

CHAPTER 7

METHODOLOGY

7.1 Introduction

In South Africa the cost per year as a result of absenteeism and loss of productivity due to stress is estimated to be approximately R500 million (“Executive Stress”, 1991: 102), with both white managers and black high level employees suffering from high levels of work stress (Van Zyl, 1993: 36). Research has been conducted on stress inherent in specific groups within the work context (Van Zyl, 1993: 36; Van Zyl 1998: 22; Van Zyl & Pietersen, 1999: 74) with some findings suggesting that approximately 30-40% of South Africans suffer from high levels of stress (Van Zyl in Van Zyl, 1993: 36). In the USA the comparative figures were found to be 13-25% (Spielberger & Reheiser in Van Zyl, 1998: 22) which underlines the seriousness of the South African stress experience. Generally the research focuses on the various sources of stress and on the symptoms associated with the experience of stress, such as anxiety, depression, and aggression (Van Zyl, 1993: 37; Van Zyl, 1998: 24. However, no research relating stress and types of workplace aggression could be traced in the South African research literature. Similarly only one study researching the specific coping strategies used by South African managers was found (Spangenberg & Orpen-Lyall, 2000: 6). No research investigating the social problem solving strategies of employees coping with stress could be traced. Van Zyl (2002: 27) believes that the levels of stress in the South African organizations are exceptionally high. The seriousness of the stress experience in South Africa should encourage research to not only focus on the causes and consequences of stress but also on how employees cope with their experienced stress with the aim to aid organizations and individuals to develop improved strategies and programmes to counter the negative effect of stress. In view of the above discussion, the main aims of the present study were to determine:

- Overall levels of stress experienced by a sample of high-level employees.
- Ramifications or branched structures of stress in the workplace experienced by employees by comparing biographic substructures such as gender, marital state, age, type of organization, qualification, and position level in the organization.
- Types of stressors that contribute towards participants’ experience of stress.
- Levels of workplace aggression experienced and witnessed by these high-level employees.
- The psychological Impact that stress might have on the sample of high-level employees with regard to anxiety, depression, and worry.
- Coping strategies used by the sample with respect to social problem solving.

- Multivariate relationships between stress, aggression in the workplace, anxiety, depression, worry, and social problem solving with the biographical variables mentioned earlier, for example the total group, gender as well as age, marital status, type of organization, qualification, and position level substructures in the organization.
- The co-relationship between on the one hand stress and on the other hand aggression in the workplace, anxiety, depression, worry as well as social problem solving.

This chapter sets out the methodological approach that was used to achieve the aims of the outlined study.

7.2 Research hypotheses

The research hypotheses that will be tested in the main investigation are as follows:

7.2.1 First set

This set of hypotheses refers to all instances where the z test was used.

- Null hypothesis $H_0: z_{(j)} = 0$

Levels of overall stress or stress from causes outside the workplace, witnessed and experienced aggression in the workplace, characteristics of anxiety, depression, sources of worry and social-problem solving approaches did not differ from zero and thus were insignificant.

- Alternative hypotheses $H_1: z > 0$

All the above levels referred to were greater than 0 and were thus of significance.

The above hypotheses are referred to in sections 9.4.1.1, 1) a) to 9.4.1.1, 1) h), sections 9.4.1.1, 2) a) to 9.4.1.1, 2) b), sections 9.4.1.1, 3) a) to 9.4.1.1, 3) b), sections 9.4.1.1, 4) and 9.4.1.1, 5) as well as sections 9.4.1.1, 6) a) to 9.4.1.1, 6) j) of chapter 9.

7.2.2 Second set

This particular set of hypotheses refers to all instances where the student's T- test was used.

- Null hypotheses $H_0: \mu_D = 0$

The two genders and marital groups did not differ significantly in terms of stress, experienced and witnessed aggression in the workplace, anxiety, depression, worry and social problem-solving approaches.

- Alternative hypotheses $H_{1:\mu_D} > 0$

The first mentioned gender and marital group obtained significantly higher scores in terms of stress, experienced and witnessed aggression in the workplace, anxiety, depression, worry and social problem-solving approaches.

- Alternative hypotheses $H_{1:\mu_D} < 0$

The first mentioned gender and marital group obtained significantly lower scores in terms of stress, experienced and witnessed aggression in the workplace, anxiety, depression, worry and social problem-solving approaches.

The above hypotheses are referred to in sections 9.4.2.1, 1), sections 9.4.2.1, 2) a) and 9.4.2.1, 2) b), sections 9.4.2.1, 3), 9.4.2.1, 4), 9.4.2.1, 5) and 9.4.2.1, 6), sections 9.4.2.2, 1) and 9.4.2.2, 2) a) and 9.4.2.2, 2) b) as well as sections 9.4.2.2, 3), 9.4.2.2, 4), 9.4.2.2, 5) and 9.4.2.2, 6) of chapter 9.

7.2.3 Third set

This particular set of hypotheses refers to all instances where advanced analysis of variance was undertaken by the simultaneous comparison of three or more biographical subgroups for each particular variable. Analysis of variance might lead to two other sets of calculations. Firstly, two or more biographic variables occasionally might produce significant interactions (RxC). Secondly, where this is the case, subgroups are paired two-at-a-time and subjected to further analysis by means of the Scheffé test. All of these calculations provide information relevant to the various ramifications of stress and other stress-related variables of importance in the study that was undertaken.

- Null hypotheses $\mu_{(1)} = \mu_{(2)} = \mu_{(j)}$

The first, second and j^{th} subgroups of a particular biographical variable did not differ significantly in terms of stress, experienced and witnessed aggression in the workplace, anxiety, depression, worry and social problem-solving approaches.

- Alternative hypotheses $\mu_{(1)} \neq \mu_{(2)} \neq \mu_{(j)}$

The first, second and j^{th} subgroups of a particular biographical variable did differ significantly in terms of stress, experienced and witnessed aggression in the workplace, anxiety, depression, worry and social problem-solving

- Null hypothesis $RxC = 0$

This hypothesis states that no noticeable interaction of any significance was observed between subgroups of the relevant biographical variables.

- Alternative hypothesis $RxC > 0$

This hypothesis states that significant interaction occurred between two or more of the subgroups of relevant biographical variables.

During post-hoc comparisons subgroups are paired off two-at-a-time. The null and alternative hypotheses have the same structure as those that are applicable to the T-test as set out in section 7.2.2 of chapter 7.

Sections 9.4.3.1, 1) to 9.4.3.1, 8), sections 9.4.3.2, 1) a) to 9.4.3.2, 2) d), sections 9.4.3.3, 1) to 9.4.3.3, 8), sections 9.4.3.4 and, 9.4.3.5 as well as sections 9.4.3.6, 1) to 9.4.3.6, 10) are applicable.

7.2.4 Fourth set

The fourth set of calculations refers to all instances where Bravais-Pearson product-moment correlation coefficients were calculated.

- Null hypothesis $\rho_{xy} \approx 0$

The co-relationships between stress and the variables pertaining to aggression in the workplace, anxiety, depression, worry as well as social problem solving, all approximate 0 and are thus insignificant.

- Alternative hypothesis $\rho_{xy} \approx 1$

The co-relationships between stress and the variables pertaining to aggression in the workplace, anxiety, depression, worry as well as social problem solving, all approximate 1 and are thus particularly significant.

Likewise, Bravais-Pearson product-moment correlation coefficients between aggression in the workplace, anxiety, depression, worry as well as social problem solving were calculated for the different gender, age, marital status, organizational type as well as the qualification and position level subgroups of the biographical variables. The null and alternative hypotheses are expressed in the same way as above but hold for subgroups only and not for the total sample.

The final set of hypotheses refers to sections 9.5.1.1, 1) to 9.5.1.1, 2), sections 9.5.1.2 to 9.5.1.5, sections 9.5.2.1, 1) to 9.5.2.1, 2), sections 9.5.2.2 to 9.5.2.5, section 9.5.3.1, 1) to 9.5.3.1, 2), sections 9.5.3.2 to 9.5.3.5, sections 9.5.4.1, 1) to 9.5.4.1, 2), sections 9.5.4.2 to 9.5.4.5, section 9.5.5.1, 1) to 9.5.5.1, 2), sections 9.5.5.2 to 9.5.5.5, sections 9.5.6.1, 1) to 9.5.6.1, 2), sections 9.5.6.2 to 9.5.6.5, section 9.5.7.1, 1) to 9.5.7.1, 2), sections 9.5.7.2 to 9.5.7.5 of Chapter 9.

Hypothesis testing throughout the entire study was done at least at the 5% (< 0.05) level.

7.3 Research design

The first phase of the research was to approach various organizations so as to obtain permission for the outlined study. A simple random sampling of high-level employees throughout the country could not be carried out and instead a sample of convenience was chosen, as the organizations that could be approached were accessible to the researcher (McMillan & Schumacher, 2001:175). Fifteen organizations were approached of which two declined based on the fact that they were undergoing major restructuring and one declined because management felt it would waste valuable time. In all cases the research was discussed with the relevant personnel manager. Once permission had been obtained the testing was completed in conjunction with the relevant personnel manager. A passive design was chosen where the researcher 'neither actively forms groups or conditions through random or non-random assignment, nor manipulates an independent variable' (Heppner, Kivlighan, & Wampold, 1992: 213). A simple passive design is also called a correlation design in which the investigator collects data on two variables and then uses a statistical analysis, to describe their relationship.

7.3.1 Data collection

To minimize costs the organizations that were approached were either in Pretoria itself or in adjacent major industrial cities and towns within travelling distance of Pretoria. For statistical reasons a return rate of 100 useable questionnaires was required. However this requirement was surpassed. The study was begun on the 19th of October 1999 and the last questionnaires were completed by the 22nd of February 2000. A comprehensive description of the sample is given in Chapter 8.

7.3.1.1 Psychometric instruments

Twelve biographical items were combined with Experience of Work and Life Circumstances Questionnaire developed by the HSRC (Van Zyl & Van der Walt, 1991), Aggression in the

Workplace Questionnaire developed by Baron and Neuman (1996), IPAT Anxiety Scale, Beck's Depression Inventory, the Penn State Worry Questionnaire, and the Social Problem Solving Inventory-Revised developed by D'Zurilla, Nezu, and Maydeu-Olivares (1996).

7.3.1.2 Biographical questionnaire

The participants responded to 12 items, for example by stating their sex, age in years and months, ethnicity, marital status, home language, highest qualification achieved, the organization they presently work for, their present position title, their overall work experience, their work experience with their present employer, the department they were presently in, and their occupation. Their name was not required so as to maintain confidentiality.

7.3.1.3 Experience of Work and Life Circumstances Questionnaire

The Experience of Work and Life Circumstances Questionnaire (WLQ) was developed by the Human Sciences Research Council (Van Zyl & Van der Walt, 1991) with the view to meeting the need for a stress questionnaire standardized for South African circumstances. It not only attempts to measure the level of stress, but also the causes of stress an employee may be experiencing. The WLQ consists of two parts, experience of work, and circumstances and expectations.

The experience of work part of the questionnaire determines the individual's level of stress. The value obtained is an indication of whether the individual's experiences a normal, high or very high level of stress. This result is based on the answers of 40 questions. Ratings are made on a five-point scale ranging from "Virtually never" to "Virtually always", which are indicative of how often certain feelings of stress, such as depression, anxiety, and frustration, occur.

The circumstances and expectations part of the questionnaire analyses the causes of the individual's level of stress. The respondent selects one of the answers according to a five-point Likert scale that is indicative of how often certain aspects occur. It is made up of two subsections, Scale A and Scale B, totalling 76 questions about the individuals' circumstances and unfulfilled expectations.

The circumstances that are viewed as stressful may be found within and/or outside the work situation. Within the work environment seven items assess the functioning of the organization, the characteristics of the task(s) to be performed, physical working conditions and job equipment, social as well as career matters, and remuneration, fringe benefits and personnel policy. A high score is indicative that the individuals experience the above issues as problematic.

Outside the work situation 16 items assess family problems, financial circumstances, phase of life, general economic situation in the country, changing technology, facilities at home, social situations, status, health, background, effect of work on home life, transport facilities, religious life, political view, the availability of accommodation and recreational facilities.

The reliability of the different fields of the WLQ, calculated according to the Kuder-Richardson formula 8 as modified by Ferguson ranges from 0.83 to 0.92. The test-retest reliability coefficients vary from 0.62 to 0.80. Based on these results the reliability of the WLQ may be regarded as satisfactory.

The WLQ was found to have both face and logical validity, each regarded as indications of content validity (Van Zyl & Van der Walt, 1991). Construct validity was determined by both the intratest and intertest methods (Van Zyl & Van der Walt, 1991). The intratest method reflected a fairly significant relation between the different fields/scales of the WLQ. The intertest method showed a good relation with the 16 PF Questionnaire, the PHSF Relations Questionnaire, and the Reaction to the Demands of Life Questionnaire.

7.3.1.4 Aggression in the Workplace Questionnaire

The Aggression in the Workplace Questionnaire (AWQ) was obtained directly from Robert A. Baron to be used in the study. The AWQ consists of a total of 53 items of which 40 items relate to the perceived frequency of various forms of aggression, both witnessed and experienced. Five items represent each of the eight types of aggression suggested by Buss' three dichotomies: physical-verbal, active-passive, direct-indirect (Buss in Baron & Neuman, 1996: 164). Participants were asked to rate the extent to which they had personally witnessed and experienced each type of aggression. Ratings were made on a five-point scale ranging from "Never" to "Very Often" for both witnessed and experienced aggression. The reliability of both these scales were high, Cronbach's alpha = 0.94 for witnessed aggression, Cronbach's alpha = 0.95 for experienced aggression.

7.3.1.5 IPAT Anxiety Scale

The IPAT Anxiety Scale (IAS) was adapted for use in South Africa by the Human Sciences Research Council (Cattell *et al*, 1995). The IAS was developed from extensive research and practice as a means of measuring anxiety. It is applicable to all age groups from the ages of 14 or 15 years upwards throughout the adult range.

It consists of 40 items distributed among five anxiety-measuring factors. These factors consist of Defective Integration, lack of Self-sentiment (-Q₃), Ego Weakness, lack of Ego Strength (-C), Suspiciousness or Paranoid Insecurity (L), Guilt Proneness (O), and Frustrative Tension or Id Pressure (Q₄). The items can be divided into those items, which manifestly refer to anxiety (B-score), also called overt, symptomatic, conscious anxiety, and the more covert hidden-purpose cryptic probes of anxiety (A-score). The responses are arranged so that left-right position preferences cannot speciously affect anxiety scores. The total score on these 40 items measures the total anxiety experienced by the respondent. Each item has three alternative answers, with the high-score keyed responses somewhat more frequently acquiescent (“yes”, “true”) rather than disagreeing (“no”, “false”). This actually adds to the validity of the score, since acquiescence has been established empirically as itself an expression of anxiety.

The reliability coefficients for the total anxiety score, as well as the covert and the overt part score based on Ferguson’s variation of the Kuder-Richardson Formula 20 varied from 0.76 to 0.88. The internal consistency reliability coefficients for the five personality components based on Ferguson’s variation of the Kuder-Richardson Formula 20 varied from 0.27 to 0.70 for English and Afrikaans speaking girls and boys, which were remarkably high for the brevity of the subscales.

Correlating the covert and the overt scores, as well as the total anxiety score of the IAS with the NB Adjustment Questionnaire assessed construct validity. The coefficients varied from -0.21 to -0.55 and from 0.40 to 0.53.

7.3.1.6 Beck Depression Inventory

The Beck Depression Inventory (BDI) is a device that detects depression and accurately rates its severity (Beck *et al*, 1988). It consists of 21 items that deal with how a person has been feeling during the past few days. Each question consists of four possibilities ranging from the least severe to the most severe, e.g. “I do not feel sad” to “I am so sad or unhappy that I can’t stand it”. The least severe possibility is assigned a score of zero and the most severe a score of four. The respondent reads each item carefully and selects one answer out of the four that reflects the severity of how he or she is feeling. The 21 scores are totalled with the lowest possible score being zero and the highest possible score being 63. The total obtained is then compared to table and a category selected that describes the severity of the depression ranging from “These ups and downs are considered normal” to “Extreme depression”.

7.3.1.7 Penn State Worry Questionnaire

The Penn State Worry Questionnaire (PSWQ) was obtained directly from Tom Borkovec of Pennsylvania State University. It consists of 16 items all relating to worry as a trait and to crucial aspects of clinically significant worry. The subject rates each item on a five-point scale ranging from “not at all typical” to “very typical”. After correcting the reverse-score items, the sum of the 16 items is obtained. The total value can be compared to the mean for a number of criterion groups, for example the Unselected Groups, which provides an estimate of worry in a general population, bearing in mind that the vast majority of its subjects were college students. The mean for this group nearly matches the actual middle score (48) of the PSWQ (Molina & Borkovec, 1994: 270).

The 16-item PSWQ has been found to possess high internal consistency in both college samples (Davey; Ladouceur *et al*; Meyer *et al* in Molina & Borkovec, 1994: 269) and in a large sample of mixed anxiety disorders and GAD clients (Brown *et al* in Molina & Borkovec, 1994: 269), the coefficient alphas varying from 0.86 to 0.95.

The PSWQ has been found to correlate significantly to two alternative questionnaires for assessing worry, the Student Worry Scale (SWS) and the Worry Domains Questionnaire (WDQ). The correlation between the PSWQ and the SWS was $r = 0.59$ and that between the PSWQ and the WDQ was $r = 0.67$. These moderately high correlations are to be expected as the PSWQ was designed as a trait measure of the general predisposition to engage in pathological worry irrespective of worry content, whereas the other two questionnaires were created to tap into normal worry based on specific content areas.

7.3.1.8 Social Problem-Solving Inventory-Revised

The Social Problem-Solving Inventory–Revised (SPSI-R) is a 52-item self-report instrument that is linked to a five-dimensional model of social problem solving, which was derived from a factor-analytic study (Maydeu-Olivares & D’Zurilla, 1996: 119) of the original Social Problem-Solving Inventory (D’Zurilla & Nezu, 1990: 158). The SPSI-R consists of two constructive or adaptive problem solving scales, Positive Problem Orientation and Rational Problem Solving, and three dysfunctional scales, Negative Problem Orientation, Impulsivity/ Carelessness Style, and Avoidance Style. The Rational Problem Scale can be broken down into four subscales, Problem Definition and Formulation, Generation of Alternatives Solutions, Decision Making, and Solution Implementation and Verification (D’Zurilla, Nezu, & Maydeu-Olivares, 1996: 9). D’Zurilla, Nezu, and Maydeu-Olivares (1996: 9) describe each of these scales as follows:

Positive Problem Orientation may be described as a constructive, problem solving cognitive set that involves the general disposition to: (a) appraise a problem as a *challenge* (for example opportunity for benefit or gain) rather than a threat; (b) a belief that problems are solvable (*optimism*); (c) belief in one's own personal ability to solve problems successfully ("self-efficacy"); (d) belief that successful problem solving takes time, effort, and persistence; and (e) committing oneself to solving problems with dispatch rather than avoiding them.

In contrast, *Negative Problem Orientation* is a dysfunctional or inhibitive cognitive-emotional set that involves the general tendency to: (a) view a problem as a significant threat to well-being; (b) expect problems to be insolvable (*pessimism*), doubt one's own personal ability to solve problems successfully (*low self-efficacy*); and (d) become frustrated and upset when confronted with problems on living (*low frustration tolerance*).

Turning to the proper dimensions of problem solving, *Rational Problem Solving* is a constructive dimension that may be defined as the rational, deliberate, systematic, and skilful application of effective or adaptive problem solving principles and techniques (for example problem definition and formulation, generation of alternative solutions, etc.). When faced with a problem, the person carefully and systematically gathers facts and information, identifies demands and obstacles, sets a problem solving goal, generates a variety of different alternative solutions, evaluates the possible consequences, judges and compares the alternatives, and then chooses and implements a solution while carefully monitoring and evaluating the outcome.

The *Impulsivity/Carelessness Style* is a deficient problem solving pattern characterized by active attempts to apply problem solving strategies and techniques. However, these attempts are narrowed, impulsive, careless, hurried, and incomplete. The person who scores high on this scale considers only a few solution alternatives, often impulsively going with the first idea that comes to mind; alternatives and consequences are scanned quickly, carelessly, and unsystematically, and solution outcomes are monitored and evaluated carelessly and inadequately.

Finally, the *Avoidance Style* is another defective problem solving pattern characterized by procrastination, passivity or inaction, and dependency. The person scoring high on this scale prefers to avoid problems rather than confronting them, puts off solving problems for as long as possible, waits for problems to resolve themselves, and attempts to shift the responsibility for solving his or her problems to others.

The reliability coefficients for the SPSI-R in four different samples found that all five scales of the SPSI-R showed adequate to high internal consistency in all four samples with the coefficient alpha varying from 0.69 to 0.95. The test-retest reliability for two samples was also adequate to high varying from 0.68 to 0.91 (D’Zurilla, Nezu, & Maydeu-Olivares, 1996: 19).

7.4 Quantitative analysis of test data

The quantitative analysis of the data obtained was carried out by means of different statistical techniques that are described below. Calculations were done using the SAS computer programme. The statistical procedures that were chosen for the data set of 206 respondents were the SAS procedures of Proc Print, Proc Frequency, Proc Means, Proc Anova and Proc Uniwrite. Pearson Correlations and the reliability coefficients Cronbach-alpha were obtained using the ITEMAN item and test analysis program.

7.4.1 Descriptive and other statistics

Descriptive statistics are used to summarize, organize, and reduce large numbers of observations (McMillan & Schumacher, 2001: 207). When data are collected the observations must be organized in such a fashion to allow the researcher to correctly interpret the data and trace underlying trends. The methods that are commonly used to provide grouped data include frequency distributions, measures of central tendency such as the mean, skewness, measures of variability such as the standard deviation, a numerical index that indicates the average variability of the scores from the mean and variance a measure of dispersion related to the standard deviation.

7.4.1.1 The z-test

The z-test is a parametric statistical test that permits the testing of the null hypothesis for a single sample when the population variance is known (Jackson, 2006: 151). Jackson (2006: 151) states that this procedure permits the comparison of a ‘sample with a population in order to assess whether the sample differs significantly from the population’. If a difference between the randomly drawn sample and the broader population upon comparison is obtained then it can be concluded that the sample population differs significantly from the reference population.

7.4.1.2 The t-test

The t-test is a parametric statistical test that allows the comparison of the means of two different and independent samples of participants (Jackson, 2006: 197). If the results show that the two

samples do not differ significantly then it may be that they are likely from the same population, or if they do differ significantly then it may be concluded that they represent two different populations. The test has two versions, namely unpooled or pooled (Bordens & Abbott, 2002: 392). The choice depends on the error term selected. Bordens & Abbot (2002: 392) state that the 'unpooled version computes an error term based on standard error of the mean provided separately by each sample'. In the case of the pooled version it computes an error term 'based on the two samples combined, under the assumption that both samples come from populations having the same variance'.

7.4.1.3 Correlation coefficient

One of the basic tools for evaluating and understanding the relationship between two variables is the correlation coefficient (McMillan & Schumacher, 2001: 230). The most common correlation technique is the Pearson product-moment coefficient and is represented by the symbol r .

Correlation coefficients can be described by in terms of their sign and their size. The sign of the correlation is indicative of the direction of the relationship, i.e., a negative sign indicates that the variables are negatively related and a positive sign shows that the variables are positively related. The size of the correlation is represented by a number that can vary from -1.00 to 0.00 for a negative correlation and from 0.00 to $+1.00$ for a positive correlation. This number is a reflection of the strength of the relationship and the closer it becomes to -1.00 or $+1.00$ the stronger it is.

7.4.1.4 Analysis of variance

Analysis of variance refers to statistical techniques that allow the comparison of two or more means to determine if a significant difference exists between these means (McMillan & Schumacher, 2001: 373). When two or more sample means are compared on one independent variable, it is possible to test the null hypothesis by applying a procedure called a one-way analysis of variance (ANOVA). The ANOVA uses the variances of the groups and not the means to calculate a value that reflects the degree of differences in the means. It calculates the F statistic. If the F statistic is large enough, then the null hypothesis can be rejected with confidence and it may be concluded that at least two means are different.

7.4.1.5 Post hoc comparisons (Scheffé)

When the ANOVA is used to test the null hypothesis and the F statistic allows the conclusion that two or more of the means are different then post hoc comparisons are used to indicate those means that are different from each other (McMillan & Schumacher, 2001: 374). The two most

common tests are Tukey and Scheffé of which the Scheffé is considered the most conservative. When employing Scheffé's test, a single range value for all comparisons is used, which is appropriate for examining all possible linear combinations of group means and not just pairwise comparisons. The Scheffé test is exact, even for unequal group sizes.

7.4.1.6 Reliability coefficient

Reliability refers to the consistency of measurement, which is indicative of the extent the results are similar over different forms of the same instrument or occasions of data collection (McMillan & Schumacher, 2001: 244). Another way to view reliability is to determine the extent to the measure is free from error. If a measure has little error it is considered reliable, and if it has a great amount of error it is considered unreliable. Reliability can be estimated in a number of ways of which the two most common are internal consistency and stability (Heppner, Kivlighan, & Wampold, 1992: 244). Only internal consistency will be discussed, as the same tests were not administered on two occasions. Internal consistency is a measure of the homogeneity of the items and can be estimated from giving one form of the measure once. It can be obtained by calculating Cronbach's alpha, the coefficient derived from the Kuder-Richardson 20 formula, and split-half coefficients. The Cronbach alpha assumes equivalence of all items and is used for items that are not scored right or wrong (McMillan & Schumacher, 2001: 247). The Kuder-Richardson 20 formula is a special case of Cronbach's alpha where each item is scored right or wrong. The split-half coefficients are obtained when the test after it has been administered is divided into two halves and a correlation coefficient is calculated between the halves. The Spearman-Brown formula may be used to determine the reliability of the whole test from the split-half reliabilities.

The reliability coefficient varies from 0.00 to 1.00. When the reliability coefficient is found to be 0.70 and higher, it is considered to be high and the scores have little error and are highly reliable.

7.5 Impact of response patterns

When respondents take part in research that requires them to complete a questionnaire or inventory some may present themselves in a positive light, which can affect the validity of their self-reports (Leak & Parsons, 2001: 23; Bartz *et al*, 1996: 248). Response biases due to social desirability continue to be a problematic issue distorting the findings of the research. Responding due to social desirability may occur in two forms, namely by impression management or by self-deception. The former is viewed as valid indicator of lying and intentionally deceptive while the latter is an 'honest, but perhaps inaccurate, overly positive self-description' (Leak & Parsons, 2001:

23; Bartz *et al*, 1996: 248). Within organizational research demographic or factual data are the least susceptible to response biases (Podsakoff & Organ, 1986: 532). Data obtained by the use of scaling, for example job attitude or stress, is subject to response biases. One way to overcome this problem is to develop a self-report measure that contains 'multiple, Likert-type items that, after summation, produce scores with an acceptable coefficient alpha (Gardener *et al*, 1998: 1). Another major problem occurs when measures of two or more variables are obtained from the same respondents using self-reports based on scaling to determine a relationship between them (Gardener *et al*, 1998: 1; Podsakoff & Organ, 1986: 533). This may result in what is called common methods variance which refers to the fact that when items intended to measure different but related constructs have similar item contents and identical scale response formats, it may cause spurious correlations to some degree. One way to reduce common methods variance is to develop "good" items that differ substantially in format from the other measures used in the research. This interrupts the respondent's response style (Harrison & McLaughlin in Gardener *et al*, 1998: 1). All of the questionnaires and inventories used in the study had an acceptable coefficient alpha (see section 7.3.1). Although Likert scales were used throughout the format varied from one set of questionnaires and inventories to another (see section 7.3.1).

7.6 Effect size

Analysis of data obtained from social and behavioural research traditionally focuses on the statistical significance of the results (Whitley, 2002: 431). However, statistical significance does not mean that the results are always important or meaningful but only say something of the likelihood of the obtained result (Hays in Whitley, 2002: 431). Effect size is one of the ways to overcome this discrepancy.

Effect size according to Whitley (2002: 431) refers to 'the magnitude of the impact an independent variable has on a dependent variable in experimental research and to the size of the relationship between two variables in non-experimental research.' Essentially effect size is an indication of how much of the variance in the dependent variable is due to or caused by the independent variable. For categorical independent variables the effect size, d , is obtained by finding the difference between the means of two conditions, for example between experimental and control conditions of an experiment, and then dividing by the pooled or combined standard deviation of the conditions (Whitley, 2002: 526). However, when using the pooled standard deviation it is still slightly biased particularly when using small samples (Coe, 2000). Hedges and Olkin (in Coe, 2000) have found a way to correct for this bias. The closer the obtained value is to zero, the smaller the effect size.

Judgement of the impact of the effect size on research results is useful and necessary. However it needs to be viewed in the context of the operational definitions used in the research to ensure that the appropriateness of the result is not questioned (Whitley, 2002: 432).

7.7 Conclusion

It is essential that any study be grounded in well-established research methodology to ensure the attainment of the research objectives. To answer the research question it is critical that all terms and constructs are defined concretely. This then leads to the selection of the research design that would be effective in answering the research question. All research studies have limitations and influence the choice of research design. Costs, availability, and accessibility of respondents may impose such limitations. This may influence the manner the research data is collected, whether quantitatively or qualitatively. The research question again dictates the statistical methods chosen. The researcher has the responsibility to not only plan and conduct research, but also to evaluate its ethical acceptability. The researcher has a responsibility to report the research findings and present them in a clear and understandable way whether they support the research question or not.

CHAPTER 8

DESCRIPTION OF SAMPLE

8.1 Introduction

Chapter eight deals with the description of the sample of 206 respondents with the focus on demographic factors, for example sex, age, ethnicity, marital status, home language, highest qualification achieved, the organization they presently work for, their present position title, their overall work experience, their work experience with their present employer, the department they were presently in, and their occupation.

8.2 Subjects

Individuals with at least one year working experience as well as at least a half a year working experience with their present employer were approached. A minimum qualification of each participating respondent was set to ensure an adequate level of literacy and language proficiency. The groups that were targeted were senior management, middle management and specialists who were professionals working mainly in their field of expertise. The number of questionnaires given out and completed is given (Table 8.1).

Table 8.1: Balance of questionnaires

Business sector	No given out	No completed	Response rate
Commercial bank A	106	40	37.7%
Commercial bank B	30	20	66.7%
Private Hospital in major rural area	26	8	30.8%
Provincial Development Cooperation	30	10	66.7%
Bakery in major rural area	17	8	47.1%
Manganese producer	31	7	22.6%
Quality control organization	20	8	40.0%
Petrochemical company	70	39	55.7%
Academic department of a Technikon in major rural area	10	6	60.0%
Academic department of a Technikon in major urban area	15	7	46.7%
Academic department of a university	18	15	83.3%
University library	61	21	34.4%
Insurance company	25	17	68.0%
Total	459	206	44.9%

However, of all the questionnaires used in the statistical analysis, 206 completed the Experience of Work and Life Circumstances Questionnaire (WLQ), Aggression in the Workplace Questionnaire (AWQ), IPAT Anxiety Scale (IAS), Beck's Depression Inventory (BDI), and the Social Problem

Solving Inventory-Revised (SPSI-R), whereas 205 respondents completed the Penn State Worry Questionnaire (PSWQ).

8.2.1 Description of the total survey group

The total survey group will be described in terms of biographical information that was gathered. This includes gender, age, ethnicity, marital status, home language, highest qualifications achieved, type of organization each respondent works for, position level, and work experience.

8.2.1.1 Gender

With regard to gender 41.3% (85 respondents) of the survey were female where as 58.7% (121 respondents) were male (Table 8.2).

Table 8.2: Gender distribution

Gender	N	%
Male	121	58.7
Female	85	41.3
Total	206	100

8.2.1.2 Age

The youngest respondent was 22 years old and the oldest 64 years. The mean age of the participants in the study was 40.16 years (thus in terms of development, generally middle-aged participants) with a standard deviation of 9.84 years. Two respondents did not indicate their age on the questionnaire (Table 8.3).

Table 8.3: Mean age (\bar{x}), standard deviation (s), and variance (s^2) for age of respondents

Variable	N	\bar{x}	s	s^2
Age	204	40.16	9.84	96.83

The age distribution of the respondents was unevenly spread throughout the sample (Table 8.4). Over a third of the respondents were found in the range from 40 to 49 years (38.2% or 78 respondents), just over a quarter in the 40 to 49-age range (28.9% or 59) followed by two smaller groupings, one ranging from 50 years or older (21.1% or 43 respondents), and one ranging from 20 to 29 years (11.8% or 24 respondents). Two respondents had not indicated their age and were regarded as missing. The respondents could be classed as older and more experienced individuals as they were mainly found in the late adulthood or middle age categories.

Table 8.4: Age distribution of respondents

Age range	N	%
20-29	24	11.8
30-39	78	38.2
40-49	59	28.9
50 or older	43	21.1

8.2.1.3 Ethnicity

With regard to ethnicity the majority (88.3% or 182 respondents) described themselves as Whites while the remainder of the respondents described themselves as Africans (5.8% or 12 respondents), Coloureds (2.4% or 5 respondents), or Indians (3.4% or 7 respondents) (Table 8.5).

Table 8.5: Ethnicity

Ethnicity	N	%
African	12	5.8
Coloured	5	2.4
Indian	7	3.4
White	182	88.3

8.2.1.4 Marital status

Of all the respondents, less than a fifth were unmarried (15.5% or 32 respondents), about three-quarters were married (74.8% or 154 respondents), with the remaining respondents either being divorced (8.7% or 18 respondents) or having lost a spouse (1.0% or 2 respondents) (Table 8.6). For the purposes of statistical calculations, the marital status was simplified into two categories, namely married (74.8% or 154 respondents) and non-married (25.2% or 52 respondents).

Table 8.6: Marital status

Marital Status	N	%
Unmarried	32	15.5
Married	154	74.8
Divorced	18	8.7
Widow/er	2	1.0

8.2.1.5 Home language

With regard to home languages it was found that the majority of respondents were Afrikaans speaking (66.0% equal to 136 respondents), a quarter were English speaking (24.8% or 51 respondents) and the remaining respondents considered themselves either bilingual (English/Afrikaans) (2.9% or 6 respondents), Zulu speaking (2.4% equal to 5 respondents), German speaking (1.0%, 2 respondents), Se-Pedi (1.0%, 2 respondents), Xhosa (0.5% or 1 respondent),

Swazi (0.5%, also 1 respondent), Tswana (0.5% or 1 respondent) or Se-Sotho (0.5% or 1 respondent) (Table 8.7).

Table 8.7: Home language distribution

Home Language	N	%
Afrikaans	136	66.0
English	51	24.8
English/Afrikaans	6	2.9
German	2	1.0
Se-Pedi	2	1.0
Se-Sotho	1	0.5
Swazi	1	0.5
Tswana	1	0.5
Xhosa	1	0.5
Zulu	5	2.4

8.2.1.6 Organizations

A number of organizations were approached of which three large organizations declined to take part in the survey. The types of institutions that took part come from a wide range of organizations mostly from the private sector (Table 8.8).

Table 8.8: Type of institution

Type of Institution	Organization	N	%
Financial sector	Commercial banks	60	29.1
Production/Services	Private sector	50	24.3
Research and Development	State-owned & research	47	22.8
Academic/ Auxiliary Services	Academic institutions	49	23.8

8.2.1.7 Qualifications

The minimum requirement with regard to the survey sample was a matric qualification. An exception was made if the individuals had completed either their grade 8, 9 10, or 11 and had worked themselves up into a management position within their organizations. Of the survey group, a quarter of the respondents had completed their grade 12 or lower (26.2% equal to 54 respondents), a sixth had obtained a National Diploma or a grade 12 with a Bank diploma (17.0% or 35 respondents), just over one fifth had Bachelors degrees (11.7% or 24 respondents), another sixth had obtained Honours and Law degrees (16.0% or 33 respondents) and about a third had obtained their Masters or Doctoral degrees (29.1% or 60 respondents) (Table 8.9).

Table 8.9: Qualifications of the survey group

Qualification	N	%
Std. 10 + Bank exams	2	2.4
Std 10 (Grade 12)	51	24.8
< Std. 10	3	1.5
National Diploma	27	13.1
National Higher Diploma	6	2.9
BA	11	5.3
B.Sc	5	2.4
B.Sc (Eng)	4	1.9
B.Com	4	1.9
B.Juris/Proc	2	1.0
BA (Hon)	22	10.7
B.Sc (Hon)	6	2.9
B.Com (Hon)	2	1.0
B.Pharm	1	0.5
M.Sc	27	13.1
Ph.D	33	16.0

8.2.1.8 Position level

The survey group was divided into three categories, namely senior management, middle management, and specialist staff levels (Table 8.10). It was found that half of the respondents (49.5% totalling 102 respondents) worked on a senior management level, a quarter (27.6% or 61 respondents) worked in middle management, and the remaining respondents (16.5% or 34 respondents) were in specialist staff positions. One individual did not indicate his or her position.

Table 8.10: Position level

Position	N	%
Senior management	102	49.5
Middle management	61	29.6
Specialist staff	42	20.4
Unknown	1	0.5

8.2.1.9 Work experience

The respondents overall work experience varied from 8 months to 46 years with a mean of 17.35 years and a standard deviation of 10.58 years (Table 8.11). Five respondents did not indicate their overall work experience. The distribution of work experience was skewed towards the higher position levels in the various organizations.

In the case of work experience with the present employer, it varied from 8 months to 39 years with a mean of 10.57 years and a standard deviation of 9.16 years (Table 8.11). Three respondents did not indicate their present work experience.

Table 8.11: Mean work experience (\bar{x}), standard deviation (s), and variance (s^2) for work experience of respondents

Type	N	\bar{x}	s	s^2
Total work experience	201	17.35	10.58	111.84
Work experience with present employer	203	10.57	9.16	83.92

The results for total work experience (Table 8.12) showed that one third of the respondents (33.3% equal to 67 respondents) had between 10 and 20 years of work experience, about a quarter (23.4% or 47 persons) had between 20 and 30 years of total work experience whereas just over a fifth (22.4% or 45 respondents) had less than 10 years of total work experience. The remaining fifth (18.9% or 32 respondents) had more than 30 years of total work experience.

Comparatively just over half of the respondents (52.2% or 106 respondents) had worked less than 10 years for their present employer, about a third (31.5% or 64 respondents) had worked between 10 and 20 years for their present employer with the remaining sixth (16.2% or 33 respondents) having worked for their present employers for between 20 and 40 years (Table 8.12). Three respondents did not complete this section.

Table 8.12: Work experience distribution

Type	Years	N	%
Total work experience	0 – 9	45	22.4
	10 – 19	67	33.3
	20 – 30	47	23.4
	30 years and higher	32	18.9
Work experience with present employer	0 – 9	106	52.2
	10 – 19	64	31.5
	20 – 29	22	10.8
	30 years and higher	11	5.4

8.3 Conclusion

Ideally, the subjects that took part would be randomly selected from a given subject pool. However, this was not possible due to financial, logistical, other constraints. The “good enough for our purpose” principal (Kruskal & Mosteller, in Heppner, Kivlighan, & Wampold, 1992: 274) stipulates that non-random samples can have sufficient characteristics that a generalization to a certain population is reasonable. Therefore it is essential to describe the characteristics of the subjects used in the study to show that the characteristics of the sample match those of a certain portion of

the population. Furthermore the biographical characteristics chosen impinge on the type of statistical analysis selected to answer the research question.