VALIDATION OF THE STRAIN INDEX

IN A WINDOW MANUFACTURING FACILITY

BY

SUSAN ELIZABETH WANDS

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfilment of the Requirements
for the Degree of

MASTER OF SCIENCE

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ABSTRACT

A semi-quantitative exposure assessment tool introduced to the ergonomics community in the mid-1990's was examined for its predictive and external validity in the window manufacturing industry. The Strain Index (Moore and Garg, 1995) has been proposed as a method to accurately distinguish jobs that are "safe" from those that are "hazardous" when evaluating a worker's risk of developing distal upper extremity disorders. The Strain Index was validated in a pork-processing plant. The jobs assessed were simple in nature and the results suggested that a criterion threshold Strain Index (SI) score of 5.0 was suitable to distinguish "safe" versus "hazardous" exposures when performing work.

This study evaluates the usefulness of the Strain Index semi-quantitative job analysis methodology in a complex work environment, where the jobs performed are primarily assembly in nature, and the exertional cycles are lengthy and multi-faceted. Forty-two separate exposures, representative of a wide variety of jobs within the industry were analyzed by investigators who were blinded to health outcomes. Each exposure was classified as either "safe" or "hazardous" based on the Strain Index score generated against the Moore and Garg (1995) criterion threshold of 5.0. Exposure-related subjective pain (pain, stiffness, tingling, and numbness) data obtained from worker questionnaires was examined to ascertain whether the categories of "safe" versus "hazardous" could be used as a possible means of early detection for jobs perceived as problematic. Workers Compensation Board of Manitoba "Employer Record of Injury or Occupational Disease"

records were then examined to reveal possible association between specific exposures and the prevalence of distal upper extremity disorders. 2x2 contingency tables were used to evaluate the association between "safe" and "hazardous" exposures and subjective pain, and morbidity. Receiver-operator characteristic curves were then used to determine the Strain Index score values with the best trade-off between sensitivity and specificity for both subjective pain and morbidity. With respect to subjective pain, the criterion threshold Strain Index score of 50.0 offered the best discrimination point (sensitivity = 0.565; specificity = 0.706; positive predictive value = 0.722; negative predictive value = 0.545; odds ratio = 3.12; Fisher's (2-tailed) p = 0.1159). Similarly, with respect to morbidity, a Strain Index score of 50.0 provided the best threshold criterion value as well (sensitivity = 0.833; specificity = 0.583; positive predictive value = 0.25; negative predictive value = 0.955; odds ratio = 7.0; Fisher's (2-tailed) p = 0.087). It is suggested that the Strain Index score of 5.0 is not the best discriminator between "safe" and "hazardous" jobs in the window manufacturing industry, as it generates high levels of false positives. Rather, the value of 50.0 has been found to be the Strain Index criterion threshold score of choice.

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To my family who have told me that I can accomplish anything I set my mind to.

And finally, to the "special" men in my life who have encouraged my independent thinking over the decades and whose continued support is essential.

DEDICATION

To my son, Aaron, who, after living through the behind-the-scenes side of Graduate Studies, will hopefully be inspired in years to come to achieve his fullest academic potential.

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LIST OF ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
CTD	Cumulative trauma disorder
DUE	Distal upper extremity
FN	False negatives
FP	False positives
FTE	Full Time Employee
HAL	Hand Activity Level
KEY	Keyserling
msi50	Strain Index score calculated from the median of the task variables from the exposure trials
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OWAS	Ovako Working Posture Analysing System
REBA	Rapid Entire Body Assessment
RULA	Rapid Upper Limb Assessment
si50	Strain Index score calculated from the median of the Strain Index score from the trials
SI	Strain Index
TLV	Threshold Limit Value
TN	True negatives
TP	True positives

LIST OF ABBREVIATIONS cont'd

VIRA	Video film technique for Registration and Analysis of working postures and movements
WOPALAS	Working Posture Analysing System

CHAPTER 1

INTRODUCTION

Plagued with countless cases of musculoskeletal injuries related to assembly and manual materials handling, the manufacturing sector in Manitoba, representing 38.4% of all Workers Compensation Board (WCB) time loss injuries in the year 2000 (N. Alberg, personal communication, July 6, 2001), has been targeted by Manitoba Labour and Immigration's Workplace Safety and Health Branch to reduce its injury rates.

In an attempt to find methodologies useful in significantly reducing these figures, the purpose of this research is to examine the application of the Strain Index approach to job risk assessment. If the underlying validity of this approach can be established and the scoring of "safe" versus "hazardous" jobs distinguished, then the Strain Index may provide a very necessary "first step" in aiding employers and Joint Workplace Safety and Health Committees in the identification of problematic jobs.

In response to the growing necessity by practitioners to make informed decisions regarding the work-relatedness of a disease, investigators have attempted to establish causal relationships regarding distal upper extremity (DUE) disorders and exposure. Studies have focussed on associations involving single or multiple generic risk factors (Armstrong, 1983, Armstrong, Radwin, Hansen, and Kennedy, 1986, Armstrong & Lifshitz, 1987, Armstrong, Fine, Goldstein, Lifshitz, and Silverstein, 1987; Bernard, 1997;

Keyserling, 2000; Kuorinka & Forcier, 1995; Moore, Rucker and Knox, 2001; Rodgers, 1988, 1992; Silverstein, Fine, and Armstrong, 1986a), quantification of intensity or their interactions (Armstrong et al., 1987; Keyserling, 2000; Silverstein, Fine, and Armstrong, 1987), job and/or task variables and increased prevalence or incidence (Armstrong et al. 1987; Moore & Garg, 1994; Silverstein et al. 1987), and hazard assessment as it relates to morbidity (Knox & Moore, in press; Moore & Garg, 1995; Moore, Rucker, and Knox, 2001; Rucker & Moore, in press).

Historically, there has been a lack of standardization and objectivity in gathering exposure data, as field measurements are often difficult and unsafe to obtain during normal work procedures. Professional judgement, although desirable, is subjective and often influenced by personal bias (Moore & Garg, 1995). Suggestions have been made that the work-relatedness of a disease (Kusnetz and Hutchinson, 1979), or the presence of a hazardous exposure (Moore & Garg, 1995) should only be defined using a job analysis. The physiological model proposed by Rodgers (1988, 1992), McAtamney and Corlett's Rapid Upper Limb Assessment (RULA) (1993), and Moore and Garg's Strain Index (1995) are examples of methodologies for assessment based on physiological, biomechanical or epidemiological principles.

First introduced in 1995, the Strain Index was proposed as a semi-quantitative job analysis methodology believed useful for predicting the risk of distal upper extremity disorders to workers when evaluating job-related exertional demands. The Strain Index is based on the multiplicative interactions of six task variables representing physical stress: intensity of exertion, duration of exertion, efforts/minute, hand/wrist posture, speed of work, and duration/day. Each of the six task variables when measured or estimated, is assigned a rating value at one of five corresponding levels. The rating value for each task variable is then assigned a multiplier. The product of the six multipliers generates a final Strain Index (SI) score for a given exposure. Initial validation of the Strain Index was conducted using data collected in a pork processing plant (Moore & Garg, 1994). When compared with distal upper extremity morbidity and incidence rates, a threshold criterion SI score of 5.0 was suggested to best distinguish between jobs that are "safe" and those that are "hazardous".

There were a number of limitations and assumptions surrounding the Strain Index which must be considered when assessing the usefulness of this analytical tool. These include, but are not limited to: the threshold criterion SI score of 5.0 being established based on a relatively small number of job categories (n = 25); the jobs were representative of one industry and little variation amongst some of the task variables was observed; three of the task variables rely on qualitative estimates; the investigators were not blinded for health outcomes; and, test-retest reliability and inter-rater variability were not formally evaluated.

Most recently, Knox and Moore (in press) and Rucker and Moore (in press) have stated that their studies in turkey processing, and manufacturing (hose connector and chair) respectively, shed additional evidence of the external and predictive validity of the Strain Index. The call for further validation of the Strain Index remains however (Moore & Garg, 1995; Knox & Moore, in press; Rucker & Moore, in press), as this semi-quantitative job analysis methodology requires a larger and broader pool of data from which to establish the best SI threshold criterion score to distinguish "safe" from "hazardous" jobs.

This thesis documents the application of the Strain Index in window manufacturing, where 9.6% of all manufacturing WCB time loss claims occurred in the province of Manitoba in the year 2000 (N. Alberg, personal communication, July 6, 2001), The objective of the work is to establish underlying validity of the approach and to distinguish "safe" and "hazardous" Strain Index scores for this industry. The usefulness of reported subjective pain by workers as an early indicator of problematic jobs is also evaluated. It is hypothesized that the Strain Index methodology will be capable of identifying "safe" versus "hazardous" job exposures. However, due to the primarily complex and multi-faceted nature of the window manufacturing jobs, the criterion threshold value of 5.0 may need to be reassessed. It is also hypothesized that the report of subjective pain by workers may be found to provide valuable insight into the early identification of problematic jobs, as high mobility of this workforce leads to scepticism regarding the potential under-reporting of morbidity claims.

CHAPTER 2

REVIEW OF THE LITERATURE

In 1995, the Strain Index was introduced to the ergonomics community as a proposed semi-quantitative job methodology which could evaluate exertional demands, the key component believed to cause ergonomic risk to workers (Moore & Garg, 1995; Hegmann, Garg, and Moore, 1997). A recent comparison of the OSHA, RULA, and KEY checklists for predicting health outcomes in a car manufacturing environment showed that the checklists for the upper extremity performed poorly and their outputs were very unreliable and inaccurate (Brodie, 1996). The Strain Index has been a welcomed change from the standard checklist format (Freivalds & Kong, 2000) used by many in industry for the purpose of conducting job risk assessment.

The attractiveness of the Strain Index is best explained by its approach to examine the multiplicative interactions of six task variables (intensity of exertion, percent duration of exertions, efforts per minute, hand/wrist posture, speed of work, and duration of task per day) to determine the risk of distal upper extremity disorders, based on existing knowledge and theory relating to biomechanical, epidemiological, and physiological principles (Moore & Garg, 1995). It requires the three recognized categories of data collection -- subjective judgments, systematic observations, and direct measurements as described by Burdorf and van der Beek (1999), and the final Strain Index score takes into consideration the duration, frequency, and level of exposure for a given job. The search for a common metric, one which can convert data collection from disparate measurement methods into exposure measures of the same units has been of interest to investigators, as it would facilitate a method to consistently measure exposure across jobs and facilitate data reduction (Burdorf & van der Beek, 1999; Wells, et al., 1997; Winkel & Mathiassen, 1994). Burdorf and van der Beek (1999) reported that the Strain Index is one example of a common metric that is based on actual workplace measurements and expert judgment, yielding a distinctive dose-response relationship between the Strain Index score and the incidence rate of distal upper extremity disorders.

The value of the Strain Index methodology is not limited to the identification of "safe" versus "hazardous" jobs for risk of distal upper extremity disorders. Rather, it has been suggested that the Strain Index would be of importance in providing ergonomic guidelines in work design (Hegman et al., 1997; Lin & Radwin, 1998; Moore & Garg, 1997), preventing worker discomfort and musculoskeletal disorders in repetitive hand-intensive tasks (Lin & Radwin, 1998), and as a preventative measure in the identification of hand activities likely to be related to the development of specific disorders such as DeQuervain's tenosynovitis (Moore, 1997) and flexor tendon entrapment (Moore, 2000).

Despite its newness, investigators have referenced the Strain Index methodology (Brodie, 1996; Burdorf & van der Beek, 1999; Burt, et al., 2000; Colombini, 1998; Freivalds & Kong, 2000; Gorsche, et al., 1999; Joseph, Reeve, Kilduff, Hall-Counts, and

Long, 2000; Lin & Radwin, 1998; Muggleton, Allen, and Chappell, 1999; Punnett & van der Beek, 2000; Occhipinti, 1998; Spielholz, Silverstein, and Stuart, 1999; Tanaka, Wild, Cameron, and Freund, 1997), noting it as a "recognized tool" (Stephens & Kilduff, 2000), and applauding it as a quantitative method for assessing various physical factors of manual work (Tanaka, et al., 1997). It has also been criticized as one of a group of publications related to exposure methodology (Drury, 1987; Silverstein, Fine, and Armstrong, 1986b; Tanaka & McGlothlin, 1993) as being "inadequate", for providing only partial or incomplete definition of the variables (Occhipinti, 1998). Yet, at the same time, Occhipinti (1998) recognized the intent of these methodologies to incorporate a range of risk factors within a concise index of exposure. Other studies have referred to the Strain Index when discussing issues pertaining to the under-reporting of work-related disorders in the workplace (Pransky, Synder, Dembe, and Himmelstein, 1999), the reproducibility of a self-report questionnaire for upper extremity musculoskeltal disorder risk factors (Spielholz, et al., 1999) and the association of occupational and non-occupational risk factors with the prevalence of self-reported carpal tunnel syndrome (Tanaka, et al., 1997).

Validation of the Strain Index

In order to pass judgement on an exposure assessment tool, it is necessary to conduct research to test the instrument's reliability and predictive and external validity. In other words, "is it possible to produce the same outcome when the tool is used by an evaluator on different occasions, or by more than one evaluator at the same time?" (test

-retest and inter-rater reliability), "does the tool have the ability to discriminate between opposing exposure types, for example, "safe" versus "hazardous?" (predictive validity), and "can the tool be used in a variety of different jobs and industries effectively?" (external validity).

The Strain Index goes beyond the standard output of a checklist to accurately predict an external outcome such as risk of musculoskeletal disorders and takes it to a higher level, where it can be used to predict risk of injury (Brodie, 1996). The Strain Index methodology requires only the collection of data, the assignment of rating values and determination of multipliers for the six task variables, and the calculation of a Strain Index score using simple multiplication (Moore & Garg, 1995; Hegmann, Garg and Moore; 1997).

Using data from a previous pork processing study, Moore and Garg (1995) evaluated the Strain Index methodology on 25 job categories representative of typical work practices within the industry. They reported that 12 positive and 13 negative job categories were identified when compared against morbidity records. Further evaluation showed Strain Index scores for the jobs with associated morbidity ("positive") ranging from 4.5 to 81, and for those with no associated morbidity ("negative"), between 0.5 and 4.5. The difference between groups was statistically significant ($t = 4.05$, $df = 23$, $p < 0.01$). A Strain Index criterion threshold score of 5.0 was then suggested as offering the best discrimination between jobs that are "safe" and those that are "hazardous" for distal upper extremity injuries to workers. Using this criterion, the Strain Index was able to correctly classify 11 of the 12 positive jobs and all of the 13 negative jobs, yielding a sensitivity of 0.92 and a specificity of 1.00.

Although this outcome appears extremely favourable, there were a number of limitations and assumptions surrounding the Strain Index which must be considered when assessing the value of this analytical tool. These include, but are not limited to: the threshold criterion SI score of 5.0 being established based on a relatively small number of job categories (n = 25); the jobs were representative of one industry and little variation amongst some of the task variables was observed; three of the task variables rely on qualitative estimates; the investigators were not blinded for health outcomes; and, test -retest reliability and inter-rater variability was not formally evaluated. Fully aware of the preliminary nature of their work, Moore and Garg (1995) called for additional research to be conducted to test the reliability, predictive and external validity of the Strain Index.

Subsequent to their initial study, Moore and Garg (1996, 1997) reported the usefulness of the Strain Index in evaluating and redesigning jobs involving a demonstration project in the red meat packing industry. The focus of this project was on the use of participatory ergonomic teams to address musculoskeletal hazards. Strain Index exposure data was collected and analyzed as an additional tool in the evaluative process (problem identification, problem evaluation, solution development, solution implementation, and solution evaluation). For the three jobs evaluated, pulling leaf lard (SI = 27), snatching guts (SI = 30.4), and pulling ribs (SI = 18), the Strain Index scores were consistent with the observed morbidity. Redesign of the jobs resulted in the Strain Index scores dropping to 3.0 for the leaf lard pull, and 4.5 for the rib pulling. Unfortunately, the solution for the snatching of guts was not acceptable by the United States Drug Administration (USDA) standards for this industry (Moore & Garg, 1997).

In addition to the Moore and Garg research group, use of the Strain Index, although somewhat limited, have been attempted by others.

In 1996, the National Institute of Occupational Safety and Health (NIOSH) began to evaluate current methods for assessing ergonomic risk to the upper extremities. The Strain Index was compared against OWAS, VIRA, Postural Analysis in Simulated Real Time, Ergonomic Job Analysis, Hand Exertion Classification System, RULA, REBA, WOPALAS, and Guidelines for rating work-related factors. The Strain Index scored positively for (a) involving at least three levels for the upper limb, (b) explicit criteria, and (c) having a balanced evaluation of all stressors; negative ratings were noted for (d) the Index's ability to rate ergonomic stressors separately, and (e) its ability to apply to a variety of jobs. Only the WOPALAS methodology and the Guidelines for rating work-related factors scored higher, with four out of five, and five out of five, respectively. The goal of the NIOSH meetings is to agree on the use of a more universal observational method when evaluating basic ergonomic stressors to the upper extremities. It is hoped that using this approach, the chosen methodology can be utilized in a wide range of jobs and industries (Burt, et al., 2000).

Frievalds and Kong (2000) attempted to validate a quantitative risk assessment upper extremities (CTD) model developed using grip force and hand motion data input from a "touch glove" with the Strain Index for 11 jobs. In this study, the regression of the predicted incident rate with the actual incident rate was significant ($r^2 = 0.51$; $p = 0.5$) for the CTD risk model, but not for the Strain Index model ($r^2 = 0.17$; $p = 0.2$).

Another comparative study to evaluate the accuracy of various assessment tools and to evaluate ergonomic risk and associated outcomes has been reported by Joseph, et al. (2000). Approximately 750 jobs, with two operators performing each job, at six car manufacturing and assembly plants were chosen for their study. The Strain Index (Max task) was compared against Expert Opinion DUE, OSHA A score, Rodgers Max DUE score, RULA Job Level Max Task, and the RULA Max C score for two situations: (a) DUE symptoms with congruent medical findings and, (b) DUE symptoms only. A Strain Index threshold criterion score of 7.0 was used. The researchers reported that most of the assessment tools tested showed poor sensitivity, leading to an unacceptable level of false positives. When compared against the other methodologies, the Strain Index however had the second highest sensitivity readings, second only to the RULA Max C score.

Most recently, two studies examining the predictive and external validity of the Strain Index have been completed in turkey processing (Knox & Moore, (in press)) and chair, and hose connector manufacturing (Rucker & Moore, (in press)).

The methodology and analytical techniques of the Knox and Moore (in press) and Rucker and Moore (in press) studies are similar. Each looked at a variety of 28 simple jobs within their particular industries and evaluated the Strain Index for both left and right sides (56 exposures) of the worker's body, as well as for the overall job as a whole. For the latter, the highest SI score obtained for either side of the body, for the specified job was used as the overall score for that job. As per the original Moore and Garg (1995) Strain Index paper, a threshold criterion Strain Index score of 5.0 was used to discriminate between "safe" and "hazardous" sides and jobs. In turkey processing, at least 10 job cycles were observed and video taped for all the jobs studied. For both the chair, and hose connector manufacturing jobs, a minimum of 5 job cycles were evaluated in a similar fashion. Following the data collection and tabulation of the SI scores, OSHA logs were reviewed for the three year period prior to the study period to obtain morbidity records relating to the workers performing the specified jobs. The turkey processing jobs, when evaluated for each of the 56 sides, had a corresponding 75% morbidity rate; the manufacturing jobs, had a corresponding 12.5% morbidity when the 56 sides were evaluated.

When the evidence of association analyses between hazard and morbidity classifications were conducted for the 28 jobs and 56 sides, both studies showed statistically significant odds ratio results. Knox and Moore (in press) reported the following results for their turkey processing study: 28 jobs - sensitivity = 0.91; specificity = 0.83, positive predictive value - 0.95; negative predictive value = 0.71; odds ratio = 50.0; 56 sides - sensitivity = 0.86; specificity = 0.79; positive predictive value = 0.92; negative predictive value = 0.65; odds ratio = 22.0. For the chair, and hose connector manufacturing study, Rucker and Moore (in press) reported the following values: 28 jobs - sensitivity = 1.00; specificity = 0.84; positive predictive value = 0.75; negative predictive value = 1.00; empirical odds ratio = 106.6; 56 sides - sensitivity = 1.00; specificity = 0.84; positive predictive value = 0.47; negative predictive value = 1.00; empirical odds ratio = 73.2). Both studies concluded that the variability of the SI scores was largely due to the temporal patterns of exertion (durations and frequencies). They also stated that the Strain Index is capable of predicting separate exposure hazards, as seen by the results of the analyses for the left and right sides of the workers' bodies. Based of the individual findings of these studies, the authors report that there appears to be evidence that the Strain Index methodology has both predictive and external validity.

Finally, the recently released Moore, Rucker, and Knox study (2001) looked at the validity of the Strain Index and generic risk factors for predicting nontraumatic distal upper extremity morbidity. Specifically, it evaluated the nine individual generic risk factors (high repetitiveness; pinch grip; gloves; high forcefulness - SI; high forcefulness - all; non-neutral posture; vibration; localized compression; cold), eight combinations of the generic risk factors, the presence of any generic risk factor, and the Strain Index for 56 jobs from the turkey processing and chair, and hose connector manufacturing industries. Moore, Rucker, and Knox reported that the Strain Index had the largest estimated odds ratio (108.3) of any of the exposure factors, and that it also had the best sensitivity, specificity, positive predictive value, and negative predictive value (all approximately 0.90) than any of the individual or combinations of generic risk factors. For the purposes of this study, a high predictive value was considered to be ≥ 0.75, and a low predictive value < 0.75. The authors concluded that their results indicate that the Strain Index is a better "true" measure of risk than the other generic risk factors studied. They cautioned as well, that there is no "gold standard" for validating the presence or absence of a neuromusculoskeletal hazard, nor is there a consensus method for determining when the occurrence of morbidity represents evidence of a hazard.

CHAPTER 3

METHODOLOGY

The design of this research is consistent with a longitudinal study (also known as a cohort study), as it required the status of the exposure to be defined by a Strain Index score before any evaluation of subjective pain and morbidity was made. The cohort represented all workers that performed the study job exposures. The number of workers remained consistent during the observation period, with no migration allowed. Due to the nature of this study, a defined order of process was also necessary in order to ensure that the investigative team was blinded to all health outcomes until the exposure data collection was completed and Strain Index (SI) scores tabulated.

The study methodology was approved by the Faculty of Medicine's Ethics Committee at the University of Manitoba and by the General Manager of the company that volunteered to participate in this thesis project. All participants were required to sign a consent form acknowledging their understanding of the rationale and methods to be used during the project (Appendix A). There was no special compensation given to the workers, by either the company or investigative team, for participating.

In order to avoid confusion when comparing this study to those in the literature, there are several terms which require clear definition. For the purpose of this study, a "job" refers to a category of work which best described the duties required to be performed by the individual employee. Examples of a "job" would include: cutting metal clad, installing hardware, etc.. As each job may or may not require the worker to use their distal upper extremity on both left and right sides of their body in a significant way, each job has been evaluated using the side(s) most applicable for the duties being performed. Each side of the worker's body has therefore been classified as a separate "exposure". The final definition is "subjective pain". This term is used to describe the symptoms of pain, stiffness, tingling, and numbness, as a collective group, reported by each worker on a confidential questionnaire. The worker may have experienced only one of, a combination of, or all four symptoms of "subjective pain" in a particular part(s) of their distal upper extremity for "subjective pain" to be deemed present.

3.1. Selection of Suitable Exposures for Analysis

Forty-two window manufacturing-related exposures, requiring primary use of the distal upper extremity (DUE), were chosen for this study conducted in Manitoba, Canada. These exposures, either left, right, or both sides of the worker's body, were representative of 34 simple and complex, multi-faceted jobs (Table 1). An attempt to gather a representative sample of DUE jobs, from all company production departments, was made in order to demonstrate the usefulness of the Strain Index methodology across industry-specific work. The majority of the jobs were performed by one full-time employee (FTE) per shift at any given time; data was collected on multiple workers performing the same

Table 1.
Subject and Exposure Listing

Subject Identification	Gender	Age	Job Number	Exposure	Exposure Identifier	Work Experience with Exposure
M -1	Female	56	1	Weather- Stripping Applied	Right	10 1/2 months
M-2	Male	45	2	Installing Hardware - Door Dept.	Left/Right	10 months
M-3	Male	20	3	Sills In and Swing Out	Right	5 1/2 months
M-4	Male	45	4	Edge Deleting	Left/Right	5 years 8 months
M-5	Male	49	5	Installing Headers	Right	6 months
M-6	Male	39	6	Cutting Metal Clad	Left/Right	3 years
M-7	Male	35	7	Glass Washing	Left/Right	3 months
M-8	Female	28	8	Casement Screening	Left/Right	7 months
M-9	Male	48	9	Tradesman's Choice Door Assembly	Right	7 months
M-10	Male	34	10	Wrapping Slabs	Left/Right	3 months
M-11	Male	60	11	Installing Hardware - WWA	Right	5 years
M-12	Female	21	12	Trimming Brick Moulding	Right	3 months
M-13	Male	46	13	Screening - Installing Pins	Right	5 years
M-13	Male	46	14	Making Screens - Flat Table	Right	5 years
M-14	Male	62	15	Applying Hinges on Jambs	Right	1 year
M-14	Male	62	16	Applying Weather-Stripping to Jambs	Right	1 year
M-15	Male	30	7	Glass Washing	Left/Right	8 years
M-16	Female	26	16	Applying Weather-Stripping to Jambs	Right	8 months
M-17	Male	36	17	Frame Assembly with Door Light	Left	11 months
M-18	Male	39	18	Applying Swiggle to Glass	Right	8 years 6 months
M-19	Female	43	19	Making Screens - Tilt Table	Right	5 years
M-20	Male	43	18	Applying Swiggle to Glass	Left/Right	14 years
M-21	Male	46	20	Installing Windows into Doors	Right	3 years 9 months
M-22	Male	38	21	Making Sills	Left	6 months

Table 1.
Subject and Exposure Listing cont'd

Subject Identification	Gender	Age	Job Number	Exposure	Exposure Identifier	Work Experience with Exposure
M-23	Female	30	22	Priming Window Jambs	Right	3 months
M-24	Male	44	23	Cutting Screen Retainer	Left/Right	1 year 6 months
M-24	Male	44	24	Using Punch Press	Left	1 year 6 months
M-24	Male	44	25	Painting Metal Clad	Right	1 year 6 months
M-24	Male	44	26	Flipping Metal Clad	Left	1 year 6 months
M-25	Female	32	27	Door Jamb Machine for Striker Plate	Right	7 months
M-25	Female	32	28	Door Jamb Machine for Hinges	Right	7 months
M-26	Female	42	29	Screening - Patio	Right	1 year
M-26	Female	42	30	Guiding Copy Router	Right	1 year
M-26	Female	42	31	Guiding Copy Router-A	Right	1 year
M-27	Male	49	19	Screening - Tilt Table	Right	4 years
M-28	Male	32	32	Making Steel Door Insert Frames	Left/Right	2 years
M-29	Male	41	33	Glazing and Insert of Peepholes	Right	7 years 8 months
M -30	Female	20	1	Weather-Stripping Applied	Left/Right	6 months

job to demonstrate inter-worker variability where possible. Twenty-two males and 9 females, between the ages of 20 and 62 years of age participated in this study. Although no discrimination based on sex, age, hand dominance, or first language was made, all workers were required to have a minimum of 3 months job-specific experience. The company was fully operational during the day, with some operations carrying over to the afternoon and evening shifts. For logistical reasons, only workers on the fully operational day shift were included in this study. There was no history of modifications to the work exposures during the study period.

3.2 Collection of the Data

3.2.1 Variables Defined in the Strain Index

The task variable data (intensity of exertion, duration of exertion (% exertional cycle), efforts per minute, hand/wrist posture, speed of work, and duration per day) was collected on-site at two plant locations, for forty-two separate exposures. The definitions for each variable used in the original Strain Index study (Moore & Garg, 1995) are as follows:

Intensity of Exertion - an estimation of the strength required to perform the exposure throughout one exertional cycle. It is either measured as a percentage of maximal strength (Table 2), using the perceived effort guideline (Table 2), or by the job analyst rating the perceived effort of the worker using the Borg CR-10 scale (Borg, 1990) (Figure 1).

Table 2.

Guidelines for Assigning a Rating Criterion for Intensity of Exertion

Rating Criterion	% MS[a]	Borg Scale[b]	Perceived Effort
light	<10%	≤2	barely noticeable or relaxed effort
somewhat hard	10% - 29%	3	noticeable or definite effort
hard	30% - 49%	4 - 5	obvious effort; unchanged facial expression
very hard	50% - 79%	6 - 7	substantial effort; changes facial expression
near maximal	≥80%	>7	uses shoulder or trunk to generate force

[a] Percentage of maximal strength
[b] Compared to the Borg CR-10 scale

Note. From "A User's Guide for the Strain Index", in J.S. Moore and A. Garg, 1995, American Journal of Industrial Hygiene Journal, 56, p. 457-458. (Appendix B)

Borg's CR-10 scale

0	Nothing at all	
0.5	Extremely weak	(just noticeable)
1	Very weak	
2	Weak	(light)
3	Moderate	
4		
5	Strong (heavy)	
6		
7	Very strong (very heavy)	
8		
9		
10	Extremely strong	(almost max)
•	Maximal	

Figure 1. The Borg category ratio (CR)-10 scale[1].

[1]From: Borg, G. (1990). Psychophysical scaling with applications in physical work and the perception of exertion. Scandinavian Journal of Work, Environment and Health 16 (Supplement 1), 55-58, 1990.

Duration of Exertion - the length of all exertions measured in seconds during one exertional cycle, divided by the total observation time of the exertional cycle measured in seconds. The result is then multiplied by 100 to generate a figure that is recorded as the percent duration of exertion of the cycle.

Exertional Cycle - the period of time an exertion is applied; synonymous with "cycle" in the Strain Index methodology.

Duration of Recovery per Cycle - represents the exertional cycle time minus the duration of exertion per cycle.

Efforts per Minute - the number of exertions that occur during one cycle, divided by the total observation time of the cycle measured in minutes.

Hand/Wrist Posture - an estimation of the hand or wrist position relative to neutral for wrist extension, wrist flexion, or ulnar deviation. The estimated angle of deviation is assessed for any or all positions if they apply to the current job being assessed. For each range of deviation, an associated perceived posture guideline is available to compare against (see Table 3).

Table 3.

Guidelines for Assessing a Rating Criterion for Hand/Wrist Posture

Rating Criterion	Wrist Extension[a] (degrees)	Wrist Flexion[a] (degrees)	Ulnar Deviation[a] (degrees)	Perceived Posture
very good	0 - 10	0 - 5	0 - 10	perfectly neutral
good	11 - 25	6 - 15	11 - 15	near neutral
fair	26 - 40	16 - 30	16 - 20	non-neutral
bad	41 - 55	31 - 50	21 - 25	marked deviation
very bad	> 60	>50	> 25	near extreme

[a] Derived from data presented in Stetson, D.S., Keyserling, W.M., Silverstein, B.A., and Leonard, J.A. (1991).

Note. From "A User's Guide for the Strain Index", in J.S. Moore and A. Garg, 1995, American Industrial Hygiene Association Journal 56, p. 457-458. (Appendix B)

Speed of Work - an estimation of how quickly the job is being performed. The observed pace can either be divided by Methods-Time Measurement (MTM)-1's predicted pace and expressed as a percentage of predicted (Barnes, 1980) (Table 4), or by the job analyst rating the worker's perceived speed using the verbal descriptors (Table 4).

Table 4.

Guidelines for Assigning a Rating Criterion for Speed of Work

Rating Criterion	Compared to MTM-1 [a]	Perceived Speed
very slow	≤80%	extremely relaxed pace
slow	81 - 90%	"taking one's own time"
fair	91 - 100%	"normal" speed of motion
fast	101 - 115%	rushed, but able to keep up
very fast	>115%	rushed and barely or unable to keep up

[a] The observed pace is divided by MTM-1's predicted pace and expressed as a percentage of predicted

Note. From "A User's Guide for the Strain Index", in J.S. Moore and A. Garg, 1995, American Industrial Hygiene Association Journal 56, p. 457-458. (Appendix B)

Duration of Task per Day - recorded in number of hours, determined either by direct measurement using a stopwatch, or obtained from plant personnel/records.

3.2.2 Variables Used in Present Study

In this study, the intensity of exertion for each exposure was rated by the worker using a visual Borg CR-10 scale (Figure 1). The worker was asked to choose a number from the scale based on the corresponding descriptions of perceived effort. The speed of work was measured using a visual list of the perceived speed guidelines from the "User's Guide for the Strain Index" in Moore and Garg (1995) (Appendix B). Each worker was asked to choose the level of work pace that best described the exposure being assessed. Where the use of written English was problematic, the Borg CR-10 and/or perceived speed options were read to the worker, or translated by another fully bilingual individual who was not in a supervisory or management role with the company. This procedure was deemed to give a more accurate reflection of the work demands, due to the job-specific experience level of the workers.

3.2.3 Procedures

Each exposure was documented using 8mm videography. Ten job cycles (minimum of 3, average of 7.25) were observed to obtain a representative sample of the specific requirements for each exposure. An additional 2 job cycles were observed, but not videotaped, in order that goniometer readings of representative hand/wrist postures could be measured by the principal investigator and recorded. Although not required by the Strain Index methodology, as the hand/wrist posture is an estimated visual measure, this approach was deemed appropriate as an additional source of information in the event difficulties arose when the videotapes were analyzed. In this industry, the hand/wrist postures were observed to be extremely awkward due to the multiple deviations and quick hand action required by most of the work practices. Warehouse Persons (formerly named Lead Hands or Departmental Supervisors) confirmed that the duration each exposure was performed per day, and that the recorded activities were representative of the company's performance standards. Demographic information and verbal responses to questions concerning the perceived intensity of exertion and speed of work were collected from the worker and recorded during an interview process before and after the videotaping respectively. Each worker was asked to complete an "Assessment of Risk Factors for Distal Upper Extremity and Shoulder Disorders" questionnaire (© Arun Garg, 1997) (Appendix C) during a subsequent interview process in order to gather additional demographic and subjective pain assessment data. Where language barriers prohibited the accurate collection of information, a bilingual co-worker selected by the employee was invited to participate as an interpreter. When no other employee spoke the same language, the worker was permitted to take the questionnaire home and complete it with a bilingual family member or friend.

3.3 Analysis of the Exposure Data

3.3.1 Calculation of the Strain Index

The Strain Index methodology required the data collected for the six task variables to be assigned a rating of 1,2,3,4, or 5 which corresponded with the appropriate categories in Table 5.

Table 5.

Assignment of Task Variable Rating Values

Rating Values	Intensity of Exertion	Duration of Exertion	Efforts per Minute	Hand/Wrist Posture	Speed of Work	Duration per Day
1	light	<10	<4	very good	very slow	≤ 1 hour
2	somewhat hard	10 - 20	4 - 8	good	slow	1 - 2 hours
3	hard	30 - 49	9 - 14	fair	fair	2 - 4 hours
4	very hard	50 - 79	15 - 19	bad	fast	4 - 8 hours
5	near maximal	≥ 80	≥ 20	very bad	very fast	≥ 8 hours

Note. From "A User's Guide for the Strain Index", in J.S. Moore and A. Garg, 1995, American Industrial Hygiene Association Journal, 56, p. 457-458. (Appendix B)

For example, if the measured % duration of exertion calculated for an exposure was 58%, then the rating value assigned would be "4". For hand/wrist posture, the deviation (wrist extension, wrist flexion, or ulnar deviation) with the angle producing the highest rating criterion (not the largest angle) per exposure trial would be assessed for an appropriate rating value. An example to illustrate this point would be: given, Trial "X": wrist extension - 26 degrees; wrist flexion - not applicable; ulnar deviation - 26 degrees. The rating criterion is as follows: wrist extension - 26 degrees - "fair"; ulnar deviation - 25 degrees - "bad". Although both wrist extension and ulnar deviation have the same angle deviations, the rating criterion for ulnar deviation is higher and this value must be used when the rating values are assigned.

Upon completion of this step, each rating value for each task variable was assigned a multiplier from Table 6.

Table 6.

Assignment of Task Variable Multipliers

Rating Values	Intensity of Exertion	Duration of Exertion	Efforts per Minute	Hand/Wrist Posture	Speed of Work	Duration per Day
1	1	0.5	0.5	1.0	1.0	0.25
2	3	1.0	1.0	1.0	1.0	0.5
3	6	1.5	1.5	1.5	1.0	0.75
4	9	2.0	2.0	2.0	1.5	1.0
5	13	3.0[a]	3.0[a]	3.0	2.0	1.5

[a] If duration of exertion is 100%, then efforts/minute multiplier should be set to 3.0

Note. From the 'User's Guide for the Strain Index', in J.S. Moore and A. Garg, 1995, American Industrial Hygiene Association Journal, 56, p. 457-458. (Appendix B)

Continuing with the % duration of exertion example, the rating value of "4" would be found in the left column and a line drawn over to the multiplier of "2.0" found under the heading of "Duration of Exertion". The multiplier would then be placed in its correct position as per Figure 2 in order to begin the calculation of the Strain Index score for the trial.

Intensity of Exertion	Duration of Exertion	Efforts per Minute	Hand/Wrist Posture	Speed of Work	Duration of Task	=	SI Score
________ x	________ x	________ x	________ x	________ x	________	=	______

Figure 2. Formula for entering the task variable multipliers to calculate the Strain Index score.

3.3.2 Management of the Data

Using the video recordings, two job analysts observed, measured and recorded the task variables relating to duration of exertion (% of exertional cycle) and efforts per minute. The hand/wrist posture was analyzed by the principal investigator who was experienced in joint angle readings. The values of intensity of exertion, speed of work, and duration per day were provided to the job analysts on field collection sheets for incorporation with the three other variables. The intensity of exertion was measured using the Borg CR-10 scale (Figure 1), and the speed of work by using the perceived speed of work guidelines (Table 3). Any questions arising from the analysis process were resolved by consensus; in the case of the hand/wrist posture, by using the goniometer measurements collected during the additional two exertional cycles. A Strain Index score was calculated for each individual trial and each of the 42 exposures following the protocol described by Moore and Garg (1995). The median, as opposed to the mean, of the exposure data was calculated (see Discussion 4.6.2).

3.4 Hazard Classification of "Safe" versus "Hazardous" Exposures

3.4.1 Variables Defined in the Strain Index

As described in Moore and Garg (1995), there is an increased risk of musculoskeletal disorders occurring in workers exposed to one or more of the following stressors: intensity, frequency, and duration. The task variables which comprise the Strain Index equation therefore reflect these stressors as they relate to work performed during an exertional cycle. The definitions of "safe" and "hazardous" when used in the context of the Strain Index refer to jobs, the Strain Index does not assess individual workers. Moore and Garg (1995) chose to define a "safe" job (SI $\leq$ 3.0) as one where workers are not at increased risk of distal upper extremity disorders. This classification however, does not imply that although the job is not hazardous, there is no exposure to musculoskeletal stressors. Conversely, "hazardous" jobs/separate exposures (SI > 7.0) cause the worker to be exposed to one or more of the stressors.

3.4.2 Variables Used in Present Study

For this study, Strain Index scores for each of the 42 separate exposures were initially compared against a threshold value of 5.0, as per the suggestion of Moore and Garg (1995). An exposure was categorized as "safe" with a Strain Index score of 0 - 4.99; a "hazardous" exposure was indicated when the Strain Index score was 5.0 or higher. Further analyses were then conducted to determine which task variable made the largest relative weight contribution to the final Strain Index score, and to ascertain whether the threshold value of 5.0 did indeed offer the best discrimination between the two categories for jobs performed in the window manufacturing industry.

3.5 Subjective Pain

3.5.1 Subjective Pain Assessment

Following the calculation of the Strain Index scores for all trials and all exposures, an analysis was conducted to ascertain whether an association existed between the Strain Index score and the subjective report of distal upper extremity exposure-related pain. These symptoms included: pain, stiffness, numbness, and/or tingling to the elbow, forearm, hand/wrist. Each worker was interviewed and required to complete an "Assessment of Risk Factors for Distal Upper Extremity and Shoulder Disorders" questionnaire (© Arun Garg) (Appendix C). The report of subjective work-related pain was limited to those symptoms felt to have occurred due to the specific exposure being assessed. Only questions #31 and 32 of the questionnaire were used for the purpose gathering subjective pain data.

3.5.2 Subjective Pain Classification

As the purpose of assessing whether the association between subjective pain and "safe" versus "hazardous" exposures was to determine whether this type of analysis could provide earlier detection for the identification of problematic jobs, all four symptom types (pain, stiffness, tingling, and numbness) were grouped as one category. Each exposure was assigned a subjective pain classification based on the occurrence ("positive") or non-occurrence ("negative") of related pain symptoms experienced by the worker(s) performing that job. A "positive" classification was considered to be a report of one or more of the symptoms occurring in the past 12 months after the commencement of the current job. In addition, the worker was asked to report only those symptoms believed to be a direct result of the job demands of the specific exposure. A "negative" classification indicated that no symptoms associated with the exposure were reported by the worker.

3.6 Morbidity

3.6.1 Morbidity Assessment

A review of the Workers Compensation Board of Manitoba "Employer Report of Injury or Occupational Disease" forms (Appendix D) for the 2 year period during the on-site evaluation was conducted following the subjective pain assessment (see Discussion 4.6.3). The principal investigator, schooled in kinesiology, health and safety, and accredited in ergonomics, analyzed the WCB records for reported cases of distal upper extremity disorders related to musculoskeletal origin. Any related injury was specified as either left- or right-sided and counted as one case of morbidity for that specific exposure.

3.6.2 Morbidity Classification

Each exposure was assigned a morbidity classification based on the occurrence ("positive") or non-occurrence ("negative") of a work-related injury to the worker(s) performing the specific exposure. If more than one occurrence of morbidity was reported per exposure, the classification remained as "positive" with no discrimination made for the additional associated morbidity.

3.7 Data Analysis

SAS version 8.0 was used to investigate the relationships between the task variables and the resultant Strain Index score for each of the 42 exposures. A further analysis was conducted to establish whether predictive validity existed when associations between the Strain Index scores and the categories of "safe" versus "hazardous" exposures, subjective pain, and morbidity classifications were compared against the suggested threshold criterion of 5.0 (Moore & Garg, 1995). The external validity of the Strain Index was then tested to determine whether indeed this value was the best threshold for discriminating between "safe" and "hazardous" jobs in window manufacturing.

The data was entered using two distinct scales of measurement. Continuous variables included the percent duration of exertion, efforts per minute and the Strain Index scores. Ordinal categorical variables included the rating values for intensity of exertion, percent duration of exertion, efforts per minute, hand/wrist posture, speed of work, and duration per day. The "safe" versus "hazardous" exposures, subjective pain, and morbidity classifications were treated as dichotomous nominal variables, each being reported as either "positive" or "negative".

Student's t-tests were used to compare the mean values of percent duration of exertion and efforts per minute between the two hazard (subjective pain and morbidity) classifications. The Chi-square test for independence was used to assess the association of the task variable ratings with subjective pain and morbidity. Evidence and strength of association between the categories of "safe" versus "hazardous" exposures, with subjective pain and morbidity was evaluated using the likelihood ratio (LR) test for independence and odds ratio were estimated, respectively. The acceptable level of type 1 error was established at a value of 0.05, with no adjustments for multiple comparisons. The Fisher's exact test (2-tailed) was utilized to determine statistical significance if at least one cell of the 2 x 2 contingency tables had a count of less than 5.

The sensitivity, specificity, positive predictive value, and negative predictive values were calculated for both subjective pain (n = 40 exposures) and morbidity (n = 42 exposures) classifications relative to selected threshold criterion values in order to determine the predictive validity of the Strain Index. External validity was assessed by plotting the sensitivity and 1 - specificity on receiver-operator characteristic (ROC) curves to establish the best trade-off point between the sensitivity and specificity at various Strain Index score cut-off values for both subjective pain and morbidity. The results were then verified by constructing tables demonstrating the effect of varying the threshold on the strength of association with outcomes.

CHAPTER 4

RESULTS AND DISCUSSION

Results

4.1 Exposure Data

4.1.1 Range of Strain Index Scores for all Exposures Within Jobs

Inspection of Table 7 shows a range of Strain Index scores from 1.5 to 162 for the exposures examined within the window manufacturing jobs. The presence or absence of subjective pain and/or morbidity in the workers performing each exposure are also presented as either positive or negative classifications respectively. Statistical analysis established a median score of 44.25 for the 42 exposures with the upper quadrile (75th%ile) at 81.

4.1.2 Task Variable Data and Resultant Strain Index Scores

When the task variables were compared across the 42 exposures, the majority of the work was rated as being "somewhat hard" in intensity, taking 50-80$^+$ percent of the exertional cycle, with $\geq$20 efforts per minute and requiring very bad hand/wrist posture. These exposures were performed at a "fair" speed for an average 4 - 8 hours per day (Table 8).

Table 7.
All Exposures In Order of SI Score From Highest to Lowest

Exposure Identifier	**FTE**	**Exposure**	**Strain Index Score** (calculated from median variables from trials)	**Subjective Pain**	**Morbidity**
Installing Hardware - Door	1	Left	162	P	N
Tradesman's Choice -Doors	1	Right	162	P	N
Making Steel Door Insert Frames	1	Left	162	N	N
Making Steel Door Insert Frames	1	Right	162	N	N
Wrapping Slabs	1	Right	121.5	N	N
Making Screens (flat table)	1	Right	121.5	P	N
Guiding Copy Router	1	Right	121.5	P	P
Guiding Copy Router-A	1	Right	121.5	P	P
Making Screens -patio	1	Right	108	P	P
Installing Hardware - Door	1	Right	81	P	N
Applying Weatherstripping to Jambs	2	Right	81	P	P
Frame Assembly with Door Light	1	Left	81	N	N
Making Screens (on tilt)	2	Right	81	P	N
Installing Windows into Doors	1	Right	81	P	N
Door Jamb Machine Operation for Striker Plate	1	Right	81	P	N
Priming Window Jambs	1	Right	75.9	no data	N
Edge Deleting	1	Left	60.8	P	N
Glass Washing	2	Left	54	P	N
Trimming Brick Moulding	1	Right	54	no data	P
Applying Swiggle to Glass	1	Left	54	N	N
Installing Headers	1	Right	48	N	N
Wrapping Slabs	1	Left	40.5	N	N
Door Jamb Machine Operation for Hinges	1	Right	36	P	N
Screening - Installing Pins	1	Right	33.8	P	N
Cutting Screen Retainer	1	Right	30.4	N	N
Casement Screening	1	Right	27	N	N

Table 7.
All Exposures In Order of SI Score From Highest to Lowest cont'd

Exposure Identifier	FTE	Exposure	Strain Index Score (calculated from median variables from trials)	Subjective Pain	Morbidity
Installing Hardware WWA	1	Right	27	N	N
Edge Deleting	1	Right	27	**P**	N
Applying Hinges on Jambs	1	Right	27	**P**	N
Apply Swiggle to Glass	2	Right	22.5	N	N
Sills In and Out Swing	1	Right	18	N	N
Cutting Screen Retainer	1	Left	17.7	N	N
Making Sills	1	Left	12	N	N
Glass Washing	2	Right	9	**P**	N
Glazing and Insert of Peepholes	1	Right	9	**P**	N
Weather Stripping Applied	1	Left	6.75	**P**	N
Weather Stripping Applied	2	Right	6.75	**P**	N
Using Punch Press	1	Left	6.75	N	N
Cutting Metal Clad	1	Left	4.5	N	**P**
Painting Metal Clad	1	Right	4.5	N	N
Flipping Metal Clad	1	Left	4.5	N	N
Cutting Metal Clad	1	Right	1.5	**P**	N

Table 8.

Majority Rankings of Task Variables – All Exposures

Task Variable	Rating	Ranking	Exposure Results
Intensity of Exertion	somewhat hard	2	45.24%
Duration of Exertion	50 - 79% of cycle; ≥ 80%	4 5	40.48% 40.48%
Efforts/Minute	≥ 20	5	59.52%
Hand/Wrist Posture	very bad	5	64.29%
Speed	fair	3	76.19%
Duration per Day	4 - 8 hours	4	59.52%

The individual breakdown of task variables for each exposure with the corresponding Strain Index Score is found in Table 9. When the Strain Index scores were calculated using the median of the task variables from the trials of each exposure (msi50), and then from the median of the SI from the trials (si50), no significant difference was found ($t = 0.28$, $df = 41$, $p = 0.78$). The principal investigator chose to analyze the remainder of the study using the Strain Index score calculated from the median of the task variables from the trials (msi50) for each exposure.

Multiple regression results of the weighted contribution of each task variable indicated that the intensity of exertion accounted for the highest partial r^2 value (0.3657) (Table 10).

Table 9.
Task Variables and Strain Index Scores for all Exposures

Exposure Identifier	FTE	Exposure	Intensity of Exertion	Duration of Exertion (%)	Efforts per Minute	Hand/ Wrist Posture	Speed of Work	Duration per Day	Strain Index Score msi50 (SI calculated from median variables from trials)	Strain Index Score si50 (median of SI from trials)
Weather-Stripping Applied	1	left	light	75	28.3	fair	fair	2 -4 hours	6.8	6.8
	2	right	somewhat hard	15.5	8	very bad	fair	2 -4 hours	6.8	6.8
Installing Hardware - Door Dept.	1	left	hard	83.3	31.9	very bad	fair	4 - 8 hours	162	162
	1	right	somewhat hard	91.4	19.8	very bad	fair	4 - 8 hours	81	81
Sills In and Swing Out	1	right	somewhat hard	21.5	18.9	very bad	fair	4 - 8 hours	18	22.5
Edge Deleting	1	left	somewhat hard	95.5	30	very bad	fair	2 - 4 hours	60.8	60.8
	1	right	somewhat hard	95.7	15.6	bad	fair	2 - 4 hours	27	20.3
Installing Headers	1	right	hard	51.8	16.4	bad	fair	4 - 8 hours	48	48
Cutting Metal Clad	1	left	light	18.3	39.2	very bad	fair	1 -2 hours	9	4.5
	1	right	light	26.8	32.2	very good	fair	1 -2 hours	1.5	1.5
Glass Washing	2	left	somewhat hard	86.7	20	bad	fair	4 - 8 hours	54	54
	2	right	somewhat hard	77.8	13.8	good	fair	4 - 8 hours	9	18
Casement Screening	1	right	light	64.2	34.9	very bad	fast	4 - 8 hours	27	27
Tradesman's Choice Door Assembly	1	right	hard	66.9	24.6	very bad	fast	4 - 8 hours	162	162
Wrapping Slabs	1	left	somewhat hard	77.7	13	very bad	fast	4 - 8 hours	40.5	40.5
	1	right	hard	81.7	13.9	very bad	fast	4 - 8 hours	121.5	121.5
Installing Hardware - WWA	1	right	somewhat hard	49.5	15.5	very bad	fair	4 - 8 hours	27	27
Trimming Brick Mould	1	right	hard	66.7	20.4	very bad	fair	1 -2 hours	54	54
Screening - Applying Pins	1	right	hard	80.3	9.3	very bad	fair	1 -2 hours	33.8	27
Screening -Flat Table	1	right	very hard	78.1	20.9	very bad	fair	2 - 4 hours	121.5	121.5
Applying Hinges on Jambs	1	right	somewhat hard	37.5	15.5	very bad	fair	4 - 8 hours	27	27
Applying Weather-Stripping to Jambs	2	right	somewhat hard	94.3	38.3	very bad	fair	4 - 8 hours	81	81
Frame Assembly with Door Light	1	left	hard	67.1	11	very bad	fast	4 - 8 hours	81	81
Applying Swiggle to Glass	1	left	somewhat hard	80.8	25.6	bad	fair	4 - 8 hours	54	54
	2	right	hard	66.6	6.9	very bad	fair	4 - 8 hours	22.5	21
Screening - Tilt Table	2	right	hard	61.9	34.5	very bad	fair	2 - 4 hours	81	81
Installing Windows into Doors	1	right	somewhat hard	71.3	43.3	very bad	fast	4 - 8 hours	81	81
Making Sills	1	left	light	57.1	45.7	bad	slow	4 - 8 hours	12	12
Priming Window Jambs	1	right	somewhat hard	79.3	31.8	very bad	fast	2 - 4 hours	76	75.9
Cutting Screen Retainer	1	left	somewhat hard	45	11	very bad	fair	2 - 4 hours	17.7	15.2
	1	right	hard	40	12	bad	fast	2 - 4 hours	30.4	30.4
Using Punch Press	1	left	somewhat hard	55.6	12.5	very good	fast	1 - 2 hours	6.8	6.8
Painting Metal Clad	1	right	light	73.2	135.2	very bad	fair	<= 1 hour	4.5	4.5

Table 9.
Task Variables and Strain Index Scores for all Exposures cont'd

Exposure Identifier	FTE	Exposure	Intensity of Exertion	Duration of Exertion (%)	Efforts per Minute	Hand/ Wrist Posture	Speed of Work	Duration per Day	Strain Index Score msi50 (SI calculated from median variables from trials)	Strain Index Score si50 (median of SI from trials)
Flipping Metal Clad	1	left	light	100	47.9	bad	fair	<= 1 hour	4.5	4.7
Door Jamb Machining for Striker Plate	1	right	hard	100	93.3	very bad	fair	4 - 8 hours	81	81
Door Jamb Machining for Hinges	1	right	hard	55.6	16.7	very bad	fair	4 - 8 hours	36	36
Screening - Patio	1	right	hard	65.2	30.9	very bad	fair	4 - 8 hours	108	126
Guiding Copy Router	1	right	very hard	91.2	37.6	fair	fair	4 - 8 hours	121.5	114.8
Guiding Copy Router-A	1	right	very hard	100	31.2	fair	fair	4 - 8 hours	121.5	121.5
Making Steel Door Insert Frames	1	left	very hard	91.8	16.4	very bad	fair	4 - 8 hours	162	162
	1	right	very hard	92.9	31.8	bad	fair	4 - 8 hours	162	162
Glazing and Insert of Peepholes	1	right	somewhat hard	74.4	75.3	bad	fair	<= 1 hour	9	9

Table 10.

Multiple Regression Analysis of the Relative Contributions of the Six Task Variables

Task Variable	**r^2 partial**	**F_{ratio}**	**Probability**
Intensity of Exertion	0.3657	134.89	$p < .0001$
Efforts per Minute	0.1043	38.48	$p < .0001$
Duration per Day	0.0416	15.35	$p = .0004$
Hand/Wrist Posture	0.0393	14.49	$p = .0005$
Speed of Work	0.0235	8.66	$p = .0058$
% Duration of Exertion	0.0184	6.78	$p = .0134$

4.2 Subjective Pain – Assessment and Classification

Twenty-four questionnaires addressing the presence ("positive") or absence ("negative") of subjective pain (exposure-related upper extremity pain, stiffness, tingling, and/or numbness) involving the distal upper extremities were completed by the workers. Four of the original cohort were not available to participate in this part of the study, as they had left the employment of the company shortly after the video taping was completed and the detailed interview and questionnaire process commenced. As a result, trimming brick mould and priming window jambs were eliminated from the exposure list. One job, glass washing, was not eliminated as there were two full time employees (FTEs) observed for bilateral (left, right) exposures originally; the data was adjusted to reflect the results from only one FTE. The following results are therefore representative of twenty-four workers reporting on the presence or absence of work-related subjective pain for 31 jobs, represented by 40 exposures.

Twenty-three (57.5%) of the 40 exposure results observed were associated with related subjective pain, and 17 (42.5%) of the exposures were not. Table 11 shows the distribution of the task variables for the exposures associated with related subjective pain. The mean SI score for the presence of subjective pain ("positive" symptoms) classification was 64.761 (std. deviation - 50.223; range 1.5 - 162); the mean SI score for the absence of subjective pain ("negative" symptoms) classification was 48.43 (std. deviation - 52.539; range 4.5 - 162). The differences in the mean SI scores between the presence and absence of subjective pain classifications was not significant ($t = -1.00$, $df = 38$, $p = 0.3251$).

The majority of the exposures with subjective pain were characterized by work that was of "somewhat hard" intensity, with exertional durations of 50 - 80^+ percent of the cycle, $\geq$ 20 efforts per minute, with very bad hand/wrist posture. The speed was "fair" and the work done 4 - 8 hours of the day (Table 12).

Table 11.
Characteristics of the Task Variables Associated With Exposure-Related Subjective Pain

Exposure Identifier	Exposure	Intensity	Duration of Exertion	Efforts/Minute	Hand/Wrist Posture	Speed of Work	Duration per Day	SI Score
Installing Hardware - Door Dept.	left	hard	83.3	31.9	very bad	fair	four to eight	162
Tradesman's Choice Door Assembly	right	hard	66.9	24.6	very bad	fast	four to eight	162
Glass Washing	right	somewhat hard	76.2	60.8	good	fair	four to eight	141.8
Making Screens on Flat Table	right	very hard	78.1	20.9	very bad	fair	two to four	121.5
Guiding Copy Router	right	very hard	91.2	37.6	fair	fair	four to eight	121.5
Guiding Copy Router-A	right	very hard	100	31.2	fair	fair	four to eight	121.5
Patio Screens	right	hard	65.2	30.9	very bad	fair	four to eight	108
Install Hardware - Door Dept.	right	somewhat hard	91.4	19.8	very bad	fair	four to eight	81
Apply Weatherstripping to Jambs	right	somewhat hard	95.5	41	very bad	fair	four to eight	81
Making Screens on Tilt Table	right	hard	61.9	34.5	very bad	fair	two to four	81
Install Windows into Doors	right	somewhat hard	71.3	43.3	very bad	fast	four to eight	81
Door Jamb Machine Operation for Striker Plate	right	somewhat hard	100	93.3	very bad	fair	four to eight	81
Glass Washing	left	somewhat hard	79.1	26.7	bad	fair	four to eight	72
Edge Deleting	left	somewhat hard	95.5	30	very bad	fair	two to four	60.75
Door Jamb Machine Operation for Hinges	right	somewhat hard	55.6	16.6	very bad	fair	four to eight	36
Screening - Applying Pins	right	hard	80.3	9.3	very bad	fair	one to two	33.8
Applying Swiggle to Glass	right	hard	77.2	8.6	very bad	fair	four to eight	31.7
Apply Hinges on Jambs	right	somewhat hard	37.5	15.5	very bad	fair	four to eight	27
Edge Deleting	right	somewhat hard	95.7	15.6	bad	fair	two to four	27
Glazing and Insert of Peepholes	right	somewhat hard	74.4	75.3	bad	fair	less than one	9
Weatherstripping Applied	right	light	55	21	very bad	fair	two to four	11.4
Weatherstripping Applied	left	light	75	28.3	fair	fair	two to four	6.75
Cutting Metal Clad	right	light	26.8	32.2	very good	fair	one to two	1.5

Table 12.

Majority Rankings – Subjective Pain Occurrences

Task Variable	Rating	Ranking	Exposure Results
Intensity of Exertion	somewhat hard	2	52.17%
Duration of Exertion	50 - 79 ≥ 80	4 5	43.47% 43.47%
Efforts/Minute	≥ 20	5	65.22%
Hand/Wrist Posture	very bad	5	65.22%
Speed	fair	3	91.30%
Duration per Day	4 - 8 hours	4	60.87%

The mean percentage duration of exertion among the 23 exposures with the presence of subjective pain was 73.506 (std. dev. = 22.633). The mean percentage duration of exertion among the 17 exposures in which subjective pain was absent, was 62.837 (std. dev. = 23.802). The difference between the two groups was not significant ($t = -1.44$, $df = 38$, $p = 0.1575$). The mean efforts per minute for the 23 exposures with the presence of subjective pain was 29.48 (std. dev. = 20.249). The mean efforts per minute for the 17 exposures absent of subjective pain was 29.47 (std. dev. = 29.972). The difference between the two groups was not significant ($t = -0.00$, $df = 38$, $p = 0.9990$).

4.3 Morbidity Assessment and Classification

As worker participation was not required to gather the morbidity data, the absence of the four workers who had terminated their employment with the company did not affect this section of the analysis.

For the 42 exposures, 6 (14.29%) were "positive" (presence of an injury) and 36 (85.7%) were "negative" (no injury reported) for one or more occurrences of distal upper extremity morbidity. The mean SI score for "positive" morbidity classification was 81.75 (std. deviation - 46.016; range of 4.5 - 121.5); the mean SI score for "negative" morbidity classification was 53.807 (std. deviation - 50.356; range of 1.5 - 162). The differences in the mean SI scores between the "positive" and "negative" morbidity classifications was not significant ($t = -1.28$, $df = 40$, $p = 0.2085$). Five (83.3%) of the 6 injuries occurred amongst female employees, with 1 (16.66%) occurring in a male worker. Four employees accounted for the 6 exposures with injuries; one female worker had a single injury which was reflected in three exposures.

Of the 6 exposures where injury was present, the associated upper extremity distal disorders included: three (50%) with numbness in the fingers (making patio screens, guiding copy router, guiding copy router-A), 1 (16.66%) with tendinitis of the wrist/forearm (applying weather stripping to jambs), 1 (16.66%) with a sore hand from twisting and additional pressure while using a dull knife (trimming brick mould), and 1 (16.66%) with pain in the elbow (cutting metal clad, left exposure) (Table 13) . The

Table 13.
Characteristics of Exposures Associated with Morbidity

Exposure Identifier	Exposure	Intensity	Duration of Exertion (% job cycle)	Efforts/Minute	Hand/Wrist Posture	Speed of Work	Duration per Day	SI Score	Injury	Body Part(s) Injured
Guiding Copy Router-A	right	very hard	100	31.2	fair	fair	4 - 8 hours	121.5	numbness in fingers	hand
Guiding Copy Router	right	very hard	91.2	37.6	fair	fair	4 - 8 hours	121.5	numbness in fingers	hand
Making Patio Screens	right	hard	65.2	30.9	very bad	fair	4 - 8 hours	108	numbness in fingers	hand
Applying Weather Stripping to Jambs	right	somewhat hard	94.3	38.3	very bad	fair	4 - 8 hours	81	tendonitis	wrist/forearm
Trimming Brick Mould	right	hard	66.7	20.4	very bad	fair	1 - 2 hours	54	sore; from twisting and additional pressure using a dull knife	hand
Cutting Metal Clad	left	light	18.3	39.2	very bad	fair	1 - 2 hours	4.5	pain	elbow

exposures associated with these injuries were characterized by the majority rankings of: intensity of exertions ranging from "somewhat hard" to "very hard", the percent duration ≥ 80% of the cycle, ≥ 20 efforts per minute, and very bad hand/wrist posture. The speed of work was "fair" and the duration of work per day 4 - 8 hours (Table 14). The individual task variables of the exposures associated with each injury can be inspected in Table 13.

Table 14.

Majority Rankings – Morbidity Occurrences

Task Variable	**Rating**	**Ranking**	**Exposure Results**
Intensity of Exertion	somewhat hard hard very hard	2 3 4	33.30% 33.30% 33.30%
Duration of Exertion	≥ 80	5	50.00%
Efforts/Minute	≥ 20	5	83.30%
Hand/Wrist Posture	very bad	5	66.60%
Speed	fair	3	100.00%
Duration per Day	4 - 8 hours	4	66.60%

The mean percentage duration of exertion among the 6 exposures with the presence of morbidity was 72.608 (std. dev. = 30.339). The mean percentage duration of exertion among the 36 exposures absent of morbidity was 68.588 (std. dev. = 21.955). The difference between the two groups was not significant (t = -0.39, df = 40, p = 0.6961). The mean efforts per minute for the 6 exposures with the presence of morbidity was 32.934 (std. dev. = 7.1395). The mean efforts per minute for the 36 exposures absent of morbidity was 28.711 (std. dev. = 25.71). The difference between the two groups was not significant ($t = -0.40$, $df = 40$, $p = 0.6942$).

4.4 Evidence of Strength of Association - Predictive Validity

4.4.1 2 x 2 Contingency Tables

4.4.1.1 *Subjective Pain*

Table 15 demonstrates the effect of placing the threshold criterion Strain Index score at various cut-off levels for the subjective pain data, from the Moore and Garg (1995) recommended standard of SI = 5.0 to an arbitrary highest point of SI = 125. A review of all outcomes was completed in order to search for the cut-off of "best fit" for the window manufacturing jobs studied.

At an SI = 5.0, the following results were calculated: true positives = 22; false positives = 14; false negatives = 1; true negatives = 3; sensitivity = 0.9565; specificity = 0.1765; positive predictive value = 0.61; negative predictive value = 0.75; likelihood ratio: $X^2 = 1.1374$, $df = 1$, $p = 0.2862$; odds ratio = 3.2857, Fisher's 2 tailed, $p = 0.6085$. The Strain Index correctly identified 22 of the 23 exposures with associated subjective pain.

When compared with the other cut-off levels, the sensitivity at SI = 5.0 was the highest (95.65%) and the specificity the lowest (17.65%). The low specificity created a very high false positive rate (n = 14) for this cut-off level, and notably the highest false positive rate over all the cut-off points.

Table 15.
The Effect of Placing the Threshold Criterion Strain Index Score at Various Cut-off Levels for Subjective Pain

n=40*

SI Score Result	Subjective Pain (symptoms) Present	Subjective Pain (symptoms) Absent
150 – 162	2	2
125 – 149	0	0
100 – 124	4	1
81 – 99	5	1
75 – 80	0	0
65 – 74	0	0
60 – 64	1	0
55 – 59	0	0
50 – 54	1	1
44.25 – 49	0	1
35 – 44	1	1
25 – 34	3	3
15 – 24	2	1
5 – 14	4	2
1 – 4.99	1	3
	24	36

Effect of placing cut-off at various SI levels

Cut-off	a	b	c	d	Sensitivity = a / (a+c)	Specificity = d / (b+d)
>125	2	2	21	15	9%	88%
>100	6	3	17	14	26%	82%
>81	11	4	12	13	48%	77%
>75	11	4	12	13	48%	77%
>65	11	4	12	13	48%	77%
>60	12	4	11	13	52%	77%
>55	12	4	11	13	52%	77%
>50	13	5	10	12	57%	71%
>44.25	13	6	10	11	57%	65%
>35	14	7	9	10	61%	59%
>25	17	10	7	7	71%	41%
>15	18	12	5	5	78%	29%
>5	22	14	1	3	96%	18%

* no data available for 2 exposures

Further examination of the other cut-off points indicated that an SI = 50.0 offered the best discrimination between "safe" and "hazardous" exposures (true positives = 13; false positives = 5; false negatives = 10; true negatives = 12; sensitivity = 0.5652; specificity = 0.7058; positive predictive value = 0.722; negative predictive value = 0.545; likelihood ratio: $X^2 = 2.9616$, df = 1, p = 0.0853; odds ratio = 3.12, Fisher's 2 tailed, p = 0.1159) when all factors were considered. Of particular note, was the low number of false positives (n = 5) relative to the count of 14 at SI = 5.0. The Strain Index correctly identified 13 of the 23 exposures with subjective pain at the cut-off point of SI = 50.0.

4.4.1.2 *Morbidity*

Table 16 reviews the effect of altering the threshold criterion Strain Index score for the morbidity data between the Moore and Garg (1995) recommended standard of SI = 5.0 and a highest arbitrary cut-off point of SI = 125.

At SI = 5.0 (true positives = 5; false positives = 33; false negatives = 1; true negatives = 3; sensitivity = 0.8333; specificity = 0.08333; positive predictive value = 0.13157; negative predictive value = 0.75; likelihood ratio: $X^2 = 0.3584$, df = 1, p = 0.5494; odds ratio = 0.4545, Fisher's 2 tailed, p = 0.4737), the sensitivity was found to be one of the highest, however the specificity was the lowest in comparison with all the other cut-off points, yielding the highest false positive rate. The Strain Index correctly identified 5 of the 6 exposures with associated morbidity at this cut-off point.

Table 16.
The Effect of Placing the Threshold Criterion Strain Index Score at Various Cut-off Levels for Morbidity

n=42

SI Score Result	Morbidity Present	Morbidity Absent
150 -- 162	0	4
125 -- 149	0	0
100 -- 124	3	2
81 -- 99	1	5
75 -- 80	0	1
65 -- 74	0	0
60 -- 64	0	1
55 -- 59	0	0
50 -- 54	1	2
44.25 -- 49	0	1
35 -- 44	0	2
25 -- 34	0	6
15 -- 24	0	3
5 -- 14	0	6
1 -- 4.99	1	3
	6	36

Effect of placing cut-off at various SI levels

Cut-off	a	b	c	d	Sensitivity = a / (a+c)	Specificity = d / (b+d)
>125	0.5	4.5	6.5	32.5	7%	88%
>100	3	6	3	30	50%	83%
>81	4	11	2	25	67%	69%
>75	4	13	2	23	66%	64%
>50	5	15	1	21	83%	58%
>44.25	5	16	1	20	83%	56%
>25	5	24	1	12	83%	33%
>5	5	33	1	3	83%	8%

Comparison of the other cut-off points indicated that at an SI = 50.0 (true positives = 5; false positives = 15; false negatives = 1; true negatives = 21; sensitivity = 0.8333; specificity = 0.583; positive predictive value = 0.25; negative predictive value = 0.9545; likelihood ratio: $X^2 = 3.8204$, df = 1, $p = 0.0506$; odds ratio = 7.0, Fisher's 2 tailed, $p = 0.0866$) yielded a similar level of sensitivity as the SI = 5.0 cut-off, with a lower specificity and a much lower false positive rate. The cut-off point of SI = 50.0 therefore offered the best discrimination between "safe" and "hazardous" exposures for the morbidity data in this study. Similar to the SI = 5.0 cut-off, the Strain Index correctly identified 5 of the 6 exposures with associated morbidity when the threshold criterion was set at SI = 50.0.

4.4.2 Receiver-Operator Characteristic Curve Analysis

Following the examination of the 2 x 2 contingency tables and associated calculations, receiver-operator characteristic curves were plotted to verify the best trade-off point between sensitivity and specificity for the window manufacturing jobs observed.

4.4.2.1 *Subjective Pain*

The Strain Index co-ordinates at 50.0, 55.0, and 60.0 presented as those located closest to the upper left hand corner of the ROC curve (Figure 3). Review of the 2 x 2 contingency tables and associated calculations for these SI values revealed only slight differences (SI at 50.0: sensitivity = 0.5652; specificity = 0.7058; false positives = 5; false negatives = 10; SI at 55.0: sensitivity = 0.5217; specificity = 0.7647; false positives = 4;

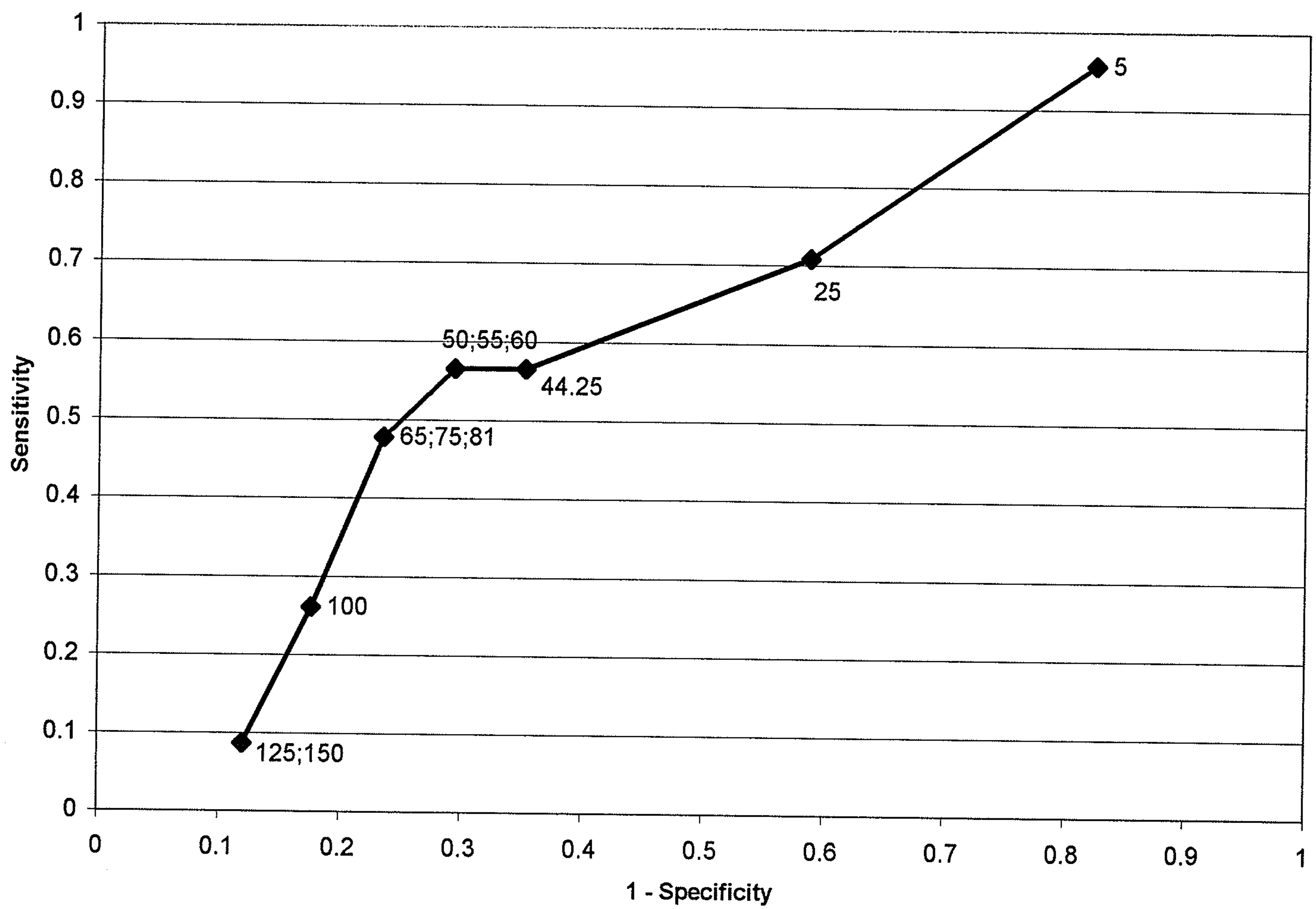

Figure 3. Receiver-operator characteristic curve - subjective pain.

false negatives = 11; and SI at 60.0: sensitivity = 0.5217; specificity = 0.764; false positives = 4; false negatives = 11). As the sensitivity at SI = 50.0 was found to be slightly higher than at either SI = 55.0 or SI = 60.0, the SI = 50.0 co-ordinates were determined to offer the best trade-off between the sensitivity and specificity for subjective pain.

4.4.2.2 *Morbidity*

Due to the nature of the convexity of this particular ROC plot (Figure 4), a closer examination of the 2 x 2 contingency tables and associated calculations for the upper quadrile SI = 81.0 (sensitivity = 0.6667; specificity = 69.44; false positives = 11; false negatives = 2) and the SI = 50.0 co-ordinates (sensitivity = 0.83; specificity = 0.583; false positives = 15; false negatives = 1) were made. Although the values at SI = 81 yielded a lower false positive rate (n = 11), the sensitivity was also lower (66.67%) in comparison with the SI = 50.0 cut-off. Given the speculation of injury under-reporting associated with the high mobility of the study workforce (see Discussion 4.9), it was determined that the higher sensitivity level should be used as the truer measure. The SI = 50.0 co-ordinates were therefore deemed the best trade-off between the sensitivity and specificity related to morbidity. This occurred despite the SI = 80 cut-off, following a "line of best fit", appearing in the furthest (but not highest) left hand corner of the graph.

4.4.2.3 *Overall Findings*

The use of receiver-operator characteristic curves to determine the point where the best trade-off between sensitivity and specificity occurs, demonstrated that an SI score of

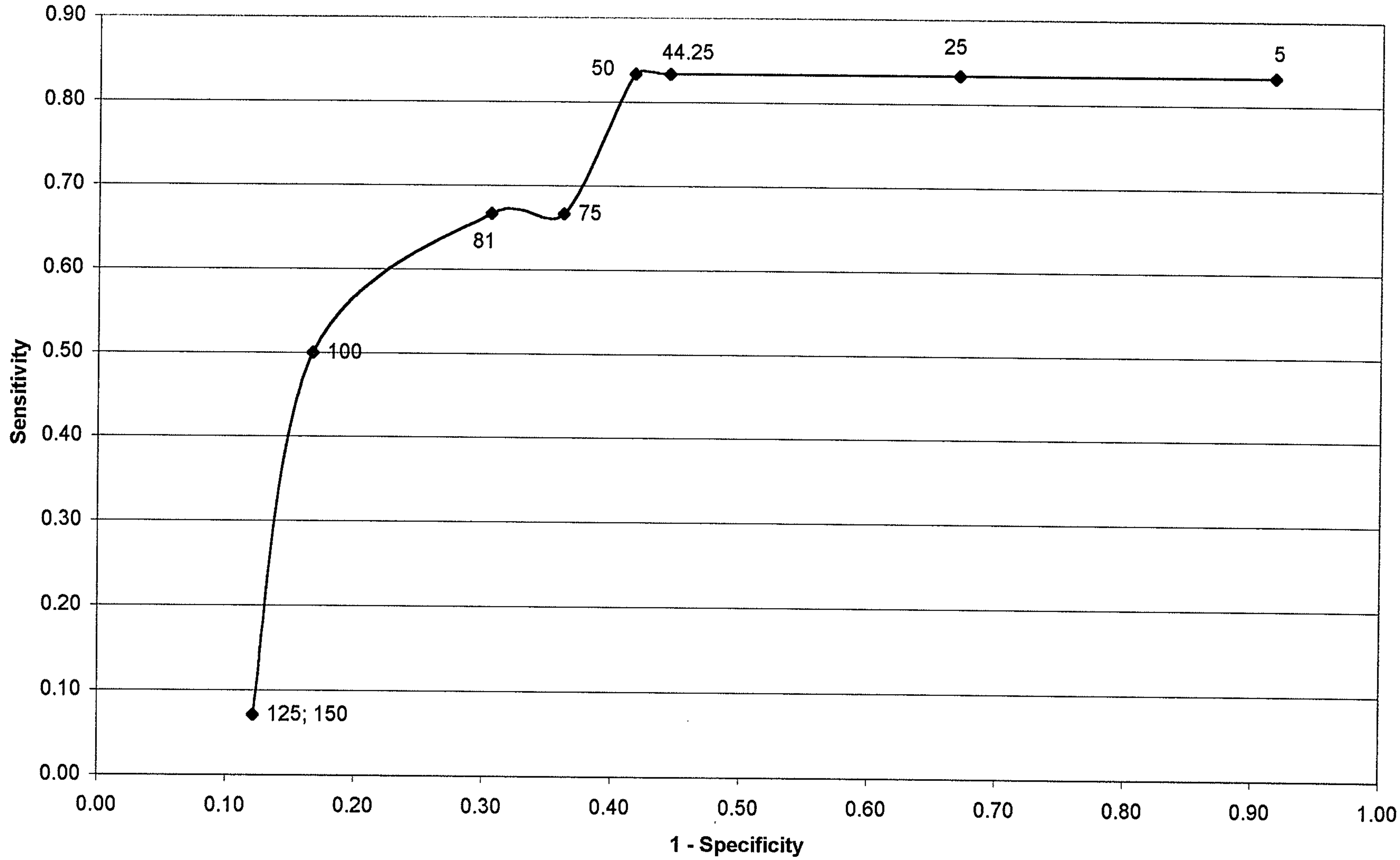

Figure 4. Receiver-operator characteristic curve -- morbidity.

50.0 optimized the association between "safe" versus "hazardous" exposures for subjective pain and morbidity. At this cut-off, 13 exposures (56.5%) with associated subjective pain were captured and 10 out of the 23 exposures (43.47%) were not identified; the number of exposures with no associated subjective pain falsely identified as "hazardous" was reduced from 14 to 5, in comparison to the Moore and Garg (1995) recommended standard of SI = 5.0. The threshold of SI = 50.0, still allowed 5 out of 6 (83.3%) of the exposures with associated morbidity to be correctly labelled as "hazardous", but decreased the number of "hazardous" exposures with no associated morbidity from 33 to 15 for the 42 exposures.

4.5. Comparison of the Study Data at SI = 5.0 and SI = 50.0

4.5.1. "Safe" versus "Hazardous" Exposure Categories and Related Strain Index Scores (Table 17.)

4.5.1.1 *Using SI Threshold Criterion of 5.0*

When comparing the window manufacturing job exposures against the SI = 5.0 threshold criterion (Moore & Garg, 1995), 38 (90.48 %) of the exposures were predicted to be "hazardous", and 4 (9.52 %) as "safe" for risk of upper extremity distal disorders to the workers. The mean SI score for the "hazardous" exposures was 63.996 (range 6.75 – 162); the mean SI score for the "safe" exposures was 3.75 (range 1.5 – 4.5).

Those exposures ranked "hazardous" were characterized by a "somewhat hard"

Table 17.
"Safe" versus "Hazardous" Exposure Categories -- SI 5.0 versus 50.0

Exposure Identifier	FTE	Exposure	Strain Index Score (calculated from median variables from trials)	Hazard Classification if SI = 5.0	Hazard Classification if SI = 50.0
Installing Hardware - Door	1	Left	162	H	H
Tradesman's Choice -Doors	1	Right	162	H	H
Making Steel Door Insert Frames	1	Left	162	H	H
Making Steel Door Insert Frames	1	Right	162	H	H
Wrapping Slabs	1	Right	121.5	H	H
Making Screens (flat table)	1	Right	121.5	H	H
Guiding Copy Router	1	Right	121.5	H	H
Guiding Copy Router-A	1	Right	121.5	H	H
Making Screens -patio	1	Right	108	H	H
Installing Hardware - Door	1	Right	81	H	H
Applying Weatherstripping to Jambs	2	Right	81	H	H
Frame Assembly with Door Light	1	Left	81	H	H
Making Screens (on tilt)	2	Right	81	H	H
Installing Windows into Doors	1	Right	81	H	H
Door Jamb Machine Operation for Striker Plate	1	Right	81	H	H
Priming Window Jambs	1	Right	75.9	H	H
Edge Deleting	1	Left	60.8	H	H
Glass Washing	2	Left	54	H	H
Trimming Brick Moulding	1	Right	54	H	H
Applying Swiggle to Glass	1	Left	54	H	H
Installing Headers	1	Right	48	H	S
Wrapping Slabs	1	Left	40.5	H	S
Door Jamb Machine Operation for Hinges	1	Right	36	H	S
Screening - Installing Pins	1	Right	33.8	H	S
Cutting Screen Retainer	1	Right	30.4	H	S
Casement Screening	1	Right	27	H	S

Table 17.
"Safe" versus "Hazardous" Exposure Categories -- SI 5.0 versus 50.0 cont'd

Exposure Identifier	**FTE**	**Exposure**	**Strain Index Score** (calculated from median variables from trials)	**Hazard Classification if SI = 5.0**	**Hazard Classification if SI = 50.0**
Installing Hardware WWA	1	Right	27	H	S
Edge Deleting	1	Right	27	H	S
Applying Hinges on Jambs	1	Right	27	H	S
Apply Swiggle to Glass	2	Right	22.5	H	S
Sills In and Out Swing	1	Right	18	H	S
Cutting Screen Retainer	1	Left	17.7	H	S
Making Sills	1	Left	12	H	S
Glass Washing	2	Right	9	H	S
Glazing and Insert of Peepholes	1	Right	9	H	S
Weather Stripping Applied	1	Left	6.75	H	S
Weather Stripping Applied	2	Right	6.75	H	S
Using Punch Press	1	Left	6.75	H	S
Cutting Metal Clad	1	Left	4.5	S	S
Painting Metal Clad	1	Right	4.5	S	S
Flipping Metal Clad	1	Left	4.5	S	S
Cutting Metal Clad	1	Right	1.5	S	S

intensity, with an exertional component performed 50 - 79 % of the cycle, ≥ 20 efforts per minute, and requiring very bad hand/wrist posture. The exposures were performed with a "fair" speed, over 4 - 8 hours per day (Table 18).

The mean percent duration for the 38 "hazardous" exposures was 70.696 (std. dev. = 20.873). The mean percent duration for the 4 "safe" exposures was 54.583 (std. dev. = 38.715). The difference between the two groups was not significant ($t = -1.35$, $df = 40$, $p = 0.1845$). The mean efforts per minute for the 38 "hazardous" exposures was 25.7 (std. dev. = 17.486). The mean efforts per minute for the 4 "safe" exposures was 63.654 (std. dev. = 48.146). The difference between the two groups was significant ($t = 3.38$, $df = 40$, $p = 0.0016$).

Table 18.

Majority Rankings – "Hazardous" Exposures at Cut-off of SI = 5.0

Task Variable	**Rating**	**Ranking**	**Exposure Results**
Intensity of Exertion	somewhat hard	2	47.50%
Duration of Exertion	50 - 79% of cycle	4	40.00%
Efforts/Minute	≥ 20	5	59.50%
Hand/Wrist Posture	very bad	5	65.00%
Speed	fair	3	75.00%
Duration per Day	4 - 8 hours	4	62.50%

4.5.1.2 *Using SI Threshold Criterion of 50.0*

When comparing the window manufacturing job exposures against the SI = 50.0 threshold criterion, 20 (47.62 %) of the exposures were predicted to be "hazardous", and 22 (52.38 %) as "safe" for risk of upper extremity distal disorders to the workers. The mean SI score for the "hazardous" exposures was 101.335 (range 54 - 162); the mean SI score for the "safe" exposures was 19.097 (range: 1.5 - 48).

Those exposures ranked "hazardous" were characterized by a "somewhat hard" intensity, with an exertional component performed ≥ 80 % of the cycle, ≥ 20 efforts per minute, and requiring very bad hand/wrist posture. The exposures were performed with a "fair" speed, over 4 - 8 hours per day (Table 19).

Table 19.

Majority Rankings – "Hazardous" Exposures at Cut-off of SI = 50.0

Task Variable	**Rating**	**Ranking**	**Exposure Results**
Intensity of Exertion	somewhat hard	2	40.0%
Duration of Exertion	≥ 80% of cycle	5	60.0%
Efforts/Minute	≥ 20	5	80.0%
Hand/Wrist Posture	very bad	5	75.0%
Speed	fair	3	75.0%
Duration per Day	4 - 8 hours	4	75.0%

The mean percent duration for the 20 "hazardous" exposures was 82.295 (std. dev. = 12.359). The mean percent duration for the 22 "safe" exposures was 57.223 (std. dev. = 23.973). The difference between the two groups was significant (t = - 4.19, df = 40, p = 0.0001). The mean efforts per minute for the 20 "hazardous" exposures was 30.363 (std. dev. = 17.139). The mean efforts per minute for the 22 "safe" exposures was 28.362 (std. dev. = 29.161). The difference between the two groups was not significant (t = -0.27, df = 40, p = 0.7905).

4.5.2 <u>"Safe" versus "Hazardous" Exposure Categories and Subjective Pain Data</u> (Table 20.)

4.5.2.1 *Using SI Threshold Criterion of 5.0*

The Strain Index was able to capture 22 (95.65%) and failed to identify 1 (4.34%) of the 23 exposures with worker-related subjective pain.

The majority of the "hazardous" exposures were characterized by work that was of "somewhat hard" intensity, with exertional durations of 50 - 79 percent of the cycle, ≥ 20 efforts per minute, with very bad hand/wrist posture. The speed was "fair" and the work done 4 - 8 hours of the day (Table 21).

Table 20.
"Safe" versus "Hazardous" Exposure Categories and Subjective Pain -- SI 5.0 versus 50.0

Exposure Identifier	Exposure	Intensity	Duration of Exertion	Efforts/Minute	Hand/Wrist Posture	Speed of Work	Duration per Day	SI Score	Hazard Classification if SI cut-off = 5	Hazard Classification if SI cut-off = 50.0
Installing Hardware - Door Dept.	left	hard	83.3	31.9	very bad	fair	four to eight	162	H	H
Tradesman's Choice Door Assembly	right	hard	66.9	24.6	very bad	fast	four to eight	162	H	H
Glass Washing	right	somewhat hard	76.2	60.8	good	fair	four to eight	141.8	H	H
Making Screens on Flat Table	right	very hard	78.1	20.9	very bad	fair	two to four	121.5	H	H
Guiding Copy Router	right	very hard	91.2	37.6	fair	fair	four to eight	121.5	H	H
Guiding Copy Router-A	right	very hard	100	31.2	fair	fair	four to eight	121.5	H	H
Patio Screens	right	hard	65.2	30.9	very bad	fair	four to eight	108	H	H
Install Hardware - Door Dept.	right	somewhat hard	91.4	19.8	very bad	fair	four to eight	81	H	H
Apply Weatherstripping to Jambs	right	somewhat hard	95.5	41	very bad	fair	four to eight	81	H	H
Making Screens on Tilt Table	right	hard	61.9	34.5	very bad	fair	two to four	81	H	H
Install Windows into Doors	right	somewhat hard	71.3	43.3	very bad	fast	four to eight	81	H	H
Door Jamb Machine Operation for Striker Plate	right	somewhat hard	100	93.3	very bad	fair	four to eight	81	H	H
Glass Washing	left	somewhat hard	79.1	26.7	bad	fair	four to eight	72	H	H
Edge Deleting	left	somewhat hard	95.5	30	very bad	fair	two to four	60.75	H	H
Door Jamb Machine Operation for Hinges	right	somewhat hard	55.6	16.6	very bad	fair	four to eight	36	H	S
Screening - Applying Pins	right	hard	80.3	9.3	very bad	fair	one to two	33.8	H	S
Applying Swiggle to Glass	right	hard	77.2	8.6	very bad	fair	four to eight	31.7	H	S
Apply Hinges on Jambs	right	somewhat hard	37.5	15.5	very bad	fair	four to eight	27	H	S
Edge Deleting	right	somewhat hard	95.7	15.6	bad	fair	two to four	27	H	S
Glazing and Insert of Peepholes	right	somewhat hard	74.4	75.3	bad	fair	less than one	9	H	S
Weatherstripping Applied	right	light	55	21	very bad	fair	two to four	11.4	H	S
Weatherstripping Applied	left	light	75	28.3	fair	fair	two to four	6.75	H	S
Cutting Metal Clad	right	light	26.8	32.2	very good	fair	one to two	1.5	S	S

Table 21.

Majority Rankings – Subjective Pain Occurrences at Cut-off of SI = 5.0

Task Variable	Rating	Ranking	Exposure Results
Intensity of Exertion	somewhat hard	2	50.07%
Duration of Exertion	50 - 79	4	54.54%
Efforts/Minute	≥ 20	5	65.22%
Hand/Wrist Posture	very bad	5	65.22%
Speed	fair	3	91.30%
Duration per Day	4 - 8 hours	4	60.87%

The mean percentage duration of exertion among the 22 exposures with the presence of subjective pain was 66.457 (std. dev. = 20.687). The mean percentage duration of exertion among the 1 exposure absent of subjective pain was 26.785. The difference between the two groups was significant ($t = -2.31$, $df = 21$, $p = 0.0312$). The mean efforts per minute for the 22 exposures with the presence of subjective pain was 29.354 (std. dev. = 20.716). The mean efforts per minute for the 1 exposure absent of subjective pain was 32.24. The difference between the two groups was not significant ($t = 0.14$, $df = 21$, $p = 0.8929$). Note: As the group absent of subjective pain at this cut-off point was represented by a single exposure (n = 1), it was possible to calculate the statistics however, the results of the difference between the two groups for both mean percentage duration of exertion and mean efforts per minute, are questionable.

The number of false positives at this cut-off point was 14 and there were 3 true negatives.

4.5.2.2 *Using SI Threshold Criterion of 50.0*

The Strain Index was able to capture 13 (56.52%) and failed to identify 10 (43.48%) of the 23 exposures with worker-related subjective pain when the cut-off was moved to SI = 50.0.

The majority of the "hazardous" exposures were characterized by work that was of "somewhat hard" intensity, with exertional durations of 50 - 80^{+} percent of the cycle, $\geq$ 20 efforts per minute, with very bad hand/wrist posture. The speed was "fair" and the work done 4 - 8 hours of the day (Table 22).

The mean percentage duration of exertion among the 13 exposures with the presence of subjective pain was 83.51 (std. dev. = 13.52). The mean percentage duration of exertion among the 10 exposures absent of subjective pain was 60.5 (std. dev. = 25.998). The difference between the two groups was significant ($t = -2.76$, $df = 21$, $p = 0.0119$). The mean efforts per minute for the 13 exposures with the presence of subjective pain was 35.106 (std. dev. = 18.973). The mean efforts per minute for the 10 exposures absent of subjective pain was 22.165 (std. dev. = 20.423). The difference between the two groups was not significant ($t = -1.57$, $df = 21$, $p = 0.1316$).

There were 5 false positives and 12 true negatives at the SI cut-off of 50.0.

Table 22.

Majority Rankings – Subjective Pain Occurrences at Cut-off of SI = 50.0

Task Variable	**Rating**	**Ranking**	**Exposure Results**
Intensity of Exertion	somewhat hard	2	50.0%
Duration of Exertion	50 - 79 ≥ 80	4 5	50.0% 50.0%
Efforts/Minute	≥ 20	5	92.9%
Hand/Wrist Posture	very bad	5	71.42%
Speed	fair	3	85.71%
Duration per Day	4 - 8 hours	4	78.57%

4.5.3. "Safe" versus "Hazardous" Exposure Categories and Morbidity Data (Table 23.)

4.5.3.1 *Using SI Threshold Criterion of 5.0*

The Strain Index was able to capture 5 (83.33%) of the 23 exposures with associated morbidity and failed to identify 1 (16.66%).

The majority of the "hazardous" exposures were characterized by work that was of "hard" and "very hard" intensities, exertional durations of ≥80 percent of the cycle, ≥ 20 efforts per minute, with very bad hand/wrist posture. The speed was "fair" and the work

Table 23.
"Safe" versus "Hazardous" Exposure Categories and Morbidity - SI 5.0 vs. 50.0

Exposure Identifier	Exposure	Intensity	Duration of Exertion (% job cycle)	Efforts/Minute	Hand/Wrist Posture	Speed of Work	Duration per Day	SI Score	Hazard Classification if SI Cut-off = 5	Hazard Classification if SI Cut-off = 50
Guiding Copy Router-A	right	very hard	100	31.2	fair	fair	4 - 8 hours	121.5	H	H
Guiding Copy Router	right	very hard	91.2	37.6	fair	fair	4 - 8 hours	121.5	H	H
Making Patio Screens	right	hard	65.2	30.9	very bad	fair	4 - 8 hours	108	H	H
Applying Weather Stripping to Jambs	right	somewhat hard	94.3	38.3	very bad	fair	4 - 8 hours	81	H	H
Trimming Brick Mould	right	hard	66.7	20.4	very bad	fair	1 - 2 hours	54	H	H
Cutting Metal Clad	left	light	18.3	39.2	very bad	fair	1 - 2 hours	4.5	S	S

done 4 - 8 hours of the day (Table 24).

Table 24.

Majority Rankings – Morbidity Occurrences at Cut-off of SI = 5.0 and 50.0

Task Variable	**Rating**	**Ranking**	**Exposure Results**
Intensity of Exertion	hard very hard	3 4	40.0% 40.0%
Duration of Exertion	≥80	5	60.0%
Efforts/Minute	≥ 20	5	100.0%
Hand/Wrist Posture	very bad	5	60.0%
Speed	fair	3	100.0%
Duration per Day	4 - 8 hours	4	80.00%

The mean percentage duration of exertion among the 5 exposures with the presence of morbidity was 83.463 (std. dev. =16.337). The mean percentage duration of exertion among the 1 exposure absent of morbidity was 18.333. The difference between the two groups was significant ($t = -3.64$, $df = 4$, $p = 0.0220$). The mean efforts per minute for the 5 exposures with the presence of morbidity was 31.675 (std. dev. = 7.1989). The mean efforts per minute for the 1 exposure absent of morbidity was 39.23. The difference between the two groups was not significant ($t = 0.96$, $df = 4$, $p = 0.3923$). Note: As the group absent of morbidity was represented by a single exposure ($n = 1$), it was possible to calculate the statistics however, the results for the differences between the two groups for both the mean percentage duration of exertion and mean efforts per minute are questionable.

The number of false positives at this cut-off point was very large at FP = 33 and the true negatives equalled 3.

4.5.3.2 *Using SI Threshold Criterion of 50.0*

Similar to the SI = 5.0 cut-off, the Strain Index was again able to successfully capture 5 (83.33%) of the morbidity occurrences, and failed to identify 1 (16.66%) of the 6 exposures. The work characteristics for the majority of the "hazardous" exposures, and the values relating to mean percent duration of exertion and mean efforts per minute were also identical to those for the SI = 5.0 cut-off.

With the Strain Index cut-off being raised to 50.0, the false positive rate dropped from 33 (for SI = 5.0) to 15, and the true negative rate rose from 3 (at SI = 5.0) to 21. The SI cut-off level of 50.0 was therefore deemed the more appropriate discriminator between the "safe" and "hazardous" exposures for morbidity occurrences.

Discussion

4.6 Unexpected Problems With Conducting the Study

4.6.1 Mobile Workforce

Employment in the woodworking industries in Manitoba over the past few years has been extremely transient, due to the hourly wage level and the surplus of positions available. Despite attempts to secure a stable subject base when planning the study, four workers were lost between the time of the videotaping and the questionnaire-based interviews. Reorganization of the study protocol whereby the interviews followed directly after the videotaping to ensure participation of all subjects was not possible. This was due to a pre-scheduled relocation of one of the testing sites, the satellite plant, to the company's main facility four weeks after the exposure data collection commenced.

4.6.2 The Use of Means versus Medians When Examining the Trial Data

Working with wood in an assembly situation, although repetitive and reproducible, is not necessarily consistent. Imperfections in the wood can cause situations where more varying degrees of exertion and efforts per minute are required to achieve the same end product/job. During the data collection and reduction process, it became apparent that the Strain Index scores should be based on the median of the task values from the trials and not the mean, as in the original Moore and Garg (1995) paper and most recently in Knox and Moore (in press) and Rucker and Moore (in press). To eliminate trials from the raw data based on less than perfect situations would misrepresent the nature of the work performed and consequently create overall Strain Index scores of lesser severity; to eliminate the most perfect of scenarios would cause the overall Strain Index scores for each exposure to reflect higher severity. As such, the exposure trial data, where there are wide differences in variable values at either end of a given range, would cause skewing of the final Strain Index score for the particular exposure. By measuring using the median, the individual results of the data were arranged from the smallest to the largest and the middle value was selected, yielding a better representation of the actual situation.

4.6.3 Morbidity Data Collection

It was not possible to obtain WCB of Manitoba "Employer Report of Injury or Occupational Disease" records prior to the year the study commenced, as the company was bought out by a larger corporation and there was no transfer of these documents. Blinding of the principal investigator and the job analysts to the morbidity data caused the discovery of this unfortunate situation to become apparent only after the new management took over the company operation and all the study data was analyzed. Searching through the Manitoba Workers Compensation Board database was not possible by company name due to filing protocols; searching by injured party name was financially not practicable.

4.6.4 Length of Study/ Reliability and Validation

Throughout all the Strain Index validation studies there has been no mention of the length of time taken to actually perform the data collection, tabulate the Strain Index scores, review the morbidity data, and test for evidence of association. Descriptions of the Strain Index methodology (Moore & Garg, 1995; Hegmann, Garg, and Moore, 1997; Knox & Moore (in press); Rucker & Moore (in press)) appear to be straightforward, but fail to elaborate on potential pitfalls of actually carrying out the procedure in an industrial setting. Despite every consideration on the part of the employer to facilitate this study, the shop floor presented very busy work and traffic areas. The principal investigator and the company-assigned assistant were chronically looking for the best angle to conduct the testing, often dodging normal worker and machinery traffic flow. Due to the nature of the industry, it was occasionally necessary to wait while the workers obtained parts and assembly pieces from other areas of the plant before or during the recording of the multiple trials. (It should be noted that only complete, non-interrupted trials were used for the study.) Once the data was collected, the camcorder tapes were transferred and duplicated onto VHS tapes for distribution to the job analysts. This enabled conferencing to occur with the principal investigator in person or via telephone, as required.

This study, performed in the window manufacturing industry, has taken an approximate three years to complete, primarily due to the length of time required to videotape the complex jobs with long cycle times for the specified number of trials, and to perform the data reduction of each exposure trial. Due to the nature of the Strain Index formula, each trial must be reviewed numerous times in order to retrieve the required measurements of duration of exertion, efforts per minute, and hand/wrist posture. The performance of test-retest scenarios to determine reliability of the Strain Index becomes unrealistic, simply due to the time commitment required.

The predictive validity however was evaluated as per the norm, with an additional analysis procedure using receiver-operator characteristic curves to determine whether another criterion threshold Strain Index score was more appropriate for the window manufacturing industry.

4.7 Overall Weighting of the Task Variables

The multiple regression analysis determined that the intensity of exertion was the most weighted contribution of all the task variables in the Strain Index equation. This finding is consistent with conference discussions given by Hegmann, Garg, and Moore (1997) on the application of the Strain Index, and the rationale behind the development of the new draft ACGIH Threshold Limit Value (TLV) regarding hand activity level (HAL) and peak hand force (ACGIH, 2001). The TLV targets jobs involving the performance of similar sets of hand, wrist, forearm movements or exertions in a repetitious manner, for 4 or more hours per day. The hand activity level is based on the duty cycle and frequency of hand exertions. It has been developed to set a standard which is believed to allow nearly all workers the ability to perform repetitious hand activity without risk of adverse health effects.

4.8 Receiver-Operator Characteristic Curves

Receiver-operator characteristic curves represent a graphing technique used in engineering, medical diagnostics, and imaging disciplines to illustrate and aid in the interpretation of test results (Zou, 2001). Their use dates back to early problem-solving carried out by radar and other imaging personal to distinguish aircraft signals from extraneous noise (Sackett, Haynes, Guyatt, and Tugwell, 1991).

By plotting the sensitivity (true positive rates) along the "y" axis and the 1 - specificity (the false positives) along the "x" axis, it is possible to determine the implications of using different cut-off points. The cut-off point closest to the upper left hand corner of the graph represents the best trade-off between the sensitivity and specificity (Young, 1998). The investigator must then "fine tune" their interpretation of the results by selecting the cut-off point that makes the most sense for the test result under study. For example, if false positives are particularly harmful, the investigator should select a cut-off point on the graph that is located in the more leftward direction, hence minimizing the false positive rate. However, if missing false negatives in a study proves very dangerous, the investigator should choose the cut-off point which maximizes the true positive rate (Sackett, et al., 1991). The overall accuracy of the test is described by the area under the curve – the larger the area, the more accurate the test (Fletcher, Fletcher, and Wagner, 1988; McDowell and Newell, 1996).

Receiver-operator characteristic curves are a reasonable method to determine the best cut-off between "safe" and "hazardous" jobs, in combination with the 2 x 2 contingency tables and associated calculations (positive predictive value, negative predictive value, odds ratio) for both subjective pain (distal upper extremity exposure-related symptoms) and morbidity using the Strain Index methodology (T.K. Young, personal communication, March 29, 2001).

The use of receiver-operator characteristic curves to determine the point where the best trade-off between sensitivity and specificity occurs, demonstrated that an SI score of 50.0 optimized the association between "safe" versus "hazardous" exposures with the subjective pain and morbidity data. For exposures with associated subjective pain, an SI cut-off of 50.0 failed to identify 10 (43.47%), but caught 13 (56.5%) of the 23 exposures and reduced the number of exposures with no associated subjective pain (false positives) from 13 to 5. The threshold of SI = 50.0 still allowed 5 out of 6 (83.3%) of the exposures with associated morbidity to be correctly identified as "hazardous", but decreased the number of "hazardous" exposures with no associated morbidity (false positives) from 33 to 15.

4.9 Strain Index Criterion Threshold Scores – 5.0 versus 50.0

The ten-fold increase in the Strain Index cut-off point, as determined by the ROC curves, in this study raises definite questions regarding the validation of the Strain Index. Given that two recent studies (Knox & Moore (in press) and Rucker & Moore (in press)) have supported the predictive validity of the Strain Index using the SI = 5.0 cut-off as the best discriminator between "safe" and "hazardous" jobs/exposures compared with morbidity, a search for plausible explanations for the discrepancy is needed.

In reviewing the particular features of this study, several study differences should be noted:

1. This is the first Strain Index study to be performed in the window manufacturing industry.

2. The jobs were primarily multi-faceted in nature, not simple as in previous investigations.

3. The power of this study was increased by modifying the original Moore and Garg (1995) protocol by:

   (a) having the workers report their perceived effort (intensity of exertion) and speed of work, as opposed to the principal investigator, and

   (b) verifying the hand/wrist postures on the videotapes against actual goniometer readings taken during the data collection period by the principal investigator.

As in some of the other studies,

1. There was no control over the spread of the true positive, false positive, false negative, and true negative values, as the principal investigator and the two job analysts were blinded to morbidity data until after the Strain Index scores had been tabulated. The job analysts were also blinded to the subjective pain data. The

principal investigator who conducted the questionnaire-based interviews after the videotaping was completed, was blinded to the Strain Index scores until after the tabulations were completed by the job analysts.

2. There is always speculation that there may be under-reporting occurring regarding the morbidity data and this has been documented in the literature (Pransky, et al., 1999). Language barriers, the desire to simply not want to bother because it takes too much time, or the perception of being seen as a trouble maker are all possible explanations for this occurrence. With the transient workforce, it is possible that a cumulative trauma disorder may not appear until after the worker has left his current employment, or conversely, an injury precipitated at another workplace may occur as a morbidity claim shortly after a new worker arrives. There is also the issue of misclassification of injuries either from a missed diagnosis, failure by the employer/physician to complete the Manitoba Workers Compensation Board forms correctly, or coding issues occurring at the point of data entry.

4.10 Practicality of the Study Findings to the Workplace

The implication of using the Strain Index in this industry becomes a safety and a dollar and cents issue. If the ergonomist reports that 95% of the job exposures must be changed because they exceed the SI = 5.0 threshold and therefore are assumed "hazardous" for risk of injury, the company is then faced with some very difficult decisions. These would include for example, "Where do we start first?" and "How do we afford to make these changes?". Not being able to justify 78% of the exposures with associated morbidity will surely make the company's management think twice before spending the money to make changes. If the Ergonomist however, reports that the initiative should focus on 48% of the job exposures which still captures 5 out of the 6 injuries (83.33%)(the same as a SI score = 5.0), then the ergonomic intervention strategy becomes more realistic, easier to prioritize and obtain necessary funding to make changes.

The results of the subjective pain assessment, although expected, due to the nature of the work, will support the need for management to listen to workers, as they are experienced and know the issues related to their job demands well. The need to implement sound ergonomic principles and work methods in a larger proportion of the window manufacturing jobs is apparent. By being proactive, future injuries can no doubt be minimized and hopefully avoided.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The Strain Index scores in this window manufacturing study were primarily influenced by the intensity of exertion task variable.

2. The Strain Index criterion threshold score of 5.0 suggested by Moore and Garg (1995) to discriminate between "safe" and "hazardous" jobs was not found to be the optimal cut-off point for the window manufacturing jobs. Rather, a Strain Index score of 50.0 offered the best trade-off between the sensitivity and specificity for both subjective pain and morbidity.

3. The analysis of subjective pain data suggests that the Ergonomists' philosophy that "the workers know their job the best" holds true when evaluated against morbidity data. Attention should be paid to implementing ergonomic review and appropriate interventions when workers report subjective pain. Prompt response times may aid in reducing/eliminating potential future injury claims.

Recommendations

1. Further validation of the Strain Index is needed particularly in multi-faceted jobs where the work requirements are complex and long in cycle length.

2. Receiver-operator characteristic (ROC) curves should be administered to the data from the other Strain Index validation studies to determine whether the conclusions drawn, regarding the predictive validity of the Strain Index using the cut-off score of 5.0 would hold.

3. The task variable data from this study should now be analyzed against the Hand Activity Level TLV to test its validity.

4. The impact of multi-faceted jobs/exposures on the Strain Index score should be analyzed in order to examine the potential difference in scores when individual components of a job are treated as separate entities, as opposed to being added together and treated as a single job.

5. Further examination of the value of subjective pain data, as a tool and an early warning sign, for identifying potentially "hazardous" jobs should be conducted.

APPENDIX

Appendix A

Research Subject Information and Consent Form

THE UNIVERSITY OF MANITOBA

DEPARTMENT OF MECHANICAL and INDUSTRIAL ENGINEERING
DÉPARTEMENT DE GÉNIE MÉCANIQUE ET INDUSTRIEL

Winnipeg, Manitoba
Canada R3T 5V6

Tel: (204) 474-9804
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RESEARCH SUBJECT INFORMATION AND CONSENT FORM

"Validation of the Strain Index in the Manufacturing Industry"

You are being asked to participate in a research study. Research studies can include only individuals who choose to take part. Please take your time to review this consent form and discuss any questions you may have with Ms. Wands. You may take your time to make your decision about participating in this research study and you may discuss it with your friends and family. This consent form may contain words that you do not understand. Please ask Ms. Wands to explain any words or information that you do not clearly understand.

Aches and pains, both at the end of a work day and sometimes as one works, are very common complaints of people who work in the manufacturing industry. These aches and pains can sometimes lead to an injury which can cause a worker to be absent from work and have to seek the assistance of a medical doctor or a rehabilitation specialist, like a physiotherapist or occupational therapist, in order to get better.

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Validation of the Strain Index in the Manufacturing Industry cont'd

The Strain Index has been suggested as a way to classify jobs as either "hazardous" or "safe" based on the risk of aches and pains or injury in a worker's elbows, forearms, wrists, or hands. Performing jobs that require enough force, repeated actions, and/or a long time to get done during the day are known by experts to cause a higher risk of injury to the person's muscles and their skeletal system. The first testing of the Strain Index in an actual industrial setting took place in a pork processing plant. The researchers found that by analyzing six factors (intensity of effort, duration of effort per cycle, efforts per minute, hand/wrist posture, speed of effort and duration of task per day) they could accurately identify the jobs which could cause elbow, forearm, wrist and hand problems to the workers. A 'cycle' is simply the length of time some activity (for example, building a frame) takes to complete.

The purpose of the study you are being introduced to today, is to test whether the Strain Index is an accurate way to predict the risk of injury to workers in manufacturing jobs. This will be done by classifying the jobs selected as either "hazardous" or "safe" based on risk of injury to the elbow, forearm, wrist and hand areas. The results will then be compared against existing injury records and personal information from each participant. Should the results of this study find that the Strain Index does not accurately predict risk in manufacturing jobs, attempts will be made to change the Index to make it better. At that time, the Index will be retested. The new Index will also be tested in another manufacturing company using the original testing procedures and assessed.

Volunteers for the study must receive written permission to participate from their employer. The jobs which will be used for this study will be randomly selected from those that require primarily hand, wrist, forearm, and elbow actions to complete each task. The worker(s) performing each job selected will be asked to participate in the study. It is necessary to videotaping and take pictures, as well as to record the amount of time taken to perform each job (to a maximum of ten times) in order to collect the information necessary

Initials _____

to calculate the Strain Index. These measurements will be taken as the worker performs his/her daily tasks. Following the final recorded job, the worker will be asked to rate the amount of force they have exerted and the speed with which they performed their work using a scale provided by the researcher. Measurements of hand/wrist postures using a special angled ruler will be taken during two other job cycles which will not be recorded or timed. No discomfort or pain to the worker will be associated with these measurements, as the special ruler is simply placed along side the forearm and hand, and moved to the position used during the work being performed. Measurements will be taken during various times during the job cycle. Each worker will be required to complete a questionnaire which deals with personal information related to risk factors for aches and pains or injury to the shoulders, elbows, forearms, wrists, and hands. All testing will be completed at work.

The job cycles recorded with videotape will be converted to VHS format and analyzed in conjunction with the effort/speed records by hand for the six factors included in the Strain Index (intensity of effort, duration of effort, efforts per minute, hand/wrist posture, speed of work, and duration of task) using a television, VHS recorder, stop watch, counting machine, and special angle ruler. The results will be entered onto tally sheets and entered into a computer database for purposes of calculating and recording the Strain Index for each job observed. Job repetition times and hand/wrist measurements taken with the special ruler on-site will be used to verify the video results. Company accident/injury records, Workers Compensation Board (WCB) statistics (with permission of the Company), and questionnaire answers on personal risk factors will then be reviewed to determine whether any association exists between the job classifications and existing injury and/or personal risk data.

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Participation in this study is voluntary and subjects have the right to withdraw from the testing procedure at any time without prejudice. Subjects will not be paid for participating in this project. The results of the study may be used in research papers, lectures and presentations. The identity of the subjects will be kept strictly confidential and will not be associated with the findings in any way. The employer will not be able to look at the questionnaire answers; the employer will only be told which jobs have been classified as 'hazardous' or 'safe', in order that improvements can be considered.

Questions about the participating in this project can be directed during Monday to Friday, 9:00 AM to 4:00 PM to:

Susan E. Wands, Principal Researcher (204) 945-4459
Full Member HFAC/ACE

(Ms. Wands works as a professional Ergonomist with Manitoba Labour Workplace Safety and Health. She is also a graduate student with the Faculty of Engineering, University of Manitoba. This study is being conducted as part of her Masters and Ph.D. theses requirements.)

Arun Garg, Ph.D.,C.P.E. (414) 229-6240
Professor and Director
Ergonomics Laboratory
Industrial & Manufacturing Engineering
University of Wisconsin Milwaukee
Milwaukee, Wisconsin U.S.A.

(Dr. Garg is one of the researchers who created the Strain Index. His role in this project is that of theses advisor, technical support.)

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Validation of the Strain Index in the Manufacturing Industry

A.B. Thorton-Trump, Ph.D., P.Eng. (204) 474-8699
Professor
Mechanical & Industrial Engineering
University of Manitoba
Winnipeg, Manitoba

(Dr. Thorton-Trump's role in this project is that of theses advisor, administrative support.)

Or

If you have any questions relating to the rights of the individual when participating in research, please call:

The University of Manitoba (204) 787-3255
Faculty Committee on the Use of Human Subjects in Research

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Validation of the Strain Index in the Manufacturing Industry

Do not sign this consent form unless you have a chance to ask questions and have received satisfactory answers to all of your questions.

Consent

I have read this consent form. I have had the opportunity to discuss this research study with Susan Wands and or the other study staff. I have had my questions answered by them in language I understand. The risk and benefits have been explained to me. I understand that I will be given a copy of this consent form after signing it. I understand that my participation in this research project is voluntary and that I may choose to withdraw at any time. I freely agree to participate in this research study.

I understand that information regarding my personal identity will be kept confidential, and that my employer does not have access to the information gathered on the questionnaires.

I authorize Ms. S. Wands, Dr. A. Garg and Dr. A.B. Thorton-Trump to use the results of this research provided that my name is not associated with the findings in any way.

By signing this consent form, I have not waived any of the legal rights which I otherwise would have as a subject in a research study.

Participant signature ____________________________ Date ___________
Participant printed name ________________________

Study staff signature ___________________________

Study staff printed name _________________________

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Appendix B

A User's Guide for the Strain Index

A User's Guide for the Strain Index

This guide describes how to perform the five steps associated with using the Strain Index. Page 1 describes the rating criteria and the measurements and calculations for the six task variables. The numerical ranges for assigning rating criteria for the subjective iables are only guidelines. Page 2 includes a table for entering your data and guides you through calculating an SI score.

Step 1: Data Collection:

1. Intensity of Exertion is an estimate of the strength required to perform the task one time. Guidelines for assigning a rating criterion are presented in the following table. Write the most appropriate rating criterion into the data table.

Rating Criterion	%MS[A]	Borg Scale[B]	Perceived Effort
Light	< 10%	≤ 2	Barely noticeable or relaxed effort
Somewhat Hard	10% - 29%	3	Noticeable or definite effort
Hard	30% - 49%	4 - 5	Obvious effort; Unchanged facial expression
Very Hard	50% - 79%	6 - 7	Substantial effort; Changes facial expression
Near Maximal	≥ 80°	> 7	Uses shoulder or trunk to generate force

[A] Percentage of maximal strength.
[B] Compared to the Borg CR-10 scale.[76]

2. Duration of Exertion is calculated by measuring the duration of all exertions during an observation period, then dividing the measured duration of exertion by the total observation time and multiplying by 100.

$$\% \text{ DURATION OF EXERTION} = 100 \times \frac{\text{duration of all exertions (sec)}}{\text{total observation time (sec)}} = 100 \times \_\_\_\_\_\_ = \_\_\_\_\_\_$$

3. Efforts per Minute are measured by counting the number of exertions that occur during an observation period, then dividing the number of exertions by the duration of the observation period, measured in minutes.

$$\text{EFFORTS PER MINUTE} = \frac{\text{number of exertions}}{\text{total observation time (min)}} = \_\_\_\_\_\_ = \_\_\_\_\_\_$$

4. Hand/Wrist Posture is an estimate of the position of the hand or wrist relative to neutral position. Guidelines for assigning a rating criterion are presented in the following table. Enter the result in the data table.

Rating Criterion	Wrist Extension[A]	Wrist Flexion[A]	Ulnar Deviation[A]	Perceived Posture
Very Good	0° - 10°	0° - 5°	0° - 10°	Perfectly neutral
Good	11° - 25°	6° - 15°	11° - 15°	Near neutral
Fair	26° - 40°	16° - 30°	16° - 20°	Non-neutral
Bad	41° - 55°	31° - 50°	21° - 25°	Marked deviation
Very Bad	> 60°	> 50°	> 25°	Near extreme

[A] Derived from data presented in Stetson et al.[20]

5. Speed of Work is an estimate how fast the worker is working. Guidelines for assigning a rating criterion are presented in the following table. Enter the result in the data table.

Rating Criterion	Compared to MTM-1[A]	Perceived Speed
Very Slow	≤ 80%	Extremely relaxed pace
Slow	81 - 90%	"Taking one's own time"
Fair	91 - 100%	"Normal" speed of motion
Fast	101 - 115%	Rushed, but able to keep up
Very Fast	> 115%	Rushed and barely or unable to keep up

[A] The observed pace is divided by MTM-1's predicted pace and expressed as a percentage of predicted. See Barnes.[82]

6. Duration of Task per Day is either measured or obtained from plant personnel. Enter the result in the data table.

STEP 2: ASSIGN RATINGS VALUES

Use the table below to find the rating values for each task variable. Select the appropriate entry for each variable, then find the corresponding rating value is on the same row at the far left.

Rating Values	Intensity of Exertion	Duration of Exertion	Efforts/ Minute	Hand/Wrist Posture	Speed of Work	Duration per Day
1	Light	< 10	< 4	Very Good	Very Slow	≤ 1
2	Somewhat Hard	10 - 29	4 - 8	Good	Slow	1 - 2
3	Hard	30 - 49	9 - 14	Fair	Fair	2 - 4
4	Very Hard	50 - 79	15 - 19	Bad	Fast	4 - 8
5	Near Maximal	≥ 80	≥ 20	Very Bad	Very Fast	≥ 8

STEP 3: DETERMINE THE MULTIPLIERS

Rating Value	Intensity of Exertion	Duration of Exertion	Efforts/ Minute	Hand/Wrist Posture	Speed of Work	Duration per Day
1	1	0.5	0.5	1.0	1.0	0.25
2	3	1.0	1.0	1.0	1.0	0.5
3	6	1.5	1.5	1.5	1.0	0.75
4	9	2.0	2.0	2.0	1.5	1.0
5	13	3.0^	3.0^	3.0	2.0	1.5

^ If duration of exertion is 100%, then efforts/minute multiplier should be set to 3.0.

ENTER YOUR DATA HERE:

	Intensity of Exertion	Duration of Exertion	Efforts/ Minute	Hand/Wrist Posture	Speed of Work	Duration per Day
Step 1: Rating Criterion or Measured Result						
Step 2: Rating Value						
Step 3: Multiplier						

STEP 4: CALCULATE THE SI SCORE

Insert the multiplier values for each of the 6 task variables into the spaces below, then multiply them all together.

Intensity of Exertion X Duration of Exertion X Efforts per Minute X Hand/Wrist Posture X Speed of Work X Duration of Task = SI SCORE

_______ X _______ X _______ X _______ X _______ X _______ = _______

STEP 5: INTERPRET THE RESULT

Preliminary testing has revealed that jobs associated with distal upper extremity disorders had SI Scores greater than 5. SI Scores less than or equal to 3 are probably "safe." SI Scores greater than or equal to 7 are probably "hazardous." The Strain Index does not consider stresses related to localized mechanical compression. This risk factor should be considered separately.

Appendix C

Assessment of Risk Factors for the Distal Upper Extremity and Shoulder Disorders

Analyst ____________

Questionnaire

Assessment of Risk Factors for Distal Upper Extremity and Shoulder Disorders

1. Date ____________ 2. Name ____________

3. Company Name ____________ 4. Department ____________

5. Job Title ____________ 6. Job ____________

7. Age ________ years 8. Gender □ M □ F

9. Height _____ Ft. ______ inches 10. Body Weight __________ lbs.

11. Are you? □ Right handed □ Left handed □ Write with either hand

12. How long have you worked with the current employer? ______ years ______ months

13. How long have you worked in this job? ________ years ________ months

14. Do you rotate to another job? □ Yes □ No
 If yes, job title(s) for the other job(s) ____________

15. Are you a smoker? □ Yes □ No
 a. If yes, do you smoke: □ cigarettes □ cigars □ pipe
 b. If yes, how many do you smoke per day? □ 10 or less □ 11 to 20 □ more than 20

16. Do you exercise on a regular basis? □ Yes □ No
 a. If yes, type of exercise ? ____________
 b. If yes, number of times/week ____________

17. Are you currently:
 a. Pregnant □ Yes □ No □ Not applicable
 b. Using birth control pills? □ Yes □ No □ Not applicable

18. Do you have hobbies that involve repetitive use of your hands, e.g., gardening, woodworking, knitting, using computer, etc.? □ Yes □ No
 If yes, please list your hobbies? ____________
 How many hours/week do you usually spend on these hobbies? ____ hours/week

19. Do you have a second job? □ Yes □ No

20. Does your second job involve repetitive use of your hands? □ Yes □ No □ Not applicable

21. Does your second job involve working with upper arms raised (example, painting walls and ceilings) or lifting of 25 lbs or more several times above chest height? □ Yes □ No □ Not applicable

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22. Have you ever been told by a physician that you had any of the following?

			Year diagnosed
a. Diabetes	□ Yes	□ No	______
b. Arthritis	□ Yes	□ No	______
c. Thyroid problem	□ Yes	□ No	______
d. Alcoholism	□ Yes	□ No	______
e. Menopause	□ Yes	□ No	______
f. High blood pressure	□ Yes	□ No	______
g. Elevated cholesterol	□ Yes	□ No	______
h Ruptured or bulging disc in the neck?	□ Yes	□ No	______
i. Ruptured or bulging disc in the back?	□ Yes	□ No	______

23. In your job are you required to meet a specific performance standard? □ Yes □ No
    a. If yes, is the performance standard:
       □ Easy to meet □ Neither easy nor difficult to meet □ Difficult to meet
    b. If yes, is disciplinary action taken for not meeting the standard? □ Yes □ No □ Maybe

24. How would you classify your work pace?
    □ Relaxed □ Neither relaxed nor fast □ Fast □ Very fast but can keep up □ Very fast and cannot keep up

25. Using the scale on the right, please rate the **overall physical effort required** to perform your job **at the beginning of the shift** as well as **at the end of the shift** for each of the following body parts

Body Part	**Overall Physical effort required**			
	At the beginning of shift		**At the end of shift**	
	Left Side	**Right Side**	**Left Side**	**Right Side**
Neck				
Shoulder				
Elbow				
Forearm				
Hand/wrist				

Scale

0	Nothing at all
0.5	Very, very light
1	Very light
2	Light
3	Moderate
4	Somewhat hard
5	Hard
6	
7	Very hard
8	
9	
10	Very very hard
11	Maximal

26. All in all, how satisfied are you with your job?
    □ Satisfied □ Neither satisfied nor dissatisfied □ Dissatisfied

27. How often have you considered employment elsewhere in the past year?
    □ Never □ Occasionally □ Often □ Always

28. How often does your job require full attention?
    □ Never □ Occasionally □ Often □ Always

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29. How often can you set the rate (pace) at which you work?
□ Never □ Occasionally □ Often □ Always

30. Does your supervisor appreciate the work that you do?
□ Never □ Occasionally □ Often □ Always

31. In the **past year**, have you had pain, aching, stiffness, burning, numbness or tingling whether work related or not in any of the following body parts?

	None	Pain	Stiffness	Numbness	Tingling
Left Neck	□	□	□	□	□
Right Neck	□	□	□	□	□
Left Shoulder	□	□	□	□	□
Right Shoulder	□	□	□	□	□
Left Elbow	□	□	□	□	□
Right Elbow	□	□	□	□	□
Left Forearm	□	□	□	□	□
Right Forearm	□	□	□	□	□
Left Hand/Wrist	□	□	□	□	□
Right Hand/Wrist	□	□	□	□	□

32. If you checked none for all the body parts in question number 31, **stop**. You are done.

If **Yes** in question number 31, when was **first time** you experienced this problem and **was it related to work?**

Body Part	**Experienced Symptoms First Time:**		**Related to Work**
	Before starting current job?	After starting current job?	
Left Neck	□	□	□ Yes □ No □ Uncertain
Right Neck	□	□	□ Yes □ No □ Uncertain
Left Shoulder	□	□	□ Yes □ No □ Uncertain
Right Shoulder	□	□	□ Yes □ No □ Uncertain
Left Elbow	□	□	□ Yes □ No □ Uncertain
Right Elbow	□	□	□ Yes □ No □ Uncertain
Left Forearm	□	□	□ Yes □ No □ Uncertain
Right Forearm	□	□	□ Yes □ No □ Uncertain
Left Hand/Wrist	□	□	□ Yes □ No □ Uncertain
Right Hand/Wrist	□	□	□ Yes □ No □ Uncertain

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33. For all the body parts marked **yes** in question number 31, use the following scales to specify frequency, duration and intensity of symptoms. Please also specify side of body for for symptoms (**L**=Left side; **R** = Right side; **B** = Both sides).

Frequency	**Duration**	**Intensity of Symptoms**
(How often in the last year?)	(How long do they last?)	
1. Almost always (daily)	1. Up to 1 hour	1. Barely noticeable
2. Frequently (once/week)	2. Up to 1 day	2. Mild
3. Sometimes (once/month)	3. Up to 1 week	3. Moderate
4. Rarely (every 2-3 months)	4. Up to 2 weeks	4. Severe
5. Almost never (every 6 months)	5. Up to 1 month	5. Worst pain ever in life
	6. Up to 3 months	
	7. More than 3 months	

Body Part	**Symptoms (past year)**	**Frequency**	**Duration**	**Intensity**
Left Neck	□ Yes □ No	______	______	______
Right Neck	□ Yes □ No	______	______	______
Left Shoulder	□ Yes □ No	______	______	______
Right Shoulder	□ Yes □ No	______	______	______
Left Elbow	□ Yes □ No	______	______	______
Right Elbow	□ Yes □ No	______	______	______
Left Forearm	□ Yes □ No	______	______	______
Right Forearm	□ Yes □ No	______	______	______
Left Hand/Wrist	□ Yes □ No	______	______	______
Right Hand/Wrist	□ Yes □ No	______	______	______

34. If you had shoulder symptoms in question number 31, does that pain spread to or from the neck?

Left Shoulder □ Yes □ No Right Shoulder □ Yes □ No

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Appendix D

WCB of Manitoba Employer Report of Injury or Occupational Disease

PLEASE PRINT BELOW INFORMATION WHICH HAS NOT ALREADY BEEN COMPLETED OR IS INCORRECTLY SHOWN

WCB Workers Compensation Board of Manitoba

BOTH SIDES OF FORM MUST BE COMPLETED

Outside Winnipeg Call Toll Free 1 (800) 362-3340

333 Broadway
Winnipeg, Man. R3C 4W3

Telephone (204) 954-4922

Fax (204) 954-4999

EMPLOYER'S REPORT
OF INJURY OR OCCUPATIONAL DISEASE

2

ER'S PERSONAL HEALTH I.D. #	FIRM NO.	WORKER'S BIRTH DATE D M Y	SEX	MARITAL STATUS	TIME OF INJURY ☐ AM ☐ PM	CLAIM NO. FOR WCB USE ONLY
E OF BUSINESS		WORKER'S JOB TITLE			INJURY DATE D M Y	
E REPORTED TO EMPLOYER	TIME REPORTED TO EMPLOYER ☐ AM ☐ PM	BODY PARTS INJURED (INDICATE R OR L)				THIS NUMBER IS REQUIRED ON ALL COMMUNICATIONS ABOUT CLAIM

PLOYER'S NAME, ADDRESS AND POSTAL CODE (INCLUDE BRANCH WHERE APPLICABLE)

WORKER'S NAME, ADDRESS AND POSTAL CODE

IPORTANT: SOCIAL INSURANCE NUMBER | EMPLOYER'S TEL. NO. | EMPLOYER'S FILE NO. | WORKER'S TEL. NO. | DATE ENTERED YOUR EMPLOY

VHOM REPORTED
E | TITLE

L NAME & ADDRESS OF ATTENDING DOCTOR(S)

HAT CITY, TOWN OR CE DID IT HAPPEN? | PROV. | DID IT OCCUR ON YOUR PREMISES? ☐ YES ☐ NO | IF NO, WHERE?

CRIBE FULLY WHAT HAPPENED CAUSE THE INJURY (Include as much detail as possible as lack of information may delay processing of claim. If necessary to use a separate sheet, include the worker and employer names and addresses as well as claim and firm numbers.)

E ALL INJURIES REPORTED
ate right or left if applicable)

HE WORKER IN THE COURSE OF HIS/ EMPLOYMENT AT TIME OF INJURY?	☐ YES ☐ NO	IF NO, EXPLAIN	WHO RENDERED FIRST AID?
RKER A PARTNER, DIRECTOR OR R OFFICER OF THE COMPANY?	☐ YES ☐ NO	IF YES, SPECIFY	DATE D
JR OPINION WAS THERE ANY MISCON- ON THE PART OF THE WORKER?	☐ YES ☐ NO	IF YES, SPECIFY	WHAT HOSPITAL WAS WORKER TREATED AT, IF ANY?
OU ABLE TO ACCOMMODATE ER IN ALTERNATE DUTIES?	☐ YES ☐ NO	EXPLAIN	IS WORKER RELATED TO EMPLOYER AND LIVING IN HIS/HER HOUSE AT TIME OF THE ACCIDENT? YES ☐ NO ☐
NAMES AND ADDRESSES OF PERSONS SAW THE ACCIDENT (two, if possible)			WILL THE WORKER BE DISABLED LONGER THAN THE DAY OF THE ACCIDENT?
NY PERSON NOT IN YOUR EMPLOY AME FOR THE ACCIDENT?	☐ YES ☐ NO	IF YES, GIVE NAME AND ADDRESS	☐ YES IF YES, COMPLETE WAGE INFORMATION SECTION BELOW, THEN COMPLETE OTHER SIDE OF FORM. ☐ NO IF NO, COMPLETE OTHER SIDE OF FORM

WAGE INFORMATION

ATE AND HOUR ST WORKED OLLOWING THE CCIDENT ____ 19 AT ☐ AM ☐ PM | HAS THE WORKER RETURNED TO WORK? ☐ YES ☐ NO | IF YES, WHEN? ____ 19 AT ☐ AM ☐ PM | DID WORKER TEMPORARILY RETURN TO WORK BETWEEN ACCIDENT DATE AND RETURN TO WORK? ☐ YES ☐ NO | IF YES, STATE DAYS WORKED ____ 19 ☐ AM ☐ PM TO ____ 19 ☐ AM ☐ PM

RE YOU CONTINUING TO Y REGULAR EARNINGS/ AGES TO WORKER WHILE F WORK? ☐ YES ☐ NO | SHOW WORKER'S NORMAL DAYS OF REST (indicate ½ days as necessary) ☐ S ☐ M ☐ T ☐ W ☐ T ☐ F ☐ S | IF NOT EMPLOYED ON A STANDARD 5 DAY WORK WEEK, PLEASE COMPLETE CALENDAR ON REVERSE | NORMAL DAY'S PAY $ | WAGES PAID ON DAY OF LAY OFF $

RMAL WAGES
WORKER PAID HOURLY?
YES ____ HOURS PER WEEK
$ ____ PER HOUR EQUALS
$ ____ PER WEEK (REGULAR WAGE)

OR ☐ NO, WORKER PAID MONTHLY AT $ ____ PER MONTH

WORKER'S TOTAL GROSS EARNINGS DURING PREVIOUS 12 MONTHS $

WORKER'S TOTAL GROSS EARNINGS FOR LAST CALENDAR TAX YEAR $

OR IF WORKER EMPLOYED FOR PARTIAL YEAR, FROM DATE OF EMPLOYMENT TO DATE LAST WORKED, TOTAL GROSS EARNINGS WERE: $

RKERS TD1 CLAIM CODE
R THE CURRENT YEAR ____

RKERS TD1 CLAIM AMOUNT
R THE CURRENT YEAR ____

CHECK ANY OF THE FOLLOWING WHICH APPLIES TO THE WORKER: ☐ SINGLE ☐ MARRIED ☐ COMMON-LAW ☐ SEPARATED ☐ DIVORCED

☐ SPOUSE WORKING
☐ SPOUSE NOT WORKING
☐ DEPENDENT CHILDREN UNDER 18 AT END OF CURRENT YEAR. NUMBER ____
☐ DEPENDENT CHILDREN OVER 18 AT END OF CURRENT YEAR. NUMBER ____
☐ OTHER DEPENDENTS EXPLAIN ____

CK ANY OF FOLLOWING H APPLIES HE WORKER: ☐ PERMANENT/ FULL TIME ☐ SEASONAL ☐ OWNER/OPERATOR/ COURIER ☐ PIECE WORKER ☐ PART TIME ☐ SUB CONTRACTOR

ARE THE WORKERS EARNINGS SUBJECT TO ANY OF THE FOLLOWING? ☐ PERIODIC/ SEASONAL LAYOFF ☐ SHIFT PREMIUMS ☐ EARNINGS FROM OTHER SOURCES ☐ OVER TIME ☐ PRODUCTION BONUSES ☐ OTHER:

HAS WORKER APPLIED FOR INCOME FROM OTHER SOURCES DURING HIS/HER PERIOD OF DISABILITY? ☐ NO ☐ YES IF YES, FROM WHERE: ☐ UIC ☐ COMPANY DISABILITY PLAN ☐ PRIVATE INSURANCE ☐ MORTGAGE INSURANCE ☐ CPP ☐ SOCIAL INSURANCE ☐ OTHER EXPLAIN

2006 (10/97)

 IMPORTANT: PLEASE COMPLETE AND SIGN OTHER SIDE

Complete Appropriate Section: Then Sign At The Bottom

CONTRACT WORKERS:

1. a) If injured worker employed on contract basis, have earnings been reported to the WCB on Employers Statement of Earnings?
   ☐ No ☐ Yes If yes, at what percentage? ____________
   What was the value of the contract? $ ____________ Duration of the contract? ____________
2. List other projects worker has performed in past twelve months. Include value and duration of each.
   ____
   (If possible, attach copies of all contract listed. If insufficient room — attach separate list)
3. Did the worker supply any materials or equipment? ☐ No ☐ Yes, please specify ____________
   ____
4. In which assessment rate code were worker's earnings reported? ____________
5. To your knowledge, is the worker in a partnership or director of a corporation contracting with your firm? ☐ Yes ☐ No
   To your knowledge, does the worker employ other workers? ☐ Yes ☐ No

COURIERS & MESSENGERS:

1. Is the worker a commissioned broker? ☐ Yes ☐ No a salaried employee? ☐ Yes ☐ No
2. Circle rate code where worker's earnings have been reported. 501-08 503-14 506-02
3. Describe the worker's vehicle:
   Gross vehicle weight ____________ Type (auto, 1/2 ton, etc.) ____________ Does it normally haul a trailer? ☐ Yes ☐ No
4. Type of commodity normally transported (i.e. household items, appliances, etc.) Please be specific.
   ____
5. Normal delivery area? ☐ intra-city (within 16 km. radius of city or town limits) ☐ inter-city (highway hauling)
6. What was the shipment's destination at time of accident/injury? ____________
7. State worker's gross driver receipts for last 12 months ____________
8. Does the worker provide more than one vehicle? ☐ No ☐ Yes, how many? ____________
9. To your knowledge, is worker a partner or director of a corporation contracting with your firm? ☐ Yes ☐ No
   Please attach copies of worker's last commission statements.
10. To your knowledge does worker employ other workers? ☐ No ☐ Yes, how many? ____________

TRUCKING:

1. Have you reported the worker's earnings to the WCB on your Employer's Statement of Worker's Earnings?
   ☐ No ☐ Yes, at what percentage? ____________
2. Does worker provide more than one vehicle? ☐ No ☐ Yes, how many? ____________
   Does your worker employ other workers? ☐ Yes ☐ No
3. To your knowledge, is worker a partner or director of a corporation contracting with your firm? ☐ Yes ☐ No

ALL EMPLOYERS MUST SIGN HERE

I certify that the information given on this and on the reverse is true. I agree to notify the Worker's Compensation Board of Manitoba immediately of any change in circumstances affecting this claim, including any return to work. I have read and understand the letter which was attached to this form. I understand that the Workers Compensation Act requires me to submit an employers report within 5 days of notification or awareness of an injury requiring treatment or an absence from work and if I do not do so, penalties may be levied.

X ____________ ____________ ____________
SIGNATURE OF EMPLOYER OR DESIGNATED REPRESENTATIVE TITLE DATE

PLEASE COMPLETE OTHER SIDE OF FORM

If worker does not work a standard five day week, please circle assigned rest days for two complete months immediately following the day of lay off.

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
b	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
ar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
r	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
ay	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
l	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
g	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
p	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
t	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
v	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
c	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Appendix E

SAS Version 8.0 Statistical Analysis

The FREQ Procedure

Job	Person	Hand	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	M-1	R	8	2.45	8	2.45
1	M-30	L	9	2.75	17	5.20
1	M-30	R	10	3.06	27	8.26
2	M-2	L	10	3.06	37	11.31
2	M-2	R	10	3.06	47	14.37
3	M-3	R	10	3.06	57	17.43
4	M-4	L	5	1.53	62	18.96
4	M-4	R	7	2.14	69	21.10
5	M-5	R	5	1.53	74	22.63
6	M-6	L	10	3.06	84	25.69
6	M-6	R	10	3.06	94	28.75
7	M-15	L	6	1.83	100	30.58
7	M-15	R	7	2.14	107	32.72
7	M-7	L	9	2.75	116	35.47
7	M-7	R	9	2.75	125	38.23
8	M-8	R	3	0.92	128	39.14
9	M-9	R	3	0.92	131	40.06
10	M-10	L	3	0.92	134	40.98
10	M-10	R	3	0.92	137	41.90
11	M-11	R	5	1.53	142	43.43
12	M-12	R	3	0.92	145	44.34
13	M-13	R	4	1.22	149	45.57
14	M-13	R	3	0.92	152	46.48
15	M-14	R	9	2.75	161	49.24
16	M-14	R	5	1.53	166	50.76
16	M-16	R	6	1.83	172	52.60
17	M-17	L	4	1.22	176	53.82
18	M-18	R	10	3.06	186	56.88
18	M-20	L	10	3.06	196	59.94
18	M-20	R	10	3.06	206	63.00
19	M-19	R	6	1.83	212	64.83
19	M-27	R	7	2.14	219	66.97
20	M-21	R	4	1.22	223	68.20
21	M-22	L	9	2.75	232	70.95
22	M-23	R	9	2.75	241	73.70
23	M-24	L	10	3.06	251	76.76
23	M-24	R	10	3.06	261	79.82
24	M-24	L	6	1.83	267	81.65
25	M-24	R	10	3.06	277	84.71
26	M-24	L	10	3.06	287	87.77
27	M-25	R	9	2.75	296	90.52
28	M-25	R	3	0.92	299	91.44
29	M-26	R	3	0.92	302	92.35
30	M-26	R	6	1.83	308	94.19
31	M-26	R	3	0.92	311	95.11

The FREQ Procedure

Job	Person	Hand	Frequency	Percent	Cumulative Frequency	Cumulative Percent
32	M-28	R	6	1.83	323	98.78
33	M-29	R	4	1.22	327	100.00

			si		
Job	Person	Hand	Mean	Std	StdErr
1	M-1	R	11.81	4.92	1.74
	M-30	L	7.31	1.69	0.56
		R	5.40	2.73	0.86
2	M-2	L	156.60	17.08	5.40
		R	70.20	13.94	4.41
3	M-3	R	22.05	5.39	1.70
4	M-4	L	56.70	9.06	4.05
		R	22.82	3.99	1.51
5	M-5	R	46.20	16.92	7.57
6	M-6	L	5.18	1.85	0.59
		R	1.68	0.55	0.18
7	M-15	L	67.50	14.79	6.04
		R	38.25	25.16	9.51
	M-7	L	35.00	12.00	4.00
		R	14.50	7.72	2.57
8	M-8	R	27.00	0.00	0.00
9	M-9	R	162.00	0.00	0.00
10	M-10	L	36.00	7.79	4.50
		R	121.50	40.50	23.38
11	M-11	R	27.90	7.89	3.53
12	M-12	R	57.00	22.65	13.08

(Continued)

			si		
Job	Person	Hand	Mean	Std	StdErr
13	M-13	R	30.38	6.75	3.38
14	M-13	R	141.75	35.07	20.25
15	M-14	R	22.50	5.85	1.95
16	M-14	R	81.00	0.00	0.00
	M-16	R	81.00	0.00	0.00
17	M-17	L	81.00	0.00	0.00
18	M-18	R	33.60	16.30	5.15
	M-20	L	44.40	13.02	4.12
		R	16.88	5.11	1.62
19	M-19	R	141.75	31.37	12.81
	M-27	R	75.21	15.31	5.79
20	M-21	R	81.00	0.00	0.00
21	M-22	L	11.67	1.00	0.33
22	M-23	R	74.25	16.01	5.34
23	M-24	L	16.54	5.73	1.81
		R	35.35	11.71	3.70
24	M-24	L	7.59	2.97	1.21
25	M-24	R	5.03	1.57	0.50
26	M-24	L	4.50	0.00	0.00
27	M-25	R	81.00	0.00	0.00
28	M-25	R	36.00	0.00	0.00

(Continued)

			si		
			Mean	Std	StdErr
Job	Person	Hand			
29	M-26	R	126.00	31.18	18.00
30	M-26	R	114.75	16.53	6.75
31	M-26	R	121.50	0.00	0.00
32	M-28	L	155.25	16.53	6.75
		R	162.00	0.00	0.00
33	M-29	R	10.13	2.25	1.13

Obs	Person	job	Side	mint	mdur	meff	mpstr	mspeed	mdurpd	msi	mpctdur	mneffort
1	M-1	1	Right	1	1.93750	2.62500	3.00	1.0	0.75	11.813	57.375	21.661
2	M-10	10	Left	3	2.00000	1.33333	3.00	1.5	1.00	36.000	70.062	15.353
3	M-10	10	Right	6	2.66667	1.66667	3.00	1.5	1.00	121.500	84.693	14.603
4	M-11	11	Right	3	1.70000	1.80000	3.00	1.0	1.00	27.900	49.275	15.161
5	M-12	12	Right	6	2.33333	2.66667	3.00	1.0	0.50	57.000	67.113	24.620
6	M-13	13	Right	6	2.75000	1.25000	3.00	1.0	0.50	30.375	81.146	9.313
7	M-13	14	Right	9	2.33333	3.00000	3.00	1.0	0.75	141.750	77.623	21.993
8	M-14	15	Right	3	1.38889	1.77778	3.00	1.0	1.00	22.500	34.154	14.519
9	M-14	16	Right	3	3.00000	3.00000	3.00	1.0	1.00	81.000	91.043	35.980
10	M-15	7	Left	3	2.66667	3.00000	3.00	1.0	1.00	72.000	81.578	27.778
11	M-15	7	Right	3	2.25000	2.00000	3.00	1.0	1.00	43.594	65.967	14.502
12	M-16	16	Right	3	3.00000	3.00000	3.00	1.0	1.00	81.000	94.877	40.611
13	M-17	17	Right	6	2.00000	1.50000	3.00	1.5	1.00	81.000	63.955	11.262
14	M-18	18	Right	6	2.30000	1.15000	2.00	1.0	1.00	33.600	72.145	8.315
15	M-19	19	Right	9	2.33333	3.00000	3.00	1.0	0.75	141.750	76.735	60.933
16	M-2	2	Left	6	2.90000	3.00000	3.00	1.0	1.00	156.600	83.320	32.410
17	M-2	2	Right	3	3.00000	2.60000	3.00	1.0	1.00	70.200	90.115	20.505
18	M-20	18	Left	3	2.60000	2.80000	2.00	1.0	1.00	44.400	80.912	24.244
19	M-20	18	Right	3	1.85000	1.00000	3.00	1.0	1.00	16.875	55.744	5.767
20	M-21	20	Right	3	2.00000	3.00000	3.00	1.5	1.00	81.000	70.392	43.356
21	M-22	21	Left	1	1.94444	3.00000	2.00	1.0	1.00	11.667	56.463	44.686
22	M-23	22	Right	3	2.50000	3.00000	3.00	1.5	0.75	75.938	81.931	30.884
23	M-24	23	Left	3	1.75000	1.40000	3.00	1.0	0.75	16.538	47.917	10.406
24	M-24	23	Right	6	1.70000	1.55000	1.95	1.5	0.75	35.353	45.417	11.921
25	M-24	24	Left	3	1.91667	1.75000	1.00	1.5	0.50	7.593	56.858	21.034
26	M-24	25	Right	1	2.30000	2.90000	3.00	1.0	0.25	5.025	70.060	134.008
27	M-24	26	Left	1	3.00000	3.00000	2.10	1.0	0.25	4.500	100.000	50.299
28	M-25	27		3	3.00000	3.00000	3.00	1.0	1.00	81.000	100.000	102.407
29	M-25	28	Right	3	2.00000	2.00000	3.00	1.0	1.00	36.000	49.690	16.667
30	M-26	29	Right	6	2.33333	3.00000	3.00	1.0	1.00	126.000	69.897	32.007
31	M-26	30	Right	9	2.83333	3.00000	1.50	1.0	1.00	114.750	89.087	36.856
32	M-26	31	Right	9	3.00000	3.00000	1.50	1.0	1.00	121.500	100.000	31.750
33	M-27	19	Right	6	2.00000	2.78571	3.00	1.0	0.75	75.214	56.761	24.489
34	M-28	32	Left	9	3.00000	1.91667	3.00	1.0	1.00	155.250	92.478	16.107
35	M-28	32	Right	9	3.00000	3.00000	2.00	1.0	1.00	162.000	93.205	31.131
36	M-29	33	Right	3	2.25000	3.00000	2.00	1.0	0.25	10.125	75.724	76.780
37	M-3	3	Right	3	1.05000	2.35000	3.00	1.0	1.00	22.050	22.214	18.983
38	M-30	1	Left	1	2.32500	3.00000	1.50	1.0	0.75	7.847	73.706	31.500
39	M-30	1	Right	3	0.88636	0.95455	3.00	1.0	0.75	5.983	14.128	6.663
40	M-4	4	Left	3	2.80000	3.00000	3.00	1.0	0.75	56.700	90.240	31.000
41	M-4	4	Right	3	2.85714	1.78571	2.00	1.0	0.75	22.821	90.649	15.151
42	M-5	5	Right	6	1.80000	2.10000	2.00	1.0	1.00	46.200	51.232	18.217
43	M-6	6	Left	1	1.20000	2.85000	3.00	1.0	0.50	5.175	24.320	37.642
44	M-6	6	Right	1	1.20000	2.75000	1.00	1.0	0.50	1.675	25.391	32.173
45	M-7	7	Left	3	2.66667	2.16667	2.00	1.0	1.00	35.000	86.103	16.852
46	M-7	7	Right	3	2.44444	1.88889	1.00	1.0	1.00	14.500	80.636	20.038

Obs	int50	dur50	eff50	pstr50	speed50	durpd50	si50	pctdur50	neff50	mmsi	msi50
1	1	2.00	3.00	3.0	1.0	0.75	13.500	55.000	21.053	11.443	13.500
2	3	2.00	1.50	3.0	1.5	1.00	40.500	77.660	12.990	36.000	40.500
3	6	3.00	1.50	3.0	1.5	1.00	121.500	81.680	13.870	120.000	121.500
4	3	1.50	2.00	3.0	1.0	1.00	27.000	49.500	15.500	27.540	27.000
5	6	2.00	3.00	3.0	1.0	0.50	54.000	66.670	20.375	56.000	54.000
6	6	3.00	1.25	3.0	1.0	0.50	27.000	80.299	9.258	30.938	33.750
7	9	2.00	3.00	3.0	1.0	0.75	121.500	78.091	20.909	141.750	121.500
8	3	1.50	2.00	3.0	1.0	1.00	27.000	37.500	15.470	22.222	27.000
9	3	3.00	3.00	3.0	1.0	1.00	81.000	90.000	36.667	81.000	81.000
10	3	3.00	3.00	3.0	1.0	1.00	81.000	79.048	26.667	72.000	81.000
11	3	2.00	1.75	3.0	1.0	1.00	40.500	72.225	14.184	40.500	31.500
12	3	3.00	3.00	3.0	1.0	1.00	81.000	95.477	41.000	81.000	81.000
13	6	2.00	1.50	3.0	1.5	1.00	81.000	67.113	10.964	81.000	81.000
14	6	2.00	1.00	2.0	1.0	1.00	30.000	77.206	8.574	31.740	24.000
15	9	2.00	3.00	3.0	1.0	0.75	121.500	76.150	60.834	141.750	121.500
16	6	3.00	3.00	3.0	1.0	1.00	162.000	83.339	31.937	156.600	162.000
17	3	3.00	3.00	3.0	1.0	1.00	81.000	91.373	19.773	70.200	81.000
18	3	3.00	3.00	2.0	1.0	1.00	54.000	80.831	25.625	43.680	54.000
19	3	2.00	1.00	3.0	1.0	1.00	18.000	58.233	5.265	16.650	18.000
20	3	2.00	3.00	3.0	1.5	1.00	81.000	71.304	43.333	81.000	81.000
21	1	2.00	3.00	2.0	1.0	1.00	12.000	57.140	45.710	11.667	12.000
22	3	2.50	3.00	3.0	1.5	0.75	75.938	79.269	31.820	75.938	75.938
23	3	1.75	1.50	3.0	1.0	0.75	15.188	45.000	11.024	16.538	17.719
24	6	1.50	1.50	2.0	1.5	0.75	30.375	40.000	12.048	34.683	30.375
25	3	2.00	1.50	1.0	1.5	0.50	6.750	55.578	12.500	7.547	6.750
26	1	2.00	3.00	3.0	1.0	0.25	4.500	73.215	135.230	5.003	4.500
27	1	3.00	3.00	2.0	1.0	0.25	4.500	100.000	47.915	4.725	4.500
28	3	3.00	3.00	3.0	1.0	1.00	81.000	100.000	93.333	81.000	81.000
29	3	2.00	2.00	3.0	1.0	1.00	36.000	55.556	16.667	36.000	36.000
30	6	2.00	3.00	3.0	1.0	1.00	108.000	65.158	30.872	126.000	108.000
31	9	3.00	3.00	1.5	1.0	1.00	121.500	91.199	37.545	114.750	121.500
32	9	3.00	3.00	1.5	1.0	1.00	121.500	100.000	31.250	121.500	121.500
33	6	2.00	3.00	3.0	1.0	0.75	81.000	57.803	25.000	75.214	81.000
34	9	3.00	2.00	3.0	1.0	1.00	162.000	91.813	16.429	155.250	162.000
35	9	3.00	3.00	2.0	1.0	1.00	162.000	92.899	31.786	162.000	162.000
36	3	2.00	3.00	2.0	1.0	0.25	9.000	74.383	75.339	10.125	9.000
37	3	1.00	2.00	3.0	1.0	1.00	22.500	21.495	18.875	22.208	18.000
38	1	2.00	3.00	1.5	1.0	0.75	6.750	75.000	28.334	7.847	6.750
39	3	1.00	1.00	3.0	1.0	0.75	6.750	13.393	6.669	5.711	6.750
40	3	3.00	3.00	3.0	1.0	0.75	60.750	95.454	30.000	56.700	60.750
41	3	3.00	2.00	2.0	1.0	0.75	20.250	95.652	15.550	22.959	27.000
42	6	2.00	2.00	2.0	1.0	1.00	48.000	51.807	16.354	45.360	48.000
43	1	1.00	3.00	3.0	1.0	0.50	4.500	18.333	39.230	5.130	4.500
44	1	1.00	3.00	1.0	1.0	0.50	1.500	26.785	32.240	1.650	1.500
45	3	3.00	2.00	2.0	1.0	1.00	36.000	87.500	16.667	34.667	36.000
46	3	2.00	1.50	1.0	1.0	1.00	9.000	78.947	13.846	13.852	9.000

		si		
		Mean	Std	StdErr
Job	Hand			
1	L	7.31	1.69	0.56
	R	8.25	4.97	1.17
2	L	156.60	17.08	5.40
	R	70.20	13.94	4.41
3	R	22.05	5.39	1.70
4	L	56.70	9.06	4.05
	R	22.82	3.99	1.51
5	R	46.20	16.92	7.57
6	L	5.18	1.85	0.59
	R	1.68	0.55	0.18
7	L	48.00	20.78	5.37
	R	24.89	20.81	5.20
8	R	27.00	0.00	0.00
9	R	162.00	0.00	0.00
10	L	36.00	7.79	4.50
	R	121.50	40.50	23.38
11	R	27.90	7.89	3.53
12	R	57.00	22.65	13.08
13	R	30.38	6.75	3.38
14	R	141.75	35.07	20.25
15	R	22.50	5.85	1.95

(Continued)

10:47 Tuesday, February 13, 2001

		si		
		Mean	Std	StdErr
Job	Hand			
16	R	81.00	0.00	0.00
17	L	81.00	0.00	0.00
18	L	44.40	13.02	4.12
	R	25.24	14.55	3.25
19	R	105.92	41.46	11.50
20	R	81.00	0.00	0.00
21	L	11.67	1.00	0.33
22	R	74.25	16.01	5.34
23	L	16.54	5.73	1.81
	R	35.35	11.71	3.70
24	L	7.59	2.97	1.21
25	R	5.03	1.57	0.50
26	L	4.50	0.00	0.00
27	R	81.00	0.00	0.00
28	R	36.00	0.00	0.00
29	R	126.00	31.18	18.00
30	R	114.75	16.53	6.75
31	R	121.50	0.00	0.00
32	L	155.25	16.53	6.75
	R	162.00	0.00	0.00
33	R	10.13	2.25	1.13

Obs	Job	Hand	avesi	medsi
1	1	L	7.313	6.750
2	1	R	8.250	6.750
3	2	L	156.600	162.000
4	2	R	70.200	81.000
5	3	R	22.050	22.500
6	4	L	56.700	60.750
7	4	R	22.821	20.250
8	5	R	46.200	48.000
9	6	L	5.175	4.500
10	6	R	1.675	1.500
11	7	L	48.000	54.000
12	7	R	24.891	18.000
13	8	R	27.000	27.000
14	9	R	162.000	162.000
15	10	L	36.000	40.500
16	10	R	121.500	121.500
17	11	R	27.900	27.000
18	12	R	57.000	54.000
19	13	R	30.375	27.000
20	14	R	141.750	121.500
21	15	R	22.500	27.000
22	16	R	81.000	81.000
23	17	L	81.000	81.000
24	18	L	44.400	54.000
25	18	R	25.238	21.000
26	19	R	105.923	81.000
27	20	R	81.000	81.000
28	21	L	11.667	12.000
29	22	R	74.250	60.750
30	23	L	16.538	15.188
31	23	R	35.353	30.375
32	24	L	7.593	6.750
33	25	R	5.025	4.500
34	26	L	4.500	4.500
35	27	R	81.000	81.000
36	28	R	36.000	36.000
37	29	R	126.000	108.000
38	30	R	114.750	121.500
39	31	R	121.500	121.500
40	32	L	155.250	162.000
41	32	R	162.000	162.000
42	33	R	10.125	9.000

The UNIVARIATE Procedure

Variable: medsi (the median, si)

Moments

N	42	Sum Weights	42
Mean	57.799119	Sum Observations	2427.563
Std Deviation	49.9484339	Variance	2494.84605
Skewness	0.83760229	Kurtosis	-0.3933213
Uncorrected SS	242599.691	Corrected SS	102288.688
Coeff Variation	86.4172928	Std Error Mean	7.70721068

Basic Statistical Measures

Location		Variability	
Mean	57.79912	Std Deviation	49.94843
Median	44.25000	Variance	2495
Mode	81.00000	Range	160.50000
		Interquartile Range	63.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.499356	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.00
99%	162.00
95%	162.00
90%	121.50
75% Q3	81.00
50% Median	44.25
25% Q1	18.00
10%	6.75
5%	4.50
1%	1.50
0% Min	1.50

The UNIVARIATE Procedure
Variable: medsi (the median, si)

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
1.50	10	121.5	39
4.50	34	162.0	3
4.50	33	162.0	14
4.50	9	162.0	40
6.75	32	162.0	41

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.50	1	2.4	2.4	20.25	1	2.4	28.6	48.00	1	2.4	52.4
4.50	3	7.1	9.5	21.00	1	2.4	31.0	54.00	3	7.1	59.5
6.75	3	7.1	16.7	22.50	1	2.4	33.3	60.75	2	4.8	64.3
9.00	1	2.4	19.0	27.00	4	9.5	42.9	81.00	6	14.3	78.6
12.00	1	2.4	21.4	30.38	1	2.4	45.2	108.00	1	2.4	81.0
15.19	1	2.4	23.8	36.00	1	2.4	47.6	121.50	4	9.5	90.5
18.00	1	2.4	26.2	40.50	1	2.4	50.0	162.00	4	9.5	100.0

The UNIVARIATE Procedure
Variable: avesi (the mean, si)

Moments

N	42	Sum Weights	42
Mean	58.9526421	Sum Observations	2476.01097
Std Deviation	50.4599297	Variance	2546.20451
Skewness	0.79312306	Kurtosis	-0.6267027
Uncorrected SS	250361.773	Corrected SS	104394.385
Coeff Variation	85.5940089	Std Error Mean	7.7861362

Basic Statistical Measures

Location		Variability	
Mean	58.95264	Std Deviation	50.45993
Median	40.20000	Variance	2546
Mode	81.00000	Range	160.32500
		Interquartile Range	58.95000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value-----	
Student's t	t	7.571489	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.0000
99%	162.0000
95%	156.6000
90%	141.7500
75% Q3	81.0000
50% Median	40.2000
25% Q1	22.0500
10%	7.3125
5%	5.0250
1%	1.6750
0% Min	1.6750

The UNIVARIATE Procedure

Variable: avesi (the mean, si)

Extreme Observations

-----Lowest-----		-----Highest----	
Value	Obs	Value	Obs
1.6750	10	141.75	20
4.5000	34	155.25	40
5.0250	33	156.60	3
5.1750	9	162.00	14
7.3125	1	162.00	41

Frequency Counts

		Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.6750000	1	2.4	2.4	35.3530000	1	2.4	45.2
4.5000000	1	2.4	4.8	36.0000000	2	4.8	50.0
5.0250000	1	2.4	7.1	44.4000000	1	2.4	52.4
5.1750000	1	2.4	9.5	46.2000000	1	2.4	54.8
7.3125000	1	2.4	11.9	48.0000000	1	2.4	57.1
7.5933333	1	2.4	14.3	56.7000000	1	2.4	59.5
8.2501389	1	2.4	16.7	57.0000000	1	2.4	61.9
10.1250000	1	2.4	19.0	70.2000000	1	2.4	64.3
11.6666667	1	2.4	21.4	74.2500000	1	2.4	66.7
16.5377000	1	2.4	23.8	81.0000000	4	9.5	76.2
22.0500000	1	2.4	26.2	105.9230769	1	2.4	78.6
22.5000000	1	2.4	28.6	114.7500000	1	2.4	81.0
22.8214286	1	2.4	31.0	121.5000000	2	4.8	85.7
24.8906250	1	2.4	33.3	126.0000000	1	2.4	88.1
25.2375000	1	2.4	35.7	141.7500000	1	2.4	90.5
27.0000000	1	2.4	38.1	155.2500000	1	2.4	92.9
27.9000000	1	2.4	40.5	156.6000000	1	2.4	95.2
30.3750000	1	2.4	42.9	162.0000000	2	4.8	100.0

By Trial
Separate
Exposures

The UNIVARIATE Procedure
Variable: IntensityofExertion (IntensityofExertion)

Moments

N	353	Sum Weights	353
Mean	3.58356941	Sum Observations	1265
Std Deviation	2.28494623	Variance	5.22097927
Skewness	1.01220797	Kurtosis	0.31579387
Uncorrected SS	6371	Corrected SS	1837.7847
Coeff Variation	63.7617406	Std Error Mean	0.12161542

Basic Statistical Measures

Location		Variability	
Mean	3.583569	Std Deviation	2.28495
Median	3.000000	Variance	5.22098
Mode	3.000000	Range	8.00000
		Interquartile Range	3.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	29.46641	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	9
99%	9
95%	9
90%	6
75% Q3	6
50% Median	3
25% Q1	3
10%	1
5%	1
1%	1
0% Min	1

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The UNIVARIATE Procedure
Variable: IntensityofExertion (IntensityofExertion)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	365	9	314
1	364	9	315
1	363	9	316
1	362	9	317
1	361	9	318

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
1	80	22.7	22.7	6	62	17.6	91.5	9	30	8.5	100.0
3	181	51.3	73.9								

The UNIVARIATE Procedure
Variable: DurationofExertion (DurationofExertion)

Moments

N	353	Sum Weights	353
Mean	2.17847025	Sum Observations	769
Std Deviation	0.73034156	Variance	0.53339879
Skewness	-0.2569388	Kurtosis	-1.027194
Uncorrected SS	1863	Corrected SS	187.756374
Coeff Variation	33.5254317	Std Error Mean	0.03887216

Basic Statistical Measures

Location		Variability	
Mean	2.178470	Std Deviation	0.73034
Median	2.000000	Variance	0.53340
Mode	3.000000	Range	2.50000
		Interquartile Range	1.50000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	56.04192	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	2.0
25% Q1	1.5
10%	1.0
5%	1.0
1%	0.5
0% Min	0.5

The UNIVARIATE Procedure
Variable: DurationofExertion (DurationofExertion)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.5	344	3	356
0.5	340	3	357
0.5	333	3	358
0.5	332	3	360
0.5	329	3	363

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
0.5	6	1.7	1.7	1.5	42	11.9	25.2	3.0	134	38.0	100.0
1.0	41	11.6	13.3	2.0	130	36.8	62.0				

The UNIVARIATE Procedure

Variable: Efforts_Minute (Efforts_Minute)

Moments

N	353	Sum Weights	353
Mean	2.34419263	Sum Observations	827.5
Std Deviation	0.79670949	Variance	0.63474601
Skewness	-0.6538302	Kurtosis	-1.0757784
Uncorrected SS	2163.25	Corrected SS	223.430595
Coeff Variation	33.9865195	Std Error Mean	0.04240457

Basic Statistical Measures

Location		Variability	
Mean	2.344193	Std Deviation	0.79671
Median	3.000000	Variance	0.63475
Mode	3.000000	Range	2.50000
		Interquartile Range	1.50000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	55.28161	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	3.0
25% Q1	1.5
10%	1.0
5%	1.0
1%	0.5
0% Min	0.5

The UNIVARIATE Procedure

Variable: Efforts_Minute (Efforts_Minute)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.5	344	3	361
0.5	333	3	362
0.5	332	3	363
0.5	328	3	364
0.5	324	3	365

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
0.5	8	2.3	2.3	1.5	61	17.3	29.2	3.0	198	56.1	100.0
1.0	34	9.6	11.9	2.0	52	14.7	43.9				

The UNIVARIATE Procedure
Variable: Hand_WristPosture (Hand_WristPosture)

Moments

N	353	Sum Weights	353
Mean	2.50991501	Sum Observations	886
Std Deviation	0.67570522	Variance	0.45657755
Skewness	-0.939109	Kurtosis	-0.5428247
Uncorrected SS	2384.5	Corrected SS	160.715297
Coeff Variation	26.9214384	Std Error Mean	0.03596416

Basic Statistical Measures

Location		Variability	
Mean	2.509915	Std Deviation	0.67571
Median	3.000000	Variance	0.45658
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	69.78934	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	3.0
25% Q1	2.0
10%	1.5
5%	1.0
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure
Variable: Hand_WristPosture (Hand_WristPosture)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	254	3	340
1	253	3	341
1	252	3	342
1	251	3	343
1	250	3	344

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
1.0	25	7.1	7.1	2.0	78	22.1	37.7	3.0	220	62.3	100.0
1.5	30	8.5	15.6								

The UNIVARIATE Procedure
Variable: SpeedofWork (SpeedofWork)

Moments

N	353	Sum Weights	353
Mean	1.06657224	Sum Observations	376.5
Std Deviation	0.17010652	Variance	0.02893623
Skewness	2.16891079	Kurtosis	2.7195503
Uncorrected SS	411.75	Corrected SS	10.1855524
Coeff Variation	15.9488982	Std Error Mean	0.00905386

Basic Statistical Measures

Location		Variability	
Mean	1.066572	Std Deviation	0.17011
Median	1.000000	Variance	0.02894
Mode	1.000000	Range	0.50000
		Interquartile Range	0

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	117.8031	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.5
99%	1.5
95%	1.5
90%	1.5
75% Q3	1.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure
Variable: SpeedofWork (SpeedofWork)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	365	1.5	250
1	364	1.5	251
1	363	1.5	252
1	362	1.5	253
1	361	1.5	254

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
1.0	306	86.7	86.7	1.5	47	13.3	100.0

The UNIVARIATE Procedure
Variable: DurationperDay (DurationperDay)

Moments

N	353	Sum Weights	353
Mean	0.82577904	Sum Observations	291.5
Std Deviation	0.22478153	Variance	0.05052674
Skewness	-1.2012081	Kurtosis	0.58083941
Uncorrected SS	258.5	Corrected SS	17.7854108
Coeff Variation	27.2205418	Std Error Mean	0.01196391

Basic Statistical Measures

Location		Variability	
Mean	0.825779	Std Deviation	0.22478
Median	1.000000	Variance	0.05053
Mode	1.000000	Range	0.75000
		Interquartile Range	0.25000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	69.02248	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.00
99%	1.00
95%	1.00
90%	1.00
75% Q3	1.00
50% Median	1.00
25% Q1	0.75
10%	0.50
5%	0.25
1%	0.25
0% Min	0.25

The UNIVARIATE Procedure
Variable: DurationperDay (DurationperDay)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.25	322	1	314
0.25	321	1	315
0.25	320	1	316
0.25	319	1	317
0.25	274	1	318

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
0.25	24	6.8	6.8	0.75	108	30.6	46.7	1.00	188	53.3	100.0
0.50	33	9.3	16.1								

The UNIVARIATE Procedure
Variable: SIScore (SIScore)

Moments

N	353	Sum Weights	353
Mean	47.086847	Sum Observations	16621.657
Std Deviation	47.6369008	Variance	2269.27432
Skewness	1.21215133	Kurtosis	0.52998612
Uncorrected SS	1581445.98	Corrected SS	798784.56
Coeff Variation	101.168169	Std Error Mean	2.5354564

Basic Statistical Measures

Location		Variability	
Mean	47.08685	Std Deviation	47.63690
Median	27.00000	Variance	2269
Mode	81.00000	Range	181.50000
		Interquartile Range	72.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	18.57135	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	182.250
99%	162.000
95%	162.000
90%	121.500
75% Q3	81.000
50% Median	27.000
25% Q1	9.000
10%	4.500
5%	3.375
1%	1.500
0% Min	0.750

The UNIVARIATE Procedure
Variable: SIScore (SIScore)

Extreme Observations

----Lowest----		-----Highest----	
Value	Obs	Value	Obs
0.75	58	162.00	317
1.00	61	162.00	318
1.50	67	182.25	124
1.50	63	182.25	177
1.50	62	182.25	178

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
0.75	1	0.3	0.3	6.75	36	10.2	22.7	36.00	14	4.0	59.5
1.00	1	0.3	0.6	9.00	11	3.1	25.8	40.50	7	2.0	61.5
1.50	4	1.1	1.7	10.13	12	3.4	29.2	48.00	2	0.6	62.0
1.69	3	0.8	2.5	12.00	8	2.3	31.4	54.00	22	6.2	68.3
1.69	1	0.3	2.8	13.50	13	3.7	35.1	60.75	9	2.5	70.8
2.25	5	1.4	4.2	15.19	4	1.1	36.3	72.00	1	0.3	71.1
3.00	1	0.3	4.5	18.00	13	3.7	39.9	81.00	50	14.2	85.3
3.38	5	1.4	5.9	20.25	13	3.7	43.6	91.13	5	1.4	86.7
4.50	20	5.7	11.6	22.78	1	0.3	43.9	108.00	3	0.8	87.5
5.06	1	0.3	11.9	24.00	9	2.5	46.5	121.50	16	4.5	92.1
5.06	1	0.3	12.2	27.00	28	7.9	54.4	162.00	25	7.1	99.2
6.00	1	0.3	12.5	30.38	4	1.1	55.5	182.25	3	0.8	100.0

The UNIVARIATE Procedure
Variable: pctDurExer (pctDurExer)

by trial

Moments

N	353	Sum Weights	353
Mean	65.5278785	Sum Observations	23131.3411
Std Deviation	26.6141614	Variance	708.313588
Skewness	-0.5941885	Kurtosis	-0.7338536
Uncorrected SS	1765074.09	Corrected SS	249326.383
Coeff Variation	40.6150207	Std Error Mean	1.41652888

Basic Statistical Measures

Location		Variability	
Mean	65.5279	Std Deviation	26.61416
Median	71.7740	Variance	708.31359
Mode	100.0000	Range	97.14300
		Interquartile Range	40.44000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	46.25947	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.000
99%	100.000
95%	100.000
90%	96.296
75% Q3	87.500
50% Median	71.774
25% Q1	47.060
10%	22.220
5%	14.286
1%	6.250
0% Min	2.857

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The UNIVARIATE Procedure
Variable: pctDurExer (pctDurExer)

Extreme Observations

-----Lowest----		----Highest---	
Value	Obs	Value	Obs
2.857	344	100	282
5.260	324	100	283
6.250	333	100	296
6.250	332	100	297
8.330	329	100	298

Missing Values

		-----Percent Of-----	
Missing Value	Count	All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
3	1	0.3	0.3	21	1	0.3	9.3	38	6	1.7	19.8
5	1	0.3	0.6	21	1	0.3	9.6	38	1	0.3	20.1
6	2	0.6	1.1	22	1	0.3	9.9	39	1	0.3	20.4
8	1	0.3	1.4	22	1	0.3	10.2	39	1	0.3	20.7
9	1	0.3	1.7	22	1	0.3	10.5	40	5	1.4	22.1
11	1	0.3	2.0	24	1	0.3	10.8	40	1	0.3	22.4
11	2	0.6	2.5	25	4	1.1	11.9	43	2	0.6	22.9
11	1	0.3	2.8	26	1	0.3	12.2	43	1	0.3	23.2
12	1	0.3	3.1	26	1	0.3	12.5	44	1	0.3	23.5
13	2	0.6	3.7	28	1	0.3	12.7	45	1	0.3	23.8
14	1	0.3	4.0	29	2	0.6	13.3	45	1	0.3	24.1
14	1	0.3	4.2	30	1	0.3	13.6	45	1	0.3	24.4
14	4	1.1	5.4	31	1	0.3	13.9	46	1	0.3	24.6
14	1	0.3	5.7	33	1	0.3	14.2	47	1	0.3	24.9
14	1	0.3	5.9	33	4	1.1	15.3	47	1	0.3	25.2
17	3	0.8	6.8	33	1	0.3	15.6	50	1	0.3	25.5
17	2	0.6	7.4	33	5	1.4	17.0	50	8	2.3	27.8
17	1	0.3	7.6	34	1	0.3	17.3	51	1	0.3	28.0
18	1	0.3	7.9	35	1	0.3	17.6	51	1	0.3	28.3
20	1	0.3	8.2	36	1	0.3	17.8	52	1	0.3	28.6
20	3	0.8	9.1	37	1	0.3	18.1	52	1	0.3	28.9

The UNIVARIATE Procedure
Variable: pctDurExer (pctDurExer)

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
52	1	0.3	29.2	67	3	0.8	44.8	79	1	0.3	60.9
52	1	0.3	29.5	67	1	0.3	45.0	79	1	0.3	61.2
53	1	0.3	29.7	67	1	0.3	45.3	79	1	0.3	61.5
53	1	0.3	30.0	68	1	0.3	45.6	79	1	0.3	61.8
54	1	0.3	30.3	68	1	0.3	45.9	79	1	0.3	62.0
54	1	0.3	30.6	69	1	0.3	46.2	80	1	0.3	62.3
55	1	0.3	30.9	70	1	0.3	46.5	80	1	0.3	62.6
55	1	0.3	31.2	70	2	0.6	47.0	80	1	0.3	62.9
56	1	0.3	31.4	70	1	0.3	47.3	80	3	0.8	63.7
56	1	0.3	31.7	70	1	0.3	47.6	80	1	0.3	64.0
56	1	0.3	32.0	71	1	0.3	47.9	81	1	0.3	64.3
56	1	0.3	32.3	71	1	0.3	48.2	81	1	0.3	64.6
56	1	0.3	32.6	71	1	0.3	48.4	81	2	0.6	65.2
57	1	0.3	32.9	71	1	0.3	48.7	81	1	0.3	65.4
57	1	0.3	33.1	71	3	0.8	49.6	82	1	0.3	65.7
57	1	0.3	33.4	71	1	0.3	49.9	82	1	0.3	66.0
57	2	0.6	34.0	72	1	0.3	50.1	82	1	0.3	66.3
57	1	0.3	34.3	72	1	0.3	50.4	82	1	0.3	66.6
57	1	0.3	34.6	72	1	0.3	50.7	82	1	0.3	66.9
58	1	0.3	34.8	72	1	0.3	51.0	83	1	0.3	67.1
58	1	0.3	35.1	72	1	0.3	51.3	83	1	0.3	67.4
58	1	0.3	35.4	72	1	0.3	51.6	83	1	0.3	67.7
59	1	0.3	35.7	73	1	0.3	51.8	83	1	0.3	68.0
59	1	0.3	36.0	73	1	0.3	52.1	83	1	0.3	68.3
59	1	0.3	36.3	73	1	0.3	52.4	83	1	0.3	68.6
60	1	0.3	36.5	73	1	0.3	52.7	83	2	0.6	69.1
60	1	0.3	36.8	74	1	0.3	53.0	83	1	0.3	69.4
60	6	1.7	38.5	74	1	0.3	53.3	83	1	0.3	69.7
61	1	0.3	38.8	74	2	0.6	53.8	84	1	0.3	70.0
62	1	0.3	39.1	75	10	2.8	56.7	84	1	0.3	70.3
62	1	0.3	39.4	75	1	0.3	56.9	84	1	0.3	70.5
62	1	0.3	39.7	76	1	0.3	57.2	84	1	0.3	70.8
63	1	0.3	39.9	76	1	0.3	57.5	84	1	0.3	71.1
63	1	0.3	40.2	76	1	0.3	57.8	85	1	0.3	71.4
64	1	0.3	40.5	77	1	0.3	58.1	85	2	0.6	72.0
64	1	0.3	40.8	77	1	0.3	58.4	85	1	0.3	72.2
65	1	0.3	41.1	78	1	0.3	58.6	86	3	0.8	73.1
65	1	0.3	41.4	78	1	0.3	58.9	86	1	0.3	73.4
65	1	0.3	41.6	78	2	0.6	59.5	87	1	0.3	73.7
66	1	0.3	41.9	78	1	0.3	59.8	87	1	0.3	73.9
66	1	0.3	42.2	78	1	0.3	60.1	87	1	0.3	74.2
67	2	0.6	42.8	78	1	0.3	60.3	87	1	0.3	74.5
67	4	1.1	43.9	78	1	0.3	60.6	87	1	0.3	74.8

The UNIVARIATE Procedure
Variable: pctDurExer (pctDurExer)

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
88	2	0.6	75.4	92	2	0.6	81.3	94	2	0.6	86.4
88	1	0.3	75.6	92	1	0.3	81.6	94	1	0.3	86.7
88	1	0.3	75.9	92	1	0.3	81.9	94	1	0.3	87.0
88	1	0.3	76.2	92	1	0.3	82.2	95	1	0.3	87.3
89	2	0.6	76.8	92	1	0.3	82.4	95	1	0.3	87.5
89	1	0.3	77.1	92	2	0.6	83.0	95	1	0.3	87.8
90	2	0.6	77.6	92	1	0.3	83.3	95	1	0.3	88.1
90	1	0.3	77.9	93	1	0.3	83.6	96	3	0.8	89.0
91	1	0.3	78.2	93	1	0.3	83.9	96	1	0.3	89.2
91	1	0.3	78.5	93	1	0.3	84.1	96	4	1.1	90.4
91	2	0.6	79.0	93	1	0.3	84.4	96	1	0.3	90.7
91	1	0.3	79.3	93	1	0.3	84.7	97	1	0.3	90.9
92	1	0.3	79.6	93	1	0.3	85.0	97	1	0.3	91.2
92	1	0.3	79.9	93	1	0.3	85.3	97	1	0.3	91.5
92	1	0.3	80.2	93	1	0.3	85.6	97	1	0.3	91.8
92	1	0.3	80.5	94	1	0.3	85.8	100	29	8.2	100.0
92	1	0.3	80.7								

The UNIVARIATE Procedure
Variable: nEfforts (nEfforts)

by trial

Moments

N	353	Sum Weights	353
Mean	29.6591465	Sum Observations	10469.6787
Std Deviation	28.0674363	Variance	787.780982
Skewness	3.08020888	Kurtosis	12.6970459
Uncorrected SS	587820.64	Corrected SS	277298.906
Coeff Variation	94.6333245	Std Error Mean	1.4938789

Basic Statistical Measures

Location		Variability	
Mean	29.65915	Std Deviation	28.06744
Median	21.57000	Variance	787.78098
Mode	30.00000	Range	215.15100
		Interquartile Range	21.30700

NOTE: The mode displayed is the smallest of 2 modes with a count of 14.

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	19.85378	Pr > |t|	<.0001
Sign	M	176.5	Pr >= |M|	<.0001
Signed Rank	S	31240.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	216.666
99%	144.570
95%	84.610
90%	56.800
75% Q3	34.938
50% Median	21.570
25% Q1	13.631
10%	8.569
5%	5.990
1%	3.157
0% Min	1.515

115

The UNIVARIATE Procedure
Variable: nEfforts (nEfforts)

Extreme Observations

-----Lowest----		-----Highest-----	
Value	Obs	Value	Obs
1.515	248	137.930	255
1.714	344	144.570	263
2.590	169	156.630	256
3.157	328	200.000	261
3.157	324	216.666	257

Missing Values

Missing Value	Count	-----Percent Of----- All Obs	Missing Obs
.	12	3.29	100.00

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
2	1	0.3	0.3	7	2	0.6	7.1	10	1	0.3	17.0
2	1	0.3	0.6	7	1	0.3	7.4	10	1	0.3	17.3
3	1	0.3	0.8	7	1	0.3	7.6	10	1	0.3	17.6
3	2	0.6	1.4	8	2	0.6	8.2	11	1	0.3	17.8
3	1	0.3	1.7	8	2	0.6	8.8	11	1	0.3	18.1
4	1	0.3	2.0	8	1	0.3	9.1	12	1	0.3	18.4
4	1	0.3	2.3	8	1	0.3	9.3	12	1	0.3	18.7
4	1	0.3	2.5	8	1	0.3	9.6	12	1	0.3	19.0
4	1	0.3	2.8	8	1	0.3	9.9	12	1	0.3	19.3
4	1	0.3	3.1	9	2	0.6	10.5	12	8	2.3	21.5
5	2	0.6	3.7	9	2	0.6	11.0	12	1	0.3	21.8
5	1	0.3	4.0	9	1	0.3	11.3	12	1	0.3	22.1
5	1	0.3	4.2	9	1	0.3	11.6	13	3	0.8	22.9
5	1	0.3	4.5	9	1	0.3	11.9	13	1	0.3	23.2
6	1	0.3	4.8	9	1	0.3	12.2	13	1	0.3	23.5
6	1	0.3	5.1	10	1	0.3	12.5	13	1	0.3	23.8
6	1	0.3	5.4	10	1	0.3	12.7	13	3	0.8	24.6
6	1	0.3	5.7	10	1	0.3	13.0	13	1	0.3	24.9
6	1	0.3	5.9	10	1	0.3	13.3	14	1	0.3	25.2
7	1	0.3	6.2	10	10	2.8	16.1	14	1	0.3	25.5
7	1	0.3	6.5	10	2	0.6	16.7	14	1	0.3	25.8

The UNIVARIATE Procedure
Variable: nEfforts (nEfforts)

Frequency Counts

Value	Count	Percents Cell	Percents Cum
14	2	0.6	26.3
14	1	0.3	26.6
14	1	0.3	26.9
14	1	0.3	27.2
14	2	0.6	27.8
14	1	0.3	28.0
15	1	0.3	28.3
15	1	0.3	28.6
15	1	0.3	28.9
15	5	1.4	30.3
15	1	0.3	30.6
15	1	0.3	30.9
15	1	0.3	31.2
16	1	0.3	31.4
16	1	0.3	31.7
16	1	0.3	32.0
16	1	0.3	32.3
16	1	0.3	32.6
16	1	0.3	32.9
16	1	0.3	33.1
16	1	0.3	33.4
16	1	0.3	33.7
16	1	0.3	34.0
16	2	0.6	34.6
17	1	0.3	34.8
17	1	0.3	35.1
17	5	1.4	36.5
17	5	1.4	38.0
17	1	0.3	38.2
17	1	0.3	38.5
17	1	0.3	38.8
17	1	0.3	39.1
17	1	0.3	39.4
18	1	0.3	39.7
18	1	0.3	39.9
18	1	0.3	40.2
18	1	0.3	40.5
18	1	0.3	40.8
18	1	0.3	41.1
18	1	0.3	41.4
18	2	0.6	41.9
19	1	0.3	42.2
19	1	0.3	42.5

Value	Count	Percents Cell	Percents Cum
19	1	0.3	42.8
19	1	0.3	43.1
19	1	0.3	43.3
19	1	0.3	43.6
20	1	0.3	43.9
20	10	2.8	46.7
20	1	0.3	47.0
20	1	0.3	47.3
20	1	0.3	47.6
20	1	0.3	47.9
21	2	0.6	48.4
21	1	0.3	48.7
21	1	0.3	49.0
21	1	0.3	49.3
21	1	0.3	49.6
21	1	0.3	49.9
22	1	0.3	50.1
22	1	0.3	50.4
23	2	0.6	51.0
23	1	0.3	51.3
23	6	1.7	53.0
24	1	0.3	53.3
24	1	0.3	53.5
24	1	0.3	53.8
25	1	0.3	54.1
25	1	0.3	54.4
25	1	0.3	54.7
25	7	2.0	56.7
25	1	0.3	56.9
26	1	0.3	57.2
26	1	0.3	57.5
26	1	0.3	57.8
26	1	0.3	58.1
27	3	0.8	58.9
27	1	0.3	59.2
28	1	0.3	59.5
28	1	0.3	59.8
28	1	0.3	60.1
29	1	0.3	60.3
29	1	0.3	60.6
29	1	0.3	60.9
29	1	0.3	61.2
29	1	0.3	61.5

Value	Count	Percents Cell	Percents Cum
30	1	0.3	61.8
30	14	4.0	65.7
30	1	0.3	66.0
30	1	0.3	66.3
31	1	0.3	66.6
31	2	0.6	67.1
31	1	0.3	67.4
31	1	0.3	67.7
31	1	0.3	68.0
31	1	0.3	68.3
32	1	0.3	68.6
32	1	0.3	68.8
32	1	0.3	69.1
32	1	0.3	69.4
32	1	0.3	69.7
33	1	0.3	70.0
33	1	0.3	70.3
33	4	1.1	71.4
33	3	0.8	72.2
34	1	0.3	72.5
34	1	0.3	72.8
34	1	0.3	73.1
34	2	0.6	73.7
34	1	0.3	73.9
34	2	0.6	74.5
35	1	0.3	74.8
35	1	0.3	75.1
35	1	0.3	75.4
35	1	0.3	75.6
35	1	0.3	75.9
36	1	0.3	76.2
36	1	0.3	76.5
37	1	0.3	76.8
37	2	0.6	77.3
37	1	0.3	77.6
38	2	0.6	78.2
38	1	0.3	78.5
38	2	0.6	79.0
39	1	0.3	79.3
40	14	4.0	83.3
41	1	0.3	83.6
41	1	0.3	83.9
42	1	0.3	84.1

The UNIVARIATE Procedure
Variable: nEfforts (nEfforts)

Frequency Counts

Value	Count	Percents Cell	Percents Cum
42	1	0.3	84.4
42	1	0.3	84.7
42	1	0.3	85.0
43	1	0.3	85.3
43	1	0.3	85.6
43	1	0.3	85.8
43	1	0.3	86.1
44	1	0.3	86.4
44	1	0.3	86.7
44	1	0.3	87.0
45	1	0.3	87.3
46	1	0.3	87.5
46	1	0.3	87.8
49	1	0.3	88.1
50	4	1.1	89.2
53	1	0.3	89.5

Value	Count	Percents Cell	Percents Cum
53	1	0.3	89.8
57	1	0.3	90.1
58	1	0.3	90.4
59	1	0.3	90.7
60	3	0.8	91.5
62	1	0.3	91.8
63	2	0.6	92.4
63	1	0.3	92.6
64	1	0.3	92.9
66	1	0.3	93.2
67	1	0.3	93.5
68	1	0.3	93.8
69	1	0.3	94.1
77	1	0.3	94.3
77	1	0.3	94.6
80	1	0.3	94.9

Value	Count	Percents Cell	Percents Cum
85	1	0.3	95.2
85	1	0.3	95.5
87	1	0.3	95.8
90	1	0.3	96.0
93	1	0.3	96.3
100	1	0.3	96.6
120	2	0.6	97.2
120	1	0.3	97.5
125	1	0.3	97.7
130	2	0.6	98.3
133	1	0.3	98.6
138	1	0.3	98.9
145	1	0.3	99.2
157	1	0.3	99.4
200	1	0.3	99.7
217	1	0.3	100.0

Obs	job	Side	mint	mdur	meff	mpstr	mspeed	mdurpd	msi	mpctdur	mneffort
1	1	Left	1.00000	2.32500	3.00000	1.50000	1.0	0.75	7.847	73.706	31.500
2	1	Right	2.46667	1.16667	1.40000	3.00000	1.0	0.75	7.538	25.660	10.662
3	2	Left	6.00000	2.90000	3.00000	3.00000	1.0	1.00	156.600	83.320	32.410
4	2	Right	3.00000	3.00000	2.60000	3.00000	1.0	1.00	70.200	90.115	20.505
5	3	Right	3.00000	1.05000	2.35000	3.00000	1.0	1.00	22.050	22.214	18.983
6	4	Left	3.00000	2.80000	3.00000	3.00000	1.0	0.75	56.700	90.240	31.000
7	4	Right	3.00000	2.85714	1.78571	2.00000	1.0	0.75	22.821	90.649	15.151
8	5	Right	6.00000	1.80000	2.10000	2.00000	1.0	1.00	46.200	51.232	18.217
9	6	Left	1.00000	1.20000	2.85000	3.00000	1.0	0.50	5.175	24.320	37.642
10	6	Right	1.00000	1.20000	2.75000	1.00000	1.0	0.50	1.675	25.391	32.173
11	7	Left	3.00000	2.66667	2.50000	2.40000	1.0	1.00	49.800	84.293	21.222
12	7	Right	3.00000	2.35294	1.94118	1.94118	1.0	1.00	28.191	73.733	17.433
13	8	Right	1.00000	2.00000	3.00000	3.00000	1.5	1.00	27.000	65.946	35.078
14	9	Right	6.00000	2.00000	3.00000	3.00000	1.5	1.00	162.000	69.524	24.436
15	10	Left	3.00000	2.00000	1.33333	3.00000	1.5	1.00	36.000	70.062	15.353
16	10	Right	6.00000	2.66667	1.66667	3.00000	1.5	1.00	121.500	84.693	14.603
17	11	Right	3.00000	1.70000	1.80000	3.00000	1.0	1.00	27.900	49.275	15.161
18	12	Right	6.00000	2.33333	2.66667	3.00000	1.0	0.50	57.000	67.113	24.620
19	13	Right	6.00000	2.75000	1.25000	3.00000	1.0	0.50	30.375	81.146	9.313
20	14	Right	9.00000	2.33333	3.00000	3.00000	1.0	0.75	141.750	77.623	21.993
21	15	Right	3.00000	1.38889	1.77778	3.00000	1.0	1.00	22.500	34.154	14.519
22	16	Right	3.00000	3.00000	3.00000	3.00000	1.0	1.00	81.000	93.134	38.506
23	17	Right	6.00000	2.00000	1.50000	3.00000	1.5	1.00	81.000	63.955	11.262

Obs	int50	dur50	eff50	pstr50	speed50	durpd50	si50	pctdur50	neff50	mmsi	msi50
1	1.0	2.00	3.00	1.5	1.0	0.75	6.750	75.000	28.334	7.847	6.750
2	3.0	1.00	1.00	3.0	1.0	0.75	6.750	15.478	8.044	9.065	6.750
3	6.0	3.00	3.00	3.0	1.0	1.00	162.000	83.339	31.937	156.600	162.000
4	3.0	3.00	3.00	3.0	1.0	1.00	81.000	91.373	19.773	70.200	81.000
5	3.0	1.00	2.00	3.0	1.0	1.00	22.500	21.495	18.875	22.208	18.000
6	3.0	3.00	3.00	3.0	1.0	0.75	60.750	95.454	30.000	56.700	60.750
7	3.0	3.00	2.00	2.0	1.0	0.75	20.250	95.652	15.550	22.959	27.000
8	6.0	2.00	2.00	2.0	1.0	1.00	48.000	51.807	16.354	45.360	48.000
9	1.0	1.00	3.00	3.0	1.0	0.50	4.500	18.333	39.230	5.130	4.500
10	1.0	1.00	3.00	1.0	1.0	0.50	1.500	26.785	32.240	1.650	1.500
11	3.0	3.00	3.00	2.0	1.0	1.00	54.000	86.667	20.000	48.000	54.000
12	3.0	2.00	1.50	1.0	1.0	1.00	18.000	77.780	13.846	26.599	9.000
13	1.0	2.00	3.00	3.0	1.5	1.00	27.000	64.172	34.938	27.000	27.000
14	6.0	2.00	3.00	3.0	1.5	1.00	162.000	66.894	24.554	162.000	162.000
15	3.0	2.00	1.50	3.0	1.5	1.00	40.500	77.660	12.990	36.000	40.500
16	6.0	3.00	1.50	3.0	1.5	1.00	121.500	81.680	13.870	120.000	121.500
17	3.0	1.50	2.00	3.0	1.0	1.00	27.000	49.500	15.500	27.540	27.000
18	6.0	2.00	3.00	3.0	1.0	0.50	54.000	66.670	20.375	56.000	54.000
19	6.0	3.00	1.25	3.0	1.0	0.50	27.000	80.299	9.258	30.938	33.750
20	9.0	2.00	3.00	3.0	1.0	0.75	121.500	78.091	20.909	141.750	121.500
21	3.0	1.50	2.00	3.0	1.0	1.00	27.000	37.500	15.470	22.222	27.000
22	3.0	3.00	3.00	3.0	1.0	1.00	81.000	94.286	38.333	81.000	81.000
23	6.0	2.00	1.50	3.0	1.5	1.00	81.000	67.113	10.964	81.000	81.000

Obs	job	Side	mint	mdur	meff	mpstr	mspeed	mdurpd	msi	mpctdur	mneffort
24	18	Left	3.00000	2.60000	2.80000	2.00000	1.0	1.00	44.400	80.912	24.244
25	18	Right	4.50000	2.07500	1.07500	2.50000	1.0	1.00	25.238	63.944	7.041
26	19	Right	7.38462	2.15385	2.88462	3.00000	1.0	0.75	105.923	65.980	41.310
27	20	Right	3.00000	2.00000	3.00000	3.00000	1.5	1.00	81.000	70.392	43.356
28	21	Left	1.00000	1.94444	3.00000	2.00000	1.0	1.00	11.667	56.463	44.686
29	22	Right	3.00000	2.50000	3.00000	3.00000	1.5	0.75	75.938	81.931	30.884
30	23	Left	3.00000	1.75000	1.40000	3.00000	1.0	0.75	16.538	47.917	10.406
31	23	Right	6.00000	1.70000	1.55000	1.95000	1.5	0.75	35.353	45.417	11.921
32	24	Left	3.00000	1.91667	1.75000	1.00000	1.5	0.50	7.593	56.858	21.034
33	25	Right	1.00000	2.30000	2.90000	3.00000	1.0	0.25	5.025	70.060	134.008
34	26	Left	1.00000	3.00000	3.00000	2.10000	1.0	0.25	4.500	100.000	50.299
35	27		3.00000	3.00000	3.00000	3.00000	1.0	1.00	81.000	100.000	102.407
36	28	Right	3.00000	2.00000	2.00000	3.00000	1.0	1.00	36.000	49.690	16.667
37	29	Right	6.00000	2.33333	3.00000	3.00000	1.0	1.00	126.000	69.897	32.007
38	30	Right	9.00000	2.83333	3.00000	1.50000	1.0	1.00	114.750	89.087	36.856
39	31	Right	9.00000	3.00000	3.00000	1.50000	1.0	1.00	121.500	100.000	31.750
40	32	Left	9.00000	3.00000	1.91667	3.00000	1.0	1.00	155.250	92.478	16.107
41	32	Right	9.00000	3.00000	3.00000	2.00000	1.0	1.00	162.000	93.205	31.131
42	33	Right	3.00000	2.25000	3.00000	2.00000	1.0	0.25	10.125	75.724	76.780

Obs	int50	dur50	eff50	pstr50	speed50	durpd50	si50	pctdur50	neff50	mmsi	msi50
24	3.0	3.00	3.00	2.0	1.0	1.00	54.000	80.831	25.625	43.680	54.000
25	4.5	2.00	1.00	2.5	1.0	1.00	21.000	66.569	6.903	25.095	22.500
26	6.0	2.00	3.00	3.0	1.0	0.75	81.000	61.861	34.545	103.232	81.000
27	3.0	2.00	3.00	3.0	1.5	1.00	81.000	71.304	43.333	81.000	81.000
28	1.0	2.00	3.00	2.0	1.0	1.00	12.000	57.140	45.710	11.667	12.000
29	3.0	2.50	3.00	3.0	1.5	0.75	75.938	79.269	31.820	75.938	75.938
30	3.0	1.75	1.50	3.0	1.0	0.75	15.188	45.000	11.024	16.538	17.719
31	6.0	1.50	1.50	2.0	1.5	0.75	30.375	40.000	12.048	34.683	30.375
32	3.0	2.00	1.50	1.0	1.5	0.50	6.750	55.578	12.500	7.547	6.750
33	1.0	2.00	3.00	3.0	1.0	0.25	4.500	73.215	135.230	5.003	4.500
34	1.0	3.00	3.00	2.0	1.0	0.25	4.500	100.000	47.915	4.725	4.500
35	3.0	3.00	3.00	3.0	1.0	1.00	81.000	100.000	93.333	81.000	81.000
36	3.0	2.00	2.00	3.0	1.0	1.00	36.000	55.556	16.667	36.000	36.000
37	6.0	2.00	3.00	3.0	1.0	1.00	108.000	65.158	30.872	126.000	108.000
38	9.0	3.00	3.00	1.5	1.0	1.00	121.500	91.199	37.545	114.750	121.500
39	9.0	3.00	3.00	1.5	1.0	1.00	121.500	100.000	31.250	121.500	121.500
40	9.0	3.00	2.00	3.0	1.0	1.00	162.000	91.813	16.429	155.250	162.000
41	9.0	3.00	3.00	2.0	1.0	1.00	162.000	92.899	31.786	162.000	162.000
42	3.0	2.00	3.00	2.0	1.0	0.25	9.000	74.383	75.339	10.125	9.000

The UNIVARIATE Procedure

Variable: mint (the mean, IntensityofExertion)

Moments

Mean of means

N	42	Sum Weights	42
Mean	4.151221	Sum Observations	174.351282
Std Deviation	2.49436577	Variance	6.22186061
Skewness	0.67560666	Kurtosis	-0.5279513
Uncorrected SS	978.866989	Corrected SS	255.096285
Coeff Variation	60.0875206	Std Error Mean	0.38488899

Basic Statistical Measures

Median of means

Location		Variability	
Mean	4.151221	Std Deviation	2.49437
Median	3.000000	Variance	6.22186
Mode	3.000000	Range	8.00000
		Interquartile Range	3.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	10.7855	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	9
99%	9
95%	9
90%	9
75% Q3	6
50% Median	3
25% Q1	3
10%	1
5%	1
1%	1
0% Min	1

The UNIVARIATE Procedure

Variable: mint (the mean, IntensityofExertion)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	34	9	20
1	33	9	38
1	28	9	39
1	13	9	40
1	10	9	41

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0000000	7	16.7	16.7	4.5000000	1	2.4	64.3	7.3846154	1	2.4	88.1
2.4666667	1	2.4	19.0	6.0000000	9	21.4	85.7	9.0000000	5	11.9	100.0
3.0000000	18	42.9	61.9								

The UNIVARIATE Procedure
Variable: mdur (the mean, DurationofExertion)

Moments

N	42	Sum Weights	42
Mean	2.25826818	Sum Observations	94.8472635
Std Deviation	0.57227138	Variance	0.32749453
Skewness	-0.3898163	Kurtosis	-0.6707565
Uncorrected SS	227.617833	Corrected SS	13.4272758
Coeff Variation	25.3411612	Std Error Mean	0.08830339

Basic Statistical Measures

Location		Variability	
Mean	2.258268	Std Deviation	0.57227
Median	2.312500	Variance	0.32749
Mode	3.000000	Range	1.95000
		Interquartile Range	0.85556

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	25.57397	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.00000
99%	3.00000
95%	3.00000
90%	3.00000
75% Q3	2.80000
50% Median	2.31250
25% Q1	1.94444
10%	1.38889
5%	1.20000
1%	1.05000
0% Min	1.05000

The UNIVARIATE Procedure
Variable: mdur (the mean, DurationofExertion)

Extreme Observations

------Lowest-----		----Highest---	
Value	Obs	Value	Obs
1.05000	5	3	34
1.16667	2	3	35
1.20000	10	3	39
1.20000	9	3	40
1.38889	21	3	41

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0500000	1	2.4	2.4	2.0000000	6	14.3	40.5	2.6000000	1	2.4	66.7
1.1666667	1	2.4	4.8	2.0750000	1	2.4	42.9	2.6666667	2	4.8	71.4
1.2000000	2	4.8	9.5	2.1538462	1	2.4	45.2	2.7500000	1	2.4	73.8
1.3888889	1	2.4	11.9	2.2500000	1	2.4	47.6	2.8000000	1	2.4	76.2
1.7000000	2	4.8	16.7	2.3000000	1	2.4	50.0	2.8333333	1	2.4	78.6
1.7500000	1	2.4	19.0	2.3250000	1	2.4	52.4	2.8571429	1	2.4	81.0
1.8000000	1	2.4	21.4	2.3333333	3	7.1	59.5	2.9000000	1	2.4	83.3
1.9166667	1	2.4	23.8	2.3529412	1	2.4	61.9	3.0000000	7	16.7	100.0
1.9444444	1	2.4	26.2	2.5000000	1	2.4	64.3				

The UNIVARIATE Procedure
Variable: meff (the mean, Efforts_Minute)

Moments

N	42	Sum Weights	42
Mean	2.41780041	Sum Observations	101.547617
Std Deviation	0.6575541	Variance	0.4323774
Skewness	-0.6190306	Kurtosis	-1.2403785
Uncorrected SS	263.249344	Corrected SS	17.7274734
Coeff Variation	27.1963766	Std Error Mean	0.1014628

Basic Statistical Measures

Location		Variability	
Mean	2.417800	Std Deviation	0.65755
Median	2.775000	Variance	0.43238
Mode	3.000000	Range	1.92500
		Interquartile Range	1.21429

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	23.82943	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.00000
99%	3.00000
95%	3.00000
90%	3.00000
75% Q3	3.00000
50% Median	2.77500
25% Q1	1.78571
10%	1.40000
5%	1.33333
1%	1.07500
0% Min	1.07500

The UNIVARIATE Procedure
Variable: meff (the mean, Efforts_Minute)

Extreme Observations

------Lowest-----		----Highest---	
Value	Obs	Value	Obs
1.07500	25	3	37
1.25000	19	3	38
1.33333	15	3	39
1.40000	30	3	41
1.40000	2	3	42

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0750000	1	2.4	2.4	1.7857143	1	2.4	26.2	2.6000000	1	2.4	45.2
1.2500000	1	2.4	4.8	1.8000000	1	2.4	28.6	2.6666667	1	2.4	47.6
1.3333333	1	2.4	7.1	1.9166667	1	2.4	31.0	2.7500000	1	2.4	50.0
1.4000000	2	4.8	11.9	1.9411765	1	2.4	33.3	2.8000000	1	2.4	52.4
1.5000000	1	2.4	14.3	2.0000000	1	2.4	35.7	2.8500000	1	2.4	54.8
1.5500000	1	2.4	16.7	2.1000000	1	2.4	38.1	2.8846154	1	2.4	57.1
1.6666667	1	2.4	19.0	2.3500000	1	2.4	40.5	2.9000000	1	2.4	59.5
1.7500000	1	2.4	21.4	2.5000000	1	2.4	42.9	3.0000000	17	40.5	100.0
1.7777778	1	2.4	23.8								

The UNIVARIATE Procedure
Variable: mpstr (the mean, Hand_WristPosture)

Moments

N	42	Sum Weights	42
Mean	2.55693277	Sum Observations	107.391176
Std Deviation	0.62759019	Variance	0.39386945
Skewness	-1.0797412	Kurtosis	-0.0659053
Uncorrected SS	290.740666	Corrected SS	16.1486474
Coeff Variation	24.5446497	Std Error Mean	0.09683927

Basic Statistical Measures

Location		Variability	
Mean	2.556933	Std Deviation	0.62759
Median	3.000000	Variance	0.39387
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	26.40388	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	3.0
25% Q1	2.0
10%	1.5
5%	1.5
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure
Variable: mpstr (the mean, Hand_WristPosture)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1.0	32	3	33
1.0	10	3	35
1.5	39	3	36
1.5	38	3	37
1.5	1	3	40

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0000000	2	4.8	4.8	1.9500000	1	2.4	16.7	2.4000000	1	2.4	35.7
1.5000000	3	7.1	11.9	2.0000000	6	14.3	31.0	2.5000000	1	2.4	38.1
1.9411765	1	2.4	14.3	2.1000000	1	2.4	33.3	3.0000000	26	61.9	100.0

The UNIVARIATE Procedure
Variable: mspeed (the mean, SpeedofWork)

Moments

N	42	Sum Weights	42
Mean	1.10714286	Sum Observations	46.5
Std Deviation	0.20764987	Variance	0.04311847
Skewness	1.44473967	Kurtosis	0.08919969
Uncorrected SS	53.25	Corrected SS	1.76785714
Coeff Variation	18.7554718	Std Error Mean	0.03204107

Basic Statistical Measures

Location		Variability	
Mean	1.107143	Std Deviation	0.20765
Median	1.000000	Variance	0.04312
Mode	1.000000	Range	0.50000
		Interquartile Range	0

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	34.55387	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.5
99%	1.5
95%	1.5
90%	1.5
75% Q3	1.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure
Variable: mspeed (the mean, SpeedofWork)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	42	1.5	23
1	41	1.5	27
1	40	1.5	29
1	39	1.5	31
1	38	1.5	32

Frequency Counts

		Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum
1	33	78.6	78.6	2	9	21.4	100.0

The UNIVARIATE Procedure
Variable: mdurpd (the mean, DurationperDay)

Moments

N	42	Sum Weights	42
Mean	0.83333333	Sum Observations	35
Std Deviation	0.23855936	Variance	0.05691057
Skewness	-1.2640984	Kurtosis	0.50581216
Uncorrected SS	31.5	Corrected SS	2.33333333
Coeff Variation	28.6271234	Std Error Mean	0.03681051

Basic Statistical Measures

Location		Variability	
Mean	0.833333	Std Deviation	0.23856
Median	1.000000	Variance	0.05691
Mode	1.000000	Range	0.75000
		Interquartile Range	0.25000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	22.63846	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.00
99%	1.00
95%	1.00
90%	1.00
75% Q3	1.00
50% Median	1.00
25% Q1	0.75
10%	0.50
5%	0.25
1%	0.25
0% Min	0.25

The UNIVARIATE Procedure
Variable: mdurpd (the mean, DurationperDay)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.25	42	1	37
0.25	34	1	38
0.25	33	1	39
0.50	32	1	40
0.50	19	1	41

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
0.25	3	7.1	7.1	0.75	9	21.4	40.5	1.00	25	59.5	100.0
0.50	5	11.9	19.0								

The UNIVARIATE Procedure

Variable: mmsi   *Si calculated from 6 mean variables.*

Moments

N	42	Sum Weights	42
Mean	58.8927986	Sum Observations	2473.49754
Std Deviation	50.3251768	Variance	2532.62342
Skewness	0.79963286	Kurtosis	-0.6092777
Uncorrected SS	249508.753	Corrected SS	103837.56
Coeff Variation	85.4521742	Std Error Mean	7.76534337

Basic Statistical Measures

Location		Variability	
Mean	58.89280	Std Deviation	50.32518
Median	39.84000	Variance	2533
Mode	81.00000	Range	160.35000
		Interquartile Range	58.79250

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.584056	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.00000
99%	162.00000
95%	156.60000
90%	141.75000
75% Q3	81.00000
50% Median	39.84000
25% Q1	22.20750
10%	7.54688
5%	5.00250
1%	1.65000
0% Min	1.65000

The UNIVARIATE Procedure

Variable: mmsi

Extreme Observations

------Lowest-----		-----Highest----	
Value	Obs	Value	Obs
1.65000	10	141.75	20
4.72500	34	155.25	40
5.00250	33	156.60	3
5.13000	9	162.00	14
7.54688	32	162.00	41

Frequency Counts

Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum	Value	Count	Percents Cell	Cum
1.650000	1	2.4	2.4	25.094531	1	2.4	33.3	70.200000	1	2.4	64.3
4.725000	1	2.4	4.8	26.598819	1	2.4	35.7	75.937500	1	2.4	66.7
5.002500	1	2.4	7.1	27.000000	1	2.4	38.1	81.000000	4	9.5	76.2
5.130000	1	2.4	9.5	27.540000	1	2.4	40.5	103.231680	1	2.4	78.6
7.546875	1	2.4	11.9	30.937500	1	2.4	42.9	114.750000	1	2.4	81.0
7.846875	1	2.4	14.3	34.683188	1	2.4	45.2	120.000000	1	2.4	83.3
9.065000	1	2.4	16.7	36.000000	2	4.8	50.0	121.500000	1	2.4	85.7
10.125000	1	2.4	19.0	43.680000	1	2.4	52.4	126.000000	1	2.4	88.1
11.666667	1	2.4	21.4	45.360000	1	2.4	54.8	141.750000	1	2.4	90.5
16.537500	1	2.4	23.8	48.000000	1	2.4	57.1	155.250000	1	2.4	92.9
22.207500	1	2.4	26.2	56.000000	1	2.4	59.5	156.600000	1	2.4	95.2
22.222222	1	2.4	28.6	56.700000	1	2.4	61.9	162.000000	2	4.8	100.0
22.959184	1	2.4	31.0								

The UNIVARIATE Procedure

Variable: int50 (the median, IntensityofExertion)

Moments

Mean of - medians

N	42	Sum Weights	42
Mean	4.13095238	Sum Observations	173.5
Std Deviation	2.45212582	Variance	6.01292102
Skewness	0.69507594	Kurtosis	-0.3930077
Uncorrected SS	963.25	Corrected SS	246.529762
Coeff Variation	59.359818	Std Error Mean	0.37837123

Basic Statistical Measures

Median of medians -

Location		Variability	
Mean	4.130952	Std Deviation	2.45213
Median	3.000000	Variance	6.01292
Mode	3.000000	Range	8.00000
		Interquartile Range	3.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value-----	
Student's t	t	10.91772	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	9
99%	9
95%	9
90%	9
75% Q3	6
50% Median	3
25% Q1	3
10%	1
5%	1
1%	1
0% Min	1

The UNIVARIATE Procedure

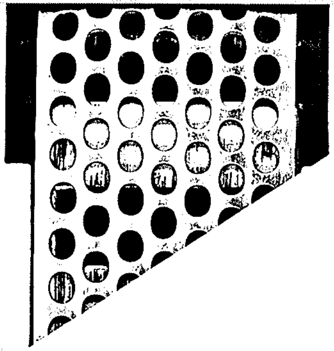
Variable: int50 (the median, IntensityofExertion)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	34	9	20
1	33	9	38
1	28	9	39
1	13	9	40
1	10	9	41

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
1	7	16.7	16.7	5	1	2.4	64.3	9	5	11.9	100.0
3	19	45.2	61.9	6	10	23.8	88.1				



,5888
,43412
2.00000
1.00000

ʻ.			Value------	
Student's t			|t|	<.0001
Sign	M		≻= |M|	<.0001
Signed Rank	S	451.	>= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	2.0
25% Q1	2.0
10%	1.5
5%	1.0
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure

Variable: dur50 (the median, DurationofExertion)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1.0	10	3	35
1.0	9	3	38
1.0	5	3	39
1.0	2	3	40
1.5	31	3	41

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0	4	9.5	9.5	1.8	1	2.4	19.0	2.5	1	2.4	64.3
1.5	3	7.1	16.7	2.0	18	42.9	61.9	3.0	15	35.7	100.0

The UNIVARIATE Procedure
Variable: eff50 (the median, Efforts_Minute)

Moments

N	42	Sum Weights	42
Mean	2.44642857	Sum Observations	102.75
Std Deviation	0.71468848	Variance	0.51077962
Skewness	-0.7072265	Kurtosis	-1.1714521
Uncorrected SS	272.3125	Corrected SS	20.9419643
Coeff Variation	29.2135435	Std Error Mean	0.11027883

Basic Statistical Measures

Location		Variability	
Mean	2.446429	Std Deviation	0.71469
Median	3.000000	Variance	0.51078
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	22.18403	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.00
99%	3.00
95%	3.00
90%	3.00
75% Q3	3.00
50% Median	3.00
25% Q1	2.00
10%	1.50
5%	1.25
1%	1.00
0% Min	1.00

The UNIVARIATE Procedure
Variable: eff50 (the median, Efforts_Minute)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1.00	25	3	37
1.00	2	3	38
1.25	19	3	39
1.50	32	3	41
1.50	31	3	42

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.0	2	4.8	4.8	1.5	7	16.7	23.8	3.0	25	59.5	100.0
1.3	1	2.4	7.1	2.0	7	16.7	40.5				

The UNIVARIATE Procedure
Variable: pstr50 (the median, Hand_WristPosture)

Moments

N	42	Sum Weights	42
Mean	2.52380952	Sum Observations	106
Std Deviation	0.67129635	Variance	0.45063879
Skewness	-1.0429985	Kurtosis	-0.2452627
Uncorrected SS	286	Corrected SS	18.4761905
Coeff Variation	26.5985347	Std Error Mean	0.10358328

Basic Statistical Measures

Location		Variability	
Mean	2.523810	Std Deviation	0.67130
Median	3.000000	Variance	0.45064
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	24.36503	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	3.0
99%	3.0
95%	3.0
90%	3.0
75% Q3	3.0
50% Median	3.0
25% Q1	2.0
10%	1.5
5%	1.0
1%	1.0
0% Min	1.0

The UNIVARIATE Procedure
Variable: pstr50 (the median, Hand_WristPosture)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1.0	32	3	33
1.0	12	3	35
1.0	10	3	36
1.5	39	3	37
1.5	38	3	40

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
1	3	7.1	7.1	2	9	21.4	35.7	3	26	61.9	100.0
2	3	7.1	14.3	3	1	2.4	38.1				

The UNIVARIATE Procedure
Variable: speed50 (the median, SpeedofWork)

Moments

N	42	Sum Weights	42
Mean	1.10714286	Sum Observations	46.5
Std Deviation	0.20764987	Variance	0.04311847
Skewness	1.44473967	Kurtosis	0.08919969
Uncorrected SS	53.25	Corrected SS	1.76785714
Coeff Variation	18.7554718	Std Error Mean	0.03204107

Basic Statistical Measures

Location		Variability	
Mean	1.107143	Std Deviation	0.20765
Median	1.000000	Variance	0.04312
Mode	1.000000	Range	0.50000
		Interquartile Range	0

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	34.55387	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.5
99%	1.5
95%	1.5
90%	1.5
75% Q3	1.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

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The UNIVARIATE Procedure
Variable: speed50 (the median, SpeedofWork)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	42	1.5	23
1	41	1.5	27
1	40	1.5	29
1	39	1.5	31
1	38	1.5	32

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
1	33	78.6	78.6	2	9	21.4	100.0

The UNIVARIATE Procedure
Variable: durpd50 (the median, DurationperDay)

Moments

N	42	Sum Weights	42
Mean	0.83333333	Sum Observations	35
Std Deviation	0.23855936	Variance	0.05691057
Skewness	-1.2640984	Kurtosis	0.50581216
Uncorrected SS	31.5	Corrected SS	2.33333333
Coeff Variation	28.6271234	Std Error Mean	0.03681051

Basic Statistical Measures

Location		Variability	
Mean	0.833333	Std Deviation	0.23856
Median	1.000000	Variance	0.05691
Mode	1.000000	Range	0.75000
		Interquartile Range	0.25000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	22.63846	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	1.00
99%	1.00
95%	1.00
90%	1.00
75% Q3	1.00
50% Median	1.00
25% Q1	0.75
10%	0.50
5%	0.25
1%	0.25
0% Min	0.25

The UNIVARIATE Procedure
Variable: durpd50 (the median, DurationperDay)

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.25	42	1	37
0.25	34	1	38
0.25	33	1	39
0.50	32	1	40
0.50	19	1	41

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
0.25	3	7.1	7.1	0.75	9	21.4	40.5	1.00	25	59.5	100.0
0.50	5	11.9	19.0								

The UNIVARIATE Procedure
Variable: si50 (the median, SIScore)

Moments

mean of medianSI from trials

N	42	Sum Weights	42
Mean	58.1607262	Sum Observations	2442.7505
Std Deviation	50.0252349	Variance	2502.52413
Skewness	0.81219579	Kurtosis	-0.4364854
Uncorrected SS	244675.632	Corrected SS	102603.489
Coeff Variation	86.0120535	Std Error Mean	7.71906134

Basic Statistical Measures

median of medianSI from trials

Location		Variability	
Mean	58.16073	Std Deviation	50.02523
Median	44.25000	Variance	2503
Mode	81.00000	Range	160.50000
		Interquartile Range	63.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.534689	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.00
99%	162.00
95%	162.00
90%	121.50
75% Q3	81.00
50% Median	44.25
25% Q1	18.00
10%	6.75
5%	4.50
1%	1.50
0% Min	1.50

The UNIVARIATE Procedure
Variable: si50 (the median, SIScore)

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
1.50	10	121.5	39
4.50	34	162.0	3
4.50	33	162.0	14
4.50	9	162.0	40
6.75	32	162.0	41

Frequency Counts

Value	Count	Percents Cell	Percents Cum
1.50	1	2.4	2.4
4.50	3	7.1	9.5
6.75	3	7.1	16.7
9.00	1	2.4	19.0
12.00	1	2.4	21.4
15.19	1	2.4	23.8
18.00	1	2.4	26.2
20.25	1	2.4	28.6
21.00	1	2.4	31.0
22.50	1	2.4	33.3
27.00	4	9.5	42.9
30.38	1	2.4	45.2
36.00	1	2.4	47.6
40.50	1	2.4	50.0
48.00	1	2.4	52.4
54.00	3	7.1	59.5
60.75	1	2.4	61.9
75.94	1	2.4	64.3
81.00	6	14.3	78.6
108.00	1	2.4	81.0
121.50	4	9.5	90.5
162.00	4	9.5	100.0

The UNIVARIATE Procedure
Variable: pctdur50 (the median, pctDurExer)

Moments

N	42	Sum Weights	42
Mean	69.1618929	Sum Observations	2904.7995
Std Deviation	22.9295267	Variance	525.763195
Skewness	-0.7594245	Kurtosis	-0.0523706
Uncorrected SS	222457.723	Corrected SS	21556.291
Coeff Variation	33.1534112	Std Error Mean	3.53810278

Basic Statistical Measures

Location		Variability	
Mean	69.1619	Std Deviation	22.92953
Median	73.7988	Variance	525.76319
Mode	100.0000	Range	84.52200
		Interquartile Range	31.08950

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	19.54773	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.0000
99%	100.0000
95%	100.0000
90%	95.4540
75% Q3	86.6670
50% Median	73.7988
25% Q1	55.5775
10%	37.5000
5%	21.4950
1%	15.4780
0% Min	15.4780

The UNIVARIATE Procedure
Variable: pctdur50 (the median, pctDurExer)

Extreme Observations

-----Lowest-----		-----Highest-----	
Value	Obs	Value	Obs
15.478	2	95.454	6
18.333	9	95.652	7
21.495	5	100.000	34
26.785	10	100.000	35
37.500	21	100.000	39

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
15.48	1	2.4	2.4	65.16	1	2.4	35.7	80.30	1	2.4	66.7
18.33	1	2.4	4.8	66.57	1	2.4	38.1	80.83	1	2.4	69.0
21.50	1	2.4	7.1	66.67	1	2.4	40.5	81.68	1	2.4	71.4
26.79	1	2.4	9.5	66.89	1	2.4	42.9	83.34	1	2.4	73.8
37.50	1	2.4	11.9	67.11	1	2.4	45.2	86.67	1	2.4	76.2
40.00	1	2.4	14.3	71.30	1	2.4	47.6	91.20	1	2.4	78.6
45.00	1	2.4	16.7	73.22	1	2.4	50.0	91.37	1	2.4	81.0
49.50	1	2.4	19.0	74.38	1	2.4	52.4	91.81	1	2.4	83.3
51.81	1	2.4	21.4	75.00	1	2.4	54.8	92.90	1	2.4	85.7
55.56	1	2.4	23.8	77.66	1	2.4	57.1	94.29	1	2.4	88.1
55.58	1	2.4	26.2	77.78	1	2.4	59.5	95.45	1	2.4	90.5
57.14	1	2.4	28.6	78.09	1	2.4	61.9	95.65	1	2.4	92.9
61.86	1	2.4	31.0	79.27	1	2.4	64.3	100.00	3	7.1	100.0
64.17	1	2.4	33.3								

The UNIVARIATE Procedure
Variable: neff50 (the median, nEfforts)

Moments

N	42	Sum Weights	42
Mean	29.3146429	Sum Observations	1231.215
Std Deviation	23.9312137	Variance	572.70299
Skewness	2.77089334	Kurtosis	9.57830225
Uncorrected SS	59573.4506	Corrected SS	23480.8226
Coeff Variation	81.6356994	Std Error Mean	3.69266644

Basic Statistical Measures

Location		Variability	
Mean	29.31464	Std Deviation	23.93121
Median	22.73150	Variance	572.70299
Mode	.	Range	128.32750
		Interquartile Range	19.07500

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.938611	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	135.2300
99%	135.2300
95%	75.3390
90%	45.7100
75% Q3	34.5450
50% Median	22.7315
25% Q1	15.4700
10%	11.0240
5%	9.2580
1%	6.9025
0% Min	6.9025

The UNIVARIATE Procedure
Variable: neff50 (the median, nEfforts)

Extreme Observations

------Lowest-----		-----Highest-----	
Value	Obs	Value	Obs
6.9025	25	45.710	28
8.0440	2	47.915	34
9.2580	19	75.339	42
10.9640	23	93.333	35
11.0240	30	135.230	33

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
6.903	1	2.4	2.4	16.429	1	2.4	35.7	31.820	1	2.4	69.0
8.044	1	2.4	4.8	16.667	1	2.4	38.1	31.937	1	2.4	71.4
9.258	1	2.4	7.1	18.875	1	2.4	40.5	32.240	1	2.4	73.8
10.964	1	2.4	9.5	19.773	1	2.4	42.9	34.545	1	2.4	76.2
11.024	1	2.4	11.9	20.000	1	2.4	45.2	34.938	1	2.4	78.6
12.048	1	2.4	14.3	20.375	1	2.4	47.6	37.545	1	2.4	81.0
12.500	1	2.4	16.7	20.909	1	2.4	50.0	38.333	1	2.4	83.3
12.990	1	2.4	19.0	24.554	1	2.4	52.4	39.230	1	2.4	85.7
13.846	1	2.4	21.4	25.625	1	2.4	54.8	43.333	1	2.4	88.1
13.870	1	2.4	23.8	28.334	1	2.4	57.1	45.710	1	2.4	90.5
15.470	1	2.4	26.2	30.000	1	2.4	59.5	47.915	1	2.4	92.9
15.500	1	2.4	28.6	30.872	1	2.4	61.9	75.339	1	2.4	95.2
15.550	1	2.4	31.0	31.250	1	2.4	64.3	93.333	1	2.4	97.6
16.354	1	2.4	33.3	31.786	1	2.4	66.7	135.230	1	2.4	100.0

The UNIVARIATE Procedure
Variable: msi (the mean, SIScore)

Moments

N	42	Sum Weights	42
Mean	59.11002	Sum Observations	2482.62084
Std Deviation	50.4166875	Variance	2541.84238
Skewness	0.78751818	Kurtosis	-0.6301458
Uncorrected SS	250963.305	Corrected SS	104215.538
Coeff Variation	85.2929631	Std Error Mean	7.77946378

Basic Statistical Measures

Location		Variability	
Mean	59.11002	Std Deviation	50.41669
Median	40.20000	Variance	2542
Mode	81.00000	Range	160.32500
		Interquartile Range	58.95000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.598213	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.00000
99%	162.00000
95%	156.60000
90%	141.75000
75% Q3	81.00000
50% Median	40.20000
25% Q1	22.05000
10%	7.53758
5%	5.02500
1%	1.67500
0% Min	1.67500

The UNIVARIATE Procedure
Variable: msi (the mean, SIScore)

Extreme Observations

------Lowest-----		-----Highest----	
Value	Obs	Value	Obs
1.67500	10	141.75	20
4.50000	34	155.25	40
5.02500	33	156.60	3
5.17500	9	162.00	14
7.53758	2	162.00	41

Frequency Counts

		Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum
1.6750000	1	2.4	2.4	35.3530000	1	2.4	45.2
4.5000000	1	2.4	4.8	36.0000000	2	4.8	50.0
5.0250000	1	2.4	7.1	44.4000000	1	2.4	52.4
5.1750000	1	2.4	9.5	46.2000000	1	2.4	54.8
7.5375833	1	2.4	11.9	49.8000000	1	2.4	57.1
7.5933333	1	2.4	14.3	56.7000000	1	2.4	59.5
7.8468750	1	2.4	16.7	57.0000000	1	2.4	61.9
10.1250000	1	2.4	19.0	70.2000000	1	2.4	64.3
11.6666667	1	2.4	21.4	75.9375000	1	2.4	66.7
16.5377000	1	2.4	23.8	81.0000000	4	9.5	76.2
22.0500000	1	2.4	26.2	105.9230769	1	2.4	78.6
22.5000000	1	2.4	28.6	114.7500000	1	2.4	81.0
22.8214286	1	2.4	31.0	121.5000000	2	4.8	85.7
25.2375000	1	2.4	33.3	126.0000000	1	2.4	88.1
27.0000000	1	2.4	35.7	141.7500000	1	2.4	90.5
27.9000000	1	2.4	38.1	155.2500000	1	2.4	92.9
28.1911765	1	2.4	40.5	156.6000000	1	2.4	95.2
30.3750000	1	2.4	42.9	162.0000000	2	4.8	100.0

The UNIVARIATE Procedure

Variable: mpctdur (the mean, pctDurExer)

Moments

N	42	Sum Weights	42
Mean	69.0821945	Sum Observations	2901.45217
Std Deviation	21.7065583	Variance	471.174674
Skewness	-0.6637784	Kurtosis	-0.2813631
Uncorrected SS	219756.844	Corrected SS	19318.1616
Coeff Variation	31.4213503	Std Error Mean	3.34939466

Basic Statistical Measures

Location		Variability	
Mean	69.0822	Std Deviation	21.70656
Median	70.2266	Variance	471.17467
Mode	100.0000	Range	77.78576
		Interquartile Range	28.23056

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	20.62528	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.0000
99%	100.0000
95%	100.0000
90%	93.1343
75% Q3	84.6933
50% Median	70.2266
25% Q1	56.4628
10%	34.1544
5%	25.3906
1%	22.2142
0% Min	22.2142

The UNIVARIATE Procedure

Variable: mpctdur (the mean, pctDurExer)

Extreme Observations

------Lowest-----		------Highest-----	
Value	Obs	Value	Obs
22.2142	5	93.1343	22
24.3202	9	93.2053	41
25.3906	10	100.0000	34
25.6603	2	100.0000	35
34.1544	21	100.0000	39

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
22.21424	1	2.4	2.4	65.94567	1	2.4	35.7	81.14625	1	2.4	66.7
24.32020	1	2.4	4.8	65.97962	1	2.4	38.1	81.93080	1	2.4	69.0
25.39060	1	2.4	7.1	67.11267	1	2.4	40.5	83.32010	1	2.4	71.4
25.66027	1	2.4	9.5	69.52400	1	2.4	42.9	84.29307	1	2.4	73.8
34.15444	1	2.4	11.9	69.89733	1	2.4	45.2	84.69333	1	2.4	76.2
45.41650	1	2.4	14.3	70.05960	1	2.4	47.6	89.08650	1	2.4	78.6
47.91660	1	2.4	16.7	70.06167	1	2.4	50.0	90.11450	1	2.4	81.0
49.27500	1	2.4	19.0	70.39160	1	2.4	52.4	90.24000	1	2.4	83.3
49.69000	1	2.4	21.4	73.70605	1	2.4	54.8	90.64871	1	2.4	85.7
51.23220	1	2.4	23.8	73.73312	1	2.4	57.1	92.47833	1	2.4	88.1
56.46278	1	2.4	26.2	75.72425	1	2.4	59.5	93.13427	1	2.4	90.5
56.85750	1	2.4	28.6	77.62333	1	2.4	61.9	93.20533	1	2.4	92.9
63.94419	1	2.4	31.0	80.91230	1	2.4	64.3	100.00000	3	7.1	100.0
63.95525	1	2.4	33.3								

The UNIVARIATE Procedure
Variable: mneffort (the mean, nEfforts)

Moments

N	42	Sum Weights	42
Mean	30.348548	Sum Observations	1274.63902
Std Deviation	24.2551594	Variance	588.31276
Skewness	2.72846314	Kurtosis	8.9089931
Uncorrected SS	62804.2665	Corrected SS	24120.8232
Coeff Variation	79.9219767	Std Error Mean	3.74265236

Basic Statistical Measures

Location		Variability	
Mean	30.34855	Std Deviation	24.25516
Median	24.34022	Variance	588.31276
Mode		Range	126.96755
		Interquartile Range	19.72500

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	8.108834	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	134.00820
99%	134.00820
95%	76.78025
90%	44.68600
75% Q3	35.07833
50% Median	24.34022
25% Q1	15.35333
10%	11.26200
5%	10.40630
1%	7.04065
0% Min	7.04065

The UNIVARIATE Procedure
Variable: mneffort (the mean, nEfforts)

Extreme Observations

------Lowest------		------Highest-----	
Value	Obs	Value	Obs
7.04065	25	44.6860	28
9.31325	19	50.2990	34
10.40630	30	76.7803	42
10.66222	2	102.4074	35
11.26200	23	134.0082	33

Frequency Counts

		Percents				Percents				Percents	
Value	Count	Cell	Cum	Value	Count	Cell	Cum	Value	Count	Cell	Cum
7.04065	1	2.4	2.4	18.21680	1	2.4	35.7	32.00733	1	2.4	69.0
9.31325	1	2.4	4.8	18.98280	1	2.4	38.1	32.17300	1	2.4	71.4
10.40630	1	2.4	7.1	20.50530	1	2.4	40.5	32.41010	1	2.4	73.8
10.66222	1	2.4	9.5	21.03433	1	2.4	42.9	35.07833	1	2.4	76.2
11.26200	1	2.4	11.9	21.22227	1	2.4	45.2	36.85550	1	2.4	78.6
11.92140	1	2.4	14.3	21.99267	1	2.4	47.6	37.64200	1	2.4	81.0
14.51911	1	2.4	16.7	24.24410	1	2.4	50.0	38.50618	1	2.4	83.3
14.60333	1	2.4	19.0	24.43633	1	2.4	52.4	41.30962	1	2.4	85.7
15.15086	1	2.4	21.4	24.62033	1	2.4	54.8	43.35640	1	2.4	88.1
15.16080	1	2.4	23.8	30.88380	1	2.4	57.1	44.68600	1	2.4	90.5
15.35333	1	2.4	26.2	31.00000	1	2.4	59.5	50.29900	1	2.4	92.9
16.10733	1	2.4	28.6	31.13083	1	2.4	61.9	76.78025	1	2.4	95.2
16.66667	1	2.4	31.0	31.49995	1	2.4	64.3	102.40744	1	2.4	97.6
17.43288	1	2.4	33.3	31.75000	1	2.4	66.7	134.00820	1	2.4	100.0

The UNIVARIATE Procedure
Variable: msi50 Si Calculated from median of 6 variables

Moments

N	42	Sum Weights	42
Mean	58.2566964	Sum Observations	2446.78125
Std Deviation	50.0210977	Variance	2502.11021
Skewness	0.8034188	Kurtosis	-0.4356716
Uncorrected SS	245127.911	Corrected SS	102586.519
Coeff Variation	85.8632582	Std Error Mean	7.71842294

Basic Statistical Measures

Location		Variability	
Mean	58.25670	Std Deviation	50.02110
Median	44.25000	Variance	2502
Mode	81.00000	Range	160.50000
		Interquartile Range	63.28125

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	7.547746	Pr > |t|	<.0001
Sign	M	21	Pr >= |M|	<.0001
Signed Rank	S	451.5	Pr >= |S|	<.0001

Quantiles (Definition 5)

Quantile	Estimate
100% Max	162.0000
99%	162.0000
95%	162.0000
90%	121.5000
75% Q3	81.0000
50% Median	44.2500
25% Q1	17.7188
10%	6.7500
5%	4.5000
1%	1.5000
0% Min	1.5000

The UNIVARIATE Procedure
Variable: msi50

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
1.50	10	121.5	39
4.50	34	162.0	3
4.50	33	162.0	14
4.50	9	162.0	40
6.75	32	162.0	41

Frequency Counts

Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum	Value	Count	Percents Cell	Percents Cum
1.500	1	2.4	2.4	22.500	1	2.4	31.0	54.000	3	7.1	59.5
4.500	3	7.1	9.5	27.000	4	9.5	40.5	60.750	1	2.4	61.9
6.750	3	7.1	16.7	30.375	1	2.4	42.9	75.938	1	2.4	64.3
9.000	2	4.8	21.4	33.750	1	2.4	45.2	81.000	6	14.3	78.6
12.000	1	2.4	23.8	36.000	1	2.4	47.6	108.000	1	2.4	81.0
17.719	1	2.4	26.2	40.500	1	2.4	50.0	121.500	4	9.5	90.5
18.000	1	2.4	28.6	48.000	1	2.4	52.4	162.000	4	9.5	100.0

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
dur50	<5	4	0.2265	1.75	3.2735	0.5424	0.9574	3.5698	0.4787
dur50	>5	38	2.0806	2.2829	2.4852	0.5019	0.6156	0.7964	0.0999
dur50	Diff (1-2)		-1.221	-0.533	0.155	0.5316	0.6475	0.8285	0.3404
eff50	<5	4	3	3	3	.	0	.	0
eff50	>5	38	2.149	2.3882	2.6273	0.5932	0.7276	0.9413	0.118
eff50	Diff (1-2)		-0.132	0.6118	1.3553	0.5745	0.6998	0.8954	0.3678
mdur	<5	4	0.5174	1.925	3.3326	0.5011	0.8846	3.2982	0.4423
mdur	>5	38	2.1175	2.2933	2.4692	0.4361	0.535	0.6921	0.0868
mdur	Diff (1-2)		-0.973	-0.368	0.2358	0.4669	0.5687	0.7276	0.2989
meff	<5	4	2.7094	2.875	3.0406	0.059	0.1041	0.3881	0.052
meff	>5	38	2.1484	2.3697	2.591	0.5489	0.6733	0.871	0.1092
meff	Diff (1-2)		-0.183	0.5053	1.1939	0.5321	0.6481	0.8293	0.3407
mpctdur	<5	4	-3.665	54.943	113.55	20.865	36.832	137.33	18.416
mpctdur	>5	38	64.094	70.571	77.047	16.064	19.704	25.491	3.1963
mpctdur	Diff (1-2)		-38.43	-15.63	7.179	17.625	21.468	27.468	11.285
pctdur50	<5	4	-7.022	54.583	116.19	21.932	38.715	144.35	19.358
pctdur50	>5	38	63.836	70.696	77.557	17.017	20.873	27.004	3.386
pctdur50	Diff (1-2)		-40.23	-16.11	8.0061	18.639	22.703	29.048	11.934

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
dur50	Pooled	Equal	40	-1.57	0.1253
dur50	Satterthwaite	Unequal	3.27	-1.09	0.3496
eff50	Pooled	Equal	40	1.66	0.1041
eff50	Satterthwaite	Unequal	37	5.18	<.0001
mdur	Pooled	Equal	40	-1.23	0.2251
mdur	Satterthwaite	Unequal	3.24	-0.82	0.4697
meff	Pooled	Equal	40	1.48	0.1459
meff	Satterthwaite	Unequal	34.1	4.18	0.0002
mpctdur	Pooled	Equal	40	-1.38	0.1738
mpctdur	Satterthwaite	Unequal	3.18	-0.84	0.4612
pctdur50	Pooled	Equal	40	-1.35	0.1845
pctdur50	Satterthwaite	Unequal	3.19	-0.82	0.4691

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
dur50	Folded F	3	37	2.42	0.1632
eff50	Folded F	37	3	Infty	<.0001
mdur	Folded F	3	37	2.73	0.1148

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
meff	Folded F	37	3	41.84	0.0102
mpctdur	Folded F	3	37	3.49	0.0500
pctdur50	Folded F	3	37	3.44	0.0529

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
dur50	<50	22	1.6106	1.875	2.1394	0.4588	0.5964	0.8522	0.1271
dur50	>=50	20	2.3988	2.625	2.8512	0.3675	0.4833	0.7059	0.1081
dur50	Diff (1-2)		-1.091	-0.75	-0.409	0.4479	0.5456	0.6981	0.1686
eff50	<50	22	1.7973	2.125	2.4527	0.5686	0.739	1.0561	0.1576
eff50	>=50	20	2.5672	2.8	3.0328	0.3782	0.4974	0.7264	0.1112
eff50	Diff (1-2)		-1.072	-0.675	-0.278	0.522	0.6358	0.8135	0.1964
mdur	<50	22	1.7021	1.9421	2.1822	0.4165	0.5414	0.7737	0.1154
mdur	>=50	20	2.4311	2.606	2.781	0.2843	0.3738	0.546	0.0836
mdur	Diff (1-2)		-0.957	-0.664	-0.371	0.3853	0.4693	0.6005	0.145
meff	<50	22	1.8341	2.137	2.4399	0.5256	0.6832	0.9763	0.1457
meff	>=50	20	2.5045	2.7267	2.9489	0.361	0.4747	0.6934	0.1062
meff	Diff (1-2)		-0.96	-0.59	-0.219	0.4872	0.5934	0.7592	0.1833
mpctdur	<50	22	47.262	56.98	66.698	16.862	21.918	31.322	4.6728
mpctdur	>=50	20	77.065	82.395	87.724	8.6596	11.387	16.631	2.5462
mpctdur	Diff (1-2)		-36.48	-25.41	-14.35	14.543	17.714	22.665	5.4729
pctdur50	<50	22	46.594	57.223	67.852	18.444	23.973	34.259	5.1111
pctdur50	>=50	20	76.511	82.295	88.079	9.3987	12.359	18.051	2.7635
pctdur50	Diff (1-2)		-37.15	-25.07	-12.99	15.883	19.346	24.753	5.9771

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
dur50	Pooled	Equal	40	-4.45	<.0001
dur50	Satterthwaite	Unequal	39.5	-4.49	<.0001
eff50	Pooled	Equal	40	-3.44	0.0014
eff50	Satterthwaite	Unequal	37	-3.50	0.0012
mdur	Pooled	Equal	40	-4.58	<.0001
mdur	Satterthwaite	Unequal	37.4	-4.66	<.0001
meff	Pooled	Equal	40	-3.22	0.0026
meff	Satterthwaite	Unequal	37.5	-3.27	0.0023
mpctdur	Pooled	Equal	40	-4.64	<.0001
mpctdur	Satterthwaite	Unequal	32.2	-4.78	<.0001
pctdur50	Pooled	Equal	40	-4.19	0.0001
pctdur50	Satterthwaite	Unequal	32	-4.32	0.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
dur50	Folded F	21	19	1.52	0.3610
eff50	Folded F	21	19	2.21	0.0879
mdur	Folded F	21	19	2.10	0.1099

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
meff	Folded F	21	19	2.07	0.1160
mpctdur	Folded F	21	19	3.70	0.0058
pctdur50	Folded F	21	19	3.76	0.0053

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	4	-12.2	63.531	139.26	26.962	47.594	177.46	23.797
mneffort	>5	38	20.825	26.856	32.887	14.959	18.349	23.739	2.9766
mneffort	Diff (1-2)		13.367	36.675	59.983	18.012	21.939	28.071	11.532
neff50	<5	4	-12.96	63.654	140.27	27.274	48.146	179.52	24.073
neff50	>5	38	19.952	25.7	31.448	14.256	17.486	22.623	2.8366
neff50	Diff (1-2)		15.25	37.954	60.657	17.545	21.37	27.343	11.233

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	40	3.18	0.0028
mneffort	Satterthwaite	Unequal	3.09	1.53	0.2210
neff50	Pooled	Equal	40	3.38	0.0016
neff50	Satterthwaite	Unequal	3.08	1.57	0.2129

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	3	37	6.73	0.0020
neff50	Folded F	3	37	7.58	0.0009

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	22	16.539	29.274	42.009	22.098	28.722	41.046	6.1236
mneffort	>=50	20	22.714	31.531	40.347	14.327	18.839	27.515	4.2125
mneffort	Diff (1-2)		-17.57	-2.257	13.06	20.139	24.529	31.385	7.5785
neff50	<50	22	15.433	28.362	41.291	22.435	29.161	41.673	6.2172
neff50	>=50	20	22.341	30.363	38.384	13.034	17.139	25.033	3.8324
neff50	Diff (1-2)		-17.12	-2.001	13.115	19.874	24.207	30.973	7.4789

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	40	-0.30	0.7674
mneffort	Satterthwaite	Unequal	36.5	-0.30	0.7632
neff50	Pooled	Equal	40	-0.27	0.7905
neff50	Satterthwaite	Unequal	34.5	-0.27	0.7858

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	21	19	2.32	0.0696
neff50	Folded F	21	19	2.89	0.0234

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	2	-73.92	41.236	156.39	5.7183	12.817	408.99	9.063
mneffort	>5	40	21.919	29.804	37.689	20.197	24.655	31.658	3.8984
mneffort	Diff (1-2)		-24.34	11.432	47.206	20.057	24.429	31.258	17.701
neff50	<5	2	-59.51	40.078	139.66	4.9451	11.084	353.69	7.8375
neff50	>5	40	20.991	28.777	36.562	19.943	24.345	31.26	3.8493
neff50	Diff (1-2)		-24	11.301	46.597	19.789	24.103	30.839	17.464

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	40	0.65	0.5221
mneffort	Satterthwaite	Unequal	1.4	1.16	0.4066
neff50	Pooled	Equal	40	0.65	0.5213
neff50	Satterthwaite	Unequal	1.54	1.29	0.3563

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	39	1	3.70	0.7878
neff50	Folded F	39	1	4.82	0.6971

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	2	-73.92	41.236	156.39	5.7183	12.817	408.99	9.063
mneffort	>5	40	21.919	29.804	37.689	20.197	24.655	31.658	3.8984
mneffort	Diff (1-2)		-24.34	11.432	47.206	20.057	24.429	31.258	17.701
neff50	<5	2	-59.51	40.078	139.66	4.9451	11.084	353.69	7.8375
neff50	>5	40	20.991	28.777	36.562	19.943	24.345	31.26	3.8493
neff50	Diff (1-2)		-24	11.301	46.597	19.789	24.103	30.839	17.464

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	40	0.65	0.5221
mneffort	Satterthwaite	Unequal	1.4	1.16	0.4066
neff50	Pooled	Equal	40	0.65	0.5213
neff50	Satterthwaite	Unequal	1.54	1.29	0.3563

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	39	1	3.70	0.7878
neff50	Folded F	39	1	4.82	0.6971

-- Morbidity1=0 --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	3	-62.79	72.16	207.11	28.284	54.323	341.41	31.364
mneffort	>5	33	19.057	25.963	32.869	15.664	19.477	25.763	3.3906
mneffort	Diff (1-2)		17.967	46.197	74.427	18.633	23.036	30.181	13.891
neff50	<5	3	-66.06	71.795	209.65	28.893	55.493	348.76	32.039
neff50	>5	33	18.25	24.795	31.339	14.843	18.457	24.412	3.2129
neff50	Diff (1-2)		19.55	47	74.451	18.119	22.4	29.348	13.508

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	34	3.33	0.0021
mneffort	Satterthwaite	Unequal	2.05	1.46	0.2780
neff50	Pooled	Equal	34	3.48	0.0014
neff50	Satterthwaite	Unequal	2.04	1.46	0.2795

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	2	32	7.78	0.0035
neff50	Folded F	2	32	9.04	0.0015

-- Morbidity1=1 --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	37.642	.	.	.	.	.
mneffort	>5	5	26.014	32.748	39.481	3.249	5.4229	15.583	2.4252
mneffort	Diff (1-2)		-11.6	4.8941	21.388	3.249	5.4229	15.583	5.9405
neff50	<5	1	.	39.23	.	.	.	.	.
neff50	>5	5	22.736	31.675	40.613	4.3131	7.1989	20.686	3.2194
neff50	Diff (1-2)		-14.34	7.5551	29.45	4.3131	7.1989	20.686	7.886

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	4	0.82	0.4563
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	4	0.96	0.3923
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	4	0	.	.
neff50	Folded F	4	0	.	.

The MEANS Procedure

Analysis Variable : diffsi = msi50 − si50

N	Mean	Std Dev	t Value	Pr > |t|
42	0.0959702	2.2121773	0.28	0.7800

The CORR Procedure

18 Variables: mint mdur meff mpstr mspeed mdurpd mmsi msi int50 dur50 eff50 pstr50 speed50 durpd50 si50 pctdur50 neff50 msi50

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
mint	42	4.15122	2.49437	174.35128	1.00000	9.00000
mdur	42	2.25827	0.57227	94.84726	1.05000	3.00000
meff	42	2.41780	0.65755	101.54762	1.07500	3.00000
mpstr	42	2.55693	0.62759	107.39118	1.00000	3.00000
mspeed	42	1.10714	0.20765	46.50000	1.00000	1.50000
mdurpd	42	0.83333	0.23856	35.00000	0.25000	1.00000
mmsi	42	58.89280	50.32518	2473	1.65000	162.00000
msi	42	59.11002	50.41669	2483	1.67500	162.00000
int50	42	4.13095	2.45213	173.50000	1.00000	9.00000
dur50	42	2.23214	0.65888	93.75000	1.00000	3.00000
eff50	42	2.44643	0.71469	102.75000	1.00000	3.00000
pstr50	42	2.52381	0.67130	106.00000	1.00000	3.00000
speed50	42	1.10714	0.20765	46.50000	1.00000	1.50000
durpd50	42	0.83333	0.23856	35.00000	0.25000	1.00000
si50	42	58.16073	50.02523	2443	1.50000	162.00000
pctdur50	42	69.16189	22.92953	2905	15.47800	100.00000
neff50	42	29.31464	23.93121	1231	6.90250	135.23000

Simple Statistics

Variable	Label
mint	the mean, IntensityofExertion
mdur	the mean, DurationofExertion
meff	the mean, Efforts_Minute
mpstr	the mean, Hand_WristPosture
mspeed	the mean, SpeedofWork
mdurpd	the mean, DurationperDay
mmsi	
msi	the mean, SIScore
int50	the median, IntensityofExertion
dur50	the median, DurationofExertion
eff50	the median, Efforts_Minute
pstr50	the median, Hand_WristPosture
speed50	the median, SpeedofWork
durpd50	the median, DurationperDay
si50	the median, SIScore
pctdur50	the median, pctDurExer
neff50	the median, nEfforts

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
msi50	42	58.25670	50.02110	2447	1.50000	162.00000

Simple Statistics

Variable	Label
msi50	

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	mint	mdur	meff	mpstr	mspeed	mdurpd
mint	1.00000	0.36317	-0.02513	0.02061	-0.00850	0.30109
the mean, IntensityofExertion		0.0181	0.8745	0.8969	0.9574	0.0527
mdur	0.36317	1.00000	0.32125	-0.03481	-0.15815	0.09806
the mean, DurationofExertion	0.0181		0.0380	0.8268	0.3172	0.5367
meff	-0.02513	0.32125	1.00000	-0.09537	-0.17508	-0.09933
the mean, Efforts_Minute	0.8745	0.0380		0.5480	0.2674	0.5314
mpstr	0.02061	-0.03481	-0.09537	1.00000	0.08774	0.19729
the mean, Hand_WristPosture	0.8969	0.8268	0.5480		0.5806	0.2104
mspeed	-0.00850	-0.15815	-0.17508	0.08774	1.00000	0.12309
the mean, SpeedofWork	0.9574	0.3172	0.2674	0.5806		0.4374
mdurpd	0.30109	0.09806	-0.09933	0.19729	0.12309	1.00000
the mean, DurationperDay	0.0527	0.5367	0.5314	0.2104	0.4374	
mmsi	0.80073	0.50702	0.31447	0.23586	0.11102	0.46635
	<.0001	0.0006	0.0425	0.1327	0.4840	0.0019
msi	0.80178	0.50741	0.31448	0.23476	0.11112	0.46747
the mean, SIScore	<.0001	0.0006	0.0425	0.1345	0.4836	0.0018
int50	0.99579	0.36182	-0.04355	0.01499	-0.00428	0.30923
the median, IntensityofExertion	<.0001	0.0185	0.7842	0.9249	0.9786	0.0463
dur50	0.33850	0.96104	0.23541	-0.03864	-0.09709	0.18427
the median, DurationofExertion	0.0283	<.0001	0.1334	0.8080	0.5407	0.2427

The CORR Procedure

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	mint	mdur	meff	mpstr	mspeed	mdurpd
eff50	-0.03992	0.34788	0.96713	-0.06189	-0.20690	-0.10729
the median, Efforts_Minute	0.8018	0.0240	<.0001	0.6970	0.1886	0.4989
pstr50	0.04770	-0.05505	-0.07181	0.97297	0.11248	0.15865
the median, Hand_WristPosture	0.7642	0.7291	0.6513	<.0001	0.4782	0.3156
speed50	-0.00850	-0.15815	-0.17508	0.08774	1.00000	0.12309
the median, SpeedofWork	0.9574	0.3172	0.2674	0.5806	<.0001	0.4374
durpd50	0.30109	0.09806	-0.09933	0.19729	0.12309	1.00000
the median, DurationperDay	0.0527	0.5367	0.5314	0.2104	0.4374	<.0001
si50 (medsi)	0.77444	0.53102	0.31030	0.22376	0.12047	0.49485
the median, SIScore	<.0001	0.0003	0.0455	0.1543	0.4473	0.0009
pctdur50	0.30805	0.96351	0.31986	-0.04975	-0.04812	0.12553
the median, pctDurExer	0.0472	<.0001	0.0389	0.7544	0.7622	0.4283
neff50	-0.26512	0.20169	0.57868	0.02288	-0.16397	-0.39958
the median, nEfforts	0.0897	0.2002	<.0001	0.8856	0.2994	0.0088
msi50	0.77799	0.53991	0.30132	0.22674	0.11947	0.48462
	<.0001	0.0002	0.0525	0.1487	0.4511	0.0011

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	mmsi	msi	int50	dur50	eff50	pstr50
mint	0.80073	0.80178	0.99579	0.33850	-0.03992	0.04770
the mean, IntensityofExertion	<.0001	<.0001	<.0001	0.0283	0.8018	0.7642
mdur	0.50702	0.50741	0.36182	0.96104	0.34788	-0.05505
the mean, DurationofExertion	0.0006	0.0006	0.0185	<.0001	0.0240	0.7291
meff	0.31447	0.31448	-0.04355	0.23541	0.96713	-0.07181
the mean, Efforts_Minute	0.0425	0.0425	0.7842	0.1334	<.0001	0.6513
mpstr	0.23586	0.23476	0.01499	-0.03864	-0.06189	0.97297
the mean, Hand_WristPosture	0.1327	0.1345	0.9249	0.8080	0.6970	<.0001
mspeed	0.11102	0.11112	-0.00428	-0.09709	-0.20690	0.11248
the mean, SpeedofWork	0.4840	0.4836	0.9786	0.5407	0.1886	0.4782

The CORR Procedure

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	mmsi	msi	int50	dur50	eff50	pstr50
mdurpd	0.46635	0.46747	0.30923	0.18427	-0.10729	0.15865
the mean, DurationperDay	0.0019	0.0018	0.0463	0.2427	0.4989	0.3156
mmsi	1.00000	0.99991	0.79713	0.47713	0.29276	0.24863
		<.0001	<.0001	0.0014	0.0599	0.1124
msi	0.99991	1.00000	0.79738	0.47769	0.29352	0.24621
the mean, SIScore	<.0001		<.0001	0.0014	0.0592	0.1160
int50	0.79713	0.79738	1.00000	0.33926	-0.06201	0.04251
the median, IntensityofExertion	<.0001	<.0001		0.0280	0.6965	0.7892
dur50	0.47713	0.47769	0.33926	1.00000	0.27308	-0.04727
the median, DurationofExertion	0.0014	0.0014	0.0280		0.0802	0.7663
eff50	0.29276	0.29352	-0.06201	0.27308	1.00000	-0.02905
the median, Efforts_Minute	0.0599	0.0592	0.6965	0.0802		0.8551
pstr50	0.24863	0.24621	0.04251	-0.04727	-0.02905	1.00000
the median, Hand_WristPosture	0.1124	0.1160	0.7892	0.7663	0.8551	
speed50	0.11102	0.11112	-0.00428	-0.09709	-0.20690	0.11248
the median, SpeedofWork	0.4840	0.4836	0.9786	0.5407	0.1886	0.4782
durpd50	0.46635	0.46747	0.30923	0.18427	-0.10729	0.15865
the median, DurationperDay	0.0019	0.0018	0.0463	0.2427	0.4989	0.3156
si50	0.99129	0.99082	0.77604	0.52070	0.29796	0.24074
the median, SIScore	<.0001	<.0001	<.0001	0.0004	0.0553	0.1246
pctdur50	0.46647	0.46707	0.30532	0.92660	0.34658	-0.07766
the median, pctDurExer	0.0018	0.0018	0.0493	<.0001	0.0245	0.6250
neff50	-0.06647	-0.06739	-0.27741	0.10834	0.55582	0.04502
the median, nEfforts	0.6758	0.6716	0.0753	0.4946	0.0001	0.7771
msi50	0.99008	0.98943	0.77967	0.53290	0.29449	0.24978
	<.0001	<.0001	<.0001	0.0003	0.0583	0.1106

The CORR Procedure

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	speed50	durpd50	si50	pctdur50	neff50	msi50
mint	-0.00850	0.30109	0.77444	0.30805	-0.26512	0.77799
the mean, IntensityofExertion	0.9574	0.0527	<.0001	0.0472	0.0897	<.0001
mdur	-0.15815	0.09806	0.53102	0.96351	0.20169	0.53991
the mean, DurationofExertion	0.3172	0.5367	0.0003	<.0001	0.2002	0.0002
meff	-0.17508	-0.09933	0.31030	0.31986	0.57868	0.30132
the mean, Efforts_Minute	0.2674	0.5314	0.0455	0.0389	<.0001	0.0525
mpstr	0.08774	0.19729	0.22376	-0.04975	0.02288	0.22674
the mean, Hand_WristPosture	0.5806	0.2104	0.1543	0.7544	0.8856	0.1487
mspeed	1.00000	0.12309	0.12047	-0.04812	-0.16397	0.11947
the mean, SpeedofWork	<.0001	0.4374	0.4473	0.7622	0.2994	0.4511
mdurpd	0.12309	1.00000	0.49485	0.12553	-0.39958	0.48462
the mean, DurationperDay	0.4374	<.0001	0.0009	0.4283	0.0088	0.0011
mmsi	0.11102	0.46635	0.99129	0.46647	-0.06647	0.99008
	0.4840	0.0019	<.0001	0.0018	0.6758	<.0001
msi	0.11112	0.46747	0.99082	0.46707	-0.06739	0.98943
the mean, SIScore	0.4836	0.0018	<.0001	0.0018	0.6716	<.0001
int50	-0.00428	0.30923	0.77604	0.30532	-0.27741	0.77967
the median, IntensityofExertion	0.9786	0.0463	<.0001	0.0493	0.0753	<.0001
dur50	-0.09709	0.18427	0.52070	0.92660	0.10834	0.53290
the median, DurationofExertion	0.5407	0.2427	0.0004	<.0001	0.4946	0.0003
eff50	-0.20690	-0.10729	0.29796	0.34658	0.55582	0.29449
the median, Efforts_Minute	0.1886	0.4989	0.0553	0.0245	0.0001	0.0583
pstr50	0.11248	0.15865	0.24074	-0.07766	0.04502	0.24978
the median, Hand_WristPosture	0.4782	0.3156	0.1246	0.6250	0.7771	0.1106
speed50	1.00000	0.12309	0.12047	-0.04812	-0.16397	0.11947
the median, SpeedofWork		0.4374	0.4473	0.7622	0.2994	0.4511
durpd50	0.12309	1.00000	0.49485	0.12553	-0.39958	0.48462
the median, DurationperDay	0.4374		0.0009	0.4283	0.0088	0.0011
si50	0.12047	0.49485	1.00000	0.49037	-0.06619	0.99902
the median, SIScore	0.4473	0.0009		0.0010	0.6771	<.0001

The CORR Procedure

Pearson Correlation Coefficients, N = 42
Prob > |r| under H0: Rho=0

	speed50	durpd50	si50	pctdur50	neff50	msi50
pctdur50	-0.04812	0.12553	0.49037	1.00000	0.22943	0.49734
the median, pctDurExer	0.7622	0.4283	0.0010		0.1439	0.0008
neff50	-0.16397	-0.39958	-0.06619	0.22943	1.00000	-0.06868
the median, nEfforts	0.2994	0.0088	0.6771	0.1439		0.6656
msi50	0.11947	0.48462	0.99902	0.49734	-0.06868	1.00000
	0.4511	0.0011	<.0001	0.0008	0.6656	

The REG Procedure
Model: MODEL1
Dependent Variable: mmsi

Backward Elimination: Step 0

All Variables Entered: R-Square = 0.9051 and C(p) = 7.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	93983	15664	55.63	<.0001
Error	35	9854.17242	281.54778		
Corrected Total	41	103838			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-217.09969	24.08389	22878	81.26	<.0001
mint	13.78732	1.18710	37978	134.89	<.0001
mdur	13.78569	5.29444	1908.83985	6.78	0.0134
meff	26.80400	4.32079	10835	38.48	<.0001
mpstr	16.30015	4.28170	4080.40740	14.49	0.0005
mspeed	38.28327	13.01293	2436.80057	8.66	0.0058
mdurpd	46.50757	11.86968	4322.36437	15.35	0.0004

Bounds on condition number: 1.3368, 42.429

Backward Elimination: Step 1

Statistics for Removal
DF = 1,35

Variable	Partial R-Square	Model R-Square	F Value	Pr > F
mint	0.3657	0.5394	134.89	<.0001
mdur	0.0184	0.8867	6.78	0.0134
meff	0.1043	0.8008	38.48	<.0001
mpstr	0.0393	0.8658	14.49	0.0005
mspeed	0.0235	0.8816	8.66	0.0058
mdurpd	0.0416	0.8635	15.35	0.0004

All variables left in the model are significant at the 0.1000 level.

The REG Procedure
Model: MODEL1
Dependent Variable: msi50

Backward Elimination: Step 0

All Variables Entered: R-Square = 0.8965 and C(p) = 7.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	91973	15329	50.55	<.0001
Error	35	10614	303.24451		
Corrected Total	41	102587			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-208.86132	23.48993	23974	79.06	<.0001
int50	13.35116	1.23525	35426	116.82	<.0001
dur50	15.05512	4.67717	3141.91983	10.36	0.0028
eff50	24.15500	4.11015	10474	34.54	<.0001
pstr50	13.86013	4.13392	3408.82207	11.24	0.0019
speed50	39.34026	13.55260	2555.18226	8.43	0.0064
durpd50	48.87689	12.36201	4740.47761	15.63	0.0004

Bounds on condition number: 1.284, 41.874

Backward Elimination: Step 1

Statistics for Removal
DF = 1,35

Variable	Partial R-Square	Model R-Square	F Value	Pr > F
int50	0.3453	0.5512	116.82	<.0001
dur50	0.0306	0.8659	10.36	0.0028
eff50	0.1021	0.7944	34.54	<.0001
pstr50	0.0332	0.8633	11.24	0.0019
speed50	0.0249	0.8716	8.43	0.0064
durpd50	0.0462	0.8503	15.63	0.0004

All variables left in the model are significant at the 0.1000 level.

The FREQ Procedure

Gender

Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
female	9	30.00	9	30.00
male	21	70.00	30	100.00

Frequency Missing = 1

JobTitle

JobTitle	Frequency	Percent	Cumulative Frequency	Cumulative Percent
assembler	5	38.46	5	38.46
glazier	1	7.69	6	46.15
labourer	1	7.69	7	53.85
material prep	1	7.69	8	61.54
screen special	1	7.69	9	69.23
screener	1	7.69	10	76.92
shipper	1	7.69	11	84.62
utility glass person	1	7.69	12	92.31
welder	1	7.69	13	100.00

Frequency Missing = 18

The FREQ Procedure

Jobname

Jobname	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Tradesman's Choice	1	3.33	1	3.33
applying hinges on jambs	1	3.33	2	6.67
applying swiggle to glass	2	6.67	4	13.33
applying weatherstrip to jambs	1	3.33	5	16.67
brick moulding trim	1	3.33	6	20.00
casement screening	1	3.33	7	23.33
cutting metal clad	1	3.33	8	26.67
edge deleting	1	3.33	9	30.00
frame assembly with door light	1	3.33	10	33.33
glass washing	2	6.67	12	40.00
glazing and insert of peep holes	1	3.33	13	43.33
installing hardware	2	6.67	15	50.00
installing headers	1	3.33	16	53.33
installing pins	1	3.33	17	56.67
installing window into doors	1	3.33	18	60.00
machining door jambs - for striker plate;	1	3.33	19	63.33
making PVC frames	1	3.33	20	66.67
making screens (on tilt)	2	6.67	22	73.33
making screens (patio)	1	3.33	23	76.67
making sills	1	3.33	24	80.00
metal clad preparation - cutting;	1	3.33	25	83.33
priming window jambs	1	3.33	26	86.67
sills in & out swing	1	3.33	27	90.00
weather stripping applied	2	6.67	29	96.67
wrapping slabs	1	3.33	30	100.00

Frequency Missing = 1

Q11

Q11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
B	1	3.70	1	3.70
L	2	7.41	3	11.11
R	24	88.89	27	100.00

Frequency Missing = 4

The FREQ Procedure

Q25HWENDR

Q25HWENDR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	11.54	3	11.54
0.5	1	3.85	4	15.38
2	2	7.69	6	23.08
3	8	30.77	14	53.85
4	5	19.23	19	73.08
5	3	11.54	22	84.62
6	1	3.85	23	88.46
7	3	11.54	26	100.00

Frequency Missing = 5

Q26

Q26	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	15	55.56	15	55.56
2	7	25.93	22	81.48
3	5	18.52	27	100.00

Frequency Missing = 4

Q27

Q27	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	11	40.74	11	40.74
2	10	37.04	21	77.78
3	3	11.11	24	88.89
4	3	11.11	27	100.00

Frequency Missing = 4

The FREQ Procedure

Q28

Q28	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	1	3.70	1	3.70
3	3	11.11	4	14.81
4	23	85.19	27	100.00

Frequency Missing = 4

Q29

Q29	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	3.70	1	3.70
2	8	29.63	9	33.33
3	8	29.63	17	62.96
4	10	37.04	27	100.00

Frequency Missing = 4

Q30

Q30	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	21.05	4	21.05
2	8	42.11	12	63.16
3	4	21.05	16	84.21
4	3	15.79	19	100.00

Frequency Missing = 12

Q31LNa

Q31LNa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	14	100.00	14	100.00

Frequency Missing = 17

The FREQ Procedure

Q31LNb

Q31LNb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.00	5	100.00

Frequency Missing = 26

Q31LNc

Q31LNc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	10	100.00	10	100.00

Frequency Missing = 21

Q31LNd

Q31LNd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LNe

Q31LNe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31RNa

Q31RNa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	11	100.00	11	100.00

Frequency Missing = 20

Q31RNb

Q31RNb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.00	5	100.00

Frequency Missing = 26

Q31RNc

Q31RNc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	11	100.00	11	100.00

Frequency Missing = 20

Q31RNd

Q31RNd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31RNe

Q31RNe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31LSa

Q31LSa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00

Frequency Missing = 19

Q31LSb

Q31LSb	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

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Q31LSc

Q31LSc	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LSd

Q31LSd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LSe

Q31LSe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31RSa

Q31RSa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	100.00	8	100.00

Frequency Missing = 23

Q31RSb

Q31RSb	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31RSc

Q31RSc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	100.00	7	100.00

Frequency Missing = 24

Q31RSd

Q31RSd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31RSe

Q31RSe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31LEa

Q31LEa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	16	100.00	16	100.00

Frequency Missing = 15

Q31LEb

Q31LEb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	100.00	6	100.00

Frequency Missing = 25

Q31LEc

Q31LEc	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LEd

Q31LEd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LEe

Q31LEe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31REa

Q31REa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00

Frequency Missing = 19

Q31REb

Q31REb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	100.00	9	100.00

Frequency Missing = 22

Q31REc

Q31REc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	100.00	2	100.00

Frequency Missing = 29

Q31REd

Q31REd	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	100.00	1	100.00

Frequency Missing = 30

Q31REe

Q31REe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31LFa

Q31LFa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	17	100.00	17	100.00

Frequency Missing = 14

Q31LFb

Q31LFb	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LFc

Q31LFc	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LFd

Q31LFd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LFe

Q31LFe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31RFa

Q31RFa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	100.00	13	100.00

Frequency Missing = 18

Q31RFb

Q31RFb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	100.00	9	100.00

Frequency Missing = 22

Q31RFc

Q31RFc	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31RFd

Q31RFd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31RFe

Q31RFe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31LHWa

Q31LHWa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00

Frequency Missing = 19

Q31LHWb

Q31LHWb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	100.00	8	100.00

Frequency Missing = 23

Q31LHWc

Q31LHWc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	100.00	6	100.00

Frequency Missing = 25

Q31LHWd

Q31LHWd	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q31LHWe

Q31LHWe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q31RHWa

Q31RHWa	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	100.00	8	100.00

Frequency Missing = 23

Q31RHWb

Q31RHWb	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00

Frequency Missing = 19

Q31RHWc

Q31RHWc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	100.00	8	100.00

Frequency Missing = 23

Q31RHWd

Q31RHWd	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	100.00	3	100.00

Frequency Missing = 28

Q31RHWe

Q31RHWe	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32LNBef

Q32LNBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32LNAft

Q32LNAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	100.00	7	100.00

Frequency Missing = 24

Q32LNWork

Q32LNWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	60.00	6	60.00
2	4	40.00	10	100.00

Frequency Missing = 21

Q32RNBef

Q32RNBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32RNAft

Q32RNAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	100.00	9	100.00

Frequency Missing = 22

Q32RNWork

Q32RNWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	58.33	7	58.33
2	5	41.67	12	100.00

Frequency Missing = 19

Q32LSBef

Q32LSBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32LSAft

Q32LSAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32LSWork

Q32LSWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32RSBef

Q32RSBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32RSAft

Q32RSAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	100.00	13	100.00

Frequency Missing = 18

Q32RSWork

Q32RSWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	6.67	1	6.67
1	14	93.33	15	100.00

Frequency Missing = 16

The FREQ Procedure

Q32LEBef

Q32LEBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32LEAft

Q32LEAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.00	5	100.00

Frequency Missing = 26

Q32LEWork

Q32LEWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	16.67	1	16.67
1	5	83.33	6	100.00

Frequency Missing = 25

Q32REBef

Q32REBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32REAft

Q32REAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00

Frequency Missing = 19

Q32REWork

Q32REWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	7.14	1	7.14
1	12	85.71	13	92.86
2	1	7.14	14	100.00

Frequency Missing = 17

Q32LFBef

Q32LFBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32LFAft

Q32LFAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32LFWork

Q32LFWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32RFBef

Q32RFBef	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32RFAft

Q32RFAft	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	11	100.00	11	100.00

Frequency Missing = 20

Q32RFWork

Q32RFWork	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	11	91.67	11	91.67
2	1	8.33	12	100.00

Frequency Missing = 19

The FREQ Procedure

Q32LHWB

Q32LHWB	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

Q32LHWA

Q32LHWA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	100.00	9	100.00

Frequency Missing = 22

Q32LHWW

Q32LHWW	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
1	10	83.33	11	91.67
2	1	8.33	12	100.00

Frequency Missing = 19

Q32RHWB

Q32RHWB	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 31

The FREQ Procedure

Q32RHWA

Q32RHWA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	15	100.00	15	100.00

Frequency Missing = 16

Q32RHWW

Q32RHWW	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	10.53	2	10.53
1	15	78.95	17	89.47
2	2	10.53	19	100.00

Frequency Missing = 12

Q33LNSym

Q33LNSym	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	28.57	4	28.57
1	10	71.43	14	100.00

Frequency Missing = 17

Q33LNFreq

Q33LNFreq	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	30.00	3	30.00
2	2	20.00	5	50.00
3	2	20.00	7	70.00
4	2	20.00	9	90.00
5	1	10.00	10	100.00

Frequency Missing = 21

Subjective Pain

The TTEST Procedure

Statistics

Variable	sa_morb	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
pctdur50	none	17	50.599	62.837	75.075	17.727	23.802	36.226	5.7729
pctdur50	any	23	63.718	73.506	83.293	17.504	22.633	32.033	4.7192
pctdur50	Diff (1-2)		-25.65	-10.67	4.3099	18.905	23.132	29.812	7.3988
neff50	none	17	14.06	29.47	44.88	22.322	29.972	45.615	7.2693
neff50	any	23	20.723	29.48	38.236	15.66	20.249	28.659	4.2222
neff50	Diff (1-2)		-16.08	-0.01	16.056	20.277	24.812	31.977	7.9359

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
pctdur50	Pooled	Equal	38	-1.44	0.1575
pctdur50	Satterthwaite	Unequal	33.6	-1.43	0.1617
neff50	Pooled	Equal	38	-0.00	0.9990
neff50	Satterthwaite	Unequal	26.4	-0.00	0.9991

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
pctdur50	Folded F	16	22	1.11	0.8109
neff50	Folded F	16	22	2.19	0.0884

sa_morb=any

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
dur50	<5	1	.	1	.	.	.	.	.
dur50	>5	22	2.1133	2.3864	2.6594	0.4738	0.6159	0.8802	0.1313
dur50	Diff (1-2)		-2.696	-1.386	-0.077	0.4738	0.6159	0.8802	0.6297
eff50	<5	1	.	3	.	.	.	.	.
eff50	>5	22	2.2055	2.5341	2.8627	0.5702	0.7412	1.0592	0.158
eff50	Diff (1-2)		-1.11	0.4659	2.042	0.5702	0.7412	1.0592	0.7579
mdur	<5	1	.	1.2	.	.	.	.	.
mdur	>5	22	2.1873	2.4176	2.6478	0.3995	0.5193	0.7421	0.1107
mdur	Diff (1-2)		-2.322	-1.218	-0.113	0.3995	0.5193	0.7421	0.5309
meff	<5	1	.	2.75	.	.	.	.	.
meff	>5	22	2.2107	2.5097	2.8088	0.5189	0.6745	0.9639	0.1438
meff	Diff (1-2)		-1.194	0.2403	1.6744	0.5189	0.6745	0.9639	0.6896
mpctdur	<5	1	.	25.391	.	.	.	.	.
mpctdur	>5	22	66.595	75.091	83.587	14.742	19.162	27.384	4.0854
mpctdur	Diff (1-2)		-90.45	-49.7	-8.955	14.742	19.162	27.384	19.593
pctdur50	<5	1	.	26.785	.	.	.	.	.
pctdur50	>5	22	66.457	75.629	84.801	15.916	20.687	29.563	4.4105
pctdur50	Diff (1-2)		-92.83	-48.84	-4.856	15.916	20.687	29.563	21.152

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
dur50	Pooled	Equal	21	-2.20	0.0390
dur50	Satterthwaite	Unequal	0	.	.
eff50	Pooled	Equal	21	0.61	0.5453
eff50	Satterthwaite	Unequal	0	.	.
mdur	Pooled	Equal	21	-2.29	0.0323
mdur	Satterthwaite	Unequal	0	.	.
meff	Pooled	Equal	21	0.35	0.7310
meff	Satterthwaite	Unequal	0	.	.
mpctdur	Pooled	Equal	21	-2.54	0.0192
mpctdur	Satterthwaite	Unequal	0	.	.
pctdur50	Pooled	Equal	21	-2.31	0.0312
pctdur50	Satterthwaite	Unequal	0	.	.

sa_morb=any

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
dur50	Folded F	21	0	.	.
eff50	Folded F	21	0	.	.
mdur	Folded F	21	0	.	.
meff	Folded F	21	0	.	.
mpctdur	Folded F	21	0	.	.
pctdur50	Folded F	21	0	.	.

-- sa_morb=none --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
dur50	<50	12	1.473	1.8125	2.152	0.3785	0.5343	0.9072	0.1542
dur50	>=50	5	2.2447	2.8	3.3553	0.2679	0.4472	1.2851	0.2
dur50	Diff (1-2)		-1.569	-0.987	-0.406	0.3786	0.5126	0.7933	0.2728
eff50	<50	12	1.8111	2.25	2.6889	0.4894	0.6908	1.173	0.1994
eff50	>=50	5	1.2585	2.2	3.1415	0.4543	0.7583	2.179	0.3391
eff50	Diff (1-2)		-0.755	0.05	0.8549	0.5241	0.7095	1.098	0.3776
mdur	<50	12	1.5486	1.8634	2.1783	0.351	0.4955	0.8414	0.1431
mdur	>=50	5	2.1451	2.6533	3.1616	0.2452	0.4093	1.1762	0.1831
mdur	Diff (1-2)		-1.328	-0.79	-0.252	0.3502	0.4741	0.7337	0.2524
meff	<50	12	1.8241	2.2528	2.6815	0.478	0.6747	1.1456	0.1948
meff	>=50	5	1.3318	2.1767	3.0215	0.4077	0.6804	1.9553	0.3043
meff	Diff (1-2)		-0.691	0.0761	0.8433	0.4995	0.6762	1.0466	0.36
mpctdur	<50	12	41.695	54.98	68.265	14.812	20.909	35.501	6.036
mpctdur	>=50	5	68.306	83.049	97.792	7.1137	11.873	34.119	5.3099
mpctdur	Diff (1-2)		-49.54	-28.07	-6.596	13.981	18.926	29.292	10.074
pctdur50	<50	12	39.916	54.492	69.067	16.251	22.94	38.949	6.6222
pctdur50	>=50	5	69.927	82.867	95.807	6.2437	10.421	29.946	4.6605
pctdur50	Diff (1-2)		-51.48	-28.38	-5.266	15.046	20.368	31.524	10.842

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
dur50	Pooled	Equal	15	-3.62	0.0025
dur50	Satterthwaite	Unequal	9.01	-3.91	0.0036
eff50	Pooled	Equal	15	0.13	0.8964
eff50	Satterthwaite	Unequal	6.94	0.13	0.9025
mdur	Pooled	Equal	15	-3.13	0.0069
mdur	Satterthwaite	Unequal	9.14	-3.40	0.0077
meff	Pooled	Equal	15	0.21	0.8354
meff	Satterthwaite	Unequal	7.49	0.21	0.8388
mpctdur	Pooled	Equal	15	-2.79	0.0138
mpctdur	Satterthwaite	Unequal	13.1	-3.49	0.0039
pctdur50	Pooled	Equal	15	-2.62	0.0194
pctdur50	Satterthwaite	Unequal	14.7	-3.50	0.0033

-- sa_morb=none --

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
dur50	Folded F	11	4	1.43	0.7848
eff50	Folded F	4	11	1.20	0.7254
mdur	Folded F	11	4	1.47	0.7627
meff	Folded F	4	11	1.02	0.8804
mpctdur	Folded F	11	4	3.10	0.2857
pctdur50	Folded F	11	4	4.85	0.1409

-- sa_morb=any --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
dur50	<50	10	1.4599	1.95	2.4401	0.4713	0.6852	1.2508	0.2167
dur50	>=50	13	2.3094	2.6154	2.9214	0.3631	0.5064	0.8359	0.1404
dur50	Diff (1-2)		-1.181	-0.665	-0.15	0.4537	0.5897	0.8427	0.248
eff50	<50	10	1.4004	1.975	2.5496	0.5525	0.8032	1.4663	0.254
eff50	>=50	13	3	3	3	.	0	.	0
eff50	Diff (1-2)		-1.485	-1.025	-0.565	0.4045	0.5258	0.7514	0.2212
mdur	<50	10	1.604	2.0366	2.4691	0.4159	0.6046	1.1038	0.1912
mdur	>=50	13	2.3774	2.617	2.8566	0.2843	0.3965	0.6545	0.11
mdur	Diff (1-2)		-1.015	-0.58	-0.146	0.382	0.4965	0.7095	0.2088
meff	<50	10	1.4956	1.998	2.5004	0.4831	0.7023	1.2822	0.2221
meff	>=50	13	2.8196	2.9219	3.0242	0.1214	0.1693	0.2795	0.047
meff	Diff (1-2)		-1.341	-0.924	-0.506	0.3672	0.4773	0.682	0.2007
mpctdur	<50	10	42.229	59.38	76.531	16.491	23.975	43.769	7.5816
mpctdur	>=50	13	76.264	83.354	90.444	8.4131	11.732	19.367	3.254
mpctdur	Diff (1-2)		-39.74	-23.97	-8.205	13.87	18.028	25.763	7.5829
pctdur50	<50	10	41.902	60.5	79.098	17.883	25.998	47.463	8.2214
pctdur50	>=50	13	75.34	83.51	91.68	9.695	13.52	22.318	3.7498
pctdur50	Diff (1-2)		-40.38	-23.01	-5.644	15.274	19.853	28.371	8.3505

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
dur50	Pooled	Equal	21	-2.68	0.0139
dur50	Satterthwaite	Unequal	16	-2.58	0.0202
eff50	Pooled	Equal	21	-4.63	0.0001
eff50	Satterthwaite	Unequal	9	-4.04	0.0029
mdur	Pooled	Equal	21	-2.78	0.0112
mdur	Satterthwaite	Unequal	14.7	-2.63	0.0191
meff	Pooled	Equal	21	-4.60	0.0002
meff	Satterthwaite	Unequal	9.81	-4.07	0.0023
mpctdur	Pooled	Equal	21	-3.16	0.0047
mpctdur	Satterthwaite	Unequal	12.3	-2.91	0.0129
pctdur50	Pooled	Equal	21	-2.76	0.0119
pctdur50	Satterthwaite	Unequal	12.7	-2.55	0.0247

-- sa_morb=any --

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
dur50	Folded F	9	12	1.83	0.3254
eff50	Folded F	9	12	Infty	<.0001
mdur	Folded F	9	12	2.33	0.1743
meff	Folded F	9	12	17.21	<.0001
mpctdur	Folded F	9	12	4.18	0.0243
pctdur50	Folded F	9	12	3.70	0.0384

sa_morb=none

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	3	-56.1	73.983	204.07	27.265	52.367	329.11	30.234
mneffort	>5	14	14.806	20.585	26.363	7.2554	10.008	16.123	2.6748
mneffort	Diff (1-2)		24.554	53.398	82.242	15.713	21.271	32.921	13.533
neff50	<5	3	-57.77	74.125	206.02	27.645	53.096	333.7	30.655
neff50	>5	14	13.76	19.901	26.042	7.7104	10.636	17.135	2.8425
neff50	Diff (1-2)		24.703	54.224	83.745	16.082	21.77	33.693	13.85

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	3.95	0.0013
mneffort	Satterthwaite	Unequal	2.03	1.76	0.2187
neff50	Pooled	Equal	15	3.92	0.0014
neff50	Satterthwaite	Unequal	2.03	1.76	0.2181

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	2	13	27.38	<.0001
neff50	Folded F	2	13	24.92	<.0001

sa_morb=any

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	32.173	.	.	.	.	.
mneffort	>5	22	20.971	30.765	40.559	16.995	22.09	31.568	4.7096
mneffort	Diff (1-2)		-45.56	1.4082	48.379	16.995	22.09	31.568	22.586
neff50	<5	1	.	32.24	.	.	.	.	.
neff50	>5	22	20.169	29.354	38.539	15.938	20.716	29.605	4.4167
neff50	Diff (1-2)		-41.16	2.8858	46.936	15.938	20.716	29.605	21.182

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	0.06	0.9509
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	21	0.14	0.8929
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	21	0	.	.
neff50	Folded F	21	0	.	.

sa_morb=none

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	12	12.739	34.399	56.059	24.149	34.09	57.881	9.841
mneffort	>=50	5	9.4372	19.47	29.502	4.8409	8.0798	23.218	3.6134
mneffort	Diff (1-2)		-18.53	14.93	48.387	21.784	29.49	45.641	15.697
neff50	<50	12	11.35	33.526	55.702	24.724	34.902	59.259	10.075
neff50	>=50	5	8.9428	19.735	30.527	5.2073	8.6914	24.975	3.8869
neff50	Diff (1-2)		-20.5	13.791	48.081	22.326	30.223	46.777	16.088

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	0.95	0.3566
mneffort	Satterthwaite	Unequal	13.5	1.42	0.1771
neff50	Pooled	Equal	15	0.86	0.4048
neff50	Satterthwaite	Unequal	13.7	1.28	0.2228

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	11	4	17.80	0.0135
neff50	Folded F	11	4	16.13	0.0163

sa_morb=any

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	10	8.3332	23.124	37.915	14.222	20.676	37.746	6.5383
mneffort	>=50	13	23.989	36.751	49.513	15.144	21.119	34.862	5.8574
mneffort	Diff (1-2)		-31.94	-13.63	4.6816	16.103	20.93	29.911	8.8038
neff50	<50	10	7.5551	22.165	36.775	14.048	20.423	37.285	6.4584
neff50	>=50	13	23.641	35.106	46.572	13.606	18.973	31.32	5.2623
neff50	Diff (1-2)		-30.09	-12.94	4.2103	15.085	19.608	28.021	8.2475

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	-1.55	0.1366
mneffort	Satterthwaite	Unequal	19.7	-1.55	0.1365
neff50	Pooled	Equal	21	-1.57	0.1316
neff50	Satterthwaite	Unequal	18.7	-1.55	0.1371

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	12	9	1.04	0.9711
neff50	Folded F	9	12	1.16	0.7938

Obs	Person	Job	Hand	medsi	sa_m_ps	sa_m_nt	sa_morb
1	M-1	1	R	13.500	1	0	1
2	M-10	10	L	40.500	0	0	0
3	M-10	10	R	121.500	0	0	0
4	M-11	11	R	27.000	0	0	0
5	M-12	12	R	54.000	0	0	0
6	M-13	13	R	27.000	3	0	3
7	M-13	14	R	121.500	3	0	3
8	M-14	15	R	27.000	1	0	1
9	M-14	16	R	81.000	1	0	1
10	M-15	7	L	67.500	2	0	2
11	M-15	7	R	27.000	2	0	2
12	M-16	16	R	81.000	0	1	1
13	M-17	17	L	81.000	0	0	0
14	M-18	18	R	30.000	3	0	3
15	M-19	19	R	121.500	1	0	1
16	M-2	2	L	162.000	1	0	1
17	M-2	2	R	81.000	1	0	1
18	M-20	18	L	54.000	0	0	0
19	M-20	18	R	18.000	0	0	0
20	M-21	20	R	81.000	2	0	2
21	M-22	21	L	12.000	0	0	0
22	M-23	22	R	60.750	0	0	0
23	M-24	23	L	15.188	0	0	0
24	M-24	23	R	30.375	0	0	0
25	M-24	24	L	6.750	0	0	0
26	M-24	25	R	4.500	0	0	0
27	M-24	26	L	4.500	0	0	0
28	M-25	27	R	81.000	1	0	1
29	M-25	28	R	36.000	1	0	1
30	M-26	29	R	108.000	2	0	2
31	M-26	30	R	121.500	2	0	2
32	M-26	31	R	121.500	2	0	2
33	M-27	19	R	81.000	3	0	3
34	M-28	32	L	162.000	0	0	0
35	M-28	32	R	162.000	0	0	0
36	M-29	33	R	9.000	5	1	6
37	M-3	3	R	22.500	0	0	0
38	M-30	1	L	6.750	0	0	0
39	M-30	1	R	6.750	0	0	0
40	M-4	4	L	60.750	1	0	1
41	M-4	4	R	20.250	1	0	1
42	M-5	5	R	48.000	0	0	0
43	M-6	6	L	4.500	0	0	0
44	M-6	6	R	1.500	3	2	5
45	M-7	7	L	36.000	0	0	0
46	M-7	7	R	9.000	0	0	0
47	M-8	8	R	27.000	0	0	0
48	M-9	9	R	162.000	2	0	2

The TTEST Procedure

Statistics

Variable	sa_m_ps	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
medsi	none	25	24.796	43.823	62.849	35.99	46.093	64.122	9.2185
medsi	any	23	50.386	71.413	92.44	37.606	48.624	68.821	10.139
medsi	Diff (1-2)		-55.11	-27.59	-0.07	39.322	47.32	59.434	13.672

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
medsi	Pooled	Equal	46	-2.02	0.0494
medsi	Satterthwaite	Unequal	45.1	-2.01	0.0501

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
medsi	Folded F	22	24	1.11	0.7951

The FREQ Procedure

Statistics for Table of medsi by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	1.0909	0.2963
Likelihood Ratio Chi-Square	1	1.1374	0.2862
Continuity Adj. Chi-Square	1	0.2727	0.6015
Mantel-Haenszel Chi-Square	1	1.0682	0.3014
Phi Coefficient		0.1508	
Contingency Coefficient		0.1491	
Cramer's V		0.1508	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	3
Left-sided Pr <= F	0.9454
Right-sided Pr >= F	0.3043
Table Probability (P)	0.2496
Two-sided Pr <= P	0.6085

The FREQ Procedure

Statistics for Table of medsi by sa_morb

Statistic	Value	ASE
Gamma	0.5333	0.4270
Kendall's Tau-b	0.1508	0.1309
Stuart's Tau-c	0.0833	0.0789
Somers' D C|R	0.2727	0.2292
Somers' D R|C	0.0833	0.0789
Pearson Correlation	0.1508	0.1309
Spearman Correlation	0.1508	0.1309
Lambda Asymmetric C|R	0.0833	0.2646
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0714	0.2283
Uncertainty Coefficient C|R	0.0171	0.0309
Uncertainty Coefficient R|C	0.0413	0.0726
Uncertainty Coefficient Symmetric	0.0242	0.0432

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	3.2857	0.3168	34.0828
Cohort (Col1 Risk)	1.5714	0.8247	2.9945
Cohort (Col2 Risk)	0.4783	0.0856	2.6727

Sample Size = 48

The FREQ Procedure

Summary Statistics for medsi by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	1.0682	0.3014
2	Row Mean Scores Differ	1	1.0682	0.3014
3	General Association	1	1.0682	0.3014

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	3.2857	0.3168	34.0828
(Odds Ratio)	Logit	3.2857	0.3168	34.0828
Cohort	Mantel-Haenszel	1.5714	0.8247	2.9945
(Col1 Risk)	Logit	1.5714	0.8247	2.9945
Cohort	Mantel-Haenszel	0.4783	0.0856	2.6727
(Col2 Risk)	Logit	0.4783	0.0856	2.6727

Total Sample Size = 48

Table of sigtmed by sa_morb

sigtmed / Frequency / Row Pct / Col Pct	sa_morb: none	any	Total
0	15	9	24
	62.50	37.50	
	62.50	37.50	
1	9	15	24
	37.50	62.50	
	37.50	62.50	
Total	24	24	48

The FREQ Procedure

Statistics for Table of sigtmed by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	3.0000	0.0833
Likelihood Ratio Chi-Square	1	3.0321	0.0816
Continuity Adj. Chi-Square	1	2.0833	0.1489
Mantel-Haenszel Chi-Square	1	2.9375	0.0865
Phi Coefficient		0.2500	
Contingency Coefficient		0.2425	
Cramer's V		0.2500	

Fisher's Exact Test

Cell (1,1) Frequency (F)	15
Left-sided Pr <= F	0.9789
Right-sided Pr >= F	0.0741
Table Probability (P)	0.0530
Two-sided Pr <= P	0.1482

The FREQ Procedure

Statistics for Table of sigtmed by sa_morb

Statistic	Value	ASE
Gamma	0.4706	0.2321
Kendall's Tau-b	0.2500	0.1398
Stuart's Tau-c	0.2500	0.1398
Somers' D C|R	0.2500	0.1398
Somers' D R|C	0.2500	0.1398
Pearson Correlation	0.2500	0.1398
Spearman Correlation	0.2500	0.1398
Lambda Asymmetric C|R	0.2500	0.1768
Lambda Asymmetric R|C	0.2500	0.1768
Lambda Symmetric	0.2500	0.1639
Uncertainty Coefficient C|R	0.0456	0.0515
Uncertainty Coefficient R|C	0.0456	0.0515
Uncertainty Coefficient Symmetric	0.0456	0.0515

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	2.7778	0.8633	8.9383
Cohort (Col1 Risk)	1.6667	0.9126	3.0440
Cohort (Col2 Risk)	0.6000	0.3285	1.0958

Sample Size = 48

The FREQ Procedure

Summary Statistics for sigtmed by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	2.9375	0.0865
2	Row Mean Scores Differ	1	2.9375	0.0865
3	General Association	1	2.9375	0.0865

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	2.7778	0.8633	8.9383
(Odds Ratio)	Logit	2.7778	0.8633	8.9383
Cohort	Mantel-Haenszel	1.6667	0.9126	3.0440
(Col1 Risk)	Logit	1.6667	0.9126	3.0440
Cohort	Mantel-Haenszel	0.6000	0.3285	1.0958
(Col2 Risk)	Logit	0.6000	0.3285	1.0958

Total Sample Size = 48

Table of sigt3q by sa_morb

sigt3q / sa_morb Frequency Row Pct Col Pct	none	any	Total
0	20 64.52 83.33	11 35.48 45.83	31
1	4 23.53 16.67	13 76.47 54.17	17
Total	24	24	48

The FREQ Procedure

Statistics for Table of sigt3q by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	7.3776	0.0066
Likelihood Ratio Chi-Square	1	7.6677	0.0056
Continuity Adj. Chi-Square	1	5.8292	0.0158
Mantel-Haenszel Chi-Square	1	7.2239	0.0072
Phi Coefficient		0.3920	
Contingency Coefficient		0.3650	
Cramer's V		0.3920	

Fisher's Exact Test

Cell (1,1) Frequency (F)	20
Left-sided Pr <= F	0.9990
Right-sided Pr >= F	0.0073
Table Probability (P)	0.0062
Two-sided Pr <= P	0.0145

The FREQ Procedure

Statistics for Table of sigt3q by sa_morb

Statistic	Value	ASE
Gamma	0.7105	0.1693
Kendall's Tau-b	0.3920	0.1294
Stuart's Tau-c	0.3750	0.1270
Somers' D C|R	0.4099	0.1340
Somers' D R|C	0.3750	0.1270
Pearson Correlation	0.3920	0.1294
Spearman Correlation	0.3920	0.1294
Lambda Asymmetric C|R	0.3750	0.1358
Lambda Asymmetric R|C	0.1176	0.2707
Lambda Symmetric	0.2683	0.1758
Uncertainty Coefficient C|R	0.1152	0.0790
Uncertainty Coefficient R|C	0.1229	0.0836
Uncertainty Coefficient Symmetric	0.1189	0.0811

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	5.9091	1.5464	22.5802
Cohort (Col1 Risk)	2.7419	1.1194	6.7162
Cohort (Col2 Risk)	0.4640	0.2696	0.7986

Sample Size = 48

The FREQ Procedure

Summary Statistics for sigt3q by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	7.2239	0.0072
2	Row Mean Scores Differ	1	7.2239	0.0072
3	General Association	1	7.2239	0.0072

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	5.9091	1.5464	22.5802
(Odds Ratio)	Logit	5.9091	1.5464	22.5802
Cohort	Mantel-Haenszel	2.7419	1.1194	6.7162
(Col1 Risk)	Logit	2.7419	1.1194	6.7162
Cohort	Mantel-Haenszel	0.4640	0.2696	0.7986
(Col2 Risk)	Logit	0.4640	0.2696	0.7986

Total Sample Size = 48

The FREQ Procedure

Statistics for Table of medsi by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	1.0909	0.2963
Likelihood Ratio Chi-Square	1	1.1374	0.2862
Continuity Adj. Chi-Square	1	0.2727	0.6015
Mantel-Haenszel Chi-Square	1	1.0682	0.3014
Phi Coefficient		0.1508	
Contingency Coefficient		0.1491	
Cramer's V		0.1508	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	3
Left-sided Pr <= F	0.9454
Right-sided Pr >= F	0.3043
Table Probability (P)	0.2496
Two-sided Pr <= P	0.6085

The FREQ Procedure

Statistics for Table of medsi by sa_morb

Statistic	Value	ASE
Gamma	0.5333	0.4270
Kendall's Tau-b	0.1508	0.1309
Stuart's Tau-c	0.0833	0.0789
Somers' D C|R	0.2727	0.2292
Somers' D R|C	0.0833	0.0789
Pearson Correlation	0.1508	0.1309
Spearman Correlation	0.1508	0.1309
Lambda Asymmetric C|R	0.0833	0.2646
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0714	0.2283
Uncertainty Coefficient C|R	0.0171	0.0309
Uncertainty Coefficient R|C	0.0413	0.0726
Uncertainty Coefficient Symmetric	0.0242	0.0432

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	3.2857	0.3168	34.0828
Cohort (Col1 Risk)	1.5714	0.8247	2.9945
Cohort (Col2 Risk)	0.4783	0.0856	2.6727

Sample Size = 48

The FREQ Procedure

Summary Statistics for medsi by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	1.0682	0.3014
2	Row Mean Scores Differ	1	1.0682	0.3014
3	General Association	1	1.0682	0.3014

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	3.2857	0.3168	34.0828
(Odds Ratio)	Logit	3.2857	0.3168	34.0828
Cohort	Mantel-Haenszel	1.5714	0.8247	2.9945
(Col1 Risk)	Logit	1.5714	0.8247	2.9945
Cohort	Mantel-Haenszel	0.4783	0.0856	2.6727
(Col2 Risk)	Logit	0.4783	0.0856	2.6727

Total Sample Size = 48

Table of sigtmed by sa_morb

sigtmed sa_morb

Frequency / Row Pct / Col Pct	none	any	Total
0	16	9	25
	64.00	36.00	
	66.67	37.50	
1	8	15	23
44.25	34.78	65.22	
	33.33	62.50	
Total	24	24	48

The FREQ Procedure

Statistics for Table of sigtmed by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	4.0904	0.0431
Likelihood Ratio Chi-Square	1	4.1511	0.0416
Continuity Adj. Chi-Square	1	3.0052	0.0830
Mantel-Haenszel Chi-Square	1	4.0052	0.0454
Phi Coefficient		0.2919	
Contingency Coefficient		0.2802	
Cramer's V		0.2919	

Fisher's Exact Test

Cell (1,1) Frequency (F)	16
Left-sided Pr <= F	0.9901
Right-sided Pr >= F	0.0410
Table Probability (P)	0.0311
Two-sided Pr <= P	0.0820

The FREQ Procedure

Statistics for Table of sigtmed by sa_morb

Statistic	Value	ASE
Gamma	0.5385	0.2146
Kendall's Tau-b	0.2919	0.1380
Stuart's Tau-c	0.2917	0.1379
Somers' D C|R	0.2922	0.1381
Somers' D R|C	0.2917	0.1379
Pearson Correlation	0.2919	0.1380
Spearman Correlation	0.2919	0.1380
Lambda Asymmetric C|R	0.2917	0.1682
Lambda Asymmetric R|C	0.2609	0.1831
Lambda Symmetric	0.2766	0.1636
Uncertainty Coefficient C|R	0.0624	0.0599
Uncertainty Coefficient R|C	0.0625	0.0600
Uncertainty Coefficient Symmetric	0.0624	0.0599

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	3.3333	1.0196	10.8976
Cohort (Col1 Risk)	1.8400	0.9779	3.4622
Cohort (Col2 Risk)	0.5520	0.3024	1.0077

Sample Size = 48

The FREQ Procedure

Summary Statistics for sigtmed by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	4.0052	0.0454
2	Row Mean Scores Differ	1	4.0052	0.0454
3	General Association	1	4.0052	0.0454

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	3.3333	1.0196	10.8976
(Odds Ratio)	Logit	3.3333	1.0196	10.8976
Cohort	Mantel-Haenszel	1.8400	0.9779	3.4622
(Col1 Risk)	Logit	1.8400	0.9779	3.4622
Cohort	Mantel-Haenszel	0.5520	0.3024	1.0077
(Col2 Risk)	Logit	0.5520	0.3024	1.0077

Total Sample Size = 48

Table of sigt3q by sa_morb

sigt3q / sa_morb (Frequency, Row Pct, Col Pct)	none	any	Total
0	20	11	31
	64.52	35.48	
	83.33	45.83	
1	4	13	17
	23.53	76.47	
	16.67	54.17	
Total	24	24	48

The FREQ Procedure

Statistics for Table of sigt3q by sa_morb

Statistic	DF	Value	Prob
Chi-Square	1	7.3776	0.0066
Likelihood Ratio Chi-Square	1	7.6677	0.0056
Continuity Adj. Chi-Square	1	5.8292	0.0158
Mantel-Haenszel Chi-Square	1	7.2239	0.0072
Phi Coefficient		0.3920	
Contingency Coefficient		0.3650	
Cramer's V		0.3920	

Fisher's Exact Test

Cell (1,1) Frequency (F)	20
Left-sided Pr <= F	0.9990
Right-sided Pr >= F	0.0073
Table Probability (P)	0.0062
Two-sided Pr <= P	0.0145

The FREQ Procedure

Statistics for Table of sigt3q by sa_morb

Statistic	Value	ASE
Gamma	0.7105	0.1693
Kendall's Tau-b	0.3920	0.1294
Stuart's Tau-c	0.3750	0.1270
Somers' D C|R	0.4099	0.1340
Somers' D R|C	0.3750	0.1270
Pearson Correlation	0.3920	0.1294
Spearman Correlation	0.3920	0.1294
Lambda Asymmetric C|R	0.3750	0.1358
Lambda Asymmetric R|C	0.1176	0.2707
Lambda Symmetric	0.2683	0.1758
Uncertainty Coefficient C|R	0.1152	0.0790
Uncertainty Coefficient R|C	0.1229	0.0836
Uncertainty Coefficient Symmetric	0.1189	0.0811

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	5.9091	1.5464	22.5802
Cohort (Col1 Risk)	2.7419	1.1194	6.7162
Cohort (Col2 Risk)	0.4640	0.2696	0.7986

Sample Size = 48

The FREQ Procedure

Summary Statistics for sigt3q by sa_morb

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	7.2239	0.0072
2	Row Mean Scores Differ	1	7.2239	0.0072
3	General Association	1	7.2239	0.0072

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	5.9091	1.5464	22.5802
(Odds Ratio)	Logit	5.9091	1.5464	22.5802
Cohort	Mantel-Haenszel	2.7419	1.1194	6.7162
(Col1 Risk)	Logit	2.7419	1.1194	6.7162
Cohort	Mantel-Haenszel	0.4640	0.2696	0.7986
(Col2 Risk)	Logit	0.4640	0.2696	0.7986

Total Sample Size = 48

Morbidity1=0

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	21	15.507	28.876	42.244	22.469	29.369	42.411	6.4089
mneffort	>=50	15	19.087	31.125	43.163	15.915	21.738	34.283	5.6127
mneffort	Diff (1-2)		-20.45	-2.249	15.953	21.431	26.495	34.713	8.9568
neff50	<50	21	14.29	27.844	41.399	22.782	29.777	43.001	6.498
neff50	>=50	15	19.087	29.925	40.763	14.329	19.571	30.866	5.0533
neff50	Diff (1-2)		-19.99	-2.081	15.826	21.082	26.063	34.148	8.8111

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	34	-0.25	0.8032
mneffort	Satterthwaite	Unequal	33.9	-0.26	0.7934
neff50	Pooled	Equal	34	-0.24	0.8147
neff50	Satterthwaite	Unequal	33.8	-0.25	0.8020

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	20	14	1.83	0.2522
neff50	Folded F	20	14	2.31	0.1123

Morbidity1=1

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	1	.	37.642	.	.	.	.	.
mneffort	>=50	5	26.014	32.748	39.481	3.249	5.4229	15.583	2.4252
mneffort	Diff (1-2)		-11.6	4.8941	21.388	3.249	5.4229	15.583	5.9405
neff50	<50	1	.	39.23	.	.	.	.	.
neff50	>=50	5	22.736	31.675	40.613	4.3131	7.1989	20.686	3.2194
neff50	Diff (1-2)		-14.34	7.5551	29.45	4.3131	7.1989	20.686	7.886

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	4	0.82	0.4563
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	4	0.96	0.3923
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	4	0	.	.
neff50	Folded F	4	0	.	.

-- Morbidity1=0 --

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	23	16.206	28.341	40.476	21.703	28.062	39.718	5.8513
mneffort	>=50	13	18.407	32.416	46.424	16.623	23.181	38.266	6.4294
mneffort	Diff (1-2)		-22.72	-4.074	14.572	21.389	26.443	34.645	9.1753
neff50	<50	23	15.108	27.407	39.706	21.996	28.441	40.254	5.9304
neff50	>=50	13	18.404	31.019	43.635	14.97	20.876	34.461	5.7901
neff50	Diff (1-2)		-21.96	-3.612	14.739	21.05	26.024	34.096	9.0299

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	34	-0.44	0.6598
mneffort	Satterthwaite	Unequal	29.2	-0.47	0.6428
neff50	Pooled	Equal	34	-0.40	0.6916
neff50	Satterthwaite	Unequal	31.5	-0.44	0.6659

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	22	12	1.47	0.4991
neff50	Folded F	22	12	1.86	0.2682

-- Morbidity1=1 --

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	1	.	37.642	.	.	.	.	.
mneffort	>=50	5	26.014	32.748	39.481	3.249	5.4229	15.583	2.4252
mneffort	Diff (1-2)		-11.6	4.8941	21.388	3.249	5.4229	15.583	5.9405
neff50	<50	1	.	39.23	.	.	.	.	.
neff50	>=50	5	22.736	31.675	40.613	4.3131	7.1989	20.686	3.2194
neff50	Diff (1-2)		-14.34	7.5551	29.45	4.3131	7.1989	20.686	7.886

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	4	0.82	0.4563
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	4	0.96	0.3923
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	4	0	.	.
neff50	Folded F	4	0	.	.

Morbidity1=0 mmsi=<5

The MEANS Procedure

Variable	Label	N	Mean	Std Dev	Std Error
mneffort	the mean, nEfforts	2	41.2360000	12.8170175	9.0630000
neff50	the median, nEfforts	2	40.0775000	11.0838988	7.8375000
mpctdur	the mean, pctDurExer	2	62.6953000	52.7568127	37.3047000
pctdur50	the median, pctDurExer	2	63.3925000	51.7708230	36.6075000

Morbidity1=0 mmsi=>5

Variable	Label	N	Mean	Std Dev	Std Error
mneffort	the mean, nEfforts	34	29.1407549	26.6687117	4.5736463
neff50	the median, nEfforts	34	28.0428088	26.2492890	4.5017159
mpctdur	the mean, pctDurExer	34	68.6032528	19.4645998	3.3381513
pctdur50	the median, pctDurExer	34	68.8931912	20.6950335	3.5491690

Morbidity1=1 mmsi=>5

Variable	Label	N	Mean	Std Dev	Std Error
mneffort	the mean, nEfforts	6	33.5635581	5.2458021	2.1415897
neff50	the median, nEfforts	6	32.9340833	7.1394917	2.9146853
mpctdur	the mean, pctDurExer	6	73.9251621	27.5754929	11.2576478
pctdur50	the median, pctDurExer	6	72.6076667	30.3394812	12.3860413

-------------------------------------- Morbidity1=0 --------------------------------------

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	2	-73.92	41.236	156.39	5.7183	12.817	408.99	9.063
mneffort	>5	34	19.836	29.141	38.446	21.51	26.669	35.103	4.5736
mneffort	Diff (1-2)		-26.89	12.095	51.081	21.326	26.365	34.544	19.184
neff50	<5	2	-59.51	40.078	139.66	4.9451	11.084	353.69	7.8375
neff50	>5	34	18.884	28.043	37.202	21.172	26.249	34.551	4.5017
neff50	Diff (1-2)		-26.31	12.035	50.377	20.974	25.93	33.974	18.867

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	34	0.63	0.5326
mneffort	Satterthwaite	Unequal	1.57	1.19	0.3828
neff50	Pooled	Equal	34	0.64	0.5278
neff50	Satterthwaite	Unequal	1.76	1.33	0.3292

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	33	1	4.33	0.7321
neff50	Folded F	33	1	5.61	0.6488

-------------------------------------- Morbidity1=0 --------------------------------------

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	2	-73.92	41.236	156.39	5.7183	12.817	408.99	9.063
mneffort	>5	34	19.836	29.141	38.446	21.51	26.669	35.103	4.5736
mneffort	Diff (1-2)		-26.89	12.095	51.081	21.326	26.365	34.544	19.184
neff50	<5	2	-59.51	40.078	139.66	4.9451	11.084	353.69	7.8375
neff50	>5	34	18.884	28.043	37.202	21.172	26.249	34.551	4.5017
neff50	Diff (1-2)		-26.31	12.035	50.377	20.974	25.93	33.974	18.867

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	34	0.63	0.5326
mneffort	Satterthwaite	Unequal	1.57	1.19	0.3828
neff50	Pooled	Equal	34	0.64	0.5278
neff50	Satterthwaite	Unequal	1.76	1.33	0.3292

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	33	1	4.33	0.7321
neff50	Folded F	33	1	5.61	0.6488

-- sa_morb=none --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	3	-56.1	73.983	204.07	27.265	52.367	329.11	30.234
mneffort	>5	14	14.806	20.585	26.363	7.2554	10.008	16.123	2.6748
mneffort	Diff (1-2)		24.554	53.398	82.242	15.713	21.271	32.921	13.533
neff50	<5	3	-57.77	74.125	206.02	27.645	53.096	333.7	30.655
neff50	>5	14	13.76	19.901	26.042	7.7104	10.636	17.135	2.8425
neff50	Diff (1-2)		24.703	54.224	83.745	16.082	21.77	33.693	13.85

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	3.95	0.0013
mneffort	Satterthwaite	Unequal	2.03	1.76	0.2187
neff50	Pooled	Equal	15	3.92	0.0014
neff50	Satterthwaite	Unequal	2.03	1.76	0.2181

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	2	13	27.38	<.0001
neff50	Folded F	2	13	24.92	<.0001

-- sa_morb=any --

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	32.173	.	.	.	.	.
mneffort	>5	22	20.971	30.765	40.559	16.995	22.09	31.568	4.7096
mneffort	Diff (1-2)		-45.56	1.4082	48.379	16.995	22.09	31.568	22.586
neff50	<5	1	.	32.24	.	.	.	.	.
neff50	>5	22	20.169	29.354	38.539	15.938	20.716	29.605	4.4167
neff50	Diff (1-2)		-41.16	2.8858	46.936	15.938	20.716	29.605	21.182

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	0.06	0.9509
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	21	0.14	0.8929
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	21	0	.	.
neff50	Folded F	21	0	.	.

sa_morb=none

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	12	12.739	34.399	56.059	24.149	34.09	57.881	9.841
mneffort	>=50	5	9.4372	19.47	29.502	4.8409	8.0798	23.218	3.6134
mneffort	Diff (1-2)		-18.53	14.93	48.387	21.784	29.49	45.641	15.697
neff50	<50	12	11.35	33.526	55.702	24.724	34.902	59.259	10.075
neff50	>=50	5	8.9428	19.735	30.527	5.2073	8.6914	24.975	3.8869
neff50	Diff (1-2)		-20.5	13.791	48.081	22.326	30.223	46.777	16.088

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	0.95	0.3566
mneffort	Satterthwaite	Unequal	13.5	1.42	0.1771
neff50	Pooled	Equal	15	0.86	0.4048
neff50	Satterthwaite	Unequal	13.7	1.28	0.2228

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	11	4	17.80	0.0135
neff50	Folded F	11	4	16.13	0.0163

sa_morb=any

The TTEST Procedure

Statistics

Variable	msi50	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<50	10	8.3332	23.124	37.915	14.222	20.676	37.746	6.5383
mneffort	>=50	13	23.989	36.751	49.513	15.144	21.119	34.862	5.8574
mneffort	Diff (1-2)		-31.94	-13.63	4.6816	16.103	20.93	29.911	8.8038
neff50	<50	10	7.5551	22.165	36.775	14.048	20.423	37.285	6.4584
neff50	>=50	13	23.641	35.106	46.572	13.606	18.973	31.32	5.2623
neff50	Diff (1-2)		-30.09	-12.94	4.2103	15.085	19.608	28.021	8.2475

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	-1.55	0.1366
mneffort	Satterthwaite	Unequal	19.7	-1.55	0.1365
neff50	Pooled	Equal	21	-1.57	0.1316
neff50	Satterthwaite	Unequal	18.7	-1.55	0.1371

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	12	9	1.04	0.9711
neff50	Folded F	9	12	1.16	0.7938

sa_morb=none

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	50.299	.	.	.	.	.
mneffort	>5	16	12.817	28.74	44.663	22.074	29.882	46.248	7.4705
mneffort	Diff (1-2)		-44.09	21.559	87.211	22.074	29.882	46.248	30.801
neff50	<5	1	.	47.915	.	.	.	.	.
neff50	>5	16	12.031	28.317	44.603	22.577	30.563	47.302	7.6408
neff50	Diff (1-2)		-47.55	19.598	86.747	22.577	30.563	47.302	31.504

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	0.70	0.4947
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	15	0.62	0.5432
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	15	0	.	.
neff50	Folded F	15	0	.	.

sa_morb=any

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	32.173	.	.	.	.	.
mneffort	>5	22	20.971	30.765	40.559	16.995	22.09	31.568	4.7096
mneffort	Diff (1-2)		-45.56	1.4082	48.379	16.995	22.09	31.568	22.586
neff50	<5	1	.	32.24	.	.	.	.	.
neff50	>5	22	20.169	29.354	38.539	15.938	20.716	29.605	4.4167
neff50	Diff (1-2)		-41.16	2.8858	46.936	15.938	20.716	29.605	21.182

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	0.06	0.9509
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	21	0.14	0.8929
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	21	0	.	.
neff50	Folded F	21	0	.	.

sa_morb=none

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	50.299	.	.	.	.	.
mneffort	>5	16	12.817	28.74	44.663	22.074	29.882	46.248	7.4705
mneffort	Diff (1-2)		-44.09	21.559	87.211	22.074	29.882	46.248	30.801
neff50	<5	1	.	47.915	.	.	.	.	.
neff50	>5	16	12.031	28.317	44.603	22.577	30.563	47.302	7.6408
neff50	Diff (1-2)		-47.55	19.598	86.747	22.577	30.563	47.302	31.504

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	15	0.70	0.4947
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	15	0.62	0.5432
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	15	0	.	.
neff50	Folded F	15	0	.	.

sa_morb=any

The TTEST Procedure

Statistics

Variable	mmsi	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mneffort	<5	1	.	32.173	.	.	.	.	.
mneffort	>5	22	20.971	30.765	40.559	16.995	22.09	31.568	4.7096
mneffort	Diff (1-2)		-45.56	1.4082	48.379	16.995	22.09	31.568	22.586
neff50	<5	1	.	32.24	.	.	.	.	.
neff50	>5	22	20.169	29.354	38.539	15.938	20.716	29.605	4.4167
neff50	Diff (1-2)		-41.16	2.8858	46.936	15.938	20.716	29.605	21.182

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mneffort	Pooled	Equal	21	0.06	0.9509
mneffort	Satterthwaite	Unequal	0	.	.
neff50	Pooled	Equal	21	0.14	0.8929
neff50	Satterthwaite	Unequal	0	.	.

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
mneffort	Folded F	21	0	.	.
neff50	Folded F	21	0	.	.

Obs	Job	Hand	avesi	medsi	Morbidity1
1	1	L	7.313	6.750	0
2	1	R	8.250	6.750	0
3	2	L	156.600	162.000	0
4	2	R	70.200	81.000	0
5	3	R	22.050	22.500	0
6	4	L	56.700	60.750	0
7	4	R	22.821	20.250	0
8	5	R	46.200	48.000	0
9	6	L	5.175	4.500	1
10	6	R	1.675	1.500	0
11	7	L	48.000	54.000	0
12	7	R	24.891	18.000	0
13	8	R	27.000	27.000	0
14	9	R	162.000	162.000	0
15	10	L	36.000	40.500	0
16	10	R	121.500	121.500	0
17	11	R	27.900	27.000	0
18	12	R	57.000	54.000	1
19	13	R	30.375	27.000	0
20	14	R	141.750	121.500	0
21	15	R	22.500	27.000	0
22	16	R	81.000	81.000	1
23	17	L	81.000	81.000	0
24	18	L	44.400	54.000	0
25	18	R	25.238	21.000	0
26	19	R	105.923	81.000	0
27	20	R	81.000	81.000	0
28	21	L	11.667	12.000	0
29	22	R	74.250	60.750	0
30	23	L	16.538	15.188	0
31	23	R	35.353	30.375	0
32	24	L	7.593	6.750	0
33	25	R	5.025	4.500	0
34	26	L	4.500	4.500	0
35	27	R	81.000	81.000	0
36	28	R	36.000	36.000	0
37	29	R	126.000	108.000	1
38	30	R	114.750	121.500	1
39	31	R	121.500	121.500	1
40	32	L	155.250	162.000	0
41	32	R	162.000	162.000	0
42	33	R	10.125	9.000	0

The FREQ Procedure

Table of medsi by Morbidity1

medsi(the median, si)
Morbidity1(Morbidity1)

Frequency / Row Pct / Col Pct	−	+	Total
<5	3 75.00 8.33	1 25.00 16.67	4
>5	33 86.84 91.67	5 13.16 83.33	38
Total	36	6	42

The FREQ Procedure

Statistics for Table of medsi by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	0.4145	0.5197
Likelihood Ratio Chi-Square	1	0.3584	0.5494
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.4046	0.5247
Fisher's Exact Test (Left)			0.4737
(Right)			0.9090
(2-Tail)			0.4737
Phi Coefficient		-0.0993	
Contingency Coefficient		0.0989	
Cramer's V		-0.0993	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	-0.3750	0.5373
Kendall's Tau-b	-0.0993	0.1868
Stuart's Tau-c	-0.0408	0.0789
Somers' D C|R	-0.1184	0.2233
Somers' D R|C	-0.0833	0.1590
Pearson Correlation	-0.0993	0.1868
Spearman Correlation	-0.0993	0.1868
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0104	0.0368
Uncertainty Coefficient R|C	0.0136	0.0479
Uncertainty Coefficient Symmetric	0.0118	0.0416

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	0.4545	0.0392	5.2719
Cohort (Col1 Risk)	0.8636	0.4839	1.5412
Cohort (Col2 Risk)	1.9000	0.2889	12.4977

Sample Size = 42

The FREQ Procedure

Summary Statistics for medsi by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.4046	0.5247
2	Row Mean Scores Differ	1	0.4046	0.5247
3	General Association	1	0.4046	0.5247

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	0.4545	0.0392	5.2719
(Odds Ratio)	Logit	0.4545	0.0392	5.2719
Cohort	Mantel-Haenszel	0.8636	0.4839	1.5412
(Col1 Risk)	Logit	0.8636	0.4839	1.5412
Cohort	Mantel-Haenszel	1.9000	0.2889	12.4977
(Col2 Risk)	Logit	1.9000	0.2889	12.4977

Total Sample Size = 42

The FREQ Procedure

Table of medsi by Morbidity1

medsi(the median, si)
Morbidity1(Morbidity1)

Frequency / Row Pct / Col Pct	--	+	Total
<44.25	20 95.24 55.56	1 4.76 16.67	21
>=44.25	16 76.19 44.44	5 23.81 83.33	21
Total	36	6	42

The FREQ Procedure

Statistics for Table of medsi by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	3.1111	0.0778
Likelihood Ratio Chi-Square	1	3.3564	0.0669
Continuity Adj. Chi-Square	1	1.7500	0.1859
Mantel-Haenszel Chi-Square	1	3.0370	0.0814
Fisher's Exact Test (Left)			0.9897
(Right)			0.0918
(2-Tail)			0.1836
Phi Coefficient		0.2722	
Contingency Coefficient		0.2626	
Cramer's V		0.2722	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	0.7241	0.2724
Kendall's Tau-b	0.2722	0.1286
Stuart's Tau-c	0.1905	0.1039
Somers' D C|R	0.1905	0.1039
Somers' D R|C	0.3889	0.1732
Pearson Correlation	0.2722	0.1286
Spearman Correlation	0.2722	0.1286
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.1905	0.1049
Lambda Symmetric	0.1481	0.0754
Uncertainty Coefficient C|R	0.0974	0.0940
Uncertainty Coefficient R|C	0.0576	0.0584
Uncertainty Coefficient Symmetric	0.0724	0.0716

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	6.2500	0.6618	59.0274
Cohort (Col1 Risk)	1.2500	0.9662	1.6171
Cohort (Col2 Risk)	0.2000	0.0255	1.5693

Sample Size = 42

The FREQ Procedure

Summary Statistics for medsi by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	3.0370	0.0814
2	Row Mean Scores Differ	1	3.0370	0.0814
3	General Association	1	3.0370	0.0814

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	6.2500	0.6618	59.0274
(Odds Ratio)	Logit	6.2500	0.6618	59.0274
Cohort	Mantel-Haenszel	1.2500	0.9662	1.6171
(Col1 Risk)	Logit	1.2500	0.9662	1.6171
Cohort	Mantel-Haenszel	0.2000	0.0255	1.5693
(Col2 Risk)	Logit	0.2000	0.0255	1.5693

Total Sample Size = 42

The FREQ Procedure

Table of medsi by Morbidity1

medsi(the median, si)
Morbidity1(Morbidity1)

Frequency / Row Pct / Col Pct	0	1	Total
<81	25 92.59 69.44	2 7.41 33.33	27
>=81	11 73.33 30.56	4 26.67 66.67	15
Total	36	6	42

The FREQ Procedure

Statistics for Table of medsi by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	2.9210	0.0874
Likelihood Ratio Chi-Square	1	2.7935	0.0946
Continuity Adj. Chi-Square	1	1.5599	0.2117
Mantel-Haenszel Chi-Square	1	2.8514	0.0913
Fisher's Exact Test (Left)			0.9836
(Right)			0.1077
(2-Tail)			0.1642
Phi Coefficient		0.2637	
Contingency Coefficient		0.2550	
Cramer's V		0.2637	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	0.6393	0.2775
Kendall's Tau-b	0.2637	0.1564
Stuart's Tau-c	0.1769	0.1158
Somers' D C|R	0.1926	0.1248
Somers' D R|C	0.3611	0.2072
Pearson Correlation	0.2637	0.1564
Spearman Correlation	0.2637	0.1564
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.1333	0.1520
Lambda Symmetric	0.0952	0.1078
Uncertainty Coefficient C|R	0.0811	0.0939
Uncertainty Coefficient R|C	0.0510	0.0609
Uncertainty Coefficient Symmetric	0.0626	0.0736

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	4.5455	0.7222	28.6080
Cohort (Col1 Risk)	1.2626	0.9139	1.7445
Cohort (Col2 Risk)	0.2778	0.0575	1.3428

Sample Size = 42

The FREQ Procedure

Summary Statistics for medsi by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	2.8514	0.0913
2	Row Mean Scores Differ	1	2.8514	0.0913
3	General Association	1	2.8514	0.0913

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control (Odds Ratio)	Mantel-Haenszel	4.5455	0.7222	28.6080
	Logit	4.5455	0.7222	28.6080
Cohort (Col1 Risk)	Mantel-Haenszel	1.2626	0.9139	1.7445
	Logit	1.2626	0.9139	1.7445
Cohort (Col2 Risk)	Mantel-Haenszel	0.2778	0.0575	1.3428
	Logit	0.2778	0.0575	1.3428

Total Sample Size = 42

The FREQ Procedure

Summary Statistics for mmsi by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.3417	0.5589
2	Row Mean Scores Differ	1	0.3417	0.5589
3	General Association	1	0.3417	0.5589

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	.	.	.
(Odds Ratio)	Logit **	0.9420	0.0404	21.9810
Cohort	Mantel-Haenszel	1.1765	1.0329	1.3400
(Col1 Risk)	Logit	1.1765	1.0329	1.3400
Cohort	Mantel-Haenszel	0.0000	.	.
(Col2 Risk)	Logit **	1.0513	0.0760	14.5377

To avoid undefined results, some estimates are not computed.
** These logit estimators use a correction of 0.5 in every cell of those tables that contain a zero.

Total Sample Size = 42

The FREQ Procedure

Table of msi50 by Morbidity1

msi50 / Frequency / Row Pct / Col Pct	Morbidity1(Morbidity1): 0	1	Total
<5	3	1	4
	75.00	25.00	
	8.33	16.67	
>5	33	5	38
	86.84	13.16	
	91.67	83.33	
Total	36	6	42

The FREQ Procedure

Statistics for Table of msi50 by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	0.4145	0.5197
Likelihood Ratio Chi-Square	1	0.3584	0.5494
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.4046	0.5247
Fisher's Exact Test (Left)			0.4737
(Right)			0.9090
(2-Tail)			0.4737
Phi Coefficient		-0.0993	
Contingency Coefficient		0.0989	
Cramer's V		-0.0993	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	-0.3750	0.5373
Kendall's Tau-b	-0.0993	0.1868
Stuart's Tau-c	-0.0408	0.0789
Somers' D C|R	-0.1184	0.2233
Somers' D R|C	-0.0833	0.1590
Pearson Correlation	-0.0993	0.1868
Spearman Correlation	-0.0993	0.1868
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0104	0.0368
Uncertainty Coefficient R|C	0.0136	0.0479
Uncertainty Coefficient Symmetric	0.0118	0.0416

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	0.4545	0.0392	5.2719
Cohort (Col1 Risk)	0.8636	0.4839	1.5412
Cohort (Col2 Risk)	1.9000	0.2889	12.4977

Sample Size = 42

The FREQ Procedure

Summary Statistics for msi50 by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.4046	0.5247
2	Row Mean Scores Differ	1	0.4046	0.5247
3	General Association	1	0.4046	0.5247

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	0.4545	0.0392	5.2719
(Odds Ratio)	Logit	0.4545	0.0392	5.2719
Cohort	Mantel-Haenszel	0.8636	0.4839	1.5412
(Col1 Risk)	Logit	0.8636	0.4839	1.5412
Cohort	Mantel-Haenszel	1.9000	0.2889	12.4977
(Col2 Risk)	Logit	1.9000	0.2889	12.4977

Total Sample Size = 42

The FREQ Procedure

Summary Statistics for mmsi by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	3.0370	0.0814
2	Row Mean Scores Differ	1	3.0370	0.0814
3	General Association	1	3.0370	0.0814

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	6.2500	0.6618	59.0274
(Odds Ratio)	Logit	6.2500	0.6618	59.0274
Cohort	Mantel-Haenszel	1.2500	0.9662	1.6171
(Col1 Risk)	Logit	1.2500	0.9662	1.6171
Cohort	Mantel-Haenszel	0.2000	0.0255	1.5693
(Col2 Risk)	Logit	0.2000	0.0255	1.5693

Total Sample Size = 42

Table of msi50 by Morbidity1

msi50 Morbidity1(Morbidity1)

Frequency / Row Pct / Col Pct			Total
<44.25	20	1	21
	95.24	4.76	
	55.56	16.67	
>=44.25	16	5	21
	76.19	23.81	
	44.44	83.33	
Total	36	6	42

The FREQ Procedure

Statistics for Table of msi50 by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	3.1111	0.0778
Likelihood Ratio Chi-Square	1	3.3564	0.0669
Continuity Adj. Chi-Square	1	1.7500	0.1859
Mantel-Haenszel Chi-Square	1	3.0370	0.0814
Fisher's Exact Test (Left)			0.9897
(Right)			0.0918
(2-Tail)			0.1836
Phi Coefficient		0.2722	
Contingency Coefficient		0.2626	
Cramer's V		0.2722	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	0.7241	0.2724
Kendall's Tau-b	0.2722	0.1286
Stuart's Tau-c	0.1905	0.1039
Somers' D C|R	0.1905	0.1039
Somers' D R|C	0.3889	0.1732
Pearson Correlation	0.2722	0.1286
Spearman Correlation	0.2722	0.1286
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.1905	0.1049
Lambda Symmetric	0.1481	0.0754
Uncertainty Coefficient C|R	0.0974	0.0940
Uncertainty Coefficient R|C	0.0576	0.0584
Uncertainty Coefficient Symmetric	0.0724	0.0716

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	6.2500	0.6618	59.0274
Cohort (Col1 Risk)	1.2500	0.9662	1.6171
Cohort (Col2 Risk)	0.2000	0.0255	1.5693

Sample Size = 42

The FREQ Procedure

Summary Statistics for msi50 by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	3.0370	0.0814
2	Row Mean Scores Differ	1	3.0370	0.0814
3	General Association	1	3.0370	0.0814

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	6.2500	0.6618	59.0274
(Odds Ratio)	Logit	6.2500	0.6618	59.0274
Cohort	Mantel-Haenszel	1.2500	0.9662	1.6171
(Col1 Risk)	Logit	1.2500	0.9662	1.6171
Cohort	Mantel-Haenszel	0.2000	0.0255	1.5693
(Col2 Risk)	Logit	0.2000	0.0255	1.5693

Total Sample Size = 42

The FREQ Procedure

Table of mmsi by Morbidity1

mmsi Morbidity1(Morbidity1)

Frequency / Row Pct / Col Pct	0	1	Total
<81	26 / 92.86 / 72.22	2 / 7.14 / 33.33	28
>=81	10 / 71.43 / 27.78	4 / 28.57 / 66.67	14
Total	36	6	42

The FREQ Procedure

Statistics for Table of msi50 by Morbidity1

Statistic	DF	Value	Prob
Chi-Square	1	2.9210	0.0874
Likelihood Ratio Chi-Square	1	2.7935	0.0946
Continuity Adj. Chi-Square	1	1.5599	0.2117
Mantel-Haenszel Chi-Square	1	2.8514	0.0913
Fisher's Exact Test (Left)			0.9836
(Right)			0.1077
(2-Tail)			0.1642
Phi Coefficient		0.2637	
Contingency Coefficient		0.2550	
Cramer's V		0.2637	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Statistic	Value	ASE
Gamma	0.6393	0.2775
Kendall's Tau-b	0.2637	0.1564
Stuart's Tau-c	0.1769	0.1158
Somers' D C|R	0.1926	0.1248
Somers' D R|C	0.3611	0.2072
Pearson Correlation	0.2637	0.1564
Spearman Correlation	0.2637	0.1564
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.1333	0.1520
Lambda Symmetric	0.0952	0.1078
Uncertainty Coefficient C|R	0.0811	0.0939
Uncertainty Coefficient R|C	0.0510	0.0609
Uncertainty Coefficient Symmetric	0.0626	0.0736

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Bounds	
Case-Control	4.5455	0.7222	28.6080
Cohort (Col1 Risk)	1.2626	0.9139	1.7445
Cohort (Col2 Risk)	0.2778	0.0575	1.3428

Sample Size = 42

The FREQ Procedure

Summary Statistics for msi50 by Morbidity1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	2.8514	0.0913
2	Row Mean Scores Differ	1	2.8514	0.0913
3	General Association	1	2.8514	0.0913

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Bounds	
Case-Control	Mantel-Haenszel	4.5455	0.7222	28.6080
(Odds Ratio)	Logit	4.5455	0.7222	28.6080
Cohort	Mantel-Haenszel	1.2626	0.9139	1.7445
(Col1 Risk)	Logit	1.2626	0.9139	1.7445
Cohort	Mantel-Haenszel	0.2778	0.0575	1.3428
(Col2 Risk)	Logit	0.2778	0.0575	1.3428

Total Sample Size = 42

Morbidity

The TTEST Procedure

Statistics

Variable	Class	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
mpctdur	0	36	61.189	68.275	75.361	16.987	20.943	27.319	3.4906
mpctdur	1	6	44.986	73.925	102.86	17.213	27.575	67.632	11.258
mpctdur	Diff (1-2)		-25.15	-5.65	13.852	17.966	21.883	27.999	9.6493
mneffort	0	36	20.969	29.813	38.656	21.2	26.137	34.095	4.3562
mneffort	1	6	28.058	33.564	39.069	3.2745	5.2458	12.866	2.1416
mneffort	Diff (1-2)		-25.6	3.751	18.101	20.131	24.52	31.373	10.812
pctdur50	0	36	61.159	68.588	76.016	17.807	21.955	28.639	3.6592
pctdur50	1	6	40.768	72.608	104.45	18.938	30.339	74.411	12.386
pctdur50	Diff (1-2)		-24.67	-4.02	16.629	19.023	23.17	29.646	10.217
neff50	0	36	20.013	28.711	37.41	20.853	25.71	33.536	4.2849
neff50	1	6	25.442	32.934	40.427	4.4565	7.1395	17.51	2.9147
neff50	Diff (1-2)		-25.77	-4.223	17.328	19.853	24.181	30.94	10.663
msi	0	36	37.886	54.922	71.958	40.838	50.35	65.678	8.3917
msi	1	6	34.865	84.238	133.61	29.367	47.046	115.39	19.207
msi	Diff (1-2)		-73.83	-29.32	15.2	41.009	49.949	63.91	22.025
mmsi	0	36	37.706	54.698	71.69	40.733	50.22	65.51	8.3701
mmsi	1	6	34.552	84.063	133.57	29.449	47.179	115.71	19.261
mmsi	Diff (1-2)		-73.79	-29.37	15.062	40.928	49.85	63.784	21.982
msi50	0	36	37.362	54.341	71.32	40.701	50.181	65.458	8.3635
msi50	1	6	33.459	81.75	130.04	28.724	46.016	112.86	18.786
msi50	Diff (1-2)		-71.68	-27.41	16.866	40.788	49.68	63.565	21.907

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
mpctdur	Pooled	Equal	40	-0.59	0.5615
mpctdur	Satterthwaite	Unequal	6	-0.48	0.6486
mneffort	Pooled	Equal	40	-0.35	0.7305
mneffort	Satterthwaite	Unequal	38.3	-0.77	0.4444
pctdur50	Pooled	Equal	40	-0.39	0.6961
pctdur50	Satterthwaite	Unequal	5.9	-0.31	0.7663
neff50	Pooled	Equal	40	-0.40	0.6942
neff50	Satterthwaite	Unequal	30	-0.81	0.4216
msi	Pooled	Equal	40	-1.33	0.1907
msi	Satterthwaite	Unequal	7.05	-1.40	0.2043
mmsi	Pooled	Equal	40	-1.34	0.1891
mmsi	Satterthwaite	Unequal	7.03	-1.40	0.2045
msi50	Pooled	Equal	40	-1.25	0.2181
msi50	Satterthwaite	Unequal	7.14	-1.33	0.2235

The TTEST Procedure

Statistics

Variable	Morbidity1	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
medsi	0	36	36.872	53.807	70.743	40.597	50.053	65.291	8.3422
medsi	1	6	33.459	81.75	130.04	28.724	46.016	112.86	18.786
medsi	Diff (1-2)		-72.12	-27.94	16.231	40.695	49.566	63.42	21.857
avesi	0	36	37.691	54.738	71.786	40.866	50.385	65.724	8.3975
avesi	1	6	34.865	84.238	133.61	29.367	47.046	115.39	19.207
avesi	Diff (1-2)		-74.04	-29.5	15.043	41.034	49.98	63.949	22.039

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
medsi	Pooled	Equal	40	-1.28	0.2085
medsi	Satterthwaite	Unequal	7.13	-1.36	0.2155
avesi	Pooled	Equal	40	-1.34	0.1883
avesi	Satterthwaite	Unequal	7.06	-1.41	0.2018

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
medsi	Folded F	35	5	1.18	0.9457
avesi	Folded F	35	5	1.15	0.9803

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