CHAPTER 6
METHODOLOGY

6.1 INTRODUCTION

This chapter addresses the investigative approach undertaken for the empirical research phase of in this study. It covers the research design, operationalisation of the key concepts derived from the preceding literature review into relevant measures, measuring instrument, the population, sample, sampling method, data collection and data analysis. It demonstrates the applicability of the researcher's choices in the context of the research questions specified in Chapter 1, namely that marketers do not know:

- Whether young South African adults (Generation Y) exhibit postmodern behaviour, in the context of today's postmodern culture.
- How young South African adults (Generation Y) use digital media?
- How to leverage the unique properties of digital media in marketing communication efforts to young South African adults (Generation Y)?

Social researchers are seldom able to isolate real world problems and investigate them in a completely controlled scenario. The purpose of the research design is to select a design which best addresses the investigation of the research problem and its constituent objectives, within the delineations, and assumptions stipulated in Chapter 1, to obtain results that, as far as possible, truly reflect reality. Mouton (1996:109) considers validity as a guide to "achieving an approximation of the truth". This infers that the success of the investigation will depend on the validity of each stage of the research process. Table 6.1 outlines a validity framework of the various stages within the research process. Entries in Table 6.1 will be referred to in relevant discussions of the different stages of the research process.

Table 6.1: The validity framework

STAGE IN RESEARCH PROCESS	SOURCES OF ERROR	METHODOLOGICAL STRATEGY	OUTCOME	EPISTEMIC (VALIDITY RELATED) QUALITY OR CRITERION
Conceptualisation	• Complex notions • Vagueness • Ambiguity • Abstract concepts	• Thorough literature review • Clear and logical definitions	Concepts/ definitions	Theoretical validity (clarity/scope)
Operationalisation	• Poor sampling of items • Leading questions • Scaling errors	• Scale validation • Face validity • Pilot test	Measuring instruments	Measurement validity (construct validity)
Sampling	• Bias • Heterogeneous populations • Incomplete sampling frame	• Probability sampling • Stratification • Optimal sample size	Sample	Representativeness
Data collection	• Observation effects • Interviewer bias • Respondent bias • Context effects	• Multi-method • Proper training of fieldworkers	Data sets	Reliability
Analysis /interpretation	• Competing/rival conclusions or explanations	• Appropriate techniques for analysis • Thorough understanding of literature	Conclusions/ results findings	Inferential validity

Source: Mouton (1996:111)

6.2 RESEARCH DESIGN

This investigation applied two research designs. The non-empirical research design utilised the literature to formulate quasi-proposition statements and questions on the basis of key issues and trends identified by previous scholars. The empirical design made use of an exploratory descriptive method, which is the focus of the current chapter.

The formulation of the research design in terms of measurement, measuring instrument, choice of sampling, approach to data collection, and analysis of data are interdependent and were considered simultaneously to optimally address the objectives of the study (Mouton, 1996:110). In the case of this study, one of the principle objectives was to

determine if Generation Y exhibit postmodern characteristics in their behaviour. A significant implication of this objective was the identification of a suitable data analysis technique, which would determine if Generation Y reflected postmodern traits in their behaviour. Thus in conjunction with the study's objectives the choice of data analysis technique was a key deciding factor in the selection of elements making up the research design. At this point it would be sensible to review the data analysis technique employed in this research design.

6.2.1 Principle component exploratory factor analysis

Principle component exploratory factor analysis is a method through which one is able to measure latent variables by measuring indicators of these variables (Everitt, 2010:235; Field, 2005:619; Hair *et al*., 2010:99). Factor analysis is a technique used to comprehend the structure of a cluster of variables (Field, 2005:619; Ho, 2006:203), which is in keeping with the main objective of this study, namely to identify if the target population exhibited behaviour that was indicative of postmodern characteristics. R-type factor analysis was applied as opposed to Q-type factor analysis, because R-type analyses variables whereas Q-type analyses cases (Field, 2005:620; Hair *et al.,* 2010:98).

Principle component exploratory factor analysis was considered as an appropriate statistical method to analyse the data for the following reasons. Firstly, for its validity in the field; factor analysis is a powerful technique commonly used in investigations of the social sciences (Field, 2005:620; Kline, 1994:11). Secondly, this technique simplifies complex sets of data (Kline, 1994:3); it aggregates items into clusters and distinguishes which are the most important items. The outcome of factor analysis is the arrangement of a set of factors. According to Kline (1994:5) a factor can be defined as a construct that is articulated as a statement or underlying key concept, which is interpreted on the basis of correlations (factor loadings) between a set of items. The meaning of a factor is indicated by the content of the highest loading items for a specific factor. However, Kline (1994:6) cautions against using factor loadings as the only criteria for interpreting factors, he recommends external criteria be taken into consideration during the deduction process.

Some objections to factor analysis have been conceptualised in Table 6.2 together with corresponding solutions. The research design took these concerns into consideration.

Table 6.2: Summary of objections of factor analysis and corresponding solutions

	OBJECTIONS TO FACTOR ANALYSIS	SOLUTIONS TO MITIGATE OBJECTIONS
a.	In factor analysis there are unlimited comparable mathematical solutions.	This concern can be mitigated to an extent through the selection of appropriate solutions, which takes account of the sample size, sample subjects, sampling items, item to subject ratio and method of factor analysis. These technical aspects will be addressed under the relevant sections in this chapter.
b.	Disagreement on which are the most important factors in the field.	Factor analysis has been employed by this study for exploratory purposes to deduce relevant factors.
c.	The difficulty of replicating factor analysis, which is related to the first objection.	This issue can be overcome through the use of suitable methodology. This shortcoming could also be addressed by replication of the scales in similar studies elsewhere and by other researchers.
d.	Contention over the results of factor analysis, in that the outputs are based on the input items.	This issue is debatable because through the process of factor analysis, factors emerge which may not have direct associations with specific items, these factors appear because they determine the relationships between different items. This shortcoming could also be addressed in future research. In this study, the researcher covered literature from a broad base, in conjunction with market experience and consultation of existing marketing scales texts in order to attempt to measure the specific construct as representatively and as complete as possible.

Source: conceptualised from Kline (1994:11)

One of the requirements of factor analysis is the use of quantitative data, which is in accordance with investigations of causal or correlational associations between variables (Ponterotto, 2005:128). Therefore based on the selection of factor analysis as the principle data analysis technique and its need for quantitative data, survey-based research appears to best meet the criteria of factor analysis. Surveys are characteristically quantitative and the results secured through a sample are anticipated to be representative of the larger population (Mouton, 2001:152), thus inferring reliability of the design in terms of generalisability of results and their applicability to the overall population under investigation.

According to Mouton (2001:152), surveys can be used in confirmatory or deductive research by starting from theory to test hypotheses; alternatively surveys are appropriate

in exploratory research where surveys are used inductively by using exploratory factor analysis. Therefore, this study made use of exploratory factor analysis (EFA) for the analysis of the data to formulate factors and assess the key independent variables associated with those factors.

The use of a survey strategy allows for the development of a structured questionnaire comprising of opinion rated items for administration to a sample; and the opportunity to obtain standardised primary quantitative data which can be readily compared and analysed using descriptive and inferential statistics (Hofstee, 2006:122; Mouton, 2001:153; Saunders *et al.,*2007:134).

Survey research possesses inherent strengths as well as weaknesses. These aspects have been addressed with reference to this study in Table 6.3.

Table 6.3: Strengths and limitations of survey research with respect to this study

STRENGTHS OF SURVEY RESEARCH	LIMITATIONS AND ERRORS OF SURVEY RESEARCH
• It's potential to produce findings that can be generalised to a larger population, at significantly lower cost than administering the survey to the whole population (Saunders *et al.*, 2007:134). • High measurement reliability (Mouton, 2001:153). • High construct validity (Mouton, 2001:153).	• The proper construction of questions (Mouton, 2001:153). • The implementation of appropriate controls (Mouton, 2001:153). • High refusal rates (Mouton, 2001:153; Aaker *et al.,* 2011:200). • High non-response rates (Mouton, 2001:153; Aaker *et al.,* 2011:200). • Respondent effects (Mouton, 2001:153; Aaker *et al.,* 2011:91). • Data analysis errors (Mouton, 2001:153; Aaker *et al.,* 2011:91). • Availability of respondents (Aaker *et al.,* 2011:91).

Source: Conceptualised and adapted from Aaker et al. (2011:91,200); Mouton (2001:153); Saunders et al. (2007:134)

These limitations and potential for errors were considered in the construction of the measuring instrument as suggested by Aaker *et al.* (2011:198).

6.3 MEASURING INSTRUMENTS

The next stage in the research process is the operationalisation of concepts for empirical testing (refer to Table 6.4). This entails the construction of an appropriate measuring instrument to test concepts (Mouton, 1996:66).

Table 6.4: Operationalisation validity framework

STAGE IN RESEARCH PROCESS	SOURCES OF ERROR	METHODOLOGICAL STRATEGY	OUTCOME	EPISTEMIC (VALIDITY RELATED) QUALITY OR CRITERION
Operationalisation	• Poor sampling of items • Leading questions • Scaling errors	• Scale validation • Face validity • Pilot validity	Measuring instruments	Measurement validity (construct validity)

Source: Mouton (1996:111)

Although multiple scales exist to measure attitude, behavioural and even individual personality dimensions (Kline, 1994:100; Saunders *et al.*, 2007:374) extensive consultation of current literature did not reveal a pre-existing measurement suitable to the investigation at hand. The situation is to be expected, due to the novelty of the topic, and that little research so far has endeavoured to examine a broad scope of constructs that may all be relevant to understanding the dynamics of how individuals behave and interact within the complexity of postmodernism and within the opportunities gained by access to multiple platforms for interactions ranging from one-on-one to many-to-many choices.

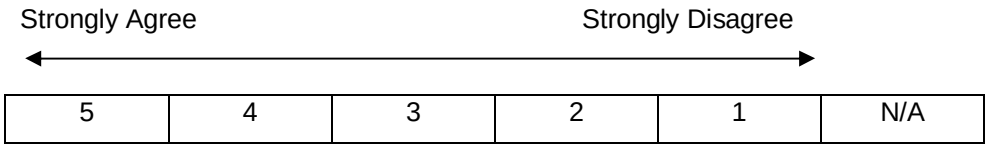
When one cannot measure a construct directly, it becomes necessary to measure the concept indirectly through the measurement of variables that are assumed to indicate the construct in question (Everitt, 2010:211). Therefore, the measuring instrument was constructed from items that were developed, using information from the preceding literature review, to measure observable postmodern characteristics amongst young adults in the context of marketing and social media. Items were carefully considered to minimise the inclusion of bloated specifics, which are paraphrases of other items, to increase variation.

One concern in this analysis is the recommendation that items should only be selected for a test if they load on a single factor (Kline, 1994:132). Mouton (2001:153) similarly notes that for construction of a valid measuring instrument, each item should be one-dimensional, that is only measuring a single aspect of the phenomenon. However postmodern characteristics (which are envisaged to form factors), as discussed in Chapter 2, are closely related and not mutually exclusive. Often an event will simultaneously exhibit multiple traits of postmodernism. Hence items constructed for this study may overlap between factors. In anticipation of this likelihood each item has been categorised according to the characteristic or characteristics it was designed to address on the basis of conceptual interpretation (Hair *et al*., 2010:125*)* (refer to Appendix A).

A Likert-style rating scale has been used in this measuring instrument because opinion data is required for analysis and Likert rating scales provide a suitable measure. Likert rating scales range from four-point to seven-point scales. Saunders *et al.* (2007:373) mention that respondents, with reference to telephone surveys, find it difficult to discern values between ratings against scales in excess of five-points. They also point out that five-point scales are commonly used in research. In view of these findings an adapted five-point Likert-style rating scale was used to collect data, although a higher point scale would have offered greater opportunity for data variation. Restriction to five-points is postulated to minimise the chance of jeopardising the integrity of the data through respondent errors, bearing in mind the earlier comment that there is potential for respondents to have difficulty distinguishing between scales with more than five-points. The reliability of the data is dependent on the respondents' ability to cope with the questionnaire, interpret it and answer it.

A bipolar scale was used, with each measure on the scale represented by a score, with 1 representing "strongly disagree" and 5 representing "strongly agree". In addition respondents were also provided with a non-applicable option (zero weighting), as depicted in Figure 6.1. Scale scores for each item listed on the measuring instrument were calculated and subjected to analysis for interpretation. In the final analyses, the not-applicable category was assigned a missing value, in order not influence mean scores or correlations in the analyses.

Figure 6.1: Bipolar scale used in measuring instrument



The instrument retained the same order of response categories to minimise confusion amongst respondents (Saunders *et al.,* 2007:372). Furthermore items in the questionnaire were arranged in an order that presents a logical flow to the respondent (Saunders *et al.,* 2007:379).

For reference the questionnaire is provided in Appendix C.

6.3.1 Reliability and validity of research instruments

The treatment of validity is important, especially when a new previously untested measuring instrument is deployed. How can one be certain that the newly constructed measuring instrument actually measures what it intends to measure?

Table 6.4 listed two validities, namely face validity and construct validity, which will be briefly discussed.

- Face validity, refers to subjective judgement, that on face value, the instrument measures what the researcher wants it to measure (Aaker *et al.,* 2011:269; Leedy & Ormrod 2005:92).
- Construct validity, is the degree to which the instrument measures a characteristic which is not directly observable, but is inferred through peoples' behaviour (Leedy & Ormrod 2005:92). Respondents' responses must be indicative of this characteristic to determine if the instrument achieves its purpose of measure. Construct validity is pertinent to this study, because characteristics of postmodernism are constructs.

The process of factor analysis also sheds light on the validity of items included in the measuring instrument, in terms of confirming if they measure anticipated factors (Field,

2005:619; Kline, 1994:120). This is based on the factors that emerge from the EFA analysis procedure. In this study one would expect postmodern characteristics (such as hyperreality, de-differentiation and fragmentation) to be detected as latent variables indicated by the factors that are produced.

Further validation of the measuring instrument would be confirmed through replication, by using it in other studies over time (Mouton, 1996:67) and comparing the results from these studies.

The reliability of a measurement refers to the ability of the measuring instrument to consistently measure what it was developed to measure (Ho, 2006;239). Reliability consists of internal and external consistency processes. External consistency can be achieved through test-retest or running parallel forms of the same test (Ho, 2006;239). In factor analysis internal consistency refers to the extent to which items in the measuring instrument measure the same construct. One would expect items that measure the same construct to always cluster together. Applying techniques of internal consistency enable the researcher to omit inconsistent items. Three methods of internal consistency are a) split-half technique, b) Cronbach's alpha, and c) item analysis (Ho, 2006:240).

- Split-half technique: In this method one half of the items are correlated with the other half of the items in the test. The greater the correlation the greater the internal reliability.
- Cronbach's alpha: This estimates the average correlation coefficient of items within a test. High alpha (0.8 or greater) corresponds to high internal consistency of the entire test. A low alpha infers that at least one item is not reliable. Cronbach's alpha was used to test internal reliability of factors in this investigation, and the value of 0.6 was used as a cut-off point.
- Item analysis: This process helps to identify unreliable items, which can then be removed to improve internal consistency.

6.3.2 Pilot study

Prior to distributing the measuring instrument to the intended sample, a pilot study is recommended, for the following purposes: a) to confirm that respondents understand the items in the questionnaire, b) to give an indication of the validity of the items, and c) to signify the reliability of the data (Saunders *et al.,* 2007:386; Leedy & Ormrod 2005:92). The conditions of the pilot test should replicate the final study as closely as possible. Thus it should be distributed to a sample that matches the intended sample for the final study and in the same manner. The main benefit of running a pilot study is that it provides an opportunity to test the measuring instrument and if necessary adjust it before releasing it to other respondents.

The pilot study was conducted at the end of September 2011. A web-based questionnaire consisting of 119 items (98 opinion and behavioural items and 21 attribute items) was distributed to a sample of 221 students who had registered on an opt in database to participate in research surveys, with the Department of Marketing and Communication Management, Faculty of Economic Management Sciences, University of Pretoria. The database consisted mainly of students that were registered for courses at the department during 2011.

In alignment with the three purposes for conducting a pilot study the main findings, implications and corresponding resolutions of the pilot test are detailed in Table 6.5.

Table 6.5: Findings, implications and resolutions from pilot study

PURPOSE	FINDING	IMPLICATION	RESOLUTION
• Respondent comprehension of questionnaire	• Responses to certain questions indicated a lack of understanding from respondents. • The coding and format of the web-based survey were found to be satisfactory for result purposes	• Inadequate comprehension of items would lead to incorrect responses, rendering items invalid. • Retain format	• Rephrase questions to minimise the potential for misunderstanding and use terms that are more familiar with the population being sampled. • N/A
• Validity of items	• In general the responses indicated that the questionnaire made sense to the respondents.	• This implies that face validity has been achieved. Although this premise is based on subjective judgement.	• N/A
• Reliability of items	• Reliability is inferred on the basis of *alternative form*, which involves the comparison of responses to alternative forms of the same question (Saunders *et al.,* 2007:367).	• Further tests are required to conclusively confirm reliability of items.	• Cronbach's alpha will be used to measure internal consistency.

Additionally, the pilot study yielded a disappointing response rate of less than 6%. This suggests a reluctance of the sample to participate despite sourcing respondents from a qualified database. A possible reason for the poor response rate stems from the fact that a lengthy questionnaire was used and respondents derive little to no value from participating in surveys in exchange for their time. Securing sufficient respondents is critical to the method of data analysis applied to this investigation, namely factor analysis. Effective factor analysis requires certain expectations from the sample size: a) the sample should be in excess of 100, b) the sample size must exceed the number of questions, and c) the ratio of the sample to variables should lie between 2:1 and 100:1 (Costello & Osborne, 2005:4).

Table 6.6 outlines some strategies to improve response rates applicable to this research.

Table 6.6: Strategies to improve response rates

STRATEGY	RELATIVE IMPACT
Length	
Shorter questionnaire versus longer questionnaire	Very high
Content	
More interesting versus less interesting questionnaire	Very high
User friendly questionnaire versus standard questionnaire	Medium
Attribute and behaviour questions only versus attribute, behaviour and opinion questions	Medium
Contact	
Pre-contact versus no pre-contact	Medium
Follow up versus no follow up	Medium
Incentives	
Monetary incentive versus no incentive	Very high
Incentive sent with questionnaire versus incentive on questionnaire return	High
Non-monetary incentive versus no incentive	Low
Origin	
University sponsorship as a source versus other organisations	Medium

Source: Adapted from Saunders *et al*., 2007:388

In an attempt to improve the response rate the following interventions were applied to the final questionnaire, in accordance with suggestions outlined in Table 6.6:

- The number of items in the measuring instrument was reduced. The questionnaire was shortened by 21 to a total of 98 items (81 opinion and behavioural items and 17 attribute items). Items were critically reassessed, which resulted in the removal of alternative form questions as well as the omission of questions that were considered peripheral to the core of the study.
- The format of the web-based questionnaire used an uncluttered design layout, which contributed to its user friendliness. Questions were phrased in an easy to understand uncomplicated manner. Opinion based questions are essential to the investigation so remained intact in conjunction with behaviour and attribute items.
- The sample was pre-contacted prior to distributing the questionnaire and follow up contacts were made to remind respondents to complete the survey.
- All survey related correspondence distributed to the respondents originated from the University of Pretoria.
- Finally an incentive to win one of six ipods (ipods are considered must have items amongst the target population) was offered to respondents that submitted complete questionnaires, making them eligible to enter the lucky draw to stand a chance to

win. The incentive is not related to the topics covered in the survey, and should not influence the responses of the participants.

6.4 SAMPLING

Sampling follows the operationalisation stage in the research process. Table 6.7 refers to the sampling validity framework.

Table 6.7: Sampling validity framework

STAGE IN RESEARCH PROCESS	SOURCES OF ERROR	METHODOLOGICAL STRATEGY	OUTCOME	EPISTEMIC (VALIDITY RELATED) QUALITY OR CRITERION
Sampling	• Bias • Heterogeneous populations • Incomplete sampling frame	• Probability sampling • Stratification • Optimal sample size	Sample	Representativeness

Source: Mouton (1996:111)

In factor analysis two key criteria for generating reliable factors concerning sampling are:

- A sufficient sample size, and
- A representative sample

These issues will be addressed respectively.

6.4.1 Sample size

A sample consisting of 400 people was used to collect data. This sample size was considered adequate to produce reliable factors on the basis that 98 items have been listed as variables in the measuring instrument. According to the literature when utilising factor analysis, it is critical that more subjects than variables are sampled for algebraic reasons, and that the ratio of subjects to variables ranges from 2:1 and 100:1 (Costello & Osborne, 2005:4), with a preference towards larger ratios to improve factor reliability. Costello and Osborne (2005:7) are of the opinion that a sample subject to item ratio of 2:1 is insufficient; they note that even with large subject to item ratios, for instance 20:1, EFA is still prone to error. The variability in the literature suggests there is contention in terms of

ideal sample size, and that this is as yet an unsettled dispute. However the ratio of 5:1 is considered the rule of thumb by contemporary writers (Field, 2005:639: Hair *et al.*, 2010:102; Ho, 2006:207).

In factor analysis a sample size of 100 or greater is advised (Hair *et al.*, 2010:102; Ho, 2006:207; Kline, 1994:20). A sample of 100 is sufficiently large enough to produce reliable factors. If less than 100 subjects is used then replication studies are required using other samples for purposes of validity.

Kass and Tinsley (1979) agree with the recommended 5:1 ratio of subjects to variables, however, they further suggest a total sample size of 300 is suitable, arguing that after this point test parameters are relatively stable irrespective of the ratio between subjects to variables.

According to Arrindel and Van der Ende (1985), another aspect influencing the sample size, when data is analysed through factor analysis, is the ratio of sample subjects to factors. This ratio should be in excess of 20:1 for purposes of producing reliable factors. However, a difficulty of exploratory factor analysis is that prior to conducting the investigation one is unlikely to know what this ratio will be. However, Arrindel and Van der Ende's sample subjects to factor ratio could be considered as part of the validation process in the analysis of the results of this investigation.

6.4.2 Sample subjects

The factors revealed through factor analysis are influenced by the sample of analysis (Kline, 1994:72). One perspective is to use heterogeneous samples, especially for exploratory factor analysis. A second perspective is to utilise a homogenous sample, which would characteristically have lower variance and lower factor loadings. These samples are typically unrepresentative of the population. Homogeneity of the sample is important with respect to the fundamental factor structure (Hair *et al.*, 2010:102; Ho, 2006:208). The sample used in this study follows the latter perspective. It is intentionally homogenous, in the use of students, for two reasons. Firstly the study investigates young

adults and secondly the study requires a sample that is technologically literate and makes use of media technologies. Details of the target population, units of analysis and sampling method are outlined below.

Taking the preceding accounts into consideration this study used a sample subject to variable ratio of 5:1 hence a sample size of 400.

6.4.3 Target population

As noted in Chapter 5 Generation Y consists of individuals born between 1978 and 2000. In reference to technology influences Prensky (2001) extends the description of a portion of individuals making up Generation Y to *Digital Natives,* who are people that were born post 1982 into a digital society. *Digital Natives* characteristically have never known a life without digital media; it has always been present in their lives. The researcher also recognises that youth have a tendency to be early adopters; however their socio-economic situations may present barriers to access digital media. Therefore, taking the above elements into consideration the target population proposed for this research is young adults, between the ages of 18-34, enrolled in tertiary education, where it is likely that by virtue of their environment they will encounter digital media and become proficient in their use of it. The lower limit of 18 was imposed in order not to seek parental or guardian consent for participation.

6.4.4 Unit of analysis

In this study the units of analysis and the sampling units are the same. The sample base for this study was students between the ages of 18-34, who were enrolled with the department of Marketing and Communication Management, Faculty of Economic and Management Sciences, at the University of Pretoria during the second semester of the 2011 academic year. This segment was selected because it forms part of the population target and it was anticipated that this group would be both available and less apathetic towards participating in research because they are assisting a fellow peer. Furthermore, it could probably be argued that this sample is likely to be more tech savvy and media

literate than other samples within the population, and might be early adopters of new media and thus be open to media solutions and experiences due to their chosen field of study.

6.4.5 Sampling method

Non-probability convenience sampling was used as the sampling method. Convenience sampling (Leedy & Ormrod, 2005:206; Saunders *et al*., 2007:594) was considered as the preferred sampling method, because a specific segment of the population was targeted, namely students enrolled with the department of Marketing and Communication Management, Faculty of Economic and Management Sciences, at the University of Pretoria. The sampling process was stopped once the required sample size had been secured.

6.5 DATA COLLECTION

Data collection follows the sampling stage in the research process. Table 6.8 refers to the data collection validity framework.

Table 6.8: Data collection validity framework

STAGE IN RESEARCH PROCESS	SOURCES OF ERROR	METHODOLOGICAL STRATEGY	OUTCOME	EPISTEMIC (VALIDITY RELATED) QUALITY OR CRITERION
Data collection	• Observation effects • Interviewer bias • Respondent bias • Context effects	• Multi-method • Proper training of fieldworkers	Data sets	Reliability

Source: Mouton (1996:111)

There are several methods of data collection in survey research such as personal interviews, telephone interviews, mail surveys, fax surveys, Internet surveys. The latter method was used in this study for the following reasons:

- Firstly, in terms of the measuring instrument a comprehensive measuring instrument was constructed. Items listed in the measuring instrument are easily understood by

potential respondents and are unlikely to require further explanation by the researcher. The measuring instrument consisted of closed questions, where each question offered several alternative answers from which the respondent was asked to select one. In this self-administered questionnaire the researcher has no contact with the respondent, thus eliminating interviewer bias and the need to train field workers.

- Secondly Internet-mediated questions cost the least to distribute and respondents have the flexibility of completing the questionnaire at a time that is convenient to them.
- Thirdly, the functionality of Internet mediated questionnaire hosts, such as *Survey Monkey*, automatically collect and start to process numerical data. These sites also allow response rates to be monitored.
- Fourthly, the study required respondents to be proficient users of digital media; in order to target digitally literate respondents the survey was distributed electronically to help avoid targeting ineligible candidates.

6.6 ANALYSIS

Data analysis is the final stage in the research process. Throughout this chapter factor analysis has been recorded as the analysis technique of choice and has received adequate coverage with respect to each stage of the research process so will not be discussed again in this section. However the effects of its implementation will become apparent during the next chapter where the results of the research will be presented. Table 6.9 encapsulates aspects of the analysis and interpretation validity framework.

Table 6.9: Analysis and interpretation validity framework

STAGE IN RESEARCH PROCESS	SOURCES OF ERROR	METHODOLOGICAL STRATEGY	OUTCOME	EPISTEMIC (VALIDITY RELATED) QUALITY OR CRITERION
Analysis /interpretation	• Competing/ rival conclusions or explanations	• Appropriate techniques for analysis • Thorough understanding of literature	Conclusions/results findings	Inferential validity

Source: Mouton (1996:111)

The steps involved in factor analysis are as follows:

- Computation of correlation matrix for all items;
- Extraction of initial factors; and
- Rotation of extracted factors.

The extraction of initial factors is based on the factor's eigenvalues or latent values. According to Ho (2006:205) an eigenvalue is the ratio between the common variance and the unique variance denoted by a specific factor. Only factors with eigenvalues of 1 or greater are regarded significant (Ho, 2006:205), this rule is also known as the Kaiser criterion (Costello & Osborne, 2005:1). Any factors with eigenvalues less than 1 were rejected. A scree plot is was also used to determine the most favourable number of factors that can be extracted.

Rotation was applied to achieve a simpler structure and aid interpretability of a solution (Everitt, 2010:225). There are three types of orthogonal rotation methods, varimax, equimax and quartimax. In this investigation varimax rotation was applied because this method produces the optimum separation of factors (Everitt, 2010:225; Ho, 2006:206).

Interpretation of factors was determined through the size of the factor loadings (correlation coefficients between the variables and the factors they represent). The larger the factor loading the more representative the variable is of the factor (Ho, 2006:267). Values of 0.8 or greater are considered high (Costello & Osborne, 2005:4; Field, 2005:640). Costello and Osborne (2005:4) reflect that social science studies generally yield low to moderate factor loadings in the range of 0.40 to 0.70. Loadings with magnitudes of 0.32 or less should not be retained, as they do not meet the minimum level of practical significance (Costello & Osborne, 2005:4; Ho, 2006:267).

These analytical guidelines were applied in the interpretation of the EFA results. The outcome of this process will be revealed in the subsequent chapter which reports the research results.

6.7 DESIGN LIMITATIONS

6.7.1 Survey limitations

Survey research reflects how people report their use of media, not how people really use media. During the history of media survey research researchers have experienced certain biases, for example more educated people tend to underestimate the influence of media, whilst less educated individuals overestimate its influence. Media influence is also associated with people's opinion of specific media (Baran & Davis, 2003:136).

Cross-sectional surveys represent a snap-shot of peoples' attitudes towards media during a particular period, therefore changes in behaviour are not captured, and the dynamics over time do not form part of the study. People could have widely differing uses of media depending on their personal and general social circumstances at the time of completing the survey, and these could vary during the time of day and by the physical space that people are at when the survey is completed. All these aspects may have some influence on the survey responses. For the purpose of this study, since the study was web-based and administered through a web-based survey, it is assumed that respondents chose to participate in the study during their own free time, and that place and time during survey completion did not have a major impact on the survey results.

6.8 ETHICAL PROCEDURES

A detailed account of the ethical procedures applied to this study can be found in Table 1.4 of Chapter 1. In brief ethics concerns the morality of the researcher towards respondents, as well as others who may be affected by the research. Researchers must ensure that people involved in the research: are protected from harm; have consented to participate in the research voluntarily; preserve their right privacy; and are assured that the findings will be reported and presented truthfully.

6.9 CONCLUSION

The aim of this chapter was to explain and validate the methodology used for the empirical research phase. The next chapter reports on the results of the self-administered questionnaire and the processing of the data, from which inferences were drawn.