MORE2)
	61 Total

Corrected for Ties

U	W	Z	2-Tailed P
464.0	931.0	-.0144	.9885

APPENDIX J

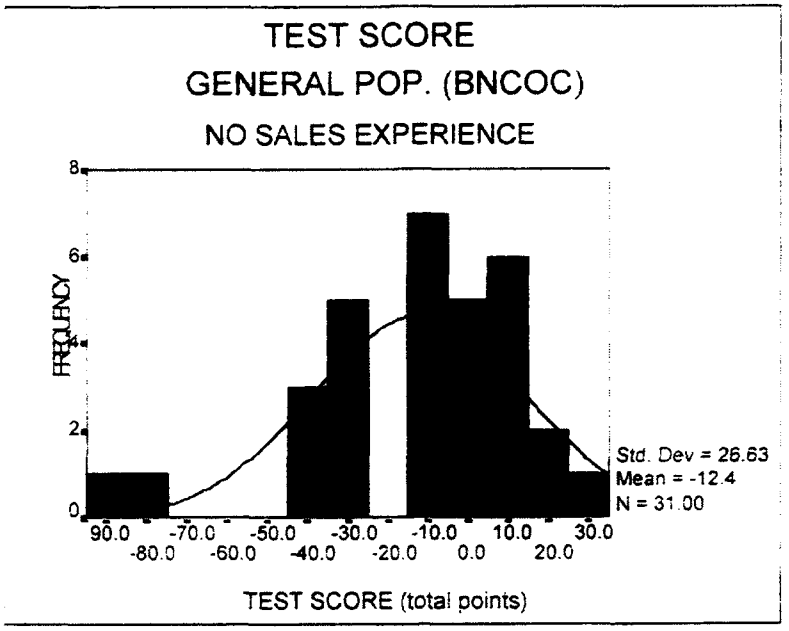

TEST SCORE
GENERAL POP. (BNCOC)
SALES EXPERIENCE
FREQUENCY
10
8
6
4
2
0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
Std. Dev = 20.77
Mean = 9.3
N = 23.00
TEST SCORE (total points)

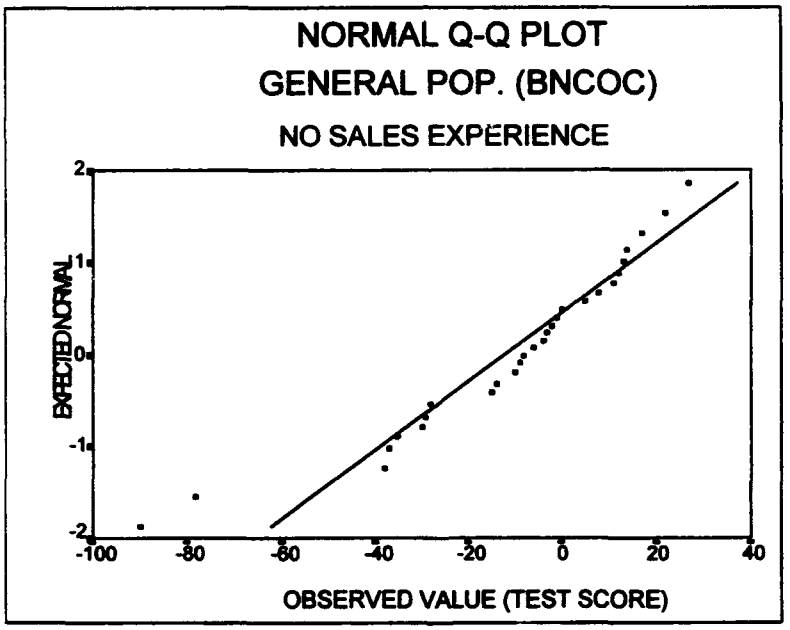

NORMAL Q-Q PLOT
GENERAL POP. (BNCOC)
SALES EXPERIENCE
EXPECTED NORMAL
2.0
1.5
1.0
.5
0.0
-.5
-1.0
-1.5
-2.0
-40
-20
0
20
40
60
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Sales Experience)	
Valid Cases:	23.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	9.3043	Std Err	4.3314	Min	-24.0000	Skewness	-.1411
Median	15.0000	Variance	431.4941	Max	47.0000	S E Skew	.4813
5% Trim	9.0966	Std Dev	20.7724	Range	71.0000	Kurtosis	-.9163
95% CI for Mean (.3217, 18.2870)				IQR	36.0000	S E Kurt	.9348

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9456	23	.3076
K-S (Lilliefors)	.1299	23	> .2000


TEST SCORE
GENERAL POP. (BNCOC)
NO SALES EXPERIENCE
FREQUENCY
8
6
4
2
0
90.0
-80.0
-70.0
-60.0
-50.0
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
Std. Dev = 26.63
Mean = -12.4
N = 31.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
GENERAL POP. (BNCOC)
NO SALES EXPERIENCE
EXPECTED NORMAL
2
1
0
-1
-2
-100
-80
-60
-40
-20
0
20
40
OBSERVED VALUE (TEST SCORE)

Random Variable:						Test Score (Sales Experience)	
Valid Cases:	31.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	-12.3871	Std Err	4.7825	Min	-90.0000	Skewness	-1.1673
Median	-8.0000	Variance	709.0452	Max	27.0000	S E Skew	.4205
5% Trim	-10.4014	Std Dev	26.6279	Range	117.0000	Kurtosis	1.7807
95% CI for Mean (-22.1543, -2.6199)				IQR	37.0000	S E Kurt	.8208

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9109	31	.0175
K-S (Lilliefors)	.1061	31	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
Sales Exp.	23	9.3043	20.772	4.331
No Sales Exp.	31	-12.3871	26.628	4.783

Mean Difference = 21.6914

Levene' s Test for Equality of Variances: F = .502 P = .482

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	3.24	52	.002	6.694	(8.256, 35.127)
Unequal	3.36	51.84	.001	6.452	(8.741, 34.642)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by CIV Sales Exp./ No CIV Sales Exp.

Mean Rank	Cases
35.00	23 CIV Sales
21.94	31 No CIV Sales
	54 Total

			Corrected for Ties
U	W	Z	2-Tailed P
184.0	805.0	-3.0182	.0025

APPENDIX K

Random Variable:						Test Score (BNCOC w/ Sales Experience)	
Valid Cases:	23.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	9.3043	Std Err	4.3314	Min	-24.0000	Skewness	-.1411
Median	15.0000	Variance	431.4941	Max	47.0000	S E Skew	.4813
5% Trim	9.0966	Std Dev	20.7724	Range	71.0000	Kurtosis	-.9163
95% CI for Mean (.3217, 18.2870)				IQR	36.0000	S E Kurt	.9348

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9456	23	.3076
K-S (Lilliefors)	.1299	23	> .2000

Random Variable:						Test Score (TTE Recruiter)	
Valid Cases:	28.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	20.5893	Std Err	4.2591	Min	-32.0000	Skewness	-.2736
Median	19.0000	Variance	507.9084	Max	63.0000	S E Skew	.4405
5% Trim	21.1865	Std Dev	22.5368	Range	95.0000	Kurtosis	.1882
95% CI for Mean (11.8504, 29.3282)				IQR	32.7500	S E Kurt	.8583

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9655	28	.4932
K-S (Lilliefors)	.1045	28	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
BNCOC (Sales Exp.)	23	9.3043	20.772	4.331
TTE Recruiter	28	20.5893	22.537	4.259

Mean Difference = -11.2849

Levene' s Test for Equality of Variances: F = .001 P = .980

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-1.84	49	.071	6.124	(-23.595, 1.025)
Unequal	-1.86	48.31	.069	6.075	(-23.501, .932)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by Non-Recruiter w/ Sales Exp./TTE Recruiter

Mean Rank	Cases	
22.30	23	Non-Recruiter w/ Sales Exp.
29.04	28	TTE Recruiter
	51	Total

			Corrected for Ties
U	W	Z	2-Tailed P
237.0	513.0	-1.6097	.1075

APPENDIX L

ONEWAY ANOVA

Variable TEST SCORE
By Variable RECRUITER TIME GROUP

Analysis of Variance

Source	DF	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	7.0769	3.5385	0.0098	0.9902
Within Groups	273	98262.1287	359.9345		
Total	275	98269.2056			

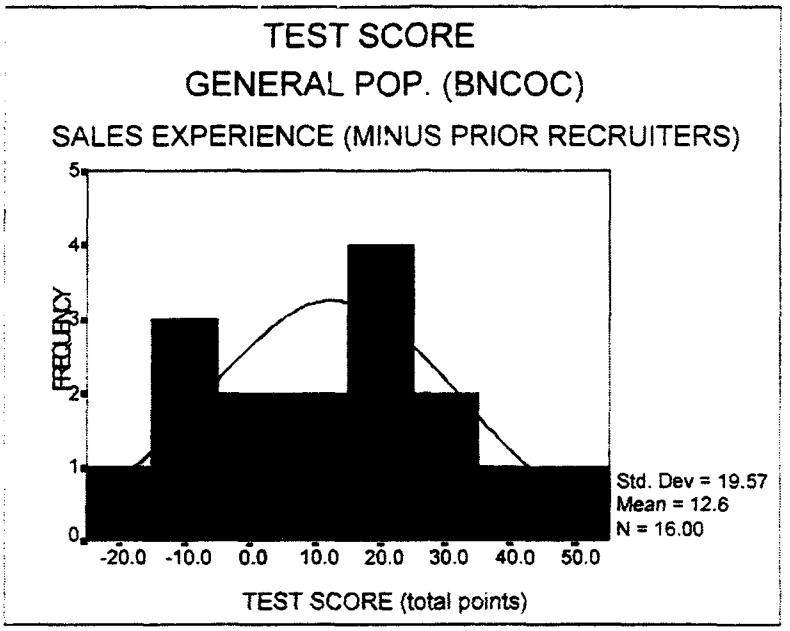
Group	Count	Standard Mean	Standard Deviation	Error	95 Pct Conf Int for Mean
0-9 MO	28	20.5893	22.5368	4.2591	11.8504 TO 29.3282
10-24 MO	116	20.4828	18.7544	1.7413	17.0336 TO 23.9319
>25 MO	132	20.8182	18.3478	1.597	17.6590 TO 23.9774
Total	276	20.654	18.9035	1.1379	18.4140 TO 22.8940

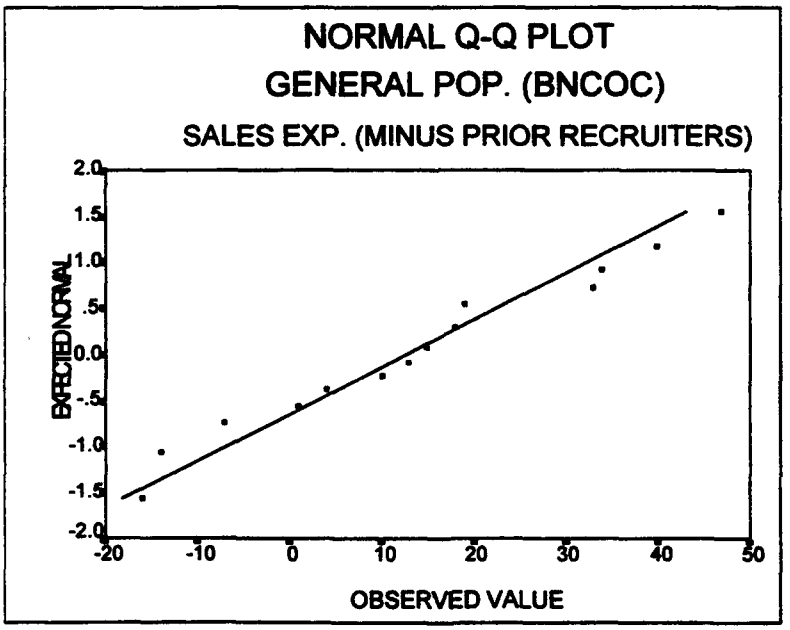
GROUP	MINIMUM	MAXIMUM
0-9 MO	-32	63
10-24 MO	-38	64
>25 MO	-26	63
TOTAL	-38	64

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
0.6193	2	273	0.539

APPENDIX M


TEST SCORE
GENERAL POP. (BNCOC)
SALES EXPERIENCE (MINUS PRIOR RECRUITERS)
FREQUENCY
5
4
3
2
1
0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
Std. Dev = 19.57
Mean = 12.6
N = 16.00
TEST SCORE (total points)


NORMAL Q-Q PLOT
GENERAL POP. (BNCOC)
SALES EXP. (MINUS PRIOR RECRUITERS)
EXPECTED NORMAL
2.0
1.5
1.0
.5
0.0
-.5
-1.0
-1.5
-2.0
-20
-10
0
10
20
30
40
50
OBSERVED VALUE

Random Variable:	Test Score (BNCOC w/Sales Experience (minus prior recruiters))

Valid Cases:	16.0	Missing Cases:	0.0	Percent Missing:	0.0

Mean	12.5625	Std Err	4.8930	Min	-16.0000	Skewness	-.1019
Median	14.0000	Variance	383.0625	Max	47.000	S E Skew	.5643
5% Trim	12.2361	Std Dev	19.5720	Range	63.0000	Kurtosis	.8616
95% CI for Mean (2.1333, 22.9917)				IQR	34.5000	S E Kurt	1.0908

Normality Test:

	Statistic	df	Significance
Shapiro-Wilks	.9542	16	.5371
K-S (Lilliefors)	.1211	16	> .2000

Comparison				
Variable	Number of Cases	Mean	SD	SE of Mean
TEST SCORE				
NONRECR W/SALES EXP (MINUS PRIOR RECR)	16	12.5625	19.5720	4.8930
TTE RECRUITER	28	20.5893	22.537	4.259

Mean Difference = -8.0268

Levene' s Test for Equality of Variances: F= .149 P= .701

t-Test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Difference	95% CI for Difference
Equal	-1.19	42	0.241	6.746	(-23.595, 1.025)
Unequal	-1.24	35.14	0.224	6.487	(-23.501, .932)

Mann-Whitney U - Wilcoxon Rank Sum W Test

Test Score by Sample Group

Mean Rank	Cases	
19.31	16	Sample Group = Nonrecr W/Sales Exp (Minus Prior Recr)
24.32	28	Sample Group = TTE Recruiter
	44	Total

Corrected for Ties

U	W	Z	2-Tailed P
173.0	309.0	-1.2448	.1075

APPENDIX N

BALTIMORE BATTALION

Random Variable:					Percent Success (MORE 1)		
Valid Cases:	131.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	133.1895	Std Err	6.1419	Min	38.4471	Skewness	4.6153
Median	123.6111	Variance	4941.752	Max	699.0000	S E Skew	.2166
5% Trim	125.0974	Std Dev	70.2976	Range	660.5529	Kurtosis	32.6051
95% CI for Mean (121.0384, 145.3406)				IQR	46.1826	S E Kurt	.4202

Random Variable:					Test Score		
Valid Cases:	131.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	21.2710	Std Err	1.7396	Min	-28.0000	Skewness	-.2431
Median	23.0000	Variance	396.4279	Max	64.0000	S E Skew	.2166
5% Trim	21.6802	Std Dev	19.9105	Range	92.0000	Kurtosis	-.0092
95% CI for Mean (17.8294, 24.7126)				IQR	26.0000	S E Kurt	.4202

SANTA ANA BATTALION

Random Variable:					Percent Success (MORE 1)		
Valid Cases:	145.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	111.4965	Std Err	3.6364	Min	37.7737	Skewness	1.7924
Median	102.5263	Variance	1917.417	Max	295.6000	S E Skew	.2014
5% Trim	107.3583	Std Dev	43.7883	Range	257.8263	Kurtosis	4.6619
95% CI for Mean (104.3088, 118.6841)				IQR	43.1188	S E Kurt	.4001

Random Variable:					Test Score		
Valid Cases:	145.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	20.0966	Std Err	1.4945	Min	-38.0000	Skewness	-.5362
Median	22.0000	Variance	323.8795	Max	63.0000	S E Skew	.2014
5% Trim	20.6360	Std Dev	17.9967	Range	101.0000	Kurtosis	.4593
95% CI for Mean (17.1425, 23.0506)				IQR	23.0000	S E Kurt	.4001

BALTIMORE BATTALION

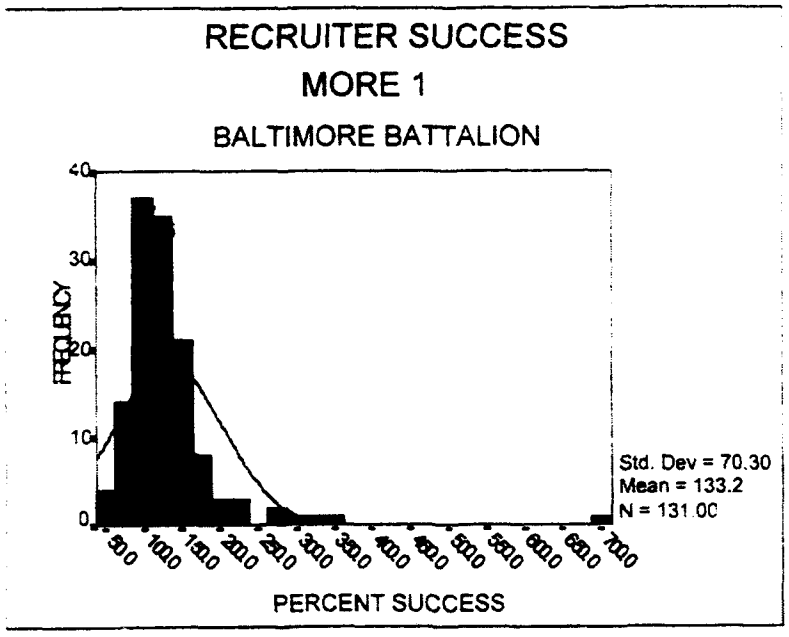
Random Variable:					Percent Success (MORE 2)		
Valid Cases:	129.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	73.7737	Std Err	1.1930	Min	38.0727	Skewness	.4011
Median	72.3333	Variance	183.5881	Max	100.0000	S E Skew	.2132
5% Trim	73.7304	Std Dev	13.5495	Range	61.9273	Kurtosis	-.0275
95% CI for Mean (71.4132, 76.1342)				IQR	14.1610	S E Kurt	.4233

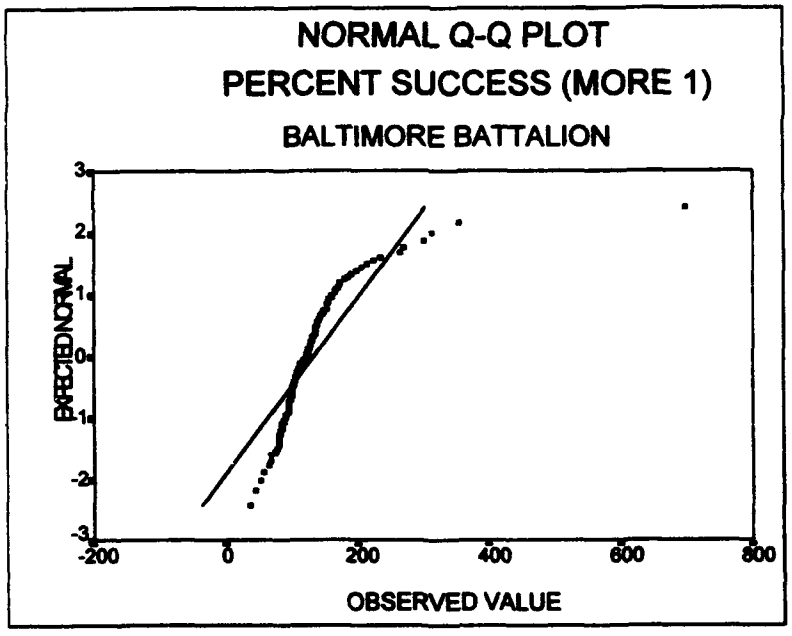
Random Variable:					Test Score		
Valid Cases:	129.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	21.2364	Std Err	1.7593	Min	-28.0000	Skewness	-.2419
Median	23.0000	Variance	399.2581	Max	64.0000	S E Skew	.2132
5% Trim	21.6443	Std Dev	19.9814	Range	92.0000	Kurtosis	-.0111
95% CI for Mean (17.7554, 24.7174)				IQR	26.5000	S E Kurt	.4233

SANTA ANA BATTALION

Random Variable:					Percent Success (MORE 2)		
Valid Cases:	142.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	68.1483	Std Err	1.1885	Min	29.9000	Skewness	-.0186
Median	66.9757	Variance	200.5815	Max	100.0000	S E Skew	.2034
5% Trim	68.1754	Std Dev	14.1627	Range	70.1000	Kurtosis	.2971
95% CI for Mean (65.7987, 70.4979)				IQR	17.3465	S E Kurt	.4042

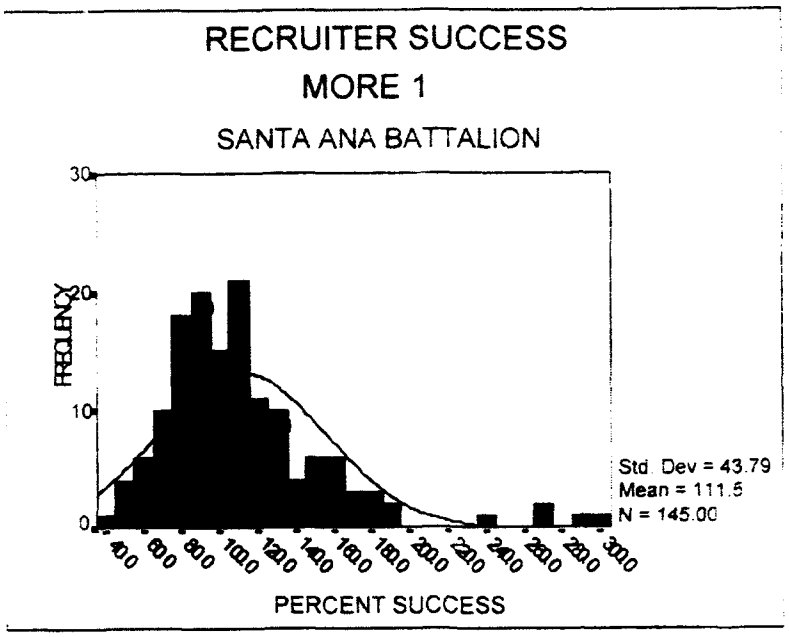
Random Variable:					Test Score		
Valid Cases:	142.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	20.0986	Std Err	1.5247	Min	-38.0000	Skewness	-.5331
Median	22.0000	Variance	330.0895	Max	63.0000	S E Skew	.2034
5% Trim	20.6448	Std Dev	18.1684	Range	101.0000	Kurtosis	.4018
95% CI for Mean (17.0845, 23.1127)				IQR	23.7500	S E Kurt	.4042

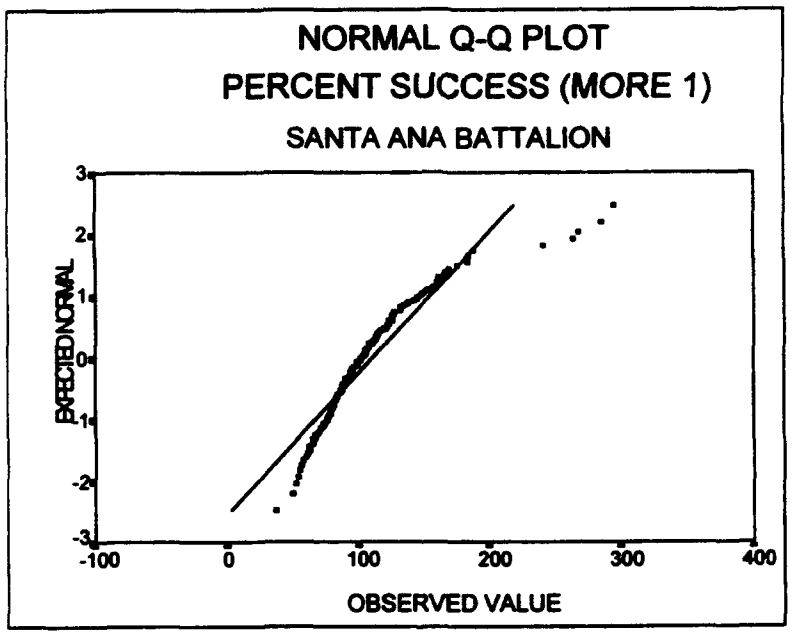

RECRUITER SUCCESS
MORE 1
BALTIMORE BATTALION
FREQUENCY
40
30
20
10
0
Std. Dev = 70.30
Mean = 133.2
N = 131.00
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
PERCENT SUCCESS


NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 1)
BALTIMORE BATTALION
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-200
0
200
400
600
800
OBSERVED VALUE

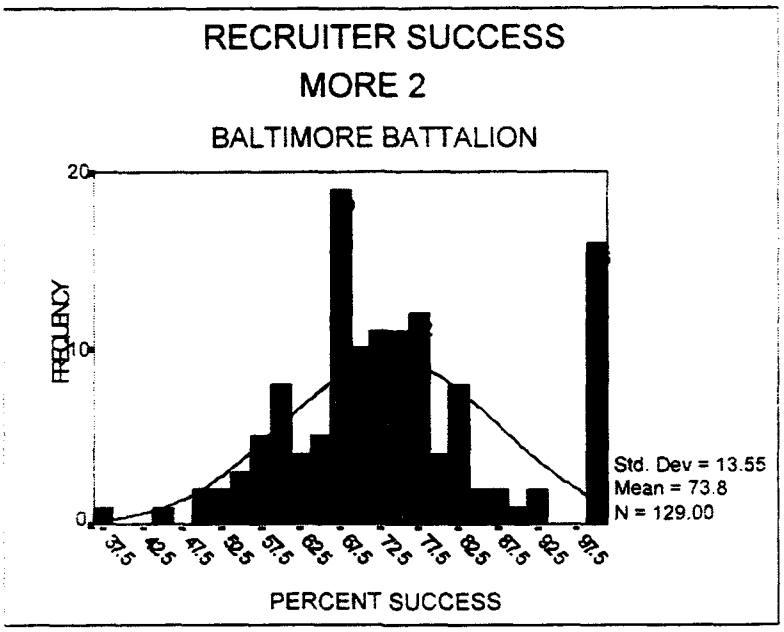
Random Variable:						Percent Success (MORE 1)	
Valid Cases:		131.0	Missing Cases:		0.0	Percent Missing:	0.0
Mean	133.1895	Std Err	6.1419	Min	38.4471	Skewness	4.6153
Median	123.6111	Variance	4941.752	Max	699.0000	S E Skew	.2166
5% Trim	125.0974	Std Dev	70.2976	Range	660.5529	Kurtosis	32.6051
95% CI for Mean (121.0384, 145.3406)				IQR	46.1826	S E Kurt	.4202

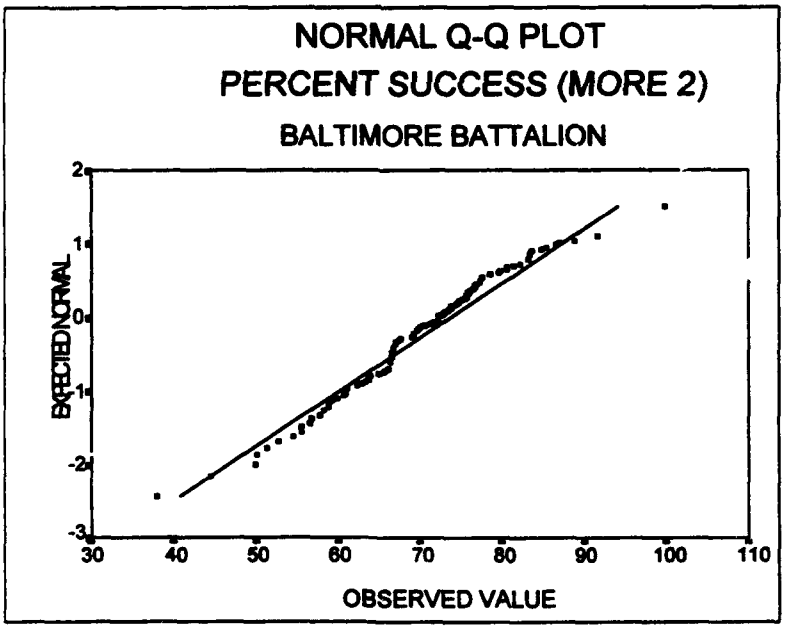
	Statistic	df	Significance
K-S (Lilliefors)	0.1969	131	.0000


RECRUITER SUCCESS
MORE 1
SANTA ANA BATTALION
FREQUENCY
30
20
10
0
Std. Dev = 43.79
Mean = 111.5
N = 145.00
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
PERCENT SUCCESS


NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 1)
SANTA ANA BATTALION
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
-100
0
100
200
300
400
OBSERVED VALUE

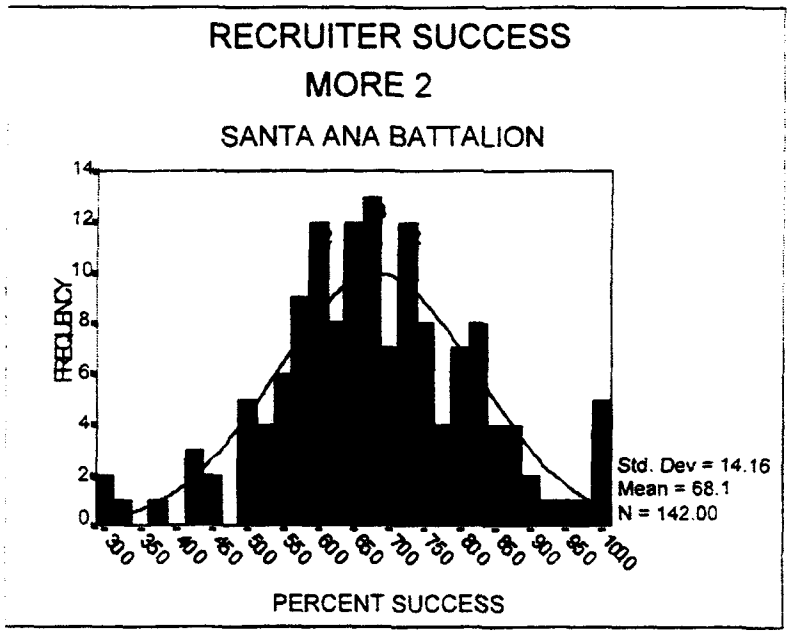
Random Variable:						Percent Success (MORE 1)	
Valid Cases:		145.0	Missing Cases:		0.0	Percent Missing:	0.0
Mean	111.4965	Std Err	3.6364	Min	38.7737	Skewness	1.7924
Median	102.5263	Variance	1917.417	Max	295.6000	S E Skew	.2014
5% Trim	107.3583	Std Dev	43.7883	Range	257.8263	Kurtosis	4.6619
95% CI for Mean (104.3088, 118.6841)				IQR	43.1188	S E Kurt	.4001
		Statistic	df	Significance			
K-S (Lilliefors)		0.1292	145	.0000			

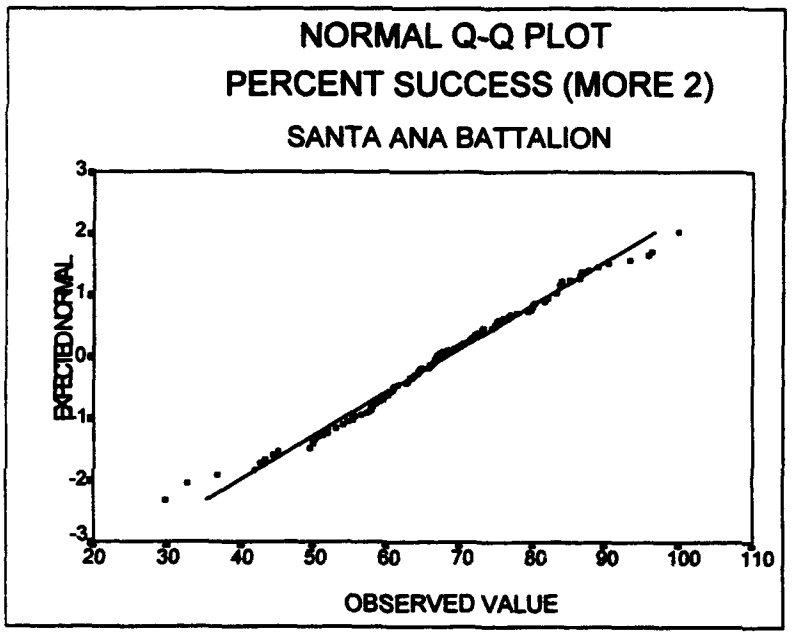

RECRUITER SUCCESS
MORE 2
BALTIMORE BATTALION
FREQUENCY
20
10
0
Std. Dev = 13.55
Mean = 73.8
N = 129.00
31.5
40.5
47.5
52.5
57.5
62.5
67.5
72.5
77.5
82.5
87.5
92.5
97.5
PERCENT SUCCESS


NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 2)
BALTIMORE BATTALION
EXPECTED NORMAL
2
1
0
-1
-2
-3
30
40
50
60
70
80
90
100
110
OBSERVED VALUE

Random Variable:						Percent Success (MORE 2)	
Valid Cases:	129.0	Missing Cases:			0.0	Percent Missing:	0.0
Mean	73.7737	Std Err	1.1930	Min	38.0727	Skewness	.4011
Median	72.3333	Variance	183.5881	Max	100.0000	S E Skew	.2132
5% Trim	73.7304	Std Dev	13.5495	Range	61.9273	Kurtosis	-.0275
95% CI for Mean (71.4132, 76.1342)				IQR	14.1610	S E Kurt	.4233

	Statistic	df	Significance
K-S (Lilliefors)	0.1079	129	.0009


RECRUITER SUCCESS
MORE 2
SANTA ANA BATTALION
FREQUENCY
14
12
10
8
6
4
2
0
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
Std. Dev = 14.16
Mean = 68.1
N = 142.00
PERCENT SUCCESS


NORMAL Q-Q PLOT
PERCENT SUCCESS (MORE 2)
SANTA ANA BATTALION
EXPECTED NORMAL
3
2
1
0
-1
-2
-3
20
30
40
50
60
70
80
90
100
110
OBSERVED VALUE

Random Variable:						Percent Success (MORE 2)	
Valid Cases:		142.0	Missing Cases:		0.0	Percent Missing:	0.0
Mean	68.1483	Std Err	1.1885	Min	29.9000	Skewness	-.0186
Median	66.9757	Variance	200.5815	Max	100.0000	S E Skew	.2034
5% Trim	68.1754	Std Dev	14.1627	Range	70.1000	Kurtosis	.2971
95% CI for Mean (65.7987. 70.4979)				IQR	17.3465	S E Kurt	.4042

	Statistic	df	Significance
K-S (Lilliefors)	0.053	142	> .2000

Mann-Whitney U - Wilcoxon Rank Sum W Test

PERCENT SUCCESS (MORE 1) by BATTALION

Mean Rank	Cases		
157.99	131 BATTALION = BALTIMORE		
120.89	145 BATTALION = SANTA ANA		
	276 Total		
			Corrected for ties
U	W	Z	2-Tailed P
6944.0	20697.0	-3.8563	0.0001

Mann-Whitney U - Wilcoxon Rank Sum W Test

PERCENT SUCCESS (MORE 2) by BATTALION

Mean Rank	Cases		
151.41	129 BATTALION = BALTIMORE		
122.00	142 BATTALION = SANTA ANA		
	271 Total		
			Corrected for ties
U	W	Z	2-Tailed P
7170.5	19532.5	-3.0868	0.002

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