CHAPTER 4
RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous chapters serve to provide a framework of the purpose and the importance of this study. The second and third chapters also contain the focused literature review of the study. The aim of this chapter is to outline the research approach, design and methods used in this study and to explain the reasons for choosing the statistical methods used in the analysis of the empirical data.

Dainty (2007) emphasises the importance of constructing a philosophical position and orientation towards the inquiry in conducting research. Merriman (1998:3) argues that it is helpful to link research and philosophical traditions in order to illustrate different research orientations.

Research, according to Bennett (1991), cited in Smith & Dainty, 1991:68) is 'a systematic, careful inquiry or examination to discover new information or relationships and to expand/verify existing knowledge for some specified purpose'. Scientific research methods are used to expand knowledge in a particular field of study (Kruger & Welman, 1999:1). Scientists should follow a well-defined research design that includes various steps to reach a conclusion regarding a specific subject(s) that is being researched. Mouton (2001:55) describes a research design as a plan or blue-print of how the researcher intends to conduct the research.

4.1.1 Philosophical position and orientation

In this study, a combination of a positivist and an interpretivist research paradigm was considered. A paradigm is defined as 'the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways' (Guba & Lincoln,

1994:105). Table 4.1 compares the positivist and interpretivist paradigms that guided this research. This comparison of differences between the two research approaches is based strongly on the contribution of Jorgen Sandberg (cited in Weber, 2004:iv).

Qualitative and quantitative research can be seen as representing two different paradigms (Samdahl, 1999). Hathaway (1995) uses the term *empirical-analytical* to describe the paradigm structuring quantitative research, and *interpretive* for the paradigm underlying qualitative research. Both paradigms and approaches historically assumed a different ontology and epistemology.

Table 4.1: A comparison of the alleged differences between the positivist and interpretivist paradigms

Theoretical assumptions about	Positivism	Interpretivism
Ontology	Person (researcher) and reality are separate.	Person (researcher) and reality are inseparable (life-world).
Epistemology	Objective reality exists beyond the human mind.	Knowledge of the world is intentionally constituted through a person's lived experience.
Research Object	The research object has inherent qualities that exist independently of the researcher.	The research object is interpreted in the light of the meaning structure of a person's (researcher's) lived experience.
Theory building/testing	Theories are postulated that can be tested to be confirmed or rejected. A theory is proven from observable phenomena /behaviour. Theories are tested in a controlled setting, empirically supporting or falsifying hypotheses through a process of experimentation.	Theories are built / constructed from multiple realities – the researcher has to look at different things in order to understand a phenomenon. Theory is shaped by social and cultural context.
Theory of truth	Correspondence theory of truth: one-to-one mapping between	Truth as intentional fulfilment: interpretations of the research object match the

Theoretical assumptions about	Positivism	Interpretivism
	research statements and reality.	lived experience of the object.
Method	Statistics, content analysis.	Hermeneutics, phenomenology, etc.
Types of data	Quantitative data	Qualitative data
Validity	Certainty: data truly measured	Defensible knowledge claims
Reliability	Replicability: research results can be reproduced.	Interpretive awareness: researchers recognize and address the implications of their subjectivity.

Source: Adapted from Sandberg (cited in Weber, 2004:4) and Samdahl (1999)

4.1.2 Inductive and deductive reasoning in research

Saunders, Lewis and Thornhill (2007:117) state that researchers can follow a deductive or inductive approach to research. In deductive research, the researcher develops a hypothesis and then designs the research in such a way that he or she tests a theory. In inductive research, the researcher first collects the data and then, from the data analysis, develops a theory. According to Gay and Airasian (2003:4), 'an inductive research approach is typically qualitative in nature, while a deductive research approach is typically quantitative in nature'.

Quantitative methodologies test theory deductively from existing knowledge, by developing hypothesized relationships and proposed outcomes for study.Cormack (1991)   states that, in comparison, qualitative researchers are guided by certain ideas and perspectives regarding the subject to be investigated and develop theory inductively. Deductive reasoning commences with generalizations, and seeks to see if these generalizations apply to specific instances, whereas inductive reasoning commences with the observation of specific facts, and seeks to establish generalizations. Onwuegbuzie and Collins (2005:283) explain that 'quantitative researchers tend to make *statistical* generalizations, which involve generalizing findings and inferences from a representative statistical sample to the population from which the sample was drawn'. By contrast, qualitative researchers tend to make *analytic* generalizations (Miles & Huberman, 1994), which are 'applied to wider theory

on the basis of how selected cases "fit" with general constructs' (Curtis, Gesler, Smith & Washburn, 2000:1002).

The difference between qualitative and qualitative research towards scientific reasoning, theory building, the acquisition of new knowledge and testing is depicted in Figure 4.1. In the current study, both an inductive and a deductive reasoning process were followed to acquire new knowledge.
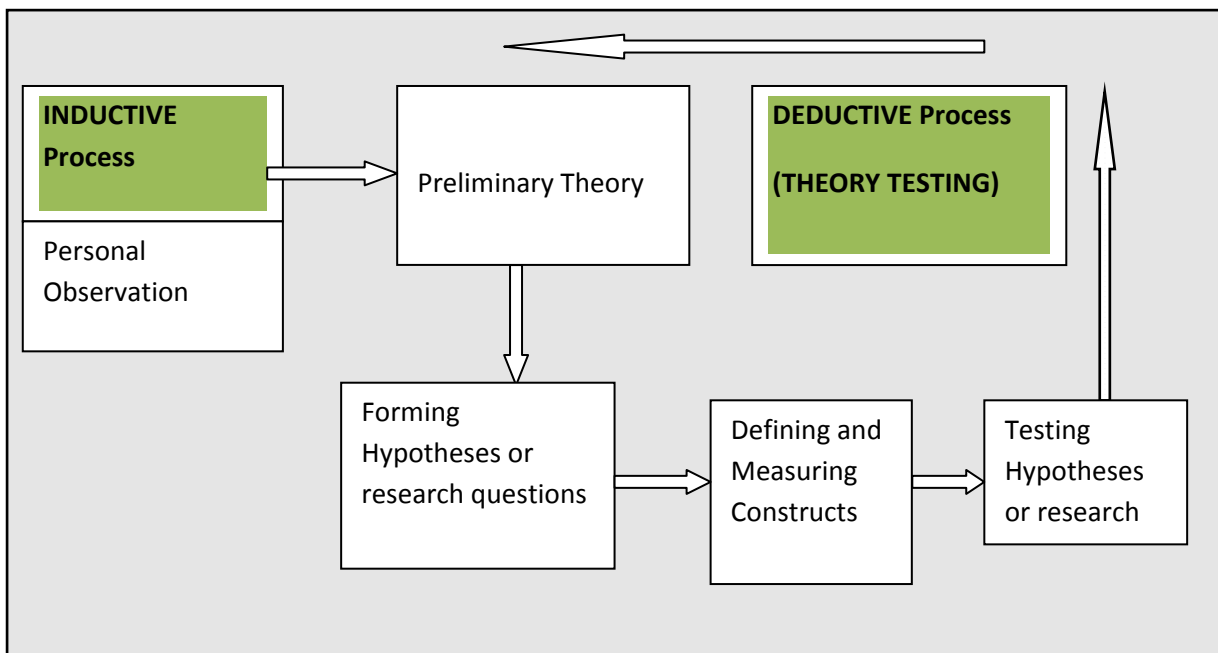
Source: (McShane, 2003:604 cited in Du Plessis, 2003)

Figure 4.1: The theory-building process

4.2 QUANTITATIVE AND QUALITATIVE RESEARCH APPROACHES

4.2.1 Quantitative research

Quantitative research is often described using the term 'empiricism' (Leach, 1990) and it derives from the scientific method used in the physical sciences (Cormack, 1991). Quantitative research is about prediction and using numbers to prove or disprove a hypothesis. This method uses strict control of variables and the focus is on static reality. Empirical researchers are interested in

generating data from a large sample of study subjects so that they can generalize the conclusion to others (York, 1998). Quantitative research uses data that are structured in the form of numbers or that can be immediately transported into numbers (Ross, 1999). It is a very controlled, exact approach to research (Muijs, 2004:2).

The assumptions underlying quantitative methods include the following, according to Cyber Kebumen (s.a:42):

'reality is objective, "out there," and independent of the researcher -- therefore reality is something that can be studied objectively;

the researcher should remain distant and independent of what is being researched;

the values of the researcher do not interfere with, or become part of the research – research is value-free;

research is based primarily on deductive forms of logic and theories and hypotheses are tested in a cause-effect order; and

the goal is to develop generalizations that contribute to theory that enable the researcher to predict, explain, and understand some phenomenon'.

4.2.2 Qualitative research

There is no universal definition of qualitative research. In the literature of the social sciences and applied professional fields, terms such as interpretive, naturalistic, constructivist, ethnographic, and fieldwork are variously employed to designate the broad collection of approaches that are called simply qualitative research (Locke, Spirduso & Silverman, 2000). Denzin and Lincoln (2005:3) contend that 'qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them'.

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena (Myers, 1997). It is data that is usually not in the form of numbers. Qualitative research is an inductive approach, and its goal is to gain a deeper understanding of a person's or

group's experience. According to Ross (1999), qualitative approaches to research are based on a 'world view' which is holistic and has the following beliefs: first, that there is not a single reality; second, that reality is based upon perceptions that are different for each person and change over time; and third, that what we know only has meaning within a given situation or context.

The assumptions underlying quantitative methods include, according to Cyber Kebumen (s.a:43), the following:

'multiple realities exist in any given situation – the researcher's, those of the individuals being investigated, and the reader or audience interpreting the results; these multiple perspectives, or voices, of informants (i.e., subjects) are included in the study;

the researcher interacts with those he studies and actively works to minimize the distance between the researcher and those being researched;

the researcher explicitly recognizes and acknowledges the value-laden nature of the research; research is context-bound;

research is based on inductive forms of logic; categories of interest emerge from informants (subjects), rather than being identified a priori by the researcher;

the goal is to uncover and discover patterns or theories that help explain a phenomenon of interest; and

determinations of accuracy involve verifying the information with informants or 'triangulating' among different sources of information (e.g., collecting information from different sources)'.

Based on the discussion of the strengths and limitations of qualitative and quantitative research presented by Schulze (2003:12) and Johnson and Onwuegbuzie (2004:19-20), it was decided to consider the 'mixed methods research process model' as a possible research approach.

4.3   INQUIRY STRATEGY AND BROAD RESEARCH DESIGN

4.3.1   The qualitative-quantitative continuum

Many research studies are more complex than the above discussion of the main approaches implies. Almost all studies have more than one hypothesis or research question that may require the use of more than one of the research approaches and their methods. Creswell (2003) believes that a forced selection of either the quantitative or qualitative approach imposes an unfair dichotomy on a research project that does not capture all possible approaches needed to acquire new knowledge. Teddlie and Tashakkori (2008) also argue that the reality of research conducted in a social and behavioural context is that it takes place within some area of a qualitative-mixed-quantitative continuum.

Teddlie and Tashakkori (2008:28) describe the qualitative-mixed-quantitative continuum in terms of three methodological approaches and areas of inquiry. This is visually illustrated in Figure 4.2.
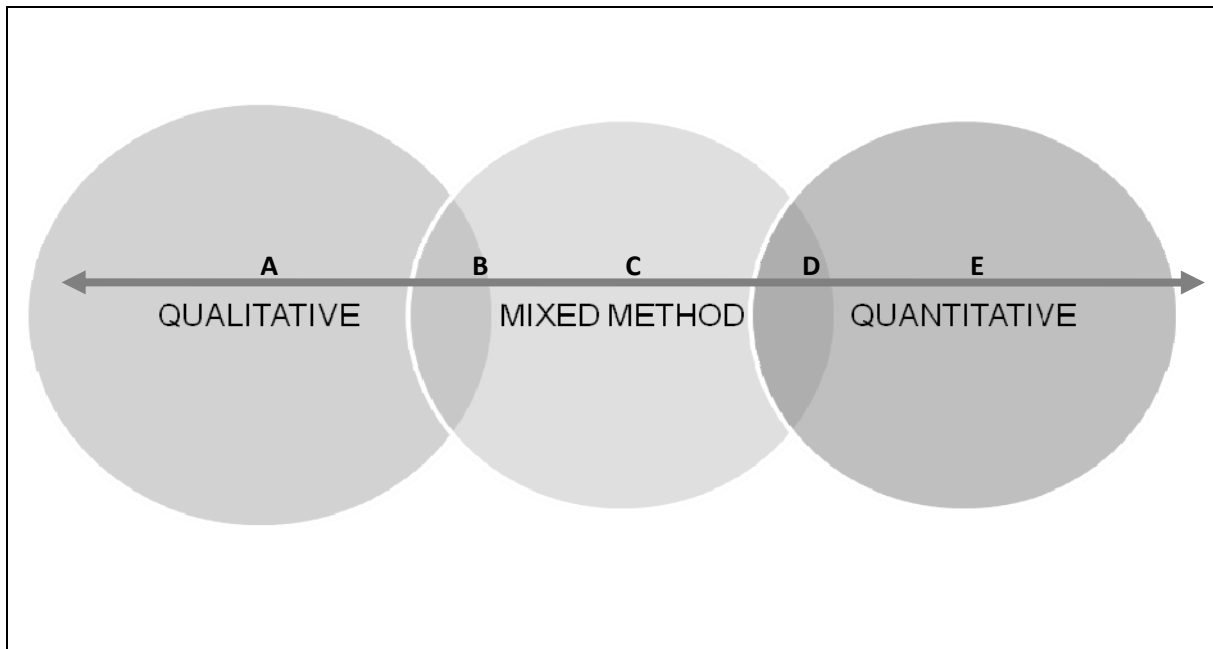
Source: Adapted from Teddlie and Tashakkori, 2008:28.

Figure 4.2: The qualitative-mixed-quantitative inquiry continuum

In Figure 4.2, Teddlie and Tashakkori (2008) display the relationship between three methodological communities. Areas A and E signify the qualitative and quantitative approach respectively. Area C visualizes an integration of both the qualitative and quantitative research approaches. A researcher's choice to move towards either end of the continuum (in other words, to Area A or Area E) represents a decision to use a purely qualitative or a purely quantitative approach. A decision to move towards the middle of the continuum (Area C) results in a mixed method approach with an equal *integration* of the two inquiry techniques. Section B describes a mixed approach in which qualitative components dominate and Section D displays an area of inquiry adopting a mixed approach in which quantitative components dominate.

According to Bergman (2008:91), using a mixed method approach with its different data collection strategies has the following advantages:

It provides *corroboration*: Combining qualitative and quantitative research mutually corroborates results, thus providing greater validity.

It can *offset* disadvantages: A study is able to take advantage of the strengths found in the two disjoint inquiries by offsetting any of the disadvantages found in either of the two.

It is *comprehensive*: The researcher is able to provide a more thorough account of the field of inquiry by using both qualitative and quantitative methods.

It allows for *instrument development*: More clear and structured scale items can be devised from a qualitative probe of the inquiry area.

It enhances *credibility*: Using both qualitative and quantitative research strategies enhances the integrity of findings.

It allows *discovery and confirmation*: This implies using qualitative research to generate objectives and thereafter employing quantitative methods to confirm hypotheses.

Due to the nature of the current study and the data that needed to be explored to generate new knowledge, the mixed method design of inquiry, which employs both qualitative and quantitative research practices, seemed to be the most appropriate approach to conduct the study.

4.3.2 A description of the mixed methods design

A mixed method design includes 'the incorporation of various quantitative or qualitative strategies within a single project. The imported strategies are supplemental to the major or core method and serve to enlighten or provide clues that are followed up within the core method' (Morse, cited in Tashakkori & Teddlie, 2003:190). The mixed method design therefore involves the collection, analysis and integration of quantitative and qualitative data in a single or multiphase study. This type of design reflects a pragmatic epistemology (Guba & Lincoln, 1994).

Although certain methodologies tend to be associated with a given research tradition, Dzurec and Abraham (1993:75) suggest that 'the objectives, scope, and nature of inquiry are consistent across methods and across paradigms'. A mixed methods study involves similar steps to those in traditional research methods. These include formulating a research problem and research objective; developing a research purpose, research questions(s), and hypotheses; selecting a research design/method; collecting data; analysing data; interpreting/validating data; and communicating findings (Onwuegbuzie & Leech, 2005:276).

Designing a mixed methods study, however, also involves at least four additional steps. These include decisions about, first, the potential use of an explicit theoretical lens; second, the implementation sequence of the quantitative and qualitative data collection; third, the priority that will be given to quantitative and qualitative data collection and analysis; and, fourth, at what stage in the research project the quantitative and qualitative data and findings can be integrated (Creswell, 2003:211; Hanson, Creswell, Plano Clark, Petska & Creswell, 2005:226). The adapted model of Creswell (2003) depicted in Figure 4.3 gives an indication of the relationship between the elements of inquiry and the design process for mixed method research.
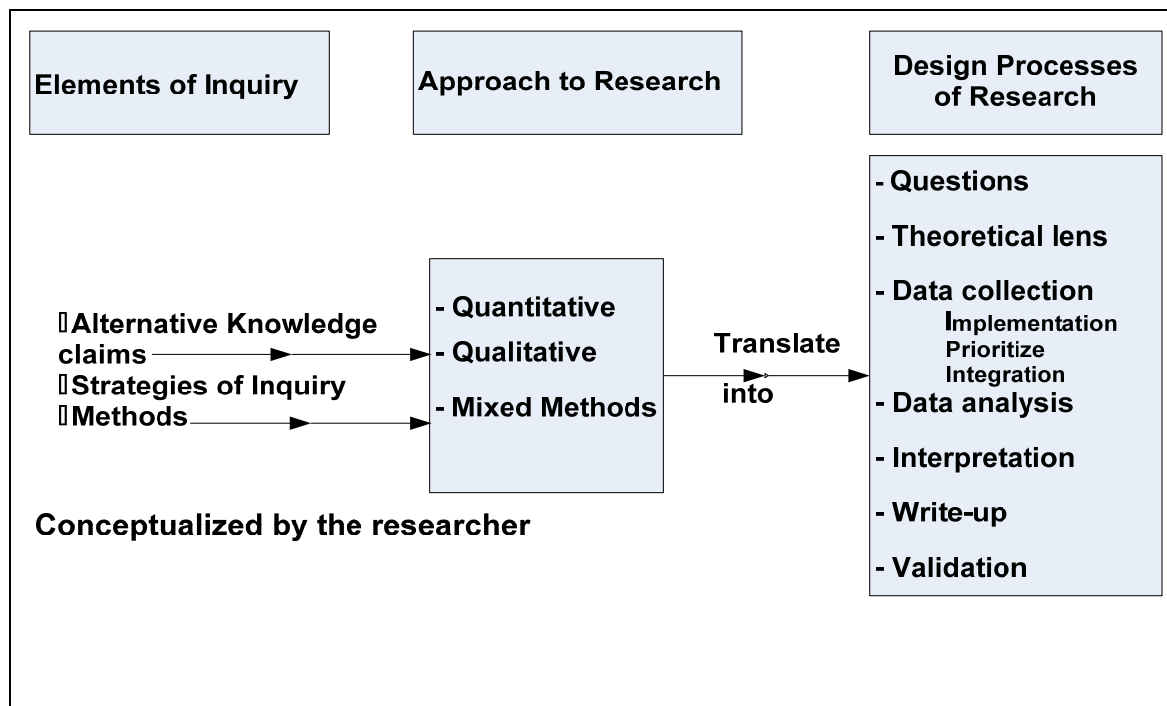
Source: Adapted from Creswell, 2003:5.

Figure 4.3: Knowledge claims, strategies of inquiry, and methods leading to approaches and the design process.

When undertaking a mixed methods study, the researcher must consider the following factors or criteria to determine the type of mixed methods design to be employed in a study:

theoretical lens, which refers to the philosophical basis, or paradigm (for example, post-positivism, constructivism or feminism) that underlies a study and subsequent methodological choices;

implementation, the order in which the qualitative and quantitative data are collected, concurrently or sequentially;

priority, the weight, or relative emphasis, given to the two types of data, equal or unequal; and

integration, the mixing of qualitative and quantitative data at one or more stages in the process of research: the data collection, the data analyses, interpretation, or some combination (Creswell, 2003:211; Hanson *et al.*, 2005:227).

The types of design according to the criteria mentioned above are presented in Table 4.2, which depicts six different types of important mixed method designs proposed by Creswell, Plano Clark, Gutmann and Hanson (2003:224).

Table 4.2: Types of design by four criteria

Design type	Implementation	Priority	Stage of integration	Theoretical perspective
Sequential Exploratory	Qualitative followed by Quantitative	Usually Qualitative; can be Quantitative or equal	Interpretation phase	May be present
Sequential Transformative	Either Quantitative followed by Qualitative or Qualitative followed by Quantitative	Quantitative, Qualitative or equal	Interpretation phase	Definitely present (i.e., conceptual framework, advocacy, empowerment)
Concurrent triangulation	Concurrent collection of Quantitative and Qualitative Data	Preferably equal; phase can be Quantitative or Qualitative	Interpretation phase Analysis phase	May be present
Concurrent nested	Concurrent collection of Quantitative and qualitative Data	Quantitative or Qualitative	Analysis phase	May be present
Concurrent transformative	Concurrent collection of Quantitative and qualitative Data	Quantitative, Qualitative, or equal	Usually analysis phase; can be during interpretation phase	Definitely present (i.e., conceptual framework advocacy, empowerment)

Source: Creswell *et al.* (2003:224)

After a content analysis of various available mixed research designs, Leech and Onwuegbuzie (2005:7) identified eight mixed methods designs. They conceptualize these designs as a function of the following three dimensions: first, the level of mixing (partially mixed vs. fully mixed); second, time orientation

(concurrent vs. sequential), and, third, the emphasis of the approaches (equal status vs. dominant status). The natures of the mixed method designs described by Creswell *et al*. (2003) and Leech and Onwuegbuzie (2005) are strongly interrelated.

The strengths and weaknesses of mixed method research design, as reported in Johnson and Onwuegbuzie (2004), are offered in Table 4.3. A comparison of the strengths and weaknesses related to the mixed research approach and the numerous researchers that opt for this approach has convinced the researcher in the current study of the practical application, feasibility and scientific acceptability of this approach.

Table 4.3: Strengths and weaknesses of mixed research

Strengths	Weaknesses
• Words, pictures, and narrative can be used to add meaning to numbers.	• Can be difficult for a single researcher to carry out both qualitative and quantitative research, especially if two or more approaches are expected to be used concurrently; it may require a research team.
• Numbers can be used to add precision to words, pictures, and narrative.	
• It can provide quantitative and qualitative research strengths.	• Researcher has to learn about multiple methods and approaches and understand how to mix them appropriately.
• Researcher can generate and test a grounded theory.	
• Can answer a broader and more complete range of research questions because the researcher is not confined to a single method or approach.	• Methodological purists contend that one should always work within either a qualitative or a quantitative paradigm.
	• More expensive.
	• More time consuming.
• The specific mixed *research designs* discussed in this article have specific strengths and weaknesses that should be considered (e.g., in a two-stage sequential design, the Stage 1 results can be used to develop and inform the purpose and design of the Stage 2 component).	• Some of the details of mixed research remain to be worked out fully by research methodologists (e.g., problems of paradigm mixing, how to qualitatively analyze quantitative data,

Strengths	Weaknesses
• A researcher can use the strengths of an additional method to overcome the weaknesses in another method by using both in a research study.	how to interpret conflicting results).
• Can provide stronger evidence for a conclusion through convergence and corroboration of findings.	
• Can add insights and understanding that might be missed when only a single method is used.	
• Can be used to increase the generalizability of the results.	
• Qualitative and quantitative research used together produce more complete knowledge necessary to inform theory and practice.	

Source: Johnson and Onwuegbuzie (2004:21)

4.4   THE RESEARCH DESIGN

4.4.1 Sequential exploratory design

Based on the four criteria of implementation, priority, integration and theoretical perspective, the current study employed a sequential exploratory **mixed method** design. These designs do not as a rule use an explicit theoretical lens (Creswell *et al*. 2003). However, in this study, the researcher adopted a feminist perspective. As Sarantakos (2004) explains, feminist research studies the social conditions of women in a male-dominated society. It goes further to enlighten people about taken-for-granted sexist practices, including the role of government and community practices. In short, '[f]eminist research is research on women, by women and for women' (Sarantakos, 2004:54). The main features of feminist research are shown in Table 4.4.

Table 4.4: Feminist research: the quest for emancipation and change

Feminist research
Assumes: ➢ That the powerful dominate social life and ideology   ➢ That research is owned by the powerful (men) at the expense of women   ➢ That men and women differ in their perceptions of life due to their social status   Employs: ➢ Engaging and value-laden methods and procedures that bring the researcher close to the subject   ➢ Subjective principles of research, encouraging taking sides and personal commitment to the feminist cause   ➢ A political stance to research topics and procedures   Aims to: ➢ Expose the structures and conditions that contribute to the present situation   ➢ Enlighten the community on the factors that generate this phenomenon and propose ways that can help alleviate the problem   ➢ Empower women and give them a voice to speak about social life from their perspective   ➢ Ultimately contribute towards social change and reconstruction

Source: Sarantakos (2004:55)

Linked to a feminist research approach, the present study adopted a sequential mixed method design to investigate the same underlying phenomenon in a single study. Both qualitative and quantitative data were sequentially collected, analysed and interpreted. The qualitative data was collected and analysed in the first phase, and the quantitative data was collected and analysed in the second phase of the research.

In this *two-phase* design a predominantly quantitative approach was followed. Priority was given to the quantitative design of the study; and the quantitative phase carries the most weight in the study. The data of the qualitative component of the study was primarily used to inform the quantitative data. Findings of the first phase were integrated and used in the beginning of the second phase. For example, the qualitative interview data collected in the first phase served as the foundation for the development of the measuring instrument used in this study. The findings of both phases were also considered during the interpretation phase. According to Hanson *et al.* (2005:229), mixed method sequential exploratory designs are particularly 'useful for exploring relationships when study variables are not known, refining and testing an emerging theory, developing new psychological test/assessment instruments based on an initial qualitative analysis, and generalizing qualitative findings to a specific population'.

The literature discussed thus far assisted the researcher in building a broad framework of the overall research design for this study. Figure 4.4 sets out the overall research design, which is divided into two phases and consists of six stages. This design is a 'fully mixed sequential dominant status design' (Leech & Onwuegbuzie, 2005:14).
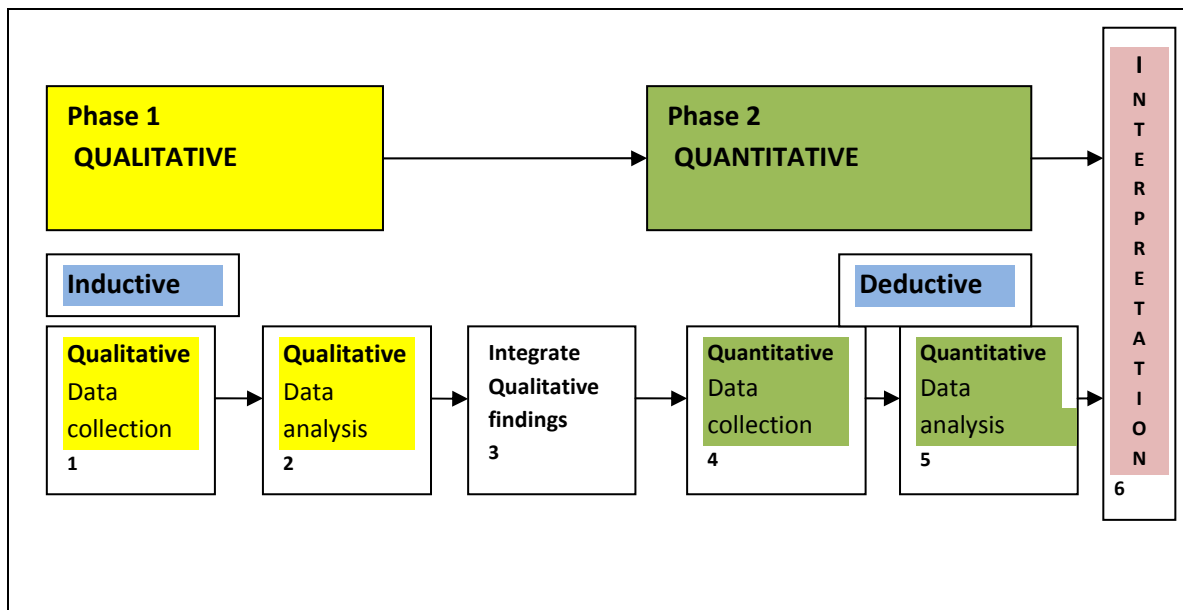

Figure 4.4: The overall research design

4.4.2 Steps followed in the execution of the study

The following steps were followed to address the research questions and research objectives;

doing a literature study to comprehend the context of the multi disciplinary field involved;

collecting and analysing data generated by means of interviews with individual working mothers;

identifying and classifying the pressures and stressors facing single working mothers;

identifying and classifying the systems and resources that support single working mothers to cope with high job and family demands;

conceptualising and categorising related themes;

generating questions to assess the pressures and support systems;

creating a preliminary questionnaire with 121 items plus demographics;

analysing the content validly of the items for each theme using Lawshe's technique;

developing a questionnaire to explore the problems and pressures facing single working mothers and to identify the resources needed to mitigate the stressors;

collecting data by means of the new questionnaire and two existing inventories to assess the level of stress and the coping behaviour of single working mothers;

confirming the problems and pressures single working mothers experience;

confirming the relevant resources that enable single working mothers to deal with high job and family demands; and

making recommendations regarding the different strategies organisations need to develop to support single working mothers.

The research methods used in the process of inquiry, the data collection and analysis performed in the current study are depicted in Table 4.5.

Table 4.5: Research method related to inquiry, data collection and data analysis

Methods of data collection	Reasoning	Methods of data analysis

Qualitative
  Literature study
 	
  Semi-structured interviews
  Purposive sample
	Inductive	Content analysis
		  Identification of themes related to the topic
		  Categorisation of relevant themes
		  Verification of themes and testing of their applicability to the interviewed sample

Qualitative & quantitative
  Grouping and consolidation of themes
  Generation of questions to assess the themes using various scientific sources
	Deductive	Selection of applicable questions/ items in each theme.
		  Analysis of the content validly of the items for each theme using Lawshe's technique
		  Construction of a preliminary questionnaire

Quantitative
  Survey of a non-probability purposive sample
  Collection, coding and electronic capture of data
  Establishment of relationships between dependent and independent variables
  Comparison of different groupings
	Deductive	Testing and validation of the measuring instrument
		Exploratory factor analysis
		Item analysis
		Reliability analysis
		Association analysis
		Multivariate analysis
		Logistic regression analysis

4.5 RESEARCH POPULATION AND SAMPLING STRATEGY

A population is the total collection of elements or participants about which the researcher makes some inferences (Cooper & Schindler, 2003:69). Alternatively, Brink (1996:121) and Bless and Higson-Smith (2000:89) define a population as a complete set of events, people or things on which the focus of the research falls and in which the researcher has an interest and about which the researcher wants to determine some characteristics.

A target population consists of a total number of elements or units from or about whom survey information is collected. These elements are usually individual persons (Dooley, 1990:140). To draw a sample, one needs to select a specific population. One also needs to identify population parameters to have a benchmark population (Nagtegaal, 1992:16). The target population in this study consisted of single and married mothers in management and professional occupations.

4.5.1 Sampling procedure

A sample is a set of individuals selected from a population and intended to represent the population under study. Samples are drawn because it would be impractical to investigate all members of a target population (Brewerton & Millward, 2002:15). Henning (2004:85) states that sampling is a process of selecting research participants.

A non-probability sampling procedure was used in this study, because all the potential candidates to be included in the sample population cannot be traced or located (Brink, 1996:56). The non-probability sampling method is applicable where the probability that a given element or individual of the population will be included in the sample is not known (Bless & Higson-Smith, 2000:73). In this regard, it is important to note that for inferential theory building, generalisations based on a non-probability sample are acceptable; however, for researchers to infer generalisations about the population at large, a *probability* sample is required (Saunders *et al*., 2007:227).

The method of non-probability sampling applied in this study was a combination of purposive sampling and convenience sampling. Purposive sampling is also referred to as judgemental sampling, as it is based on the judgement of the researcher regarding the characteristics of the representative sample (Babbie, 2004:183). Brink (1996) explains that purposive sampling is based on the judgement of the researcher regarding subjects and objects that are representative of the phenomenon or topic being studied, or who are especially knowledgeable about the question at issue.

Based on the knowledge of the phenomena, the research questions asked and the research objectives of the current study, it was decided to include only single and married working mothers from the population of females working in management and professional occupations in South Africa.

Furthermore, convenience sampling was required, since, unlike with a research study based on a single organisation or professional group, there was no designated body which represents single working mothers in professional and managerial occupations. It was therefore not possible to identify or compile a list of all the potential participants in the sample frame that comply with the characteristics required for inclusion in this study. This limitation is also the reason why the size of the total population is unknown. Consequently, participants in this study were initially recruited on an informal basis by way of the snowballing technique.

In snowball sampling the researcher identifies and requests volunteers from a group of people who meet the specific requirements to participate in the study. These individuals then spread the information and identify other members (for example, fellow colleagues) from the same population for inclusion in the sample. These members of the population may in their turn identify a further set of relevant individuals so that the sample grows in size like a rolling snowball (Welman & Kruger, 1999).

According to (Patton, 1990), the advantage of a snowballing sample is that it helps to determine stakeholders;

increases the number of participants in the process;

builds on resources of existing networks; and

determines stakeholders unknown to the researcher.

The composition of the sample started with the identification of ten single working mothers who were personally known to the researcher, in managerial positions in various organisations in both the private and public sectors. Each of these ten original participants was asked whether she knew of other single working mothers, in professional and management occupations, who might be willing to take part in the research. Each was requested to provide the e-mail addresses of all potential participants that meet the specific requirements of the study. Subsequently, the newly identified potential applicants were contacted and asked to participate in the research and to provide more e-mail addresses of working mothers in professional and management positions. This request was addressed to each subsequent participant to ensure an acceptable number of research subjects. In order to ascertain the distinctiveness of the case of single working mothers, a comparative group of seven dual-career women with similar characteristics and positions was also selected, using the same snowballing technique and procedures. The e-mail addresses of potential participants in both groups were also collected by the researcher at various women's workshops and conferences.

4.5.2   Determining the sample size

Determining a sample size in order to extract sufficient data for statistical analysis can be a daunting task for a researcher. Streiner (2003) recommends that researchers keep the following three criteria in mind when considering the size of the sampling frame: the level of precision, the level of confidence or risk the study is willing to take, and the degree of variability in the attributes being measured.

There are two fundamental reasons for extracting an acceptable sample size (Kalton, 1999:90):

a minimum number of cases is required to analyse sub-group *relationships* (factor analysis, etc.) adequately; and

to draw inferential conclusions, the sample must, as far as possible, represent the population under scrutiny.

The guidelines established by Onwuegbuzie and Collins (2007) were applied to determine whether the study's sample size was sufficiently large. These guidelines are depicted in Table 4.6.

Table 4.6: Minimum sample size recommended for most common quantitative and qualitative research designs

Research Design/Method	Minimum sample size
Correlation	64 participants for one-tailed hypothesis; 82 participants for two-tailed hypotheses
Causal-Comparative	51 participants per group for one-tailed hypotheses 64 participants per group for two-tailed hypotheses
Experiment	21 participants per group for one-tailed hypothesis
Case Study	3-5 participants
Phenomenological	≤10 interviews
Grounded Theory	15-20
Ethnography	1 cultural group; 30-50 interviews
Human Ethological	100-200 units of observation

Source: Onwuegbuzie and Collins (2007:289)

Following the guidelines indicated in Table 4.6, different sample sizes were used, each corresponding with the adequate sample size for the specified purpose of the three mixed method phases.

Ten single working mothers and seven married working mothers were selected for the first qualitative phase of the study. In-depth interviews were conducted with these 17 working mothers to discover the pressures and stressors facing working mothers and to get an indication of the resources that support single working mothers to cope with high job and family demands.

In the second phase (qualitative and quantitative), the researcher grouped and consolidated the literature and interview data into themes to define the theoretical constructs. Based on these themes, 121 descriptive elements or statements (items) were generated to assess the behaviour related to the constructs.

During this phase, a panel of 30 experts judged the *relevance* and *clarity* of each descriptive element and assessed the validity of the items related to the specific construct. In classical statistical analysis of expert judgements, Lawshe (1975:578) requires a minimum of 15 panellists for quantitative validation.

In the third phase of the research, both the number of variables to be analysed and the absolute number of subjects were considered to determine the appropriate sample size for this study. This phase of the study included the employment of quantitative methods (factor analysis, item analysis and reliability analysis) to develop a valid and reliable psychometric measurement instrument. DeVellis (2003:87) contends that a large number of unspoilt returns are required for a reliable factor analysis (that is, to uncover constructs or factors) because correlation coefficients tend to be less reliable when estimated from small samples.

The literature, notably the work of Comrey and Lee (1992:67), DeVellis (2003:87), Netemeyer, Bearden and Sharma (2003:49), Nunnally and Bernstein (1994:87) and Tabachnick and Fidell (2007:640), provide different views about the most appropriate number of elements for a good sample. Based on the guiding principles provided by these authors, eventually a sample of 300 participants was considered adequate.

Unfortunately, due to the nature of the population, the sampling procedures and practical restrictions, only a total of 205 individuals responded to the survey. While this response rate was low, it remains an adequate sample size to run exploratory analyses of items deemed to represent the specific constructs. Research has shown that fairly small samples between 100 and 200 is an appropriate number if several items are used to define each construct

(MacCallum, Widaman, Zhang & Hong, 1999). In addition, Comrey and Lee (1992) and Sapnas and Zeller (2002) remark that 200 participants can be considered a fair to adequate number to run an exploratory factor analysis and to obtain an accurate solution, which is in line with comments by Guadagnoli and Velicer (1988).

It seems from the previous discussion and guidelines in Table 4.6 that the sample of 205 *participants* is an adequate number for all the statistical analyses envisaged in the quantitative analysis of the data.

4.6   DATA COLLECTION PROCEDURES

Qualitative and quantitative methods were implemented for the data collection. The different methods used by the researcher were aligned to the research design and were applied in three waves:

During the first wave of data collection, in-depth interviews were conducted with 17 working mothers to gather qualitative information regarding the pressures and stressors that working single and married mothers experience, and to collect qualitative data about the systems and resources working mothers believe will help them in coping with high job and family demands.

The purpose of the second wave of data collection was to collect quantitative data from a panel of 30 experts to verify the relevance, clarity and the construct validity of the measurement items included in a draft questionnaire and to enable the researcher to make changes if necessary to develop a preliminary questionnaire.

During the third and final wave, quantitative data was collected from 205 working mothers with the preliminary questionnaire and two existing inventories. These questionnaires were distributed electronically by means of e-mail. The third data set was harnessed as the main source of information to assess the factor structure and reliability of the preliminary questionnaire that resulted from the analysis and interpretation of the first two sets of data. This data source was further used to assess the validity and reliability of the two existing inventories to survey the presence of stress

symptoms and the coping behaviour of working mothers. Finally, the data was used to confirm the problems and pressures that single working mothers experience and to verify the relevant resources that enable single working mothers to deal with high job and family demands.

4.6.1 Procedure to collect data to develop a theoretical framework

The data about the pressures and stressors working mothers experience and the resources they need to cope with work-family demands were generated by means of interviews. 'An interview is a method of data collection that may be described as an interaction involving an interviewer and interviewee, with the purpose to obtain valid (credible) and reliable (dependable) information' (Marshall, 1998:82). In-depth interviews are often described as a conversation with a purpose and can be used in the first stages of research to obtain clarity on the problem involved. They may also be used as the main source of data or as a supplement.

In the current study, the data was collected via 17 one-on-one semi-structured interviews that lasted between 40 minutes and one hour each. The interviews were conducted at the participants' places of work or at their residence, if required. A number of reasons dictated the use of semi-structured interviews. First, the semi-structured interview is a proven, trustworthy and versatile technique for knowledge acquisition. It is recognized as a valuable research method for exploring 'data on understandings, opinions, what people remember doing, attitudes, feelings and the like, that people have in common' (Arksey & Knight, 1999:2).

Second, a semi-structured interview combines a structured agenda with the use of flexible, sensitive and reflexive methods that explore the personal experiences and interpretations that participants attach to events (Miles & Hubermann, 1994), while at the same time ensuring that stress and potential harm are minimised. This format of interviewing also prevents information from being overlooked, as may occur when a rigid interview schedule or a completely unstructured interview is followed. Eight relevant questions were constructed

and asked during the semi-structured interview (see Appendix A). Each interview explored a number of broad questions, including daily work experiences, work and family demands, relationships, work/non-work interactions, coping mechanisms and perceived support.

The average duration of each interview was 45 minutes. This allowed the researcher time in between the prepared questions to ask supplementary questions to clarify points and ask for more detail where necessary. The opportunity to probe deeper helped the researcher to gain valuable information. Additionally, the interviews with the 17 participants were tape-recorded and later transcribed, providing a theoretical model which was based on the qualitative analysis of the pressures and experiences that the mothers faced. (See Appendix B). As a result, it was not necessary for the researcher to take extensive notes during the interviews. This also helped to promote the development of rapport and a relationship between the researcher and the interviewees. A trust relationship was established with each interviewee by informing her of the confidentiality in disclosing sensitive information and providing her with an opportunity to withdraw from the interview if she wanted to. The demographic characteristics of the 17 interviewees are summarized in Table 4.

Throughout the whole process of data gathering, the guidelines for conducting an effective interview by Patton (1990:317) were followed: the researcher listened attentively and responded appropriately to let the person know she was being heard. The researcher made an effort to maintain neutrality towards the content of what the respondents were saying, as it was 'their knowledge, experiences, attitudes and feelings', to observe while interviewing, to be aware of and sensitive to how the person was affected by and responded to different questions, to ask clear questions, using understandable and appropriate language, to communicate clearly what information was desired, why that information is important, and to let the interviewee know how the interview is progressing and make an effort to build rapport with and hold respect for, the respondent as a person.

The data obtained from the interviews, transcribed protocols and literature were triangulated to propose a theoretical framework of the constructs that conceptualize the work and family demands that women in management and professional occupations in South Africa experience, and to define the resources needed to mitigate these demands.

Table 4.7: The demographic characteristics of the interviewees (n = 17).

Marital status	Single (n=10)		Married (n=7)		Total	
Variable	F	%	F	%	F	%
Age						
25-30	4	40.0	3	42.9	7	41.1
31-35	2	20.0	1	14.3	3	17.7
36-40	2	20.0	1	14.3	3	17.7
41-45	1	10.0	2	28.6	3	17.7
46>	1	10.0	-	-	1	5.8
Employment						
Full -time	9	90.0	7	100	16	94.1
Part-time	1	10.0	-	-	1	5.9
Years work experience						
1-3	4	40.0	3	42.9	7	41.2
4-6	4	40.0	3	42.9	7	41.2
7-9	2	20.0	1	14.2	3	17.6
Job classification						
Middle management	6	60.0	4	57.1	10	58.8
Senior management	4	40.0	3	42.9	7	41.2
Hours worked p/week						
38-40	10	100.0	7	100.0	17	100.0
Number of dependants						
One	3	30.0	2	28.6	5	29.4
Two	4	40.0	2	28.6	6	35.3
Three	3	30.0	1	14.3	4	23.5
Four	-		2	28.6	2	11.8
Negative experience						
Yes	5	50.0	4	57.1	9	52.9
No	5	50.0	3	42.9	8	47.1
Ongoing pressure						
Yes	8	80.0	4	57.1	12	70.6
No	2	20.0	3	42.9	5	29.4

Marital status	Single (n=10)		Married (n=7)		Total	
Variable	**F**	**%**	**F**	**%**	**F**	**%**
Days sick leave in last three months None One day Two days Three days	5 2 3 -	50.0 20.0 30.0 -	2 2 1 2	28.6 28.6 14.3 28.6	7 4 4 2	41.2 23.5 23.5 11.8

The age of the sample of interviewees ranged from 24 to 51 years, with a mean age of 33.9 years (SD=7.978) for the single mothers, and a mean age of 34.57 years (SD=6.679) for the married mothers. Most of the sample (16 or 91.4%) were employed full-time; only one of the single mothers worked part-time. All the interviewees were in management positions, with 58.8% in middle management and 41.2% in senior management. Their work experience ranged from one to nine years, with an average of 4.23 years (SD=2.385). Both sub-samples of interviewees have responsibilities in providing support to dependent family members. The single working mothers support, on average, two dependants; and the married mothers on average look after three dependants. Both sub-samples indicated that they had only used a small number of days for sick leave during the three months prior to the interviews.

4.6.2 Procedure to collect data to validate the draft questionnaire

Subsequent to the process described above, a draft framework questionnaire was designed, containing multiple measurement items relating to all the demand and support constructs identified for measurement. A copy of this questionnaire is contained in Appendix C. The draft questionnaire was reviewed by a group of 30 experts to ensure the necessary relevance, conciseness, clarity and validity of the items related to a specific construct. DeVellis (2003) points out that a panel of experts can be of great value to

confirm or invalidate the scale developer's definition of the phenomenon;

evaluate the items' clarity and conciseness; and

point out ways of tapping the phenomenon that the developer has failed to include.

Lawshe's (1975) content validity methodology was employed for this purpose. Lawshe's technique requires that a panel of subject matter experts who are knowledgeable about a particular area of expertise, function or discipline indicate whether or not a measurement item in a set of other measurement items is 'essential' to the functionality of a theoretical construct. (Refer to Section 4.8.2.4 regarding the use of Lawshe's technique.)

The 30 members of the panel were identified and asked to serve as content experts because of their experience and expertise in the social and management sciences. The panel consisted of 27 females (90%) and three males (10%). Their ages ranged from 25 to 58 years, with a mean age of 35.3 years (SD=7.12). Most of them (17 or 56.7%) were in the 30- to 40-year age group, while the younger and the older groups constituted 23.7% and 20% respectively. All the members of the panel had academic qualifications. Nine members (30%) of the panel had a first degree, ten (33.3%) had an Honours degree, seven (23.3%) had a Master's degree, and four (13.3%) held a doctorate. Twenty-two (73.3%) of the experts perceived themselves as part of middle management and eight (26.7%) were in senior management positions. With regard to the experts' marital status, the 23 single (76, 7%) and the three divorced (10%) members constituted 86.7% of the panel. Four married members made up the13.3% difference. In terms of their title, the bulk of the panel (83.3%) were designated as 'Miss', two (6.7%) were 'Doctor' and two were professors. Only one (3.3%) had the title of 'Mrs' and another one that of 'Mr' (3.3%). The demographic characteristics of the experts are depicted in Table 4.8.

Table 4.8: Demographic characteristics of the panel of experts (n = 30)

Variables	Frequency	Percentage
Title		
Miss	24	80.0
Mrs	1	3.3
Mr	1	3.3
Doctor	2	6.7
Professor	2	6.7
Gender		
Female	27	90
Male	3	30
Marital status		
Single (never married)	23	76.7
Married	4	13.3
Divorced	3	10.0
Age		
<30 years	10	33.3
31-35 years	6	20.0
36-40years	8	26.7
>41 years	6	20.0
Qualification		
First degree	9	30.0
Honours degree	10	33.3
Master's degree	7	23.3
Doctorate	4	13.3
Job position		
Middle management	22	73.3
Senior management	8	26.7
Tenure in organisation		
1-4 years	17	56.7
5-8 years	11	36.7
9-12 years	2	6.6
Number of dependants		
None	1	3.3
One	7	23.3
Two	10	33.3
Three	7	23.3
Four	5	16.7

4.6.3 Procedure to collect data to validate the survey questionnaires

A survey approach was used for this study. Researchers that adopt a survey strategy are able to use a range of methods and tools within the strategy. This includes the use of interviews, documents, observations and questionnaires

(Denscombe, 2007) For the purpose of the current study, self-administered questionnaires were employed as the data-gathering method. The survey was administered electronically.

Due to the nature of the sample and its geographical distribution (country-wide), it was decided to use electronic mail as the method for delivering the survey questionnaires. Thach (1995:27) labels this type of research 'Email survey research' and defines it as 'the systematic data collection of information on a specific topic using computer questionnaires delivered to an online sample or population. Respondents receive, complete, and return their questionnaires via Email'. Couper, Traugott and Lamias (2001) and Sills and Song (2002) contend that the Internet has been found to be a useful means of conducting research with special populations that regularly use the Internet.

This procedure of data collection is viewed by several authors as a practical and feasible method that has the potential to aid in some aspects of the survey process with the following benefits (Andrews, Nonnecke & Preece, 2003; Marra & Bogue, 2006; Yun & Trumbo, 2000):

Faster survey processing: Using e-mail as a research method provides the advantages of speedy distribution and response cycles, because it can be sent, completed and returned in real-time. Unlike traditional mail, questionnaires by e-mail can be delivered simultaneously to all potential participants in a very short time (Schaefer & Dillman, 1998; Thach, 1995).

Cost saving: E-mail surveys have various cost saving benefits. The e-mail application almost eliminates printing and postage costs, and reduces the cost and time necessary to enter data, as the returned survey data are already in an electronic format (Cobanoglu, Warde & Moreo, 2001; Schaefer & Dillman, 1998). The costs per response decrease significantly as the sample size increases (Watt, 1999). There are also, apart from network use, no costs involved for the respondents.

Quicker response time with wider coverage: Due to the speed of online networks, participants can answer in minutes or hours, which improves the response time. E-mail surveys allow for a larger sample and unlimited geographic coverage.

Higher response rate: Research shows that for some populations, online data collection may facilitate a better response rate than paper surveys, and that the data collected is of a higher quality in comparison to that collected in mail surveys (Schaefer & Dillman, 1998; Sills & Song, 2002; Thach, 1995).

More sincere responses: Research shows that respondents are more likely to give truthful information on sensitive topics with electronic surveys than with paper surveys or interviews (Schaefer & Dillman, 1998; Thach, 1995). A study by Mukoma *et al.* (2004) in South Africa regarding the effects of a school-based HIV prevention programme on adolescent sexual behaviour confirmed that, overall, electronic questionnaires achieved better results in terms of acceptability and reliability.

Ease of administration: With all e-mail programs, it is possible to attach files to the e-mail message. These files can be opened by the respondent. The programs also provide the technical ability to track whether the delivered e-mail survey was opened, responded to or/and deleted, as well as whether the survey was undeliverable (Paolo, Bonamino, Gibson, Patridge & Kallail, 2000). Participants can print the questionnaire and complete it as a normal mail survey, or complete it on-line and return it via e-mail. The same format used for a mail survey can be used via e-mail, thus eliminating the need to design a special questionnaire. Finally, the respondents can easily be reached through the electronic medium, irrespective of their geographic location (Andrews *et al.*, 2003; Marra & Bogue, 2006; Sills & Song, 2002; Thach, 1995).

E-mail surveys also have drawbacks that were considered in this research. Issues of concern related to this format of data-gathering includes the following:

 e-mail technology imposes limitations on the questionnaire design (Schaefer & Dillman, 1998);

 the population and sample are limited to those with access to a computer and online network (Thach, 1995);

 it is difficult to guarantee privacy, anonymity and confidentiality, as the respondent's e-mail address is generally included with his/her responses (Shannon, Johnson, Searcy & Lott, 2002); and

there are potential technical problems with hardware and software (Thach, 1995).

A major concern in an e-mail survey is the possibility that participants who receive the questionnaire via e-mail perceive it as electronic 'junk mail' or 'spam' and delete it (Sills & Song 2002). As Thach (1995) argues, e-mail messages can be deleted as quickly as they were sent. Unlike with a standard mail questionnaire or interview, the respondent can discard e-mail at the touch of a button. This risk can be addressed by sending a personal e-mail to the potential participants, informing them about the study and the fact that they will be receiving the questionnaire via e-mail. Schaefer and Dillman (1998) found that multiple contacts and personalized letters to the individual participants have the potential to enhance the response rate.

An e-mail requesting potential respondents to participate in the study was sent to a sample of 300 working mothers that were identified during the snowball and purposive sampling process. The envisaged sample included 150 single and 150 married mothers working in management and professional positions and both targeted sub-groups received identical e-mails and attachments. A covering letter and three questionnaires were attached as a single document to the e-mails that were electronically dispatched to the two subsets in the sample. The covering letter accompanying the questionnaires explained the purpose of the research, its educational utility and relevance. It also stressed voluntary participation, anonymity and confidentiality. The respondents were assured that the researcher would shield the data and protect the confidentiality of respondents.

The preliminary Work-Family Pressure and Support Questionnaire (W-FPSQ), the Overall Stress Index (OSI) and the Coping Behaviour Index (CBI) were attached to the e-mail. To make it easier for the participants to complete the three questionnaires, they were presented in one document with three sections. Each section had its related instructions and relevant items. Clear standardized instructions in English were provided to direct the participants in their completion of the questionnaires. Furthermore, the layout of the comprehensive

questionnaire was offered in a user-friendly format which allowed the respondents to complete the sections one by one in their own time.

4.7 DEMOGRAPHIC INFORMATION ON THE FINAL SAMPLE

Of the 300 self-administered questionnaires sent out electronically, 205 were returned. This represented a return rate of 68.33% usable questionnaires. The return rate is marginally higher than the average return rate on mail-administrated surveys (Sheehan, 2001). The final sample included 104 single and 101 married working mothers. According to Tabachnick and Fidell (2007), this number is adequate for an exploratory factor analysis and for most multivariate statistical analyses.

The sample ranged from skilled to senior management, whilst also representing diversity in terms of age and level of experience. Demographic information was extracted from all respondents in the first section of the questionnaire. Table 4.9 provides a summary of the demographic variables contained in the sample.

Table 4.9: A summary of the demographic variables contained in the sample (n=205)

Variable	Frequency	Percentage
Title		
Ms	14	6.8
Mrs	89	43.4
Miss	96	46.8
Doctor	5	2.5
Prof	1	0.5
Age		
25-30	30	14.6
31-34	64	31.2
35-38	83	40.5
39-44	28	13.7

Variable	Frequency	Percentage
Marital status		
Single		
Never married	76 ⎤	37.1 ⎤
	⎬ 104	⎬ 50.7
Divorced	28 ⎦	13.7 ⎦
Married	101	49.3
Employment		
Full -time permanent	162	79.0
Part-time permanent	39	19.0
Casual full-time	1	0.5
Missing values	3	1.5
Years experience in organisation or profession		
1-3	44	21.5
4-6	67	32.7
7-9	48	23.4
10-12	24	11.7
13-15	12	5.9
16-18	6	2.9
19-21	1	0.5
Missing values	3	1.5
Job classification		
Skilled	6	2.9
Professional	93	45.4
Middle management	64	31.2
Senior management	38	18.5
Missing values	4	2.0
Qualification		
Certificate	3	1.5
Diploma	5	2.4
1st degree	38	18.5
Honours degree	74	36.2
Master's degree	79	38.5
Doctorate	6	2.9
Hours worked per week		
20-33	73	35.6
34-37	74	36.0
38-40	52	25.4
Over 40	6	3.0

Variable	Frequency	Percentage
Number of children		
One	39	19.0
Two	93	45.4
Three	47	22.9
Four	18	8.8
Five	6	2.9
Six	2	1.0
Negative experience in last three months		
Yes	66	32.2
No	139	67.8
Ongoing negative pressure		
Yes	109	53.2
No	96	46.8
Days of sick leave in the last three months		
0	66	32.2
1-4	112	54.6
5-7	27	13.2
Negotiate non-standard working hours		
Yes	78	38.0
No	127	62.0
Age of youngest child		
1-5	85	41.5
6-0	89	43.4
11-18	31	15.1

4.7.1 Title and marital status

Since this study focused on married and single mothers, men were not approached at all. It was imperative to measure the status of the respondents, as in South African society, status confers social dignity and approval. Two measures of status were adopted, namely title and marital status (married and single, with the 'single' category subdivided into 'never married' and 'divorced').

With regard to title, nearly all (97.0%) participants fall into the categories of Ms (6.8%), Mrs (43.4%) and Miss (46.8%). Five participants (2.5%) were called Doctor and one (0.5%) had the title of Professor. With regard to marital status, the single women (women who have never married (76) and the divorced women (28)) constituted 104 or 50.7% of the respondents. The remaining 101 or 49.3% were married, which makes it an almost even split between the foremost variable of interest to this study.

4.7.2 Age

The respondents' ages ranged from 25 to 44 years (a spread of 19 years). The mean age was 34.5 years, with a standard deviation of 3.92. It was decided to group the ages into four categories. As is shown in Table 4.9, the age group from 25 to 30 years represented 30 (14.6%), the 31- to 34-year old category represented 64 (31.2%), the 35- to 38-year old age group represented 83 (40.5%) and the age group from 39 to 44 years represented 28 (13.7%) of the respondents. This information suggests that the bulk of the sample (147 respondents) fell into the age group from 31 to 38 years, while the younger and the older groups made up 15% and 14% respectively, a picture which approximates to a normal distribution (Sk = -0.104; Ku = -0.261).

4.7.3 Years of experience in the organisation or profession

Years of experience are a measure of an individual's membership of an organisation, which in turn affects an individual's attitudes and chances of promotion. The data shows that the respondents have a wide range of experience, with about 40% having spent one to five years and six to ten years respectively in their organisations or profession. A total of 37 or 17.1% have more than ten years of professional experience.

4.7.4 Nature of employment

The data on the nature of employment shows that nearly 80% of the respondents are permanently employed, while 39 (19%) are employed part-

time. The nature of employment may have an effect on a respondent's perceptions of work and personal pressure and the type of support she needs to cope with work and family demands.

4.7.5 Job classification

The table shows that the respondents mostly came from managerial ranks with 45.4% in professional management, and 50% in either senior or middle management positions. Four respondents did not indicate their levels of management. The management levels are important in determining not only the load of managerial responsibilities, but also the perquisites of the office.

4.7.6 Qualification

Only 8 or 4% of the respondents had less than a first degree, while others had either a first degree (18.5%), an Honours degree (36.1%) or Master's degree (38.5%). Six (2.9%) had doctorates. In essence, therefore, the respondents are highly educated by the standards of the South African workforce in general and women in particular.

4.7.7 Hours worked per week

The table shows that the hours worked per week ranged from 20 to 50 (with a spread of 30). The mean hours worked per week was 33.6 hours, with a standard deviation of 6.24. The data, when reorganised, indicated that 73 (35.6%) of the respondents worked between 20 to 30 hours per week, 74 (36%) worked between 34 and 37 hours per week, and 52 (25.4%) worked between 38 and 40 hours per week. Only six (3%) worked over 40 hours a week. The influence of time on the pressures experienced could be a significant factor in the managerial lives of working married and single mothers.

4.7.8 Number of children

The respondents all had children, ranging from one to six. The average is two

children, with a standard deviation of one. The attachment of black African families to children is an important cultural trait, which the modern working life has put under pressure. It is at the centre of the work-family conflict and is especially acute for single working mothers, more so than for their partnered counterparts (one of the significant motivations for undertaking this study).

In addition to taking care of their children, the members of a black African family, more so than their European counterparts, are also obliged to care for other members of the extended family, such as cousins, nephews and nieces. It was therefore important to measure the extent of the respondents' responsibilities for the extended family system. The data shows that the single mothers in the study provided for seven family members and the married mothers had to contribute to meet the needs of up to 17 additional persons. Extended family members included parents (5), mothers-in-law (2) and fathers-in-law (3), step-children (6), cousins (4), nieces (2) and nephews (2).

4.7.9 Negative experiences

Work and family pressures are often exacerbated by life's unpredictable traumas. It was important that this information be sought from the respondents. About one third of the respondents (66 or 32.2%) reported having had such negative experiences, while 139 or 67.8% did not. The nature of these negative experiences was also explored and the responses yielded the following categories:

Negative experiences happening to self

The most frequently cited cases were

- o a break-up in a relationship;
- o automobile accidents, thefts and hijacking;
- o divorce;
- o betrayal by partners, infidelity;
- o home burglary; and
- o rape.

Negative experiences happening to very close friends

- o a break-up of relationships;

o death of close friends (classmates, pals, friends, colleagues, family members);

o retrenchment of husband/wife; and

o the rape of a best friend.

4.7.10 Ongoing negative pressures

Some of these negative pressures are also on-going for 109 (53.2%) of the respondents, which means that there were probably fewer people who admitted to experiencing negative pressures in the first instance. The important point to bear in mind is that about half of the respondents have been victims, directly or indirectly, of recent negative experiences which are still having an impact on their lives. Cross-tabulation of the respondents' experiences of unpleasant events and their experience of on-going negative pressures indicated a significant association between the two sets of responses (Phi = 0.375; $p < 0.001$).

4.7.11 Days of sick leave

The incidence of sick leave was measured by asking the respondents the number of days of sick leave they had taken in the last three months. They reported taking between zero and seven days. The mean was 2.1, with a standard deviation of 1.89. The data, when reorganised, indicated that 66 or 32.2% of the respondents had not taken any sick leave during the last three months. On the other hand, 112 or 54.6% took between one and four days, while 27 or 13.2% took between five and seven days. Apart from the number of days of productive work lost to the organisations and the nation, sick leave, whether permitted or unpermitted, is symptomatic of pressures, including sickness and other negative experiences such as the trauma mentioned above.

4.7.12 Negotiate non-standard working hours

The pressures at work and the incidents of family demands might necessitate

the reorganisation of work to accommodate the workers. Hence, the ability of the workers to negotiate such non-standard working hours was tested by asking the respondents if it was possible for them to enter into such negotiations. About 38% indicated that they could negotiate non-standard working hours while 62% indicated otherwise.

4.7.13 Age of youngest child

The respondents were asked to indicate the age of their youngest child, since this could affect working mothers' priorities and commitment to their home life. Children at a tender age are more dependent and need more full-time care. The results indicate that the mean age of the youngest child was 6.87, with a standard deviation of 3.74. The children's ages ranged from one to 18 years and the reorganised data shows that 85 or 41.5% were between one and five years old, while 89 or 43.4% were between six and ten years old. In other words, 85% of the respondents had children aged between one and ten years. Only 31 or 15.1% had children over the age of ten years. Thus, most of the children of the respondents were of primary school age, when children need much attention in and out of school.

Although South Africa is a country with a diverse population encompassing many people with different cultures and languages, it was decided beforehand not to ask the participants to classify themselves in terms of ethnicity. In post-apartheid South Africa, a question regarding a person's ethnicity or race remains a sensitive topic, and the researcher did not want to offend any of the potential participants in the targeted sample. It was also reasoned that the decision not to enclose questions related to race might increase the response rate. However, the most important reason for this decision is the underlying assumption that women of all races have more in common as women than there are differences.

4.8   MEASUREMENT INSTRUMENT

4.8.1   Introduction

A questionnaire as a measure of behaviour is one of the most efficient instruments available for collecting data. Hence, questionnaires are widely used by social scientists to measure factors as diverse as opinions, attitudes, emotional states, personality and a variety of organisational behaviour constructs. A questionnaire is a series of written questions in a sequence on a topic about which the respondent's opinions are sought (Sommer & Sommer, 1991). In the field of Organisational Psychology, questionnaires typically contain fixed-response questions about organisational and personal variables and can be administered to large numbers of people simultaneously. According to Foddy (2001), questionnaires provide a rapid and often inexpensive way of discovering the characteristics of subjects under investigation. Behr (1988) points out that questionnaires are used in more than half of the total research in education to look for factual information, and to determine opinions, attitudes and interests.

Researchers can use either closed-ended (structured) or open-ended questionnaires (unstructured) to obtain the data relevant to the topic of the research study. A structured questionnaire provides different options for each question, and the respondent is simply required to select and mark the applicable answer (Babbie, 1998). This makes it easier to answer questions and classify and code information. However, this may force the respondent to think along certain lines (Behr, 1988).

Unstructured questionnaires require far more cooperation on the part of the respondents, since they are required to answer the open-ended questions in their own words. The use of unstructured questionnaires in a mail survey significantly reduces cooperation without providing much helpful information (Sudman & Blair, 1998), and mail surveys with unstructured questionnaires tend to have the lowest response rates of all survey methods (Welman & Kruger, 1999).

The researcher therefore considered the closed-ended format questionnaire as the most suitable method for collecting the primary data to answer the research questions asked in this study. The advantages of using a structured questionnaire included the following, according to Behr (1988):

A great advantage of the structured questionnaire is its *usefulness.* It can be sent to a large number of respondents to obtain their input and opinions on the topic of the study.

It is a relatively inexpensive method that saves time and cost. Questioning people is usually much faster and more cost-effective than observing respondents. Both time and money are saved.

Structured questionnaires are more convenient for respondents to complete. It is easier for respondents to answer as they are given choices and the answering of questions can be kept impersonal.

The questionnaire technique promotes anonymity and may result in more honest responses.

Closed-ended questionnaires with standardised scales simplify the coding of data and facilitate the accumulation and analysis of data.

The closed-ended questionnaire provides a level of objectivity of measurement, as it offers a quantifiable framework for the quantitative processing of the responses of the respondents.

The downside of using structured questionnaires includes, first, that responses are only related to the questions covered in the instrument; second, that respondents cannot seek clarification; and, third, that these instruments are impersonal and allow response biases (Cummings & Worley, 2001:115). A fourth limitation is that there is limited opportunity for probing for clarification, or to provide such clarification. The questionnaire technique is not suited to answering questions related to 'How?' and 'Why?'

4.8.2 Questionnaire construction

There are specific sets of rules on constructing a structured questionnaire. Hence, the development of a valid and reliable questionnaire is a complex process (Bless & Higson-Smith, 1995:115). Nevertheless, there are general

guidelines on where to start and the kind of pitfalls to avoid. According to Oppenheim (1996), there are five categories of decisions one has to consider before constructing a questionnaire. These relate to the main method of data collection; methods of approach to the respondents; how questions will be ordered and sequenced; and the order of questions within each question sequence; and lastly the use of different types of questions, such as closed or free response questions.

The methodology for developing a measurement instrument described in the guidelines by DeVellis (2003:60-71) and Pett, Lackey and Sullivan (2003:47) was found to be the most useful in developing the measurement instrument for the current study.

Table 4.10: Comparison of two sets of scale development guidelines

Steps	DeVellis (2003:60-71)	Pett *et al*. (2003:47)
1	Determine clearly what must be measured.	Identify the measurement framework.
2	Generate item pool.	Identify the empirical indicators of the construct.
3	Determine the format for measurement.	Develop the instrument.
4	Have initial item pool reviewed by experts.	Pilot test the instrument.
5	Consider inclusion of validated items.	Determine the number of subjects.
6	Administer the items to a development sample.	Administer the instrument.
7	Evaluate the items.	
8	Optimise scale length.	

Sources: DeVellis (2003:60) and Pett *et al*. (2003:47).

A combination of the steps referred to in Table 4.10 was followed in this study to develop the measurement instrument needed to quantitatively estimate the theoretical constructs. The following steps were followed:

  identify the measurement framework and define the construct;

  generate an item pool;

  determine the format for measurement;

  have the initial item pool reviewed by experts;

  administer items to a development sample; and

  evaluate the items and optimize scale length.

4.8.2.1 Identify the measurement framework and determine what must be measured

In Step One, clear and exact parameters of what is to be measured was established through a comprehensive literature study and an analysis of data generated by means of the interviews. This step helped the researcher to comprehend the context of the subject matter involved and to determine a clear frame of reference of the level of specificity at which the construct was to be measured.

Using these analyses, two interrelated theoretical models were developed. The first model illustrates the constructs associated with the constraints, problems and stressors that affect working women's job performance and family life. The second model shows the governmental, organisational and personal resources necessary to support working mothers to cope with high job and family demands. The systems approach was used to display both models; and the relevant concepts were presented according to input variables, process variables and output variables. Based on the two interrelated models discussed in Chapters 2 and 3 and the data generated from the interviews, the concepts identified were categorised into the following nine related themes or domains:

  Theme/Domain 1: Work demands and family responsibilities;

  Theme/Domain 2: Time pressure;

  Theme/Domain 3: Financial pressure;

  Theme/Domain 4: Feelings of isolation;

  Theme/Domain 5: Childcare arrangements;

Theme/Domain 6: The need to improve oneself;

Theme/Domain 7: Presence of mentors;

Theme/Domain 8: Organisational support; and

Theme/Domain 9: Personal support.

4.8.2.2 Identify the indicators of the construct and generate an item pool

During this step appropriate items were constructed and selected from different resources. A painstaking effort was made to ensure that all items reflect the concepts of interest and the latent underlying variables of the draft framework questionnaire. To ensure that the questions will elicit the data that is required, the researcher made sure that the content of the items was related to the themes and in line with the purpose of the framework questionnaire.

Furthermore, when the items were chosen for the draft framework questionnaire, the characteristics of good and bad items, the principles relating to redundancy, and the implications of positively and negatively worded items were considered, as recommended by DeVellis (2003:60) and Mouton (2001:103). To safeguard against possible poor internal consistency of the scales, 121 items was originally included in the initial item pool. An objective in the generation of scale items is to have at least twice as many items as the final number that is needed (Nunnally & Bernstein, 1994:128). Redundancy is more desirable in the initial item pool than in the final scale (DeVellis, 2003). Positively (90) and negatively (34) worded items were included to limit affirmation or agreement bias (a tendency of a respondent to agree with items, irrespective of their content).

4.8.2.3 Determine the format for measurement and the scaling of questions

In this step, a decision was made on the scaling methodology and the number of response categories. It was decided to use the nine key elements or latent domains of the construct (see Section 4.8.2.1) as scales in the scaling of the

draft framework questionnaire. 'Scaling', according to Netemeyer *et al*. (2003:2-10), is the measurement of the theoretical construct on a multi-item basis. The latent domains were assessed with a number of grouped items (scale) that provide quantitative estimates of the corresponding construct, as proposed by DeVellis (2003:60). The items of the nine subscales of the framework questionnaire were included on their face validity and consisted of items that are more or less parallel. In selecting the items for the different scales, the researcher aspired to choose appropriate items that fully covered a domain and not just one part of it, as recommended by Comrey and Lee (1992). Pett *et al*. (2003:16) claim that in developing a psychological scale, a researcher is more interested in the latent domain the items attempt to measure than in the items themselves. For this reason, it was important to validate the quality of the items prior to developing the actual scale, by using a technique such as Lawshe's (1975) test of content validity. Revising and discarding unnecessary items was considered after the Lawshe (1975) analysis.

In the development of the framework questionnaire, the level or scale of measurement was also considered, as it is paramount in shaping the information that was collected (DeVellis, 2003:16). The process of measurement involves assigning numbers or symbols to different characteristics of variables or to observations, according to rules. The way that the numbers are assigned determines the scale of measurement. In this research, categorical, rank ordered and continuous scales were used in the construction of the preliminary questionnaire.

Depending the use for which the data that is collected is intended (Netemeyer, *et al*., 2003:22), four levels of measurement are traditionally distinguished, namely the nominal, ordinal, interval and ratio levels. These four levels of measurement are important in determining the nature of the scale, the data and the appropriate statistics. Cooper and Schindler (2003:223), as well as Morgan, Leech, Gloeckner and Barrett (2007:37-42, 88-89), describe the measurement characteristics of four different levels of measurement and the scale associated with them along these lines:

Nominal (categorical scale): This is the most basic level of measurement and the numerals assigned simply name or categorise responses. Gender, ethnicity, language and religion are examples of variables measured on a nominal level. The arbitrary number assigned to a category gives the identity of the category and has no numerical value. Many of the variables included in the demographic section of the questionnaire are at this level.

Ordinal (rank ordered scale): The rank ordered scale can be used for the empirical determination of greater or lesser value, for example, the quality of organisational support may be ranked as very good, good, average, poor or very poor. However, the difference between a response with a higher ranking and one with a lower ranking cannot be quantified. There is no objective distance between any two points on this scale. Items with three or more ordered response levels are called ordered-category items and are assessed at an ordinal level.

Interval (continuous scale): In a continuous scale, it is assumed that the scale has equidistant points between each of the scale elements. This means that the points are ordered on the scale from low to high in categories that are equally spaced. Differences in the distance along the scale can be empirically interpreted. For example, a summated Likert-scale using several Likert-type items of which the items measure on a 'strongly agree' to a 'strongly disagree' continuum of several points would be considered an interval level measure. However, if the scores of respondents on a single Likert-type item are used for analysis, it is considered an ordered-category item that is measured at an ordinal level.

Ratio (continuous scale): This is the highest level of measurement and provides for the empirical determination of equality of ratios, as in most physical measurements, for example, age in years, temperature in degrees, mass, length or time. These measures have standardised equal intervals between the levels or scores and a true zero level. This kind of measurement scale is not normally used in the behavioural sciences.

Scaling is also referred to as the process of creating a continuum on which objects are located according to the number of the measured characteristics

they possess (Aaker, Kumar & Day, 1995). Debate continues in the literature regarding the exact number of response categories or points that it is best for a continuous scale to measure at an interval level. In this study, it was decided to use a Likert-type scale that has a relatively structured response format. This scale consists of a collection of statements or items about the attitudinal object and asks for an agreement or disagreement response on a specific statement. Based on the statement or item, the respondent chooses a number from 1 to 7, using the criteria set out in Table 4.11.

Table 4.11: Structured response format for a Likert-type item

Items	Strongly disagree	Disagree	Slightly Disagree	Neither agree or disagree	Slightly agree	Agree	Strongly agree

This is the most popular scale in psychological and behavioural research for measuring opinions, beliefs or attitudes (Cooper & Schindler, 2003:253; Creswell, 2002:310; Pett *et al*., 2003:32). Uebersax (2006) found rampant confusion about the use of Likert-designed scales and items in the literature. With this in mind, Uebersax (2006) pointed out that the following characteristics define a Likert-type scale:

the scale itself consists of several items;

options are arranged horizontally;

response options are anchored with consecutive integers;

response options should additionally be anchored with verbal labels representing evenly spaced gradation;

response options are symmetrical about a neutral point; and

the scale measures levels of agreement or disagreement in respect of a statement.

Unfortunately, due to the inherent limitations of scaling psychological measurements, the level of measurement of the questionnaire used in the present study can only be regarded as consisting of approximately equal intervals, as described by Kerlinger and Lee (2000) and Morgan *et al*. (2007).

4.8.2.4 The revision of the initial item pool by experts

In this phase, subject matter experts were asked to rate the relevancy of each statement to the latent domain the researcher intended to measure. The panel of experts was also requested to evaluate the clarity and conciseness of items; and to point out ways of enhancing the measurement of the phenomenon by identifying items that had not been included. The main purpose of this step was to test and revise the questionnaire before the main study was undertaken, in line with the recommendations of Coleman and Briggs (2002:167).

The framework questionnaire consisting of 121 items, plus demographic information, was pre-tested and verified by a group of 30 experts to ensure the necessary relevance and validity, by employing Lawshe's content validity methodology (Lawshe, 1975:263-575). A copy of this questionnaire is contained in Appendix C. The results of the application of Lawshe's technique were used to eliminate irrelevant items.

The application of this technique provided the researcher with a quantitative index of the extent to which the subject matter experts agree on the contributions of each measurement item to the constructs that the instrument is intended to measure. The subject matter experts' data was used to compute the Content Validity Ratio (CVR) for each possible item in the measurement instrument as follows:

$$CVR = \frac{n_e - N/2}{N/2}$$

Where:

CVR = CVR value for the item:

ne = number of subject matter experts indicating that a measurement item is **'essential'**; and

N/2 = total number of subject matter experts on the panel divided by two.

The CVR is a quasi-quantitative approach to content validity commonly used to facilitate 'the rejection or retention of specific items' (Lawshe, 1975:568). One can infer from the CVR equation that it takes on values between -1.0 where none of the subject matter experts think that a particular measurement item is 'essential' and +1.0 where all the subject matter experts think that a particular measurement item is 'essential'. Where a CVR = 0.0 it means that 50% of the subject matter experts in the panel of size N believe that the measurement item is 'essential'. Therefore a CVR > 0.0 would indicate that more than half of the subject matter experts believe that a particular measurement item is 'essential'.

According to Lawshe (1975:567) two assumptions can be made, namely:

any item which is perceived as 'essential' by more than half of the subject matter experts, has some degree of content validity; and

the more subject matter experts (above 50%) who perceive the item as 'essential', the greater the extent or degree of its content validity.

On this basis, content validity is achieved when an item is considered 'essential' by more than 50% of the subject matter experts. Lawshe (1975:568) has further established minimum CVRs for different panel sizes, based on a one-tailed test at the = 0.05 significance level. The minimum required CVR values as determined by Lawshe (1975:568) for different panel sizes are depicted in Table 4.12.

Table 4.12: Minimum CVR values for different numbers of subject matter experts

Number of panellists	5	10	15	20	25	30	35	40
Minimum CVR value	0.99	0.62	0.49	0.42	0.37	0.33	0.31	0.29

Source: Lawshe (1975:568)

For example, with 30 subject matter experts on the panel, measurement items for a specific construct whose CVR values are less than 0.33 would be deemed not 'essential' and would be deleted from subsequent consideration. For the

purposes of this study, a CVR value of 0.40 and higher was set as the criterion for the inclusion of an item in the domain or constructs it is related to.

4.8.2.5 Administer items to a development sample, evaluate the items and optimize the scale length

During this step, the construct validity of the final measuring instrument was determined and an evaluation of the items in each scale was done (DeVellis, 2003:51). To this end, the preliminary questionnaire was distributed to 300 potential participants that belonged to a non-probable purposive sample of mothers working in management and professional occupations. The questionnaire was distributed electronically by means of e-mail. The data set generated in this manner was used to test and validate the preliminary questionnaire.

Exploratory factor analyses, reliability analyses and item analyses were performed to ensure that the final questionnaire complies with the requirements and criteria for a measuring instrument to be suitable in the behavioural sciences. These criteria include validity, reliability and practicability, as proposed by Cooper and Schindler (2003).

Exploratory factor analysis was carried out to establish the underlying internal structure of the preliminary Work-Family Pressure and Support Questionnaire (W-FPSQ). DeVellis (2003) and Field (2009) note that factor analysis helps investigators to determine how many latent variables underlie a set of items and which groups of items, if any, constitute a unidimensional set or domain. Spector (1992) suggests that with multidimensional scales, factor analysis can be used to verify that the items empirically form the intended factors or scales. In the current study, principal axis factoring was used as a method to determine the contribution of the 96 items towards the latent domains or factors of the W-FPSQ and to get an indication of the construct validity of the W-FPSQ.

According to Spector (1992), the purpose of item analysis is to identify those items that form an internally consistent scale and to eliminate those items that do not. Reliability testing of the proposed scales of the W-FPSQ means that the related items should consistently reflect the construct that the questionnaire claims to measure, in line with the arguments of Field (2009:673). Cronbach's alpha coefficient was used to establish the reliability or extent to which items cohere with a specific scale or domain, as suggested by Field (2009:674). By determining the reliability of the W-FPSQ, the researcher was able to establish the consistency to which all the items of a scale measure the same domain, as proposed by Saunders *et al*. (2007:367). The average correlations between the items of each scale were also calculated to examine the internal consistency and unidimensionality of the factors of the W-FPSQ, as suggested by Clark and Watson (1995). Lastly, the item-discrimination index of the individual items was calculated to ascertain the ability of each item to discriminate between high and low scores, in line with Gregory (2004).

The results of the above mentioned steps and statistical calculations are depicted and discussed in detail in Chapter 5.

4.8.3 The layout of the questionnaire

It was decided to use a structured questionnaire with closed-ended questions in the present study (see Appendix D). A structured questionnaire provides alternative responses to each question, and the respondent simply needs to select and mark the applicable answer. In this study, a Likert-type scale with various items or statements was used, and the respondents had to indicate on a seven-point scale if they agree or disagree with a statement.

Survey questionnaires are normally used to obtain the following types of information from respondents: demographic details (age, marital status, job classification, and so on), perceptions, opinions, beliefs, stereotypes, attitudes and values. For this study, a questionnaire was developed for collecting information on mothers' demographic details, the various problems and stressors that they face and the resources available to mitigate work and family

demands. Two sub-scales of an existing inventory were used to assess the stress symptoms experienced by working mothers and to gauge the coping behaviour they used to manage stressful situations. The covering letter (see Appendix D) and the questionnaire (see Appendix D) were drawn up in English. The layout of the questionnaire is provided in Table 4.13.

Table 4.13: Layout of the questionnaire

Section	Topic of section	No of questions
1	Personal particulars (demographic data)	15
2	The problems , stressors and issues that working mothers face and support systems	96
3	Stress symptoms experienced over the last three months	11
4	The various ways of coping with the source of pressure experienced	17
Total number of questions		139

Section 1 consisted of 15 questions related to the respondents' personal information and required the respondents to choose the options that apply to them. These questions referred amongst other things to respondents' title, age, marital status, job classification and work arrangement.

Section 2 of the questionnaire consisted of 96 statements related to work and family demands and stressors respondents may experience and the resources available to mitigate work and family demands. The statements were formatted according to a Likert-type scale, with anchors ranging from 1 = strongly disagree to 7 = strongly agree.

Section 3 consisted of 11 questions concerning stress-related behaviour. This included physical symptoms and feelings of exhaustion and low energy levels that respondents may have experienced during the last three months prior to the completion of the questionnaire.

Section 4 included 17 items regarding various ways to consciously or subconsciously deal with sources of pressure and stress. These items provide a measurement of respondents' coping behaviour to avoid the stressors or manage their stress.

The items used in Sections 3 and 4 were derived and excerpted from 'The Pressure Management Indicator Questionnaire' (PMI) developed by Cooper and Williams (1996) and published by Resource Systems. The researcher requested and received permission from Resource Systems (Stephen Williams) to use the PMI in the present study (see Appendices E and F).

According to Gill and Davidson (2001:386-387), the PMI measures sources of stress using eight sub-scales and the effects of stress by means of seven sub-scales. The sub-scales of the PMI have been found to demonstrate high levels of reliability. Except for one sub-scale ('daily hassles'), the reliability coefficients of all the sub-scales exceed alpha = 0.7 (Williams & Cooper, 1998:311). The validity of some of the PMI scales is still to be established, according to Gill and Davidson (2001:387). Aligned with the objectives of this study, it was decided to use only two of the sub-scales of the PMI, namely the 'physical health' and 'coping strategy', to assess the level of stress symptoms and the coping behaviour of single and married working mothers. Consequently, 26 items of the 146 items of the PMI were considered for inclusion in the current survey.

Nine of the 11 items in Section 3 were extracted from the 'physical health' sub-scale of the PMI. Two additional items were added to cover the effects of stress further. The 17 items related to coping behaviour were derived from the 'coping strategy' sub-scale of the PMI. All the items included in Sections 3 and 4 were personalised to ensure that the respondents could identify themselves with the related behaviour more easily when applicable. For the purposes of this study, the 11 items which parallel the essentials of physical stress symptoms and feelings of exhaustion were incorporated into a questionnaire named the Overall Stress Index (OSI), and the 17 items that are related to coping with stress were included in a measure called the Coping Behaviour Index (CBI).

The items in both questionnaires were scaled and scored in accordance with the scoring method laid down for the relevant sub-scales by Cooper and Williams (1996). The items of the OSI are rated on a six-point scale. The respondents had to indicate how often they had experienced specific stress symptoms over the last three months. The scoring is on a continuum from 1 to 6 with the following descriptive categories: 'Never', 'Very infrequently', 'Infrequently', 'Sometimes', 'Frequently', and 'Very frequently'. The items of the CBI are also rated on a six-point scale and the respondents had to indicate the coping behaviour they used to deal with issues or events that had been a source of pressure to them during the last three months. The following descriptive categories was used for each item: (1) Never used by me, (2) Seldom used by me, (3) On balance not used by me, (4) On balance used by me, (5) Extensively used by me, (6) Very extensively used by me. Analyses of the factor structure, construct validity and the reliability of the OSI and CBI for the present sample (n = 205) are reported in Sections 5.4 and 5.5 of the study.

4.8.4 Appearance of the questionnaire and covering letter

The physical appearance of the questionnaire plays a vital role in a respondent's decision whether or not to complete it. Aaker *et al.* (1995) regard the clarity of reproduction and the appearance of crowding as important factors. For this study, the questionnaire was well formatted, and ample white space was allowed between the questions, as well as between the sections. Clear instructions on how to complete the questionnaire were also provided.

Time constraints also have a direct influence on respondents' willingness to complete the questionnaire. If the questions are too difficult or too time-consuming to complete, the respondents tend not to complete the questionnaire. Although the composite questionnaire consisted of 139 questions, which is a fairly large number of questions, the questions were formulated in a simple way which made it relatively easy for the respondents. Approximately 30 minutes were needed to complete the questionnaire for this study.

The first part of the survey questionnaire contained a covering or introductory letter and information on how the participants should complete the questionnaire. According to Coleman and Briggs (1995), a covering letter is an essential part of a survey. It is a tool which is employed to introduce the respondents to the questionnaire and to improve participation (see Appendix D). It is common, especially with mail-administered questionnaires, to have low response rates which ultimately affect the validity of the research (Yun & Trumbo, 2000). In order to increase the response rate and to prove that the e-mail was not junk mail, a covering letter using an official letterhead and signed by the study leader was attached to the questionnaire. The covering letter stated the purpose of the study, the potential benefits and its significance. Furthermore, it referred to the ethical considerations, such as privacy, voluntary participation, and the confidentiality of the answers. The respondents were also assured of anonymity in order to encourage them to be honest in answering the questionnaire.

4.8.5 Ethics

The study was conducted in an ethical manner. The University of Pretoria's ethics committee's approval was sought before the commencement of this study. According to Cooper and Schindler (2001:112), 'research must be designed so a respondent does not suffer physical harm, discomfort, pain, embarrassment, or loss of privacy'. In order to prevent any such detrimental effects for any subject, the researcher ensured that the context of the research was explained, that participation was voluntary (informed consent was obtained from all participants) and that confidentiality has been honoured. Neuman (1997:455) cites the following principles of ethical social research:

- 'ethical responsibility rests with the individual researcher;
- subjects or students should not be exploited for personal gain;
- some form of informed consent is highly recommended or required;
- all guarantees of privacy, confidentiality and anonymity should be honoured;
- subjects should not be coerced or humiliated;
- deception should only used when needed and should always be accompanied by debriefing;

- the details of the study should be released with the results;
- interpretations of the results consistent with the data should be made;
- an appropriate research method for the topic should be used;
- undesirable consequences to research subjects should be detected and removed;
- possible repercussions of the publication of the results should be anticipated;
- the sponsor funding the research should be identified;
- cooperation with hosting nations doing comparative research should be instituted;
- high methodological standards should be used and the researcher should strive for accuracy; and
- secret research should not be conducted'.

It should be noted that not all these criteria applied to this study, but all the relevant requirements mentioned above were met in the execution of all the phases of this research.

4.9   DATA ANALYSIS

4.9.1 Textual data analysis

The data analysis commenced with the textual data generated by means of the semi- structured interviews. Holsti (1969:14) offers a broad definition of content analysis; he describes it as 'any technique for making inferences by objectively and systematically identifying specified characteristics of messages'. Strauss and Corbin (1990) define content analysis as a process of breaking down, examining, comparing, conceptualising and categorising of data. Marshall and Rossman (1989, cited in De Vos, 1998; 342-343) suggest five steps in quantitative data analysis:

Step 1: Organise the data.

Step 2: Generate categories, themes and patterns.

Step 3: Test emerging hypotheses against the data.

Step 4: Search for alterative explanations of the data.

Step 5: Record the findings.

In this study, the researcher followed the steps set out below. Firstly, she listened to all the taped responses of the 17 interviewees a few of times to develop a holistic understanding of concepts involved. The second step in the data analysis involved categorizing the data. This included breaking down the semi-structured interviews into units of analysis. Thirdly, the content (words, statements and views) of the units of analysis were extracted from the data to understand how single and married mothers respectively experience their world of work and family life. Fourthly, the different examples were clustered (Miles & Huberman, 1994) to identify the existence of certain prominent themes. Fifthly, the common themes were integrated into relevant constructs that were used to build a theoretical framework. According to Cooper and Schindler (2003:43), 'a construct is an image or idea specifically invented for a given research and/or theory-building purpose'.

Nine themes or domains were identified that were important to understand the nature of the problems, pressures and stressors working mothers experience; and the nature of the resources that can mitigate the stressors and support working mothers to cope with work and family demands (refer to Section 4.8.2.1 for the list of domains that signify the measuring construct of this study).

4.9.2 Capturing and coding the quantitative data

Data obtained from respondents on questionnaires must be thoroughly scrutinized before it can be analysed. Data preparation includes data editing, coding, inspection and statistical adjustment of the data, if required (Aaker *et al*, 1995).

Upon receipt of the questionnaires, each questionnaire was edited to identify omissions, ambiguities and errors in the responses. Illegible or missing answers were coded as 'missing'. This simplified the data analysis, but did not distort any interpretations of the data.

Coding the closed-ended questions was fairly straightforward, because the questionnaire made provision for response values and a column which was used for variable identification. The response values of the sample (n=205) were originally captured on an Excel spreadsheet and later exported into the Statistical Package for the Social Sciences (SPSS) for Windows (Version 17.0) to generate the diagnostic information. The datasets of the single and married working mothers were merged in SPSS and all the variables were numerically coded, named, defined and labelled. Value labels were assigned to the different groupings and the levels of measurement were indicated. Thereafter, frequency analysis was done on the data to check for duplicate entries, labels, missing values, discrepant values, wild codes and data input errors. All mistakes were rectified.

4.9.3 Statistical analysis

One of the issues that are often raised in survey research is whether the statistical procedures used for the processing of the data are the most appropriate. Various factors have to be considered before suitable statistical techniques can be selected for analysing complicated data sets (Tabachnick & Fidell, 2007). In this research, the objectives of the study, the sample size, the distribution of sample scores, the type of measurement, the number of variables that needed to be analysed simultaneously and homogeneity of variance were the determining factors.

The data gained from all the returned questionnaires was subjected to specific quantitative explorative procedures and analyses. The frequency distribution of each variable and scale, as well as its level of measurement were determined. This exercise was important to examine the extent to which the assumptions of the statistics that were considered were met. Two general types of statistical methods were available to the researcher, namely, parametric and non-parametric methods. The conventional assumption about the population scores in a parametric test is that they are normally distributed, the variances of the groups are equal and the dependent variable is an approximate interval scale.

By contrast, the non-parametric method, often referred to as a distribution-free method, does not rely on assumptions that the data are drawn from a given probability distribution (Morgan, Leech, Gloeckner, & Barrett, 2007).

The choice of statistical procedures was also based on the level of measurement achieved in the research. In this study, categorical, rank order and continuous scales were used in collecting the data to quantify the independent and dependent variables:

Permissible statistics at a nominal measurement level or categorical scale include counts, cross-tabulation with the Chi-square, Phi or Cramer's V. Highly sophisticated modelling techniques are also available for nominal data.

Statistics that may be used at an ordinal measurement level or rank order scale are in the non-parametric group and consist of mean ranks, median and mode, the Mann-Whitney test, the Kruskal-Wallis, Spearman rank order correlation or Kendall Tau and non-parametric MANOVA.

When an interval measurement level or continuous scale are used, the statistics that may be considered fall into the parametric group and include measures of central tendency and variability, factor analysis, Student's t-test, the one-way ANOVA, Pearson correlation, Regression, Multiple regression, factorial ANOVA and MANOVA .

All the parametric statistical procedures listed above can be used for calculations involving ratio type data.

After considering the factors mentioned above, a number of statistical techniques were selected as the basis for describing and making inferences about the data set. Both descriptive and inferential statistics were employed to analyse the data. These included statistical applications and calculations such as factor analysis, correlation, comparing two means, multivariate analysis of variance and logistic regression, strength of association and effect size.

4.9.3.1 Factor analysis

In the behavioural sciences, factor analysis is frequently used to uncover the latent structure (dimensions) of a set of variables and to assess whether given instruments measure substantive constructs (Cortina, 1993). Hence, Hatcher (1994) has recommended that researchers use the exploratory factor analysis (EFA) procedure when they attempt to determine the number and content of factors measured by an instrument.

In the present study, principal factor analysis (PFA) was used to establish the internal structure and factor validity of the questionnaires that were used. PFA is also referred to as principal axis factoring (PAF) or common factor analysis and is a form of factor analysis that seeks the least number of factors that can account for the common variance of a set of variables (Garson, 2008).

In the present study, a principal factor analysis was done for each of the questionnaires, namely the Work-Family Pressure and Support Questionnaire (W-FPSQ), the Overall Stress Index (OSI), and the Coping Behaviour Index (CBI). The statistical software package SPSS for Windows (Version 17.0) was used for the majority of the statistical procedures.

The steps followed in the factor analysis were as follows:

Step 1: Computing a matrix of correlations between the items.

Step 2: Subjecting the correlation matrix to a factor analysis.

Step 3: Deciding on the number of factors (dimensions) to be extracted.

Step 4: Extracting an x-number of factors.

Step 5: Rotating the factor solution to a more interpretable solution.

4.9.3.2 Reliability analysis

Testing the internal consistency or reliability of a scale is important, because it measures the degree to which all the items in a scale measure the same attribute. Internal consistency implies a high degree of generalizability across the items within the test. Cronbach's alpha coefficient is the most common estimate of internal consistency of items in a scale. According to Cortina,

(1993), alpha is a sound measure of error variance, and can be used to confirm the unidimensionality of a scale, or to measure the strength of a dimension once the existence of a single factor has been determined.

Coefficient alpha reflects important information on the proportion of error variance contained in a scale. Owing to the multiplicity of the items measuring the factors, the Cronbach alpha coefficient is often considered to be the most suitable, since it has the most utility of multi-item scales at the internal level of measurement (Cooper & Emory, 1995). In addition to estimating internal consistency from the average correlation, the formula for alpha also takes into account the number of items, since the more items there are, the more reliable a scale will be. Nunnally and Bernstein (1994) recommend an alpha coefficient of 0.70 or higher for a set of items to be considered a reliable scale.

The internal consistency coefficient, Cronbach's alpha coefficient, was computed for each of the factors identified, and is discussed in the next chapter.

4.9.3.3 Item discrimination analysis

The items of the W-FPSQ were subjected to an item discrimination analysis to provide evidence that the items produced a statistically acceptable dispersion of scores. According to Gregory (2004:131), 'an effective test item is one that discriminates between high scores and low scores on the entire test' or scale. As suggested by Gregory (2004), the item-discrimination index was computed by comparing the item mean scores of the highest 25% and the lowest 25% of responses for each item after factor analysis. Student's t-test for independent groups was conducted to establish the differences between the item mean score of the highest and lowest quartiles for each item in the scales of the W-FPSQ.

4.9.3.4 Analysis of item distribution

Descriptive statistics (for example, means, standard deviations, skewness and kurtosis) were used to analyse the distribution of the values of each item

included in the different factors. Measures of location (mean), spread (standard deviation), and shape (skewness and kurtosis) were calculated. According to Cooper and Schindler (2003:472-477), 'the mean and standard deviation are called dimensional measures (in other words, expressed in the same units as the measured quantities). By contrast, skewness (sk) and kurtosis (ku) are regarded as non-dimensional measures'.

Skewness is an index that characterises the shape of the distribution. When sk is approximately 0, a distribution approaches symmetry. Kurtosis is a measure of a distribution's 'peakness or flatness'. According to Cooper and Schindler (2003:472), there are three different types of kurtosis:

- peaked or leptokurtic distributions – scores cluster heavily in the centre (a positive ku value);

- flat or platykurtic distributions – evenly distributed scores and facts flatter than a normal distribution (a negative ku value); and

- intermediate or mesokurtic distributions – neither too peaked nor too flat (a ku value close to 0).

As with skewness, the larger the absolute value of the index, the more extreme the characteristic of the index. To verify the results of the skewness (sk) and kurtosis (ku) analyses, the distribution of the data was further subjected to the Kolmogorov-Smirnov goodness-of-fit test (K-S) and the Shapiro-Wilk test of normality.

4.9.3.5 Analysis of the association between grouping variables

An analysis of the association between grouping variables was done to establish whether the characteristics of the single and married working mothers matched each other, and to verify that both groups were comparable. The Chi-square (^{2}), Phi-coefficient (φ) and Cramer's V (V) were computed to test the relationship and strength of the relationship between sample identity and the demographic characteristics of the participants. The Phi-coefficient (φ) and Cramer's V (V) also provided information on the effect size of the association between categorical variables (Morgan *et al*., 2007:103).

4.9.3.6 Spearman's rank order correlation

Whenever it is necessary to determine the relationship between two variables, measures of association or correlation analysis must be employed. Correlation analysis is not only directed at discovering whether there is a relationship between two variables, but also analyses the direction and magnitude of the relationship (Gravetter & Wallnau, 2002). Due to the fact the assumptions of the normality of the scores were noticeably violated, it was decided to use the Spearman's rho method to calculate the correlations between the different variables. In principle, Spearman's rho is simply a special case of the Pearson product-moment correlation; however, the Spearman statistic is based on the correlation of the ranked data, as opposed to using the actual raw scores (Field, 2005; Morgan *et al*., 2007).

Spearman's rho statistically determines the extent to which changes in one variable (in most cases, the independent variable 'X') are associated with changes in another variable (in most cases, the dependent variable 'Y') (Cooper & Schindler, 2003). However, Gravetter and Wallnau (2002) warn that although a relationship or correlation may exist between two variables, it does not necessarily imply causation.

All that an association measure expresses is the degree of covariation between two variables.

4.9.3.7 Multivariate analysis of variance

Multiple analysis of variance (MANOVA) is used to determine the main and interaction effects of categorical variables on multiple dependent interval variables. MANOVA makes use of one or more categorical independents as factor variables, with two or more dependent variables. MANOVA tests the differences in the centroid (vector) of means of the multiple interval dependents, for various categories of the independent(s). After an overall F-test has shown significance, post hoc tests are used to evaluate differences between specific

means. The post hoc multiple comparison tests are performed separately for each dependent variable (Field, 2005:571-595).

Because the data set did not meet the assumption of normality and homogeneity of variance-covariance, the non-parametric MANOVA with rank order data was performed in the present study, as suggested by Zwick (1985:148-152). Furthermore, non-parametric post hoc tests were considered to calculate the differences between the rank order means with only two categories or sub-groups (Morgan *et al*., 2007). The familiar Mann-Whitney distribution-free test was deemed appropriate for this calculation (Morgan *et al*., 2007).

4.9.3.8 The Mann-Whitney test

The Mann-Whitney (M-W) test is a non-parametric test that can be used to assess whether two samples of observations come from the same distribution. This test is used when the assumptions of the t-test are violated in that the dependent variable data set is non-normally distributed or ordinal (Field, 2005; Morgan *et al*., 2007). The M-W test is only slightly less powerful than Student's t-test. This non-parametric test (M-W) is used with a between-groups design with two levels of the independent variable, for example, marital status (single and married). Z-values are calculated that 'can be used to approximate the significance level for the test. In this case, the calculated z is compared to the standard normal significance levels' (Winks, 2008).

4.7.3.9 Logistic regression analysis

According to Field (2005:218) logistic regression is a multiple regression, but with an outcome variable that is a categorical dichotomy, and predictor variables that are continuous or categorical. Generally, the dependent or response variable is dichotomous, such as presence/absence or success/failure. In this study, logistic regression was used to predict the marital status of the respondents. In other words, logistic regression allows researchers to predict a discrete outcome, such as group membership, from a set of

variables that may be continuous, discrete, dichotomous, or a mix of any of these (Tabachnick & Fidell, 2007:437).

Logistic regression also makes no assumptions about the distributions of the predictor variables. For example, logistic regression does not require normally distributed variables, does not assume linearity of the relationship between the independent variable(s) and the dependent variable(s), and does not assume homoscedasticity (equal variance within each group) (Garson, 2008; Tabachnick & Fidell, 2007:437).

Associated with logistic regression is a set of significance tests used to determine inclusion or elimination of each coefficient from the model. These include the log-likelihood ratio, the Hosmer-Lemeshow goodness-of-fit test and the Wald test for predictors combined over multiple categories. The proportion of variance in the outcome variable that is associated with the predictor variables are estimated with a pseudo R^2, provided by Cox and Snell's R^2 and Nagelkerke's R^2 (Field, 2005:218; SPSS Electronic manual, s.a.). The impact of predictor variables is usually explained in terms of odds ratios {Exp( )} 'which is an indicator of the change in odds resulting from a unit change in the predictor' (Field, 2005:225).

4.9.3.10 Practical significance

Statistical significance tests are used to show when differences between groups are significant (Pett *et al.*, 2003). The p-value is a criterion of this, giving the probability that the obtained value or larger could be computed under the assumption that the null hypothesis (example, no difference between the means) is true. A small p-value (example, smaller than 0.05) is considered sufficient evidence that the result is of statistical significance at the 95% level of confidence. However, statistical significance does not necessarily imply that the result is important in practice, because these tests have a tendency to yield small p-values (indicating significance) as the size of the data sets increases.

According to Tabachnick and Fidell (2007), a practical significance can be understood as a large enough difference to have an effect in practice. When a relationship between variables is large enough to be important, the test statistic or correlation effect size is compared to various cut-off points or values as recommended. In many cases, it is necessary to know whether a relationship between two variables is practically significant – for example, between marital status and the respondents' perceptions of work-family demands. The statistical significance of such relationships can be determined with the correlation coefficients (r). To assess the significance of the z-statistic of the Mann-Whitney test the coefficient 'r' was computed by using the conversion formula, $r = z/\sqrt{(N)}$ suggested by Field (2005) and Morgan *et al*. (2007).

Effect size was determined by using the absolute value of 'r' and relating it to the cut-off points for practical significance as recommended by Cohen (1988):

    r = 0.10   small effect

    r = 0.30   medium effect

    r = 0.50   large effect

It is important to note that effect size in this context does not refer to cause and effect relationships between variables, but merely provides a value that quantifies the practical significance of findings (Rosenthal, Rosnow & Rubin, 2000).

4.10   CONCLUSION

This chapter has discussed the research design and methodology used in this study, which was conducted employing a social science approach, applying both inductive and deductive reasoning. The research design contained exploratory and descriptive components that informed the use of both qualitative and quantitative information gathering methods. The mixed methods approach, in which a qualitative approach was sequentially followed by a quantitative approach, was adopted (see Figure 4.5). The research as a whole was conducted within the framework of a feminist research paradigm.

The second part of this chapter dealt with the population, method of sampling, data collection procedures, the design and layout of the questionnaire, the pre-testing of the questionnaire, the data analysis and statistical methods used in the study. Statistics such as factor analysis, reliability and item distribution analysis, Spearman rank order correlation (rho), non-parametric MANOVA, analysis of variance (Mann-Whitney test) and logistics regression analysis were used in this study to provide a basis for discussion of the results as set out in Chapter 5.

Phase 1:   **Qualitative Research**

Inductive

Qualitative Data Collection

Scientific articles.

Semi-structured Interviews.

17 Participants.

Qualitative Data Analysis

Content analysis of Textual data.

Qualitative Findings

Identify themes related to the topic of the research. Generate questions to assess the themes.

Phase 2:   **Quantitative Research**

Deductive

Quantitative Instrument Development

Create a preliminary questionnaire with 121 items.
Analyse the content validly of the items for each theme using Lawshe's technique.
Administer survey to 150 single and 150 married working mothers.

QuantitativeTest of the Instrument

Determine factor structure of items. Conduct item analyses, and distribution and reliability analysis for scales (n= 205).

Quantitative Analysis of Data

Determine relationships between independent and dependent variables using appropriate statistical techniques (n = 104 single & 101 married mothers).
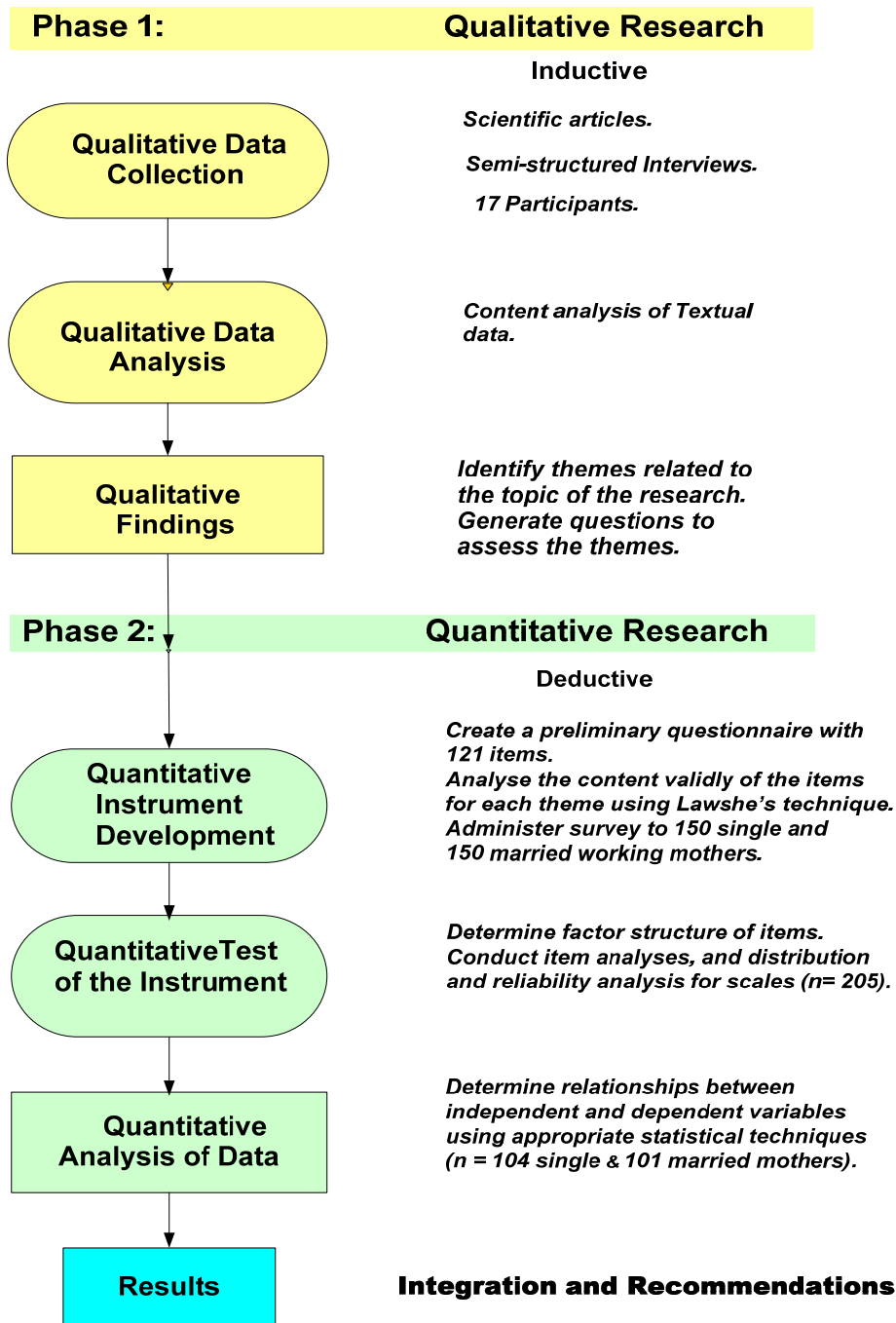
Results   **Integration and Recommendations**

Figure 4.5: Mixed methods sequential explorative approach