



CHAPTER 4 RESEARCH METHODOLOGY

4.1 INTRODUCTION

In this chapter, the methods, techniques and procedures that were employed in the process of implementing the research design (research plan) are discussed in detail. Firstly, the conceptual framework is presented and explicated to set the stage for the phenomena being studied. Next, the research problem and resultant objectives and sub-objectives are stated formally. In the ensuing sections, the research strategy, research design and sampling plan are described. Additionally, the data collection technique for this study is discussed in terms of the respective methodologies for researching consumers' complaint behaviour and causal attributions, since these methodologies serve as background for the methodology chosen for this study. The analysis of the data is discussed in terms of the coding and capturing of the data, the operationalisation of measurements and the explanation of the statistical methods respectively. Then, the quality of the data is discussed in terms of its validity and reliability. Finally, the manner in which the data is presented is indicated.

4.2 CONCEPTUAL FRAMEWORK, PROBLEM STATEMENT AND OBJECTIVES

4.2.1 Conceptual framework

This study proposes a conceptual framework of the consumer's complaint behaviour following dissatisfaction due to a performance failure of a major electrical household appliance item. As already mentioned in Chapter 1, this framework integrates three lines of CS/D and complaint behaviour research, namely the expectancy disconfirmation model (satisfaction research) (Churchill & Suprenant, 1982; Bearden & Teel, 1983), Weiner's (1986) causal dimensions (attribution theory), and Day and Landon's (1977) taxonomy of complaint behaviour. Additionally, consumer-related variables and product-specific variables that may impinge on consumers' complaint behaviour (complaint behaviour theory) are included in the framework. Figure 1.1 (Chapter 1, par. 1.3) is provided once more, and then explained, to facilitate the reader's understanding of the interrelationships between the respective concepts.

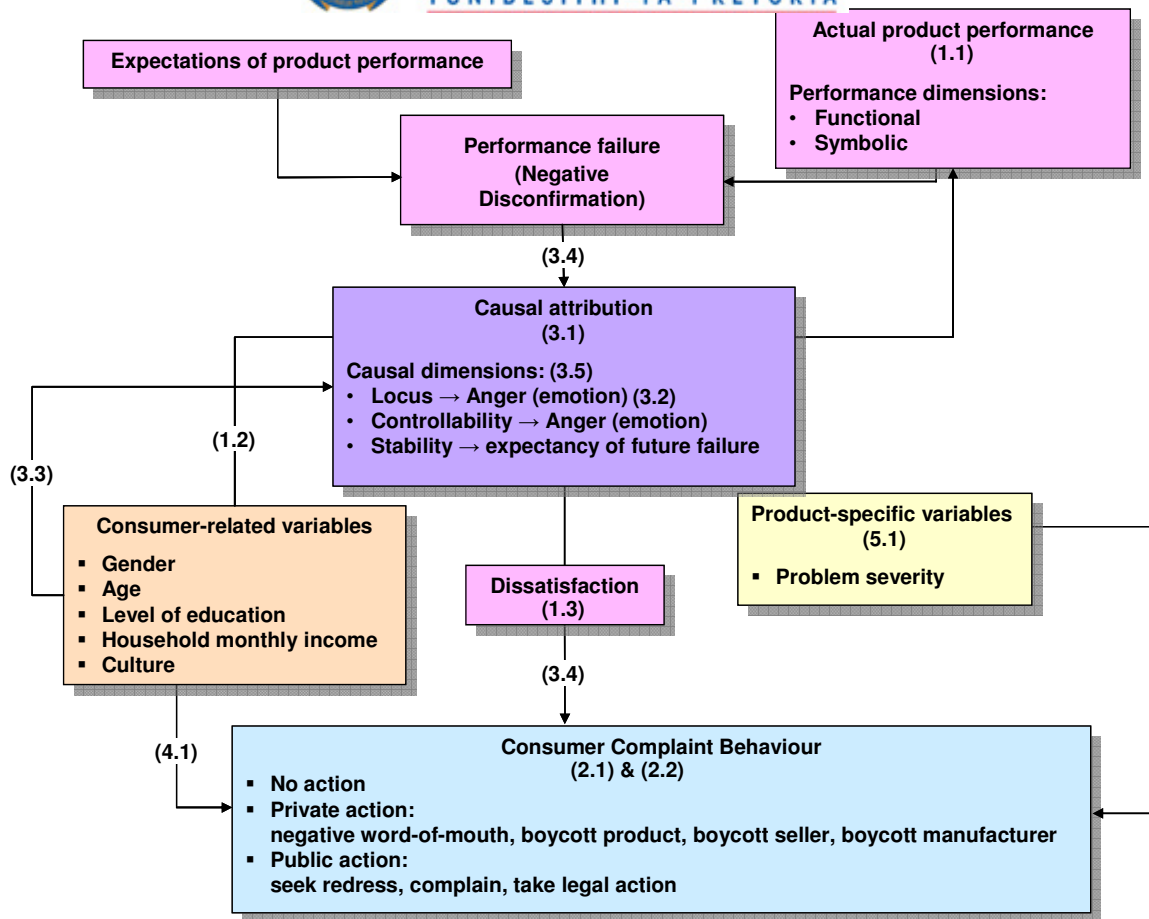


FIGURE 1.1: CONCEPTUAL FRAMEWORK OF DISSATISFIED CONSUMERS' COMPLAINT BEHAVIOUR CONCERNING THE PERFORMANCE FAILURE OF MAJOR ELECTRICAL HOUSEHOLD APPLIANCES WITH CONSIDERATION OF ATTRIBUTIONAL PROCESSING, CONSUMER-RELATED VARIABLES & PRODUCT-SPECIFIC VARIABLES

It is clear from Figure 1.1 that, prior to purchasing and consuming major electrical household appliances, consumers form expectations regarding its performance in a particular use situation. After or while using an appliance item, consumers evaluate its perceived performance in terms of their initial expectations regarding the functional and symbolic performance dimensions of the appliance. Whereas functional performance refers inter alia to durability, ease of use, ease of care and physical performance (how well the appliance does what it is supposed to do), symbolic performance refers to a “psychological” level of performance that is derived from the consumer’s response to the physical product (Swan & Combs, 1976:26; Erasmus & Donoghue, 1998; Hawkins *et al.*, 2001:641; Erasmus, Makgopa & Kachale, 2005). Consumers’ evaluation of the functional and symbolic performance of products unquestionably varies in terms of consumer characteristics (i.e. gender, age, level of education, monthly household income and culture) (Brown & Rice, 1998:46-47; Hawkins *et al.*, 2001:641). When the appliance’s performance does not meet the consumer’s expectations (i.e. when a performance failure occurs or when the product performs poorly), negative disconfirmation occurs, leading to feelings of dissatisfaction.



However, feelings of dissatisfaction are mediated by attributional reasoning, i.e. the cognitive process of wanting to find out why a negative outcome or event occurred. The perceived cause (attributions) for the product's failure and its dimensional quality (in terms of Weiner's (1986) locus, stability and controllability), influence consumers' reaction in terms of their emotions (the level of anger experienced in response to the product failure) and behaviours. Additionally, the dimensional characteristics of dissatisfied consumers' attributions may be influenced by demographic variables (i.e., gender, age, level of education, monthly household income and culture).

Consumer responses to dissatisfaction are generally referred to as "consumer complaint behaviour" (Singh, 1988:93; Maute & Forrester, 1993:220). Once dissatisfaction occurs the consumer may engage in behavioural and non-behavioural responses to resolve it (Day & Landon, 1977:229-432; Broadbridge & Marshall, 1995). Three major options are available to consumers who are dissatisfied with their purchase: no action, private action or public action. Consumers may refrain from action by rationalising and forgetting about the problem. Consumers may engage in private actions such as switching brands or retailers, boycotting the type of product or warning family and friends. Or, consumers may engage in public action such as seeking redress (i.e. a refund, an exchange or free repairs and replacement of defective parts – depending on the nature of the product and particular circumstances) directly from the retailer or manufacturer, complaining to the retailer or manufacturer, a public consumer protection agency, a voluntary organisation or the media, or taking legal action against the retailer or manufacturer.

However, consumer-related factors and product-specific factors are likely to affect the consumer's complaint behaviour. Consumer-related variables refer to characteristics that are associated or determined primarily by consumers. Demographic factors (i.e. gender, age, level of education, monthly household income and culture), as consumer-related variables, influence consumers' complaint behaviour. Product-specific variables, specifically the severity of the problem (product failure) will be addressed in this study. For the purpose of this study, the type of product failure (functional/symbolic) is not subsumed under product-specific variables (as explained in terms of complaint behaviour theory, Chapter 2, par. 2.3.3.2). With regard to the expectancy disconfirmation model (satisfaction/dissatisfaction literature), the type of product failure is considered to be part of the performance failure concept.



4.2.2 Problem statement and objectives

The research problem was stated formally in terms of the unit of analysis, research goal and approach, as follows:

To explore and describe the role of specific consumer-related variables, product-specific variables, and causal attribution in dissatisfied consumers' complaint behaviour concerning the performance failure of selected major electrical household appliances.

The main research problem was divided into subcomponents, which were stated in the form of objectives and sub-objectives. By looking at the main problem in terms of its component parts, the researcher gains a broader perspective of the research problem (Leedy & Ormrod, 2005:51-53). "The subcomponents describes the scope of the work and, taken together, defines the entire problem to be tackled as summarised in the main problem" (Walliman, 2005:34).

The following research objectives and sub-objective were formulated for this study:

- | | |
|-------------------|---|
| Objective 1: | To explore the nature of the performance failure that caused consumers to be dissatisfied with major electrical household appliances |
| Sub-objective 1.1 | To explore the functional/symbolic performance failure causing consumers' dissatisfaction concerning major electrical household appliances |
| Sub-objective 1.2 | To describe the association between demographic variables (i.e. gender, age, level of education, household monthly income and culture) and the functional/symbolic performance failure of major electrical household appliances |
| Sub-objective 1.3 | To describe consumers' degree of dissatisfaction experienced concerning the functional/symbolic performance failure of household appliances |
| Objective 2: | To describe the nature of, and the reasons for, dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances |



- Sub-objective 2.1 To describe the types of consumer complaint behaviour responses that dissatisfied consumers engage in concerning their dissatisfaction with the functional/symbolic performance failure of major electrical household appliances
- Sub-objective 2.2 To describe dissatisfied consumers' reasons for engaging in consumer complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances
- Objective 3: To describe the relationship between causal attribution and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances
- Sub-objective 3.1 To describe dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances
- Sub-objective 3.2 To describe the causal dimensional characteristics of dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances
- Sub-objective 3.3 To describe the association between the dimensional characteristics of dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances and demographic variables (i.e. gender, age, level of education, monthly household income and culture)
- Sub-objective 3.4 To describe the association between the causal dimensions (i.e. locus, stability and controllability) and dissatisfied consumers' complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances
- Sub-objective 3.5 To describe the relationship between dissatisfied consumers' anger reactions concerning the functional/symbolic performance failure of



major electrical household appliances and consumer complaint behaviour

- Objective 4: To describe the relationship between specific consumer-related variables and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances
- Sub-objective 4.1 To describe the relationship between demographic variables (i.e. gender, age, level of education, household monthly income and culture) and dissatisfied consumers' complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances
- Objective 5: To describe the relationship between product-specific variables and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances
- Sub-objective 5.1 To describe dissatisfied consumers' perceptions of the severity of the performance failure of major electrical household appliances
- Sub-objective 5.2 To describe the relationship between dissatisfied consumers' perception of the severity of the functional/symbolic performance failure concerning major electrical household appliances and their consumer complaint behaviour

4.3 RESEARCH STRATEGY, APPROACH AND DESIGN

The research objectives for this study included exploration and description. Exploratory research enables the researcher to gain insight into the research topic, to explicate central concepts and constructs and to develop methods to be employed in the study. Descriptive research allows the researcher to measure and report the frequency with which specific variables occur in the sample to present a picture of the details of a situation or relationship (Mouton, 1996:102; Babbie & Mouton, 2002:xxvi, 79-81; Fouché & De Vos, 2005a:106).

A quantitative methodological research approach was used for this study. The quantitative approach is epistemologically rooted in positivism (Babbie & Mouton, 2002:49; Fouché & Delport, 2005a:75). Quantitative research utilises deductive logic. The research starts with an



abstract idea, followed by a measurement procedure, and ends with empirical data (precise numerical information), capable of being analysed by statistical methods or other computational methods, representing the abstract ideas (Neumann, 2000; Babbie & Mouton, 2002:49; Walliman, 2005:322). Therefore, quantitative research is highly formalised, and explicitly controlled, with a range that is exactly defined and that is relatively close to the physical sciences (Mouton & Marais, 1990:155-156; Fouché & Delport, 2005a:73).

The quantitative approach entails specific methods of sampling, data collection methods and methods of data-analysis. However, the selection of methods, and their application, are always dependent on the objectives of the research, the nature of the phenomena being investigated and the underlying theory or expectations of the researcher (Babbie & Mouton, 2002:49).

Research design refers to “those groups of small worked-out formulas from which prospective researchers can select or develop one or more that are suitable for their specific research goals and objectives” (Fouché & De Vos, 2005b:133, 143). A quantitative-descriptive (survey) design, as plan or blueprint for the investigation, was followed (Fouché & De Vos, 2005b:133, 143). The type of research design can also be classified as empirical, using primary data (Babbie & Mouton, 2002:78).

The research is cross-sectional, meaning that the observations were made at one time and not over an extended period as is the case with longitudinal research (Babbie & Mouton, 2002:92, 105).

4.4 SAMPLING PLAN

4.4.1 The unit of analysis

The units of analysis for this study were consumers older than 25 years of age, who resided in the greater Pretoria area, who belonged to the Living Standards Measure (LSM) groups 5 to 10 and who had experienced dissatisfaction concerning the performance failure of major electrical household appliances.

For inclusion in the study, respondents had to meet specific criteria. Each of these criteria is justified in the following paragraphs:



- Respondents must have purchased major electrical appliances during a prior four-year recall period and must have experienced dissatisfaction concerning the performance of an appliance item as such.

Respondents had to use their own appliances to have gained experience with their appliances. Consumers' dissatisfaction with durable major electrical household appliances might manifest over a period of time and not necessarily immediately as in the case with non-durable products such as food items. Respondents should have purchased their appliance between 2002 and 2006. It should be noted that product warranties play a role in consumers' complaint behaviour – most of today's appliances have warranties of one to two years. (People whose warranties had just expired might still engage in formal complaint behaviour, as they might believe that retailers or manufacturers would react to their complaints to clear their names and to uphold their positive reputations. People whose appliances fail long after the warranty period might consider it as wear and tear – part of the ordinary course of events). Additionally, consumers had to have experienced dissatisfaction with the performance of their appliances, whether they engaged in consumer complaint behaviour or not, whereas satisfied consumers would undeniably not have engaged in consumer complaint behaviour (Day *et al.*, 1981:83).

- Respondents had to be older than 25 years.

It was assumed that the average person would, by the age of 25 years, be earning enough income to purchase and subsequently operate his/her appliances.

- Respondents had to belong to the Living Standards Measure (LSM) groups 5 to 10.

The South African Research Foundation (SAARF) devised the Living Standards Measure (LSM) to measure social class, or living standard, regardless of race, income or education. Instead of approaching social class from the perspective of obvious demographic differences, the LSM measures the population on a continuum from LSM level 1 to 10, in terms of ownership of certain durable goods, access to services and the like. For LSM levels 5 to 10, characteristics include (in ascending order): access to electricity, ownership of durables such as major electrical household appliances, educational levels varying from schooling up to Matric/Grade 12 to higher education, and average monthly household incomes ranging from R2 000 to R10 000 or higher (i.e. middle-class to top income brackets). LSM groups 5 to 10 have access to electricity and have the capacity to own major electrical appliances (Du Plessis, 2003:87-100; SAARF Universal LSM Descriptors, August 2004). At the time of the research, the *SAARF Universal LSM Descriptors* of August 2004



was used to categorise the sample into the different income brackets. Since then, a revised LSM edition has been published with different values for the various income levels and other parameters.

- Respondents had to reside in the greater Pretoria municipal area.

Since members from the different LSM groups might stay in the same suburbs, regardless of the living standard, it was decided that respondents could reside in any of the suburbs of the Pretoria area.

4.4.2 Sample selection and sample size

A convenience sampling technique was employed, but sample members were selected on the basis of the pre-specified criteria mentioned in paragraph 4.3.1. Categories were determined for gender, age, culture, level of education and average monthly household income of the target population. For this study, attributes for the demographic variables were clarified as: gender (male/female), age (25-30 years, 31-45 years, 46-55 years and 56-83 years), level of education (Grade 12/Standard 10/NTCIII or less, Grade 12 and additional certificate(s)/diploma(s) and Bachelors degree/Postgraduate qualification), level of income (R2 000-R5 000, R5 001-R10 000, and R10 001 or more) and culture (black/Caucasian). Additionally, respondents had to reside in residential areas of the Tshwane metropolitan area (city of Pretoria). A list indicating such residential areas was obtained from Space-Time Research Pty Ltd (1993-2004) to verify that respondents resided in the Tshwane metropolitan area. In this study the absolute minimum number of responses required for the factor analysis was determined at 100, according to the rule of 100 (the number of respondents should be larger than 5 times the number of variables, or 100) (Hatcher in *Statistic Solutions, Inc: factor analysis*).

4.5 CHOICE DESCRIPTION AND APPLICATION OF DATA COLLECTION METHOD

4.5.1 Overview of methodologies for studying consumer complaint behaviour, causal attributions and causal dimensions

The respective methodologies for researching consumers' complaint behaviour, causal attributions and causal dimensions are provided, since these methodologies serve as background to the methodology chosen for this study.



4.5.1.1 Methodologies for studying consumer complaint behaviour

In general, the empirical studies of consumers' complaint behaviour employ a survey methodology to report on consumers' dissatisfaction with various products/services, their reasons for being dissatisfied, the nature and extent of their complaint actions, their reasons for taking particular complaint actions and factors influencing their complaint behaviour. Self-administered questionnaires are typically administered to collect data (Day & Bodur, 1978; Richins; 1983, 1987; Broadbridge & Marshall, 1995; Singh & Wilkes, 1996; Keng & Liu, 1997; Kincade *et al.*, 1998; Liu & McClure, 2001). The population of interest concerns consumers who have experienced dissatisfaction with products and/or services, since dissatisfaction precedes complaint behaviour. It is therefore of no value to collect information concerning the failure of appliances from satisfied consumers because they will certainly not have taken part in consumer complaint behaviour (Day *et al.*, 1981).

In most research, data is collected using a questionnaire format where the description of a critical incident forms the basis for coding the responses. The Critical Incident Technique requires of respondents to recall a specific product experience that they remember most clearly (Kelley, Hoffman & Davis, 1993; Singh & Wilkes, 1996) Even though memory decay may be a potential source of bias in respondents' responses, retrospective measurements are regularly employed, as opposed to simulation or role-playing methodologies and experimental manipulation, because they appear relevant to those who take part in them and reflect "real life" reactions (Brown & Beltramini, 1989; Weiner, 2000; Dunning, O'Cass & Pecotich, 2004).

Usually a time limitation is placed on the dissatisfactory experience, in the sense that respondents must have experienced dissatisfaction within a specific period, such as within the last six months or the last two years. The time dimension obviously depends on attributes such as the type of product (for example, clothing versus appliances), product price, and the length of ownership (in some cases, problems may not appear until the product has been used for an extensive period of time) (Richins, 1983).

An appropriate screening question is normally asked to determine whether respondents qualify for inclusion in the study or not (Day *et al.*, 1981; Bloomington in Singh & Pandya, 1991; Dunning *et al.*, 2004). Alternatively, a covering letter can inform respondents of the criteria for inclusion in the study upon which respondents must decide whether they meet those requirements and wish to complete the questionnaire.



Recognised complaint behaviour models such as Hirschman's (1970) typology of exit, voice and loyalty, Day and Landon's (1977) taxonomy of consumer complaint behaviour and Singh's (1988) taxonomy of consumer complaint response options can be used to classify responses and to guide the presentation results (Singh, 1991; Broadbridge & Marshall, 1995).

Richins (1983, 1987) administered questionnaires to samples of middle- to upper-class adult male and female consumers to investigate their responses to dissatisfaction. In all of these studies, respondents were pre-screened, and only those who had experienced dissatisfaction with either a clothing item or a small or large appliance within the prior six months, were included.

Broadbridge and Marshall's (1995) survey investigated consumers' levels of post-purchase dissatisfaction with electrical goods and their specific complaint behaviour action undertaken. Dissatisfied consumers were asked about the source of their dissatisfaction and the main problem they had encountered. The questionnaire explored post-dissatisfaction responses by using Day and Landons' (1977) taxonomy of consumer complaint behaviour.

In addition to investigating consumers' true complaint behaviour by employing memory recall techniques, consumers' intentions to engage in specific complaint behaviour can also be measured. In such a context, respondents are exposed to imaginary dissatisfaction situations where they are then expected to express their intentions to engage in complaint behaviour (Nyer, 1997; Kim *et al.*, 2003; Sharma & Marshall, 2005).

4.5.1.2 Methodologies for studying causal attributions

Methodologies that have been used to collect information concerning respondents' causal attributions involve the Critical Incident Technique and experimental procedures (Weiner, 2000).

In a product failure context, the Critical Incident Technique requires respondents to recall the most recent incident of a certain type of product failure and the attributions inferred (Krishnan & Valle, 1979; Richins, 1983; Curren & Folkes, 1987; Swanson & Kelly, 2001). This technique focuses on the description of an autobiographical episode that is followed by questions to elicit the attributor's reasons for the specific incident. Among the weaknesses of the Critical Incident Technique are memory distortions (as already discussed under par. 4.5.1.1), the difficulties in combining accounts of different participants and the possibility that some causes would occur too infrequently for statistical analysis (since causes cannot be



manipulated). Yet, this approach has face validity and ecological validity (Weiner, 2000). According to Vallerand and Richer in Fiske and Taylor, (1991:53), studies that examine causal attributions in real situations, where the researcher asks respondents to reconstruct their past successes and failures, provide converging support for the validity of Weiners' model.

The experimental methodology, to determine relationships between causal dimensions and consumer responses, is often employed for the control it provides. It allows for the manipulation of all eight types of causes (2 locus levels x 2 stability levels x 2 controllability levels) so that the full spectrum of causes can be examined, as opposed to the aforementioned naturalist methodology. (Refer to Chapter 3, par. 3.4.1). Scenarios describing the same product failing for eight different reasons (where the reasons for hypothetical product failure vary orthogonally) are presented to subjects, whereafter they must describe the behaviour that they would want to engage in (Folkes, 1984; Curren & Folkes, 1987; Folkes 1990; Jones, 2006). Some researchers do not accept simulational or role-playing methodologies, arguing that they lack ecological validity and bring the variable of interest to the experimenter to the fore, while the data do not reflect "real life" reactions in those situations (Weiner, 2000). Research is thus limited due to the artificiality thereof and the fact that intentions are measured as opposed to actual behaviour (Curren & Folkes, 1987). On the other hand, these methodologies permit examination of the variables of most concern and often allow the best theory testing by enabling the investigator to gather all the responses needed (Weiner, 2000).

4.5.1.3 Methodologies for studying causal dimensions

Following the real-life or experimenter-manipulated outcome (as discussed in par. 4.5.1.1 and 4.5.1.2), subjects are asked about their causality. Product failure causes can be determined by using a free response format, with subjects generating their own causal inferences, or a list of causes can be provided where the likelihood of causes influencing the outcome can be rated on some kind of scale (Weiner, 1985).

Research in the domains of achievement and affiliation has determined that one way to predict behaviour for attributions is to first classify causes on the basis of the underlying properties (Folkes, 1984). In the traditional attribution paradigm, an essential step involves the translation of causal attributions, made by the subjects, into causal dimensions by the researcher, assuming that the researcher can accurately interpret the subjects' causal attributions (Russell, 1982). This translation of the cause into causal dimensions is based on the theoretical meaning of the cause (Russell, McAuley & Tarico, 1987). However,



attributional statements are often ambiguous, and even when clearly stated, may be interpreted quite differently by the attributor and the researcher, since the placement of a causal attribution in terms of causal dimensions may vary greatly from person to person, as well as from situation to situation (Russell, 1982). An appropriate technique to prevent such incorrect classification of causal attributions into causal dimensions (called “fundamental attribution researcher error”) is Russell’s (1982) Causal Dimension Scale (see Table 4.1), by means of which the investigator directly assesses how the attributor perceives ascribed causes. This measurement requires subjects to rate their own attributions, subjectively, on nine semantic differential statements, three for each of Weiner’s dimensions (locus, stability and controllability) (Russell *et al.*, 1987; Hewstone, 1989:33-34; Swanson & Kelly, 2001). Findings suggest that direct assessment of causal dimensions based on the attributor’s perception of the causal attribution may represent a more valid procedure for assessing causal dimensions (Russell *et al.*, 1987; Swanson & Kelly, 2001; Ployhart & Harold, 2004). Based on Russell *et al.*’s (1987) findings, Ployhart and Harold (2004) suggested that attributions should be measured in terms of the individual’s assessment of the attribution dimensions using Russell’s (1982) Causal Dimension Scale.

Russell’s Causal Dimension Scale is designed for settings in which the investigator is assessing both the respondent’s causal explanation for an event and the respondent’s perception of the causes he/she has stated. (Russell *et al.*, 1987; Hewstone, 1989:33-34; Ployhart & Harold, 2004). Refer to Table 4.1.



TABLE 4.1: THE CAUSAL DIMENSION SCALE (Russell, 1982:1143)

Think about the reason you have written above. The items below concern your impression or opinions of this cause or causes of your outcome. Circle one number for each of the following scales:			
1	Is the cause(s) something that: Reflects an aspect of yourself	9 8 7 6 5 4 3 2 1	Reflects an aspect of the situation
2	Is the cause(s): Controllable by you or other people	9 8 7 6 5 4 3 2 1	Uncontrollable by you or other people
3	Is the cause(s) something that is: Permanent	9 8 7 6 5 4 3 2 1	Temporary
4	Is the cause(s) something: Intended by you or other people	9 8 7 6 5 4 3 2 1	Unintended by you or other people
5	Is the cause(s) something that is: Outside of you	1 2 3 4 5 6 7 8 9	Inside of you
6	Is the cause(s) something that is: Variable over time	1 2 3 4 5 6 7 8 9	Stable over time
7	Is the cause(s): Something about you	9 8 7 6 5 4 3 2 1	Something about others
8	Is the cause(s) something that is: Changeable	1 2 3 4 5 6 7 8 9	Unchanging
9	Is the cause(s) something for which: No one is responsible	1 2 3 4 5 6 7 8 9	Someone is responsible
Note: A total score for each of the three subclasses is arrived at by adding the responses to the individual items as follows: (1) locus of causality – Items, 1, 5 and 7; (2) stability – items 3, 6 and 8; (3) controllability – items 2, 4 and 9. High scores on these subscales indicate that the cause is perceived as internal, stable and controllable.			

Russell (1982) conducted research to test the reliability and validity of the Causal Dimension Scale. The results of his studies confirmed that all three subscales were reliable and valid. Additionally, Weiner (1986:112) states that Russell's scale has the properties of an acceptable psychometric instrument.

Folkes (1984) examined the relationships between causal dimensions and consumer complaining reactions. The first study used the Critical Incident Technique. Respondents were asked to recall the most recent incidence or a certain type of product failure and to explain why they think the product failed. This was followed by three open-ended questions designed to elicit perception of the locus, stability and controllability of the cause. Ratings of causal locus, stability and controllability were made by judges on three 9-point scales derived from Russell's (1982) Causal Dimension Scale, whereafter dimensional scores were correlated with consumer reactions. It should be noted that judges classified the causes and not the respondents themselves. In the second study, an experimental methodology was employed. Respondents were presented with hypothetical product failures and they were asked to indicate how the consumer (in the scenario) would respond by placing checks on a 9-point scale.

Swanson and Kelly (2001) employed an experimental methodology to examine how the allocation of causality and the length of the service recovery process influence post-recovery



consumer perceptions of service quality, customers' satisfaction and behavioural intentions for word-of-mouth and repurchase. They used a fifteen-item modified Causal Dimension Scale to assess respondents' perceptions of a particular situation in terms of the locus, stability and controllability dimension. Due to the enlarged locus dimension utilised in their study, the locus scale items were adopted to capture customer perceptions of attributions for the self (i.e., for the customer), the service employee and the service firm. For each of the locus dimensions, respondents were asked whether 1) taking action was something that was "Outside" or "Inside" of "You", "The Employee", or "The Firm"; 2) taking action was something about "Others" or "You", the "The Employee", or "The Firm"; and whether 3) the action taken reflected "The Situation" or "You", "The Employee", or "The Firm". Control was assessed by asking whether the outcome of a scenario was 1) "Intended" or "Unintended", 2) "Controllable" or "Uncontrollable, and whether 3) "Someone was responsible" or "No One was Responsible". Stability items asked subjects whether the action taken in a particular scenario was perceived as 1) "Permanent" or Temporary", 2) "Stable or Unstable", and 3) "Unchanging or Changing".

Wirtz and Mattila (2004) adapted Russell's scale to measure consumers' service failure attributions. Stability and controllability (the two dimensions of interest) were each measured via a two-item, seven-point, bipolar scale. In both cases, respondents rated the causes for service failure themselves. From the foregoing description of previous research about consumers' attributions and product/service failures, it is clear that Russell's Causal Dimension Scale can be adapted, in terms of its administering and wording, to suit the context of the specific study.

Research in the domains of achievement and affiliation has determined that one way to predict behaviour for attributions is to first classify causes on the basis of the underlying properties (Folkes, 1984). Most empirical studies of product failure apply Weiner's (1986) three-dimensional schema in understanding consumers' post-purchase behaviour following product failure (i.e. how consumers infer causes for product failure and how these attributions impact on behaviour) (Folkes, 1984, 1988; Laufer, 2002). While researchers have analysed all three causal dimensions and consumers' reactions to attributions based on those dimensions, there has been research that has examined the effect of only one or two of these dimensions (Krishnan & Valle, 1979; Richins, 1983; Oliver & DeSarbo, 1988; Erevelles & Leavitt, 1992; Vaidyanathan & Aggarwal, 2003).

In this study, respondents were asked to rate their own attributions (i.e. reasons) for the appliances' failure subjectively on an adapted version of Russell's (1982) Causal Dimension Scale to facilitate the researcher's assessment of the dimensional quality of respondents'



causes (attributions). Refer to Table 4.2 or to the questionnaire (Addendum A – Section B, Question 9).

TABLE 4.2: ADAPTED VERSION OF RUSSELL'S CAUSAL DIMENSION SCALE

Copy the cause that you have selected or written in question 8 (Section B) in the space provided.			
The statements below concern your impression or opinion of the cause for the failure or poor performance of the appliance. Use the cause that you have written in the space above and cross (X) ONE shaded number for each of the following statements . (The number 1 being closest to the statement on the left and 9 being closest to the statement of the right)			
The cause of the product failure:			
1	was due to circumstances or other peoples' action (reflected on the situation)	1 2 3 4 5 6 7 8 9	was due to my own action (reflected on myself)
2	was uncontrollable by myself or other people (the retailer, manufacturer or someone else)	1 2 3 4 5 6 7 8 9	was controllable by myself or other people (the retailer, manufacturer or someone else)
3	is temporary	1 2 3 4 5 6 7 8 9	is permanent
4	was unintended by myself or other people (the retailer, manufacturer or someone else)	1 2 3 4 5 6 7 8 9	was intended by myself or other people (the retailer, manufacturer or someone else)
5	was outside of me	1 2 3 4 5 6 7 8 9	was inside of me
6	is variable over time	1 2 3 4 5 6 7 8 9	is stable over time
7	was something about others (the retailer, manufacturer or someone else)	1 2 3 4 5 6 7 8 9	was something about me
8	is changeable	1 2 3 4 5 6 7 8 9	is unchanging
9	was something for which no one is responsible	1 2 3 4 5 6 7 8 9	was something for which someone is responsible (me, the manufacturer or somebody else)
Note: A total score for each of the three subclasses is arrived at by summing the responses to the individual items as follows: (1) locus – Items, 1, 5, and 7; (2) stability – items 3, 6 and 8; (3) controllability – items 2, 4 and 9. High scores on these subscales indicate that the cause is perceived as internal, stable and controllable			

The three items for locus, the three items for stability and the three items for controllability were summated respectively to obtain a combined score (out of 27) for each respective dimension.

It should be noted that the pairs of statements of some of the original semantic differential items (i.e. 1, 2, 3, 4, and 7), and accompanying scaling categories (1 to 9), were reversed to allow the rating scales, of all 9 items, to run in the same direction (i.e. from 1 to 9). This was done to create a visually appealing causal dimension scale with number one being the closest to the statement on the left and 9 being closest to the statement of the right. The interpretation of the data was not influenced by these changes.

The meaning of the scores is indicated in Table 4.3.



TABLE 4.3: MEANING OF SCORES

A low score (i.e. 3-9 out of 27) on the locus dimension indicates that causes were perceived as external, implying that the cause for the product failure could be attributed either to the manufacturer, retailer or some outside agent in the environment or the situation. Conversely, a high score (i.e. 19-27 out of 27) indicates that causes were perceived as internal, implying that the cause for product failure could be attributed to the consumer. A score between 10-18 out of 27 indicates that the cause was perceived as relatively external (10-13.5 out of 27) to relatively internal (i.e. 13.6-18 out of 27).

A low score (i.e. 3-9 out of 27) on the stability dimension indicates that causes were perceived as unstable, implying that people should be less certain of future product failure if they purchase it again in the future. (If the attribution is unstable, consumers will view it as a once-off problem. Conversely, a high score (i.e. 19-27 out of 27) indicates that causes were perceived as stable, implying that people should expect the product to fail if they purchase it again in the future. A score between 10-18 out of 27 indicates that the cause was perceived as relatively unstable (10-13.5 out of 27) to relatively stable (i.e. 13.6-18 out of 27).

A low score (i.e. 3-9 out of 27) on the controllability dimension indicates that causes were perceived as uncontrollable, implying that both the consumer and other parties such as the manufacturer or retailer could not control the product failure. Conversely, a high score (i.e. 19-27 out of 27) indicates that causes were perceived as controllable, implying that both the consumer and other parties such as the manufacturer or retailer had control over the product failure. A score between 10-18 out of 27 indicates that the cause was perceived as relatively uncontrollable (10-13.5 out of 27) to relatively controllable (i.e. 13.6-18 out of 27).

4.6 DATA COLLECTION TECHNIQUE

Based on the above discussion about the methodologies for studying consumer complaint behaviour, causal attributions and causal dimensions (par. 4.5.1), a self-administered questionnaire was designed to obtain information from consumers who experienced dissatisfaction with the performance of their major electrical household appliances. (Refer to Addendum A.) An adapted version of Russell's Causal Dimension Scale was included in the questionnaire to translate respondents' causal attributions for product failure into causal dimensions. (Refer to Table 4.2 or Addendum A, Section B – question 9.)

4.6.1 Structure of questionnaire

The questionnaire was compiled after an in-depth review of the literature concerning various theories and theoretical constructs applicable to the problem of this research. Consumer satisfaction/dissatisfaction theory in terms of the confirmation/disconfirmation paradigm, consumers' expectations about product performance and the dimensions of product performance, serve as the conceptual background for studying consumers' complaining behaviour. Complaint behaviour theory concerning the models of consumer complaint behaviour, particularly Day and Landon's (1977) taxonomy of complaint behaviour, and consumer-related variables and product-specific variables that may impinge on consumers' complaint behaviour were examined. Attribution theory, concerning Weiner's (1986) attributional theory in social psychology, in general, as well as its application to consumer behaviour, was studied to contribute to a clearer understanding of consumers' behavioural reactions to their causal inferences (attributions) concerning product failure experiences. In addition, Russell's (1982) Causal Dimension Scale was studied.



Whereas various empirical studies and academic literature exist concerning consumers' perceptions of the functional and symbolic performance dimensions of products such as clothing, the information about the performance failure dimensions of major electrical household appliances is very limited. Donoghue and Erasmus (1999) confirmed that consumers buy major electrical household appliances not only for functional but also for symbolic purposes. Additionally, Mehlwana (1999) stated that appliances are closely associated with lifestyle.

Therefore, additional sources of information were investigated to aid the researcher in designing questionnaire items for the dimensions of product performance. Written information, including newspaper complaint letters and online letters to consumer complaint websites, was explored to become acquainted with the type of product problems that consumers experienced concerning the performance failure of major electrical household appliances. Complaint letters, published between 2001 and 2006, concerning consumer's dissatisfaction with the performance of their major electrical household appliances, were considered. These letters are respectively available on a local (Afrikaans) newspaper's website (*Beeld*) and Internet websites such as [consumeraffairs.com](http://www.consumeraffairs.com) (<http://www.consumeraffairs.com>). Owners' manuals (instruction leaflets) of top appliance manufacturers were studied to become aware of the special features that these manufactures lay claim to, and so identify possible examples of performance failures that consumers might encounter. These claims were adapted to suggest product performance failures.

After exploration of the additional sources of information, it was decided that the performance failure of major electrical household appliances manifests in their functional and symbolic performance failure. For the purpose of this study, functional performance failures can be classified into the following categories: unusual product performance in terms of the intended end-use, failure/breakdown of appliance or some component(s) thereof, inconvenience in operating the appliances, inconvenience/difficulty in the maintenance and care of the appliance, insufficient durability and safety or health risks associated with performance of the appliance. The symbolic performance failures of appliances refer to the sensory, emotional and cognitive displeasure or dissatisfaction associated with major electrical household appliances. Refer to Addendum B (Tables 1 to 9) for the distinctive performance failure dimensions, with quotations and examples from the complaint letters and owners manuals concerning these performance failures.

Exploratory research thus enabled the researcher to gain a better understanding of the functional and symbolic performance dimensions of major electrical household appliances



and to explicate these concepts. Through exploration, the researcher learned what would be the right questions to ask and the most meaningful ways to pose questions in the larger survey (Mariampolski, 2001:23; Babbie & Mouton, 2002:80).

The questionnaire was divided into three content sections (Sections A – C) to facilitate the eventual processing of the data. In Section A, respondents had to provide demographic information (i.e., gender, age, level of education, monthly household income, residential area; cultural group).

In Section B, respondents were asked to provide information concerning their dissatisfaction with the functional/symbolic performance failure of major electrical household appliances and their attributions for the specific performance failures. Respondents had to select an appliance item from a list of appliances provided, that caused them most dissatisfaction within the last four years. Respondents had to describe the type of product failure (i.e. what went wrong) in an open-ended question. Additionally, a Likert-type scale, with multiple indicators of the constructs, was used to determine the type of performance failure (functional or symbolic) that caused the dissatisfaction. Respondents were then asked to respectively indicate the degree of dissatisfaction and anger experienced concerning the appliance's faulty or poor performance, by crossing an appropriate number on a four-point dissatisfaction response scale and a four-point anger response scale. Respondents' perception of the severity of the product problem was also determined on a four-point severity response scale. (A four-point response scale (implying an even as opposed to an odd number of responses) was used, since a "neutral" or "neither/nor" response option was considered to be irrelevant. Additionally, the four-point response scale forced respondents to choose between response options).

Two additional questions were added in this section. Firstly, respondents were asked to indicate the brand names of their dissatisfactory appliances to facilitate memory recall. Additionally, respondents were asked to indicate the purchase date of the dissatisfactory appliances to facilitate memory recall and to verify that the appliances were not older than four years.

In terms of respondents' attributions for the specific performance failures, they had to select what they believe was the most important cause for the performance failure or poor performance of the appliance, from a list provided by the researcher. Additionally, an open response item was added to ensure that all the possible causes that respondents could think of were included in case none of the causes provided, applied. They were then asked to rate

their own attributions, subjectively, in terms of an adapted version of Russell's Causal Dimension scale, to determine the causal dimensional characteristics of their attributions.

Finally, Section C dealt with respondents' behavioural and non-behavioural actions taken in response to their dissatisfaction and their reasons for the specific action taken. The nature of the dissatisfaction response (complaint behaviour) was investigated by exploring the type of action taken, using Day and Landon's (1977) taxonomy of consumer complaint behaviour. Respondents had to consider a list of actual actions taken in response to their dissatisfaction, by indicating what actions, if any, were taken. A nominal scale ("yes" or "no") was used to classify the answer to each type of action taken. Respondents then selected the reason(s) for the particular complaint action(s) taken, from a list provided by the researcher. An open-ended response option was also included, for each type of action taken, to ensure that all possible reasons were included.

The structure of the questionnaire is portrayed in Table 4.4 in terms of the different sections of the questionnaire, the specific aspects measured and the question numbering according to which different aspects were measured.

TABLE 4.4: THE STRUCTURE OF THE QUESTIONNAIRE

SECTION	ASPECTS MEASURED	QUESTION NUMBERING
A	Demographic aspects Gender Age Level of education Monthly household income Residential area Cultural group	Question 1 Question 2 Question 3 Question 4 Question 5 Question 6
B	Dissatisfactory appliance Purchase date Brand name Type of performance failure (functional or symbolic) Degree of problem severity experienced Degree of anger experienced	Question 1 Question 2 Question 3 Questions 4.1, 4.2 Question 5 Question 6
C	Consumer complaint actions Type of behavioural and non-behavioural actions Reasons for actions	Questions 1 - 10 Questions 1 - 10

A variety of response systems (question types) were used in order to provide more flexibility in the design of items and to make the questionnaire more interesting (Babbie & Mouton, 2002:233; Delpont, 2005:174). Open-ended questions were especially relevant for the exploration of variables that were relatively unknown to the researcher such as consumers'



description of the performance failure (i.e. what went wrong). Open-ended questions permitted respondents to clarify their responses and to express themselves. In contrast, closed-ended questions were used where the number of possible responses were limited and where response options were relatively well known, implying that all the relevant response options to questions were determined in advance. Scaled questions and statements were used to obtain information about more subjective aspects such as respondents' perceptions of the degree of dissatisfaction or anger experienced concerning the performance failure of a major electrical household appliance or the severity of the performance failure encountered (Delpont, 2005:177). Russell's Causal Dimension Scale provided a composite measurement of the causal dimensions for respondents' attributions for product failure. Follow-up questions, with closed response options, were used to obtain more information about respondents' response to dichotomous questions (Yes/No response options for questions concerning complaint behaviour actions) (Delpont, 2005:174-178).

The questionnaire was accompanied by a covering letter stating the purpose of the research, criteria for selection, how long it would take the respondents to complete the questionnaire, assurance of anonymity and a plea for the respondent's co-operation (Delpont, 2005:170). The covering letter was written in easy and unambiguous everyday language to ensure people's easy comprehension of what was expected from them and to improve response rates. The questionnaire was first compiled in English and thereafter translated into Afrikaans in order to accommodate consumers in both language groups.

The questionnaire was carefully planned to include only those questions that were important to collect all the relevant information (Delpont, 2005:170). The questionnaire consisted of 11 pages. While all the respondents had to respond to all the questions in Sections A and B, they only had to answer the applicable questions in the last section. Therefore, respondents who took no complaint action only answered 6 pages of the questionnaire, whilst those who took action only selected the relevant questions from the remaining pages 7 to 11.

4.6.2 Procedures for administering the questionnaire

The questionnaire was tested on people having characteristics similar to those of the target group of respondents (Strydom, 2005:206). Only after the necessary modifications concerning the usage of language and the sequence of questions were made, the questionnaire was presented to the full sample of respondents.

Fieldworkers were trained to aid the researcher in the distribution and collection of the questionnaire. They included students and employees from a local retailer. The latter group



of fieldworkers were remunerated for their efforts. Fieldworkers delivered questionnaires by hand to individual respondents after ascertaining whether the respondents complied with the criteria set for inclusion in the study. Fieldworkers collected the questionnaires personally to check for the completeness of the questionnaire and whether questions were answered according to the instructions (Babbie & Mouton, 2002:258-259).

A total number of 216 questionnaires was collected between February and April 2006.

4.7 DATA-ANALYSIS

4.7.1 Coding and capturing of the data

Open-ended responses were written down and placed in categories as identified during the exploration of literature. During the construction of the questionnaire, coding categories were developed for the closed-ended questions and scaled questions to facilitate the processing of the data. Open-ended and closed-ended responses were edge-coded after all questionnaires had been returned. Edge-coding means that codes were written in the appropriate spaces provided in the outside margin of each page of the questionnaire, for the different attributes of variables (Babbie & Mouton, 2002:415). The edge-coded questionnaires were used for data capturing.

The data was captured by the data-capturing division of the University of Pretoria.

The data was captured by the data-capturing division of the University of Pretoria. SAS and BMDP (statistical software packages) were used for data analysis.

To prevent data-processing error, two types of data “cleaning” were done, namely possible-code cleaning and contingency cleaning. Processed data was checked to ensure that only those codes assigned to particular attributes – possible codes – appeared in the data file (possible-code cleaning). Contingency cleaning was done to confirm that only those cases that should have data on a particular variable actually had such data (Diamantopoulos & Schlegelmilch, 2000:39-52; Babbie & Mouton, 2002:417-418). Data errors due to incorrect coding and reading errors were rectified.

4.7.2 Operationalisation

Table 4.5 indicates the objectives and subsequent sub-objectives for this study, along with the questions and the types of statistical measurements used.



TABLE 4.5: OPERATIONALISATION IN TERMS OF OBJECTIVES AND SUB-OBJECTIVE, QUESTIONS AND STATISTICAL METHODS

OBJECTIVES AND SUB-OBJECTIVES	QUESTIONS (V = Variable)	STATISTICAL METHODS
<p>Objective 1 To explore the nature of the performance failure that caused consumers to be dissatisfied with major electrical household appliances</p> <p>Sub-objective 1.1 To explore the functional/symbolic performance failure causing consumers' dissatisfaction concerning major electrical household appliances</p> <p>Sub-objective 1.2 To describe the association between demographic variables (i.e., gender, age, level of education, monthly household income and culture) and the functional/symbolic performance failure of major electrical household appliances</p> <p>Sub-objective 1.3 To describe consumers' degree of dissatisfaction experienced concerning the functional/symbolic performance failure of major electrical household appliances</p>	<p>Section B: Question 4.1 - 4.2 (V11-V13 +V14-V23)</p> <p>Section A: Questions 1 - 4, 6 (V2 - V5, V7) Section B: Question 4.2 (V14-V23)</p> <p>Section B: Question 7 (V26)</p>	<p>Frequency tables (SAS)</p> <p>Factor analysis (reliability for each factor was determined with Cronbach's alpha) (BMDP)</p> <p>ANOVA (p-value significant on 5% level) (SAS)</p> <p>Frequency analysis (SAS)</p> <p>z-test for equal proportions (p-value significant on 5% level)</p>
<p>Objective 2 To describe the nature of, and the reasons for, dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances</p> <p>Sub-objective 2.1 To describe the types of consumer complaint behaviour responses that dissatisfied consumers engage in concerning their dissatisfaction with the functional/symbolic performance failure of major electrical household appliances</p> <p>Sub-objective 2.2 To describe dissatisfied consumer's reasons for engaging in consumer complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances</p>	<p>Section C: Question 1 - 10 (V37, V46, V52, V58, V64, V72, V79, V86, V93, V101)</p> <p>Section C: Question 1 -10 (V38-V45, V47-V51, V53-V57, V59-V63, V65-V70, V73-V78, V80-V84, V87-V91, V94-V99, V102-V107)</p>	<p>Calculation of frequencies and frequency analysis (SAS)</p> <p>Calculation of frequencies and frequency analysis (SAS)</p> <p>z-test for equal proportions (p-value significant on 5% level)</p>
<p>Objective 3 To describe the relationship between causal attribution and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances</p> <p>Sub-objective 3.1 To describe dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances</p>	<p>Section B: Question 8 (V27)</p>	<p>Calculation of frequencies and frequency analysis (SAS)</p>



OBJECTIVES AND SUB-OBJECTIVES	QUESTIONS (V = Variable)	STATISTICAL METHODS
<p>Sub-objective 3.2 To describe the causal dimensional characteristics of dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances</p> <p>Sub-objective 3.3 To describe the association between the dimensional characteristics of dissatisfied consumers' attributions for the functional/symbolic performance failure of major electrical household appliances and demographic variables (i.e., gender, age, level of education, monthly household income and culture)</p> <p>Sub-objective 3.4 To describe the association between the causal dimensions (i.e. locus, stability and controllability) and dissatisfied consumers' complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances</p> <p>Sub-objective 3.5 To describe the relationship between dissatisfied consumers' anger reactions concerning the functional/symbolic performance failure of major electrical household appliances and consumer complaint behaviour</p>	<p>Section B: Question 9 (V28-V36) Section A: Questions 1 - 4, 6 (V2 - V5, V7)</p> <p>Section B: Question 9 (V28-V36)</p> <p>Section B: Question 9 (V28-V36) Section C: Question 1 -10 (V37, V46, V52, V58, V64, V72, V79, V86, V93, V101)</p> <p>Section B: Question 6 (V25) Section C: Question 1 – 10 (V37, V46, V52, V58, V64, V72, V79, V86, V 3, V101)</p>	<p>Uni-variate analysis (SAS)</p> <p>Kruskal-Wallis (K-W) one-way ANOVA (p-value significant on 5% level) (BMDP)</p> <p>K-W one-way ANOVA (p-value significant on 5% level) (BMDP)</p> <p>K-W one-way ANOVA (p-value significant on 5% level) (BMDP)</p> <p>z-test for equal proportions Chi-square test (p-value significant on 5% level)</p>
<p>Objective 4 To describe the relationship between specific consumer-related variables and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances</p> <p>Sub-objective 4.1 To describe the relationship between demographic variables (i.e., gender, age, level of education, monthly household income and culture) and dissatisfied consumers' complaint behaviour concerning the functional/symbolic performance failure of major electrical household appliances</p>	<p>Section A: Questions 1 - 4, 6 (V2 - V5, V7) Section C: Questions 1 - 10 (V37, V46, V52, V58, V64, V72, V79, V86, V93, V101)</p>	<p>Chi-square test (p-value significant on 5% level)</p>
<p>Objective 5 To describe the relationship between product-specific variables and dissatisfied consumers' complaint behaviour concerning the performance failure of major electrical household appliances</p> <p>Sub-objective 5.1 To describe dissatisfied consumers' perceptions of the severity of the performance failure of major electrical household appliances</p> <p>Sub-objective 5.2 To describe the relationship between dissatisfied consumers' perception of the severity of the functional/symbolic performance failure concerning major electrical household appliances and their consumer complaint behaviour</p>	<p>Section B: Question 5 (V24)</p> <p>Section B: Question 5 (V24) Section C: Question 1 - 10 (V37, V46, V52, V58, V64, V72, V79, V86, V93, V101)</p>	<p>Calculation of frequencies and frequency analysis (SAS)</p> <p>z-test for equal proportions (p-value significant on 5% level)</p> <p>Chi-square test (p-value significant on 5% level)</p>



4.7.3 Explanation of statistical methods

The statistical methods are explained in the sequence indicated in Table 4.5. However, no explanation is provided for the calculation of frequencies and frequencies analysis as it is considered to be self-explanatory. At this point, it should be noted that the 5% level of significance was used throughout this study. This means that the probability of wrongly rejecting the null hypothesis should be less than 5%. The p-value was used to decide whether to accept or reject the statistical hypothesis (Trochim, 2005:207).

4.7.3.1 Factor analysis

Factor analysis refers to a range of techniques that aim to describe a larger number of variables by means of a smaller set of composite variables (so-called “factors”) and to aid with the interpretation of the data (Diamantopoulos & Schlegelmilch, 2000:216; Babbie & Mouton, 2002:472-475). For the purpose of this study, common factor analysis was applicable. Common factor analysis focuses on the common variance shared among the original variables and seeks to identify underlying dimensions (known as “common factors”). To the extent that subsets among original variables reflect a common core (i.e. are measuring the same underlying construct), the derived dimensions should be meaningful and interpretable. The original variables can then be described in terms of the common underlying dimensions. Common factor analysis is particularly useful in the context of measurement development, as it enables an assessment of the dimensionality of a multi-item scale (Diamantopoulos & Schlegelmilch, 2000:216). In this study, oblique rotation (i.e. direct quartimin rotation) was used. A Scree test was used to determine the number of factors to be extracted. The decision rule for including or excluding items from factors was .03. Cronbach’s alpha is the most common estimate of the internal consistency or reliability of items in a scale. A widely accepted assumption in the social science is that alpha should be .70 or higher for a set of items to be considered a scale (Statistics Solutions: Factor Analysis).

4.7.3.2 Z-Test for equal proportions

In this study, the z-test was used to evaluate equality of proportions.

4.7.3.3 Analysis of variance (ANOVA)

Analysis of variance is used to analyse the association between categorically independent variables and the respective continuous dependent variables. An ANOVA tests the difference between the means of two or more groups/populations (Statistics Solutions: ANOVA). In this study, an ANOVA was performed to determine the association between demographic variables and the score on the factor identified in the factor analysis.

4.7.3.4 Chi-square significance test

The chi-square test is probably the most widely used nonparametric test of significance for nominal data. Chi-square is also useful in cases of one-sample analyses, two independent samples or k independent samples.

4.7.3.5 Kruskal-Wallis (K-W) One-Way Analysis of Variance (ANOVA)

The K-W one-way ANOVA is used to compare an ordinal variable across three or more independent groups. Note that in statistical terms, the different groups are considered to be different samples of respondents. The relatively small sample size of some of the groups justifies the use of the K-W one-way ANOVA.

In this study, the K-W one-way ANOVA test was performed to compare the mean scores for Russell's Locus, Stability and Controllability dimensions (as the ordinal variable) across the different groups of respondents who selected a particular reason for the product failure (the independent groups). The K-W one-way ANOVA test was also used to compare the mean scores for uni-variate analysis of Russell's Locus, Stability and Controllability dimensions (as the ordinal variable) across the different groups of respondents for the different categories of demographic variables (the independent groups). Additionally, the K-W one-way ANOVA test was performed to compare the mean scores for Russell's Locus, Stability and Controllability dimensions (as the ordinal variable) across the different groups of respondents who engaged in particular complaint action(s) or not (i.e. the "yes" vs. the "no" groups of respondents for the different complaint actions) (the independent groups).



4.8 QUALITY OF THE DATA

4.8.1 Validity

Validity refers to the extent to which a specific measurement accurately reflects the concept it is intended to measure (Babbie & Mouton, 2002:122). Validity can be regarded as a criterion that is applicable in the whole research process, i.e. conceptualisation, operationalisation, sampling, data-collection and the analysis and interpretation of data (Mouton, 1996:109-111). In terms of Mouton's (1996:111-112) validity framework, the dimensions of validity include: theoretical validity, measurement validity and inferential validity. The validity of measurements (measurement validity) can be determined by using standard yardsticks including face validity, content validity and construct validity (Babbie & Mouton, 2002:122-124; Delport, 2005:160-162).

4.8.1.1 Theoretical validity

Methodological strategies, such as doing a thorough literature review and defining concepts in a clear manner, were employed to guarantee the theoretical validity of concepts (Mouton, 1996:111). A thorough review of the literature was done to become acquainted with established theories that have been successfully applied in similar research. The expectancy disconfirmation model (Churchill & Suprenant, 1982; Bearden & Teel, 1983), Weiner's (1986) attribution theory and Day and Landon's (1977) taxonomy of consumer complaint behaviour were integrated into a theoretical framework to guide the research. Weiner's (1986) attributional analysis of achievement behaviour was chosen above other attributional theories, since it is the most comprehensive theoretical model about the influences of attributions on cognitive processes, affect and behaviour. Additionally, Weiner's work has guided the theoretical analysis and empirical investigation of various phenomena with an attribution framework (Folkes, 1984, 1988; Fiske & Taylor, 1991:54, 56; Försterling, 2001:109). Day and Landon's taxonomy of consumer complaint behaviour has achieved wide acceptance in research on consumer complaint behaviour and has been used as base model for many complaint behaviour studies (Broadbridge & Marshall, 1995). Consumers' reasons for engaging in the particular complaint actions were obtained from the relevant literature. The central concepts of consumer dissatisfaction, attributional processing, and consumer complaint behaviour were clarified and unambiguously explicated in terms of theoretical definitions found in the literature.



4.8.1.2 Measurement validity

During the process of operationalisation, a measuring instrument is developed. The predominant epistemological criterion is measurement validity. The dimensions of measurement validity include face validity, content validity and construct validity. Other methodological strategies such as scale validation and pilot testing can be employed to ensure the measurement validity of the measuring instrument (Mouton, 1996:110, 111).

Face validity does not refer to “what an instrument actually measures but rather to what it appears to measure”. Although face validity is not technically a form of validation, it is a desirable characteristic of a measuring instrument (Delpont, 2005:161). In the case of the questionnaire, the indicators were structured so that they appeared to be relevant measurements of the variables. The questions clearly related to the performance failure of major electrical household appliances, attributions for product failures, causal dimensions and consumer complaint behaviour.

Content validity is concerned with the representivity or sampling adequacy of the content (topics or items) of an instrument. One has to determine whether the instrument contains an adequate sample of items representing the concept and whether the instrument really measures the specific concept (Babbie & Mouton, 2002:123; Delpont, 2005:161). Concerning this study, the denotations of the central concepts were accurate indicators of the connotations of concepts. Additionally, the items in the questionnaire related to the sub-objectives of the study.

Construct validity refers to the extent to which a measuring instrument successfully measures the relevant construct and not something else (Mouton, 1996:128). Construct validity is concerned with the meaning of the instrument, i.e. what it is measuring and why it operates the way it does (Delpont, 2005:161). Threats to construct validity include “inadequate pre-operational explication of constructs” and “mono-operation bias” (Mouton, 1996:128). To establish construct validity, the meaning of the construct must be understood and the proposition that the theory makes about the relationships between this and other constructs must be identified (Delpont, 2005:161). The constructs for this study were precisely explicated as already discussed in the paragraph of theoretical validity. Additionally, multiple indicators were used to measure the constructs (of performance failure and causal dimension) to prevent mono-operation bias.

Previous studies have verified the validity of Russell’s (1982) Causal Dimension Scale as a measuring instrument (scale validation).



The questionnaire was also pilot-tested (Mouton, 1996:111).

4.8.1.3 Inferential validity

Inferential validity is related to the analysis and interpretation of the data. In this study, appropriate statistical techniques were used for specific levels of measurement. Inferences were drawn according to the principles of statistical inference. Conclusions (as the outcome of the analysis and data-interpretation) followed logically from the empirical evidence (Mouton, 1996:111).

4.8.2 Reliability

In general, reliability refers to the extent to which independent administration of the same instrument consistently yields the same results under comparable situations. “Reliability is primarily concerned not with *what* is being measured but with *how well* it is being measured” (Delport, 2005:163). Techniques to develop the reliability of measurements include: the use of established measurements and the training of fieldworkers (Babbie & Mouton, 2002:123). Potential sources of error that could result in the production of unreliable data include: researcher effects, participant effects and measuring instrument effects (Mouton & Marais, 1990:91; Mouton, 1996:144-155). In the context of this study, the term *researcher* refers to the researcher per se and the fieldworkers. The term *participants* refers to the respondents.

Russell’s Causal Dimension Scale, which has proven to be a reliable and acceptable psychometric instrument (Weiner, 1986:112-114), was used to allow respondents to translate their causal attributions for the failure or poor performance of appliances into causal dimensions themselves. This was done to avoid what Russell called the “fundamental attribution research error”, whereby attributions made by the subject are “translated” into causal dimensions by the researcher (Russell, 1982; Folkes, 1984; Russell *et al.*, 1987; Hewstone, 1989:33-34, 184). This prevented the researcher from making biased classifications of causes into causal dimensions, and so contributed to the reliability of the data (Mouton, 1996:111, 151-152).

Although respondents’ memory decay, as a type of participant effect, posed a source of error in terms of the reliability of the data collected, the Critical Incident Technique was still used because its advantages outweighed the possible disadvantages (Mouton, 1996:153).



To prevent respondent bias, in terms of role selection effects, it was stated in the covering letter that the researcher was only interested in respondents' opinions and experiences and that there were no right or wrong answers to questions. Respondents were also assured of their anonymity (Mouton, 1996:153-54, 157).

The questionnaire was constructed bearing in mind the principles of questionnaire construction to counter the effect of measurement instrument effects on the reliability of the data (Mouton & Marais, 1990:91). The questionnaire used a variety of response systems or question types, and an adapted version of Russell's Causal Dimension Scale to obtain the desired information. In the Likert-type scale (to determine the different types of performance failures) and the adapted version of Russell's Causal Dimension Scale, multiple indicators of variables were used, contributing to the reliability of the data (Delport, 2005:163).

Fieldworkers were trained and were given clear instructions concerning the aims of the study (Mouton, 1996:159) to ensure the reliability of data.

4.9 DATA PRESENTATION

The raw data was statistically analysed. The data conversion is available in hard copy (researcher's files) as well as an electronic copy at the Department of Statistics of the University of Pretoria.

The results of the study are presented in Chapter 5. Firstly, the results are described in terms of the demographic variables relevant for this study. Additionally, data that do not necessarily form part of the objectives for this study, including the type of appliances causing the most dissatisfaction, the brand names and purchase dates of dissatisfactory appliances are also reported on. Next, the results for the objectives and sub-objectives are described. The sequence of the presentation follows from objectives 1 to 5. This means that the data is not presented in the particular sequence of the conceptual framework nor of the questionnaire.