Factors influencing loyalty intention behaviours of online social buying consumers in South Africa

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By

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DECLARATION

I declare that "***Factors influencing loyalty intention behaviours of online social buying consumers in South Africa***", which I hereby submit for the degree of Masters in Business Administration at the University of South Africa, Graduate School of Business Leadership, is my own work and that all the sources I have used or quoted have been indicated with complete references and acknowledgements. This dissertation has not previously been submitted by me for degree purposes at this or any other tertiary institution.

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Signature   Date

Anthony Craig Harris

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EXECUTIVE SUMMARY

Social buying is a recent marketing innovation in which provides Pareto-improving welfare gains to merchants, consumers, and brokers. Consumers benefit from access to significant discounts on advertised products and services, the broker benefits from taking a significant cut in each transaction with very low fixed costs, and merchants are able to reduce their advertising costs, gain access to new markets and drive traffic to their stores. The phenomenal growth of social buying carries commensurate risks for brokers, including increased competition due to a lack of service differentiation and low entry barriers. The complete social buying transaction is completed over two stages: the initial online e-commerce transaction and the subsequent fulfilment transaction where the voucher is redeemed with the merchant.

In order to explore the sustainability of the social buying business model, it is necessary to identify the factors which drive loyalty behaviours in social buying, as well as the interrelationships between the factors. This research proposes from the marketing literature Oliver's (1980) expectancy-disconfirmation theory (EDT) as the main theoretical framework on which to model these relationships. EDT is then successfully synthesised with DeLone and McLean's (2003) information systems success model to create a framework which can appropriately model both the online and traditional stages of the social buying transaction.

This study contributes to the marketing literature by establishing EDT as a suitable framework for investigating social buying. It is believed that this study is the first to do so. Furthermore, it is believed this is the first study examining the social buying innovation in the South African context.

Two *a priori* models are proposed representing the two stages of the complete social buying transaction, termed the broker disconfirmation and merchant disconfirmation stages. Structural equation modelling (SEM) is employed to investigate the causal relationships between the constructs of each model. In

the case of the broker disconfirmation stage, two distinct SEM models are tested. The first represents the disaggregated form, where the measurement scale items are present as indicator variables, and the second represents the partially aggregated form, where the measurement scale items are summated. A single SEM model represents the merchant disconfirmation stage. As advocated in the extant literature, a two-stage approach to SEM model estimation is followed where the measurement model is first assessed in order to establish the psychometric properties of the model, followed by an assessment of the structural model in order to establish the model's nomological validity.

The results of the two-stage assessments are presented for each of the three models identified for estimation. All three models provide good support for the use of EDT as a framework for social buying with strong positive associations between disconfirmation, consumer satisfaction and loyalty intention. However, the results suggest a version of EDT, which omits expectation under the assumption that it is mediated by perceived performance, would be better specified. The disaggregated broker disconfirmation model yielded few significant loadings of indicator variables onto higher order constructs. This may be due to limitations in the study such as low sample size, model complexity and poor multivariate normality. The partially aggregated broker disconfirmation model yielded significant positive associations in all its relationships supporting the hypothesised role of e-service quality in consumer satisfaction in social buying transactions. The merchant disconfirmation model yielded few significant loadings of indicator variables onto higher order constructs.

The main conclusions of the study support the suitability of EDT as theoretical framework for social buying, as well as the need for exploratory research to be conducted in the field to better identify antecedent factors to disconfirmation which may result in better specified models. The E-S-QUAL measurement instrument of e-service quality demonstrates good psychometric properties in the social buying context. A recommendation of the study is for a longitudinal study to be carried out which will capture the

temporal variation in the dynamic fields of information systems research and social buying.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGFI:	Adjusted goodness of fit index
AMOS:	Analysis of moment structures
AVE:	Average variance extracted
CFA:	Confirmatory factor analysis
EDT:	Expectancy-disconfirmation theory
EFA:	Exploratory factor analysis
E-S-QUAL:	Electronic service quality measurement scale
GFI:	Goodness of fit index
GLS:	Generalised least square
GOF:	Goodness of fit
IS:	Information systems
IT:	Information technology
ML:	Maximum Likelihood
OLS:	Ordinary least squares
RMSEA:	Root-mean-square error of approximation
SEM:	Structural equation modelling
SERVQUAL:	Service quality measurement scale
SRMR:	Standardised root-mean-square residual
ULS:	Unweighted least squares

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1 INTRODUCTION

1.1 Background

Traditional e-commerce offers posted-price goods and services where the consumer is offered a 'take it or leave it' choice typifying the power of the merchant over the individual consumer (Kauffman and Wang, 2001). The concept of group buying is a developing online marketing phenomenon which introduces consumers and merchants to each other in ways which generate Pareto-improving welfare gains for both parties (Anand and Aron, 2003). Group buying is targeted towards consumers with low individual bargaining power allowing them to aggregate, or pool, their purchase volume together and drive quantity discounts from the merchants (Anand and Aron, 2003).

Group buying was initially established as an online marketing practice by Mercata and Accompany (later MobShop) in September and October 1998 respectively. These organisations employed dynamic pricing mechanisms in their transaction models, where buyers (aggregated into groups) and sellers negotiate the final transaction price of the goods or service. The goods are offered at specific price ceilings depending on the quantity the consortium of buyers has committed to purchasing. As the quantity increases, various price ceilings are breached enabling greater discounts for all of the members of the consortium. The individual members are able to track, online, the approach of the quantities to the particular price ceiling levels. It is in the interests of each member to entice others to join their consortium, commit to a purchase, and help the total quantity of orders reach the level which will bring a greater discount to all members. Group buying websites therefore undergo increased purchasing activity as these order quantity levels are neared (Kauffman and Wang, 2001). This is in contrast with the more traditional posted-price strategy of traditional retailers and merchants where set prices are posted either in stores or on electronic commerce (e-commerce) portals (Anand and Aron, 2003). The consumer either decides to accept the price and make a purchase or reject it and not make a purchase.

More recently, a simpler variation on the group buying marketing model has emerged. This has been termed *social* buying in the literature as an acknowledgement to the increasing power of the consumer voice made possible

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through social networking websites and other communication tools such as blogging and online communities (Bhagat, Klein & Sharma, 2009). Social buying allows merchants to tap into the growing popularity of social media, incentivising consumers to raise further interest in their deals among the online communities (McIntosh, 2010).

Social buying involves the negotiation by a broker of several deals with participating merchants involving significant discounts, normally in the region of forty to eighty per cent, to the standard price of the product or service offered. The discount is contingent on a minimum number of orders for the product or service. The broker offers these deals to the online community through a website. Registered users 'purchase' the product or service with a committed credit card transaction through the website and if the minimum threshold of takers is reached, the deal will 'tip' and the credit card transactions are processed and vouchers are issued to the consumers via email. It is up to the consumer to then redeem the voucher with the participating merchant for the promised goods or services at a later time. The brokering organisation makes money through taking a cut of each successful transaction. If the deal does not tip, the brokering organisation earns no revenue, the participating supplier (merchant) is not inconvenienced, and the consumers' transactions are cancelled. The attractiveness to the consumer is that the service is risk free.

Whilst Pareto-improving gains are achieved by all participants in the transaction (consumer, broker and merchant) for deals which 'tip', the primary importance of social buying is as a *marketing* practice which adds value to the merchants who offer deals on the broker's platform. Merchants see social buying brokers as platforms for advertising and marketing campaigns, where the cost of the discount offered to the consumer is viewed as an advertising expense incurred for receiving significant online exposure for their brand and targeting new, affluent markets (McIntosh, 2010). Social buying is therefore a very cost-effective marketing practice for merchants. A significant advantage of social buying over traditional marketing practices is that it provides merchants with the ability to accurately measure the its effectiveness, since number of consumers who decided to make a purchase as a direct result of the social buying campaign is given by the number of vouchers sold online (Mutter, 2010). Depending on the degree of integration of the social buying platform into social networking platforms, further metrics may be collected and made available to

merchants regarding the 'interest' specific deals generated (Trusov, Bodapati and Bucklin, 2010; McEleny, 2011).

Social buying involves a two-stage transaction. The initial transaction occurs online between the consumer and the broker. It is an e-commerce transaction which results in a coupon or voucher being emailed to the consumer. The subsequent transaction is a fulfilment transaction between the consumer and the merchant where the consumer redeems the voucher at the premises of the merchant. Thus, a specific benefit of social buying to merchants is the fact that it helps drive traffic to their stores (McIntosh, 2010). Often the merchant is able to cross- and up-sell to the consumer (consider a restaurateur who fulfils a voucher for a meal but sells drinks at full price and covers some fixed costs through the waitron earning tips as normal). Merchants can quickly turnover unsold inventory, thereby lowering transaction costs, and service providers can fill unsold services during lean periods, smoothing their peaks and valleys of service utilisation (Bhagat, *et al.*, 2009).

The above benefits are manifest where one social buying company, Groupon, is concerned. Groupon (www.groupon.com) is the fastest growing company ever, reaching the one billion dollar mark in a little over two years. For comparison, Priceline.com reached the same mark in just under three years, whilst Amazon, Google and Office Depot achieved the milestone in five years, Yahoo in six, Ebay in seven, Apple in eight and Dell in nine. Ninety seven per cent of Groupon purchasers intended to make further purchases using the Groupon social buying platform (Steiner, 2010). Clearly Groupon has achieved a successful business model. Most other social buying websites imitate this model, including South African versions such as Wicount (www.wicount.com) and Twangoo (www.twangoo.com). Twangoo have recently been acquired by Groupon.

1.2 Problem review

With the evident success of Groupon, the social buying model has been taken up by a number of imitators. Social buying, whilst still a relatively new marketing phenomenon, has global reach. With success, however, come challenges. A number of key themes are alluded to from the problem background. These are now listed and subsequently elaborated.

1. The uniqueness of the market conditions for social buying.

2. The importance of not only attracting *potential* consumers to social buying platforms, but also of converting them to *purchasing* (and repurchasing) consumers.

3. The impact of a disconnected (in people, time and place) product or service fulfilment process.

4. The identification of a suitable framework which can accurately model both the marketing related and e-commerce related aspects of social buying.

1.2.1 The importance of market conditions on social buying

Group buying was the antecedent of social buying, but applied a slightly different model. The concept of group buying received a great deal of attention in the late nineties, but had largely disappeared from the commercial landscape by the following decade. The market conditions of the time (an immature electronic commerce industry, lower uptake of the Internet both from a consumer and advertising perspective, a smaller market and the economic disruption caused by the dot com crisis) where contributors to poor performance of group buying (Portsmouth, 2010). The emergence of social buying has once more generated much interest in the market, made possible by the phenomenal success of social media as evidenced by Facebook, Twitter, MySpace, FourSquare and other community platforms.

However, whilst the market conditions are clearly different from a decade ago, there are enough similarities in the development of the social buying marketing mechanism with that of group buying to raise warning flags. Chief amongst these are the number of new entrants, the lack of entry barriers, backward integration by social media platforms, poor differentiation amongst brokers, and the potential for consumer fatigue with the 'deals-of-the-day' mechanism.

1.2.2 Loyalty intention helps drive sustainability

If social buying is to become a viable marketing mechanism it is important that the current model is developed into a sustainable one. With an increasingly crowded and competitive market, it will be the players who do not apply these principles who will fail first. Over time, those who adapt to the changing market conditions and technology landscape will compete more strategically. Differentiation and innovation will become critical. Companies which hope to transition from an undifferentiated imitator of Groupon will need to discover and develop the factors which drive repurchase and loyalty intention behaviours with particular social buying platforms.

1.2.3 Social buying: a two-stage e-business transaction

The social buying model works through the supposed triple-win principle. Consumers benefit from significant discounts; merchants are exposed to a cheap, yet powerful advertising channel to new markets; and the broker receives a cut of every transaction without the risk or administrative inconvenience of carrying stock. To be viable, however, brokers depend on a certain volume of online transactions. This requires potential consumers to become aware of the benefits of the social buying website, be attracted to use the website, and be enticed to follow through with purchases. Distrust of, or uncertainty with, the social buying broker may be an inhibitor. Difficulty navigating the website or discovering important information may likewise be an impediment, as may lack of clarity in terms of how the website operates and transactions are fulfilled.

The purchase of the discount voucher online is only half of the end-to-end social buying e-business transaction. The consumer is required to redeem this voucher at a different time and place with a particular merchant. It is important to understand whether this fulfilment process is different for consumers who purchased vouchers online than for those who were exposed to the merchant through traditional market channels and are paying the full price directly to the merchant. The terms and conditions may be different; there may be restrictions on use; and attitude and service quality conveyed to the consumer may be different. Similarly the merchant may not live up to its reputation, or the perceived value of the end-to-end e-business transaction may not meet the consumers' expectations.

The above highlights the fact that there are distinct characteristics of each of the two stages (e-commerce and fulfilment) of the complete social buying e-business transaction. These characteristics will separately (at different times and different places) affect the attitude of a consumer's experience with the social buying transaction and impact the consumer's intention to reuse the social buying website for future purchases. As a service broker to the consumer, the social buying platform will need to consider these factors *holistically* if it is to be a sustainable enterprise.

1.2.4 The search for an appropriate model

The social buying marketing mechanism comprises the traditional marketing principles of service quality, customer satisfaction, customer loyalty and the intention

to repurchase. However, it is also dependent on several salient information systems qualities such as website usability, online trust, the importance of social media and online communities, and the characteristics of e-commerce. The identification of an appropriate theoretical model which permits the synthesis of traditional marketing and information systems principles will be important for this study.

1.3   Problem statement

The problem statement of this research report is given below:

Neither the factors which influence consumer loyalty intention behaviours on social buying websites in South Africa, nor their interrelationships, have yet been identified.

Social buying is today a fast developing market phenomenon. This speed in growth, however, brings commensurate challenges. For instance, the United States has seen a proliferation of group and social buying online businesses. These increasingly compete within the same target markets and generally follow the same, undifferentiated business model. The impressive growth of group buying in the late nineties was followed by an equally rapid failure rate in the first few years of this century. Whilst the social buying business model exhibits remarkable differences with the early group buying trend, conditions remain ripe for a similar succession of failed start-ups. What makes a particular start-up succeed where others fail is a very interesting question to marketers, who will seek to maximise their product exposure by aligning with only the most successful and pervasive brokers. The attraction of new consumers is just part of the story. How start-ups retain existing users is a critical consideration in their continued survival. The focus of this research is to identify the factors which drive loyalty intention and therefore customer retention. Once known to a social buying business, these factors may inform the way it engages with its consumers, thereby driving a competitive advantage and helping to sustain the business through differentiation with respect to its competitors.

1.4   Research aim and objectives

The main aim of this study is to consider the social buying e-business process holistically, investigating the factors which influence consumer loyalty intention. However, as has been discussed, this process is actually made up of two distinct stages: an e-commerce transaction between consumer and broker, and a fulfilment transaction between consumer and merchant. Each stage exhibits unique

characteristics and is subject to different influences. In order to respect these differences whilst maintaining a holistic view of social buying, the following approach is taken. An appropriate theory is proposed which can holistically describe the end-to-end social buying transaction and its impact on consumer loyalty intention. The theory is then applied in two separate, but related, models which capture the characteristics of each of the two stages of the social buying transaction.

This approach yields two main objectives, one for each of the two stages in the social buying process. Each objective is then broken into two sub-objectives. The first sub-objective of each objective will deal with the identification of the factors which are particular to a stage of social buying. The second sub-objective of each objective will deal with the interrelationships between the factors identified. The objectives of this study are thus:

1. To investigate how consumers' interactions with the social buying website influences their loyalty intention towards the social buying broker.
    a. To identify from the literature and propose potential factors affecting a consumer's experience with a social buying platform.
    b. To examine the interrelationships between the proposed factors and loyalty intention using a structural equation model informed by expectancy-disconfirmation theory.

2. To investigate how consumers' interactions with the merchants who fulfil the consumers' social buying vouchers influences their loyalty intention towards the social buying broker.
    a. To identify from the literature and propose potential factors affecting a consumer's experience with a merchant.
    b. To examine the interrelationships between the proposed factors and loyalty intention using a structural equation model informed by expectancy-disconfirmation theory.

The first sub-objectives (1a and 2a) of each objective require the identification of potential factors from the literature. Satisfying these *literature-related* sub-objectives will therefore be one of the aims of the literature review. The potential factors revealed in the literature review will then be considered for inclusion in the structural

equation models, which form the second, *empirical*, sub-objectives (1b and 2b) of each objective. Hypotheses will be presented in section 4.7 which test the relationships in the structural models.

In the course of satisfying the above research objectives, this research will aim to answer the following specific and related research questions:

- Is expectancy-disconfirmation theory (EDT) an appropriate model for social buying in South Africa?
- To what extent does 'perceived performance' mediate disconfirmation?
- To what extent does e-service quality account for consumer satisfaction with social buying platforms?
- Does the E-S-QUAL measurement scale provide a suitable basis for measuring e-service quality in social buying platforms?
- To what extent do service quality, company reputation and perceived value account for consumer satisfaction with merchants?

1.5   Importance of the study

Early success with the original group buying model drove rapid growth in 1998 and in less than 18 months there were 12 websites operating along the same lines. Most of these start-ups, however, would fail within a few years due to reasons such as the slowing digital economy after the bursting of the dot-com bubble of 2000, intense price competition between undifferentiated services within a still emerging market, and lower margins because of higher prices from suppliers (Kauffman and Wang, 2001). There are signs that the sustainability of the more recent social buying model is similarly under threat. As Salim Teja (cited in Portsmouth, 2010:16), a co-founder of the pioneering MobShop website, warns, "Eventually, consumers are going to get 'deal of the day' fatigue. How are you going to keep them interested?" Undifferentiated players will have to compete on price and take a smaller cut. It is therefore interesting to understand the factors which contribute towards consumers' satisfaction with a social buying website and their intention to return to it for repeat purchases.

Since research into social buying in the South African market is very much in its infancy, but is experiencing explosive growth, this study hopes to make two contributions to the marketing field of social buying:

- This study aims to contribute to the understanding of the factors influencing the continued success and sustainability of the social buying marketing innovation. This will be valuable to practitioners and researchers. When considering that the social buying phenomenon has led to Groupon becoming the fasted growing company ever (Steiner, 2010), it is clear that the factors which drive this impressive loyalty and repurchase intention will impart valuable information to competitors and imitators. It is believed that this is the first research study on the marketing mechanism of social buying in the South African context. In fact, a review of the literature reveals a dearth of such studies for the international context.

- It is believed that this is the first research study which applies expectation-disconfirmation theory (EDT) to the social buying context, although it has recently been applied to the online auction context which shares similar attributes with that of social buying. The success of the application of EDT to social buying will establish a theoretical framework for further study in the field.

1.6 Delineations and limitations

1.6.1 Delineations

This study is delineated in scope by the following constraints:

- The focus of this study is to the South African context, whose market exhibits specific localisation attributes.

- The study's scope is further constrained to an investigation of a single South African social buying organisation, Wicount, The selection of Wicount was made owing to the following two characteristics:
    - Accessibility of the organisation: A relationship existed between the researcher's employer and Wicount. When approached for assistance in data collection, Wicount were very responsive and helpful.
    - The shared operating model with Groupon. Groupon is the accepted benchmark for measurement in the industry. It defined the model which most competitors sought to imitate. It is also, by far, the most successful incumbent in the market.

- This study only seeks to understand loyalty intention behaviours towards the *broker*, not the *merchant*. Although the e-business transaction includes a merchant disconfirmation stage, this is only investigated with a view to how it impacts consumer loyalty intention to the broker.

- In choosing expectancy-disconfirmation theory as a means to model customer satisfaction and loyalty intention for social buying, this study is delineated along the lines dictated by this model. Whilst there is a significant body of evidence suggesting the appropriateness of the model, it remains one of a number of possibilities in describing these constructs.

- This study uses structural equation modelling (SEM) as an analytical process in establishing causal relationships between constructs. SEM specifies a five-step approach (see Appendix 9). The final step, *specification search*, is beyond the scope of this study, which is constrained to the testing of *a priori* models only.

- This study is cross-sectional. Considering the rapid pace of change in information systems research in general and the development of both the social buying and social media innovations in particular, a longitudinal study would be appropriate.

Notwithstanding the delineation in scope to the Wicount social buying platform, it is believed that the results may be generalised to most other South African social buying platforms through the proximal similarity model (Campbell and Stanley, 1963, cited in Coldwell and Herbst, 2004). This will be discussed further in sections 4.3.1 and 4.5.3.

1.6.2 Limitations

It is important to consider this study with the following limitations in mind:

- The selection from the literature of appropriate factors for the *a priori* factors was noted above as a delineation of the study. This may likewise be viewed as a limitation, insofar as structural equation modelling recommends that, when no plausible model exists, exploratory factor analysis (EFA) is first conducted on a specific sample to generate alternative models for testing (Schumacker and Lomax, 2004). Due to time and scope constraints, this study performs a confirmatory factor analysis (CFA) in testing two *a priori* models. It is acknowledged that EFA might have yielded better specified and more parsimonious models than the ones posited from the literature review.

- A 'rule of thumb' for SEM analysis is that the ratio of sample cases to parameters of interest should be of the order of 10:1 if the parameter estimates are to be trusted (Bentler, 1993, cited in Mueller, 1997). With

samples of just over 200 subjects for each model, the ratios turned out to be just less than 5:1. These low ratios indicate that the results of this study may suffer from both explanatory power, and generalizability (Mueller, 1997).

- One of the assumptions of SEM is multivariate normality of the sample. The descriptive statistics of the samples revealed a significant negative skewness and kurtosis (leptokurtic). This can be attributed to three factors, which are discussed further in section 4.3.3 on sample bias:
    - o Wicount ran a first-year birthday promotion offering *free* deals. This elicited a massive uptake among its subscribers. The promotion happened to go out the week before the survey was administered.
    - o As an enticement to respondents to complete the survey, R500 to spend at Wicount was offered to a randomly selected respondent.
    - o The sponsorship by Wicount (and the email originating from their email server) may have skewed the responses in the positive direction. These and other sample-related limitations are discussed in greater detail in section 4 on research design and methodology
    - o The question order was not randomised, and reverse scaling was not employed. This might have contributed to response set bias. The decision not to employ these devices was made intentionally to reduce the conceptual complexity of the questionnaires which involved similar concepts being tested from different perspectives. For example, subjects were asked to specify both their *expectations* relating to a concept, as well as their *perceived performance* of it.

1.7   *Assumptions*

Two main assumptions have been made in this study, both applicable to the inferential methods of analysis employed:

- It is assumed that the relationships between the construct in the *a priori* structural equation models exhibit linear relationships. If significant non-linear, or curvilinear, relationships exist, then the estimation techniques employed would need to be adapted (Schumacker and Lomax, 2004). It is believed that this is a fair assumption to make within the context of this study.
- This study employs six point Likert-type items in the two survey instruments. This strictly implies an ordinal measurement scale. However, this study will make the assumption that the collected data may be treated as interval data.

The six gradations and the wording of each level imply equal distances between selections. Furthermore, within SEM research "it is not uncommon for researchers to use data that are of the ordered categorical type. This is particularly true in applications of confirmatory factor analysis when data are based on Likert-type response scales" (Hutchinson and Olmos, 1998:346).

1.8   Chapter outlines

This study is organised into seven chapters, including this one. The following paragraphs provide the logical flow of the study, with the purpose and contents of each chapter briefly described.

Chapter 2 – Problem analysis

Section 1.4 introduced the research problem and objectives. Chapter 2 aims to position the research problem within the frame of its industry and to more deeply analyse the research problem within this context. Five theoretical tools or frameworks will be employed. In the first section, an industry analysis is conducted of the social buying mechanism using Porter's five forces framework (Grant, 2008) and conclusions are subsequently drawn. The second section deals with establishing social buying as a disruptive process innovation. Two models are applied. First, the Abernathy-Utterback model depicts how the social buying innovation has followed from the radical technology innovation that is e-commerce. Second, the social buying innovation is mapped along the dimensions of technology and market linkage. Section three applies the industry life-cycle model to social buying to describe the impact that incremental innovation and cumulative impact could have on the extension of the life-cycle and its future sustainability. Finally, section four conducts a straightforward SWOT analysis of social buying with the aim of informing a suitable strategic direction for the social buying innovation. The chapter concludes with a brief summary.

Chapter 3 – Literature review

This chapter begins with a review of the literature regarding social buying. Its origins in group buying; its position within the market, including challenges and risks; and its development and growth potential are all discussed. The aim of the section on social buying is to position it as a subject of research in the extant literature, and identify gaps. The next section deals with two of the main concepts of the research problem – loyalty intention and customer satisfaction – as well as the current state of the

literature with respect to their accepted antecedent factors. The next two sections deal with the main theoretical frameworks which are employed in the achievement of the research objectives – Oliver's (1980) expectancy-disconfirmation theory (EDT) which is a marketing-related theory; and DeLone and McClean's (2003) information systems (IS) success model. The development of each theory, their limitations, application and suitability to the research problem are all covered. The subsequent section argues how the two frameworks can be synthesised into a single model, including a discussion on the precedence for this and its applicability to e-commerce settings. Chapter 3 also surfaces the main antecedent factors to consumer satisfaction within the information systems field in partial fulfilment of research sub-objectives 1a and 2a. Finally, the chapter is concluded with a summary discussion.

Chapter 4 – Research design and methodology

This study investigates a business-related problem, putting it into the social sciences discipline which often deals with qualitative research following an interpretivist paradigm. The first section of this chapter motivates why this study falls under the positivist paradigm and is essentially quantitative in nature. Following on is a description of the research instruments employed in the study. The next section discusses the research population and samples, including the sampling methodology. Of particular importance is the discussion on sampling error and sampling bias, since it has implications on the subsequent data analysis and the characteristics of the results, including generalizability. The method of data collection is covered next and this is followed by a section on the statistical analysis of the data. Both descriptive and inferential statistics are used. Particularly, structural equation modelling (SEM) is employed as a technique for inferential statistics. Whilst being a well-established statistical technique, it is typically more multifaceted than many other techniques and this section therefore covers a brief description of SEM including its components, advantages and implications. Confirmatory factor analysis (CFA) and path analysis fall under the application of SEM. The penultimate section discusses the two research models introduced by the research problem and the specific hypotheses which will be tested under SEM. A summary section concludes the chapter.

Chapter 5 – Results and discussion

This chapter covers the results of the investigations into the research objects. It begins with a description of the demographic profile of the samples. Next, the

psychometric properties of the instruments are covered, including how reliability and validity will be established in the results including which measurements and limits will be applied. The next two sections cover the results of the analysis of the three SEM models that were introduced in chapter 4. These are discussed under the headings of reliability, construct validity and nomological validity with the primary aim of determining whether the results suggest a model which fits the sample data well. The final section summarises the chapter.

Chapter 6 – Conclusion and recommendations

The conclusions which are informed by the preceding chapters and which are relevant to the research problem and objectives are introduced in this chapter. Implications of the findings are discussed and relevant and realistic recommendations for further research are put forward. The chapter and the report are then concluded in a summary.

2 <u>PROBLEM ANALYSIS</u>

Social buying, as a fairly recent innovation, needs to be framed within the context of its competitive environment and its stage in the industry life-cycle. Industry analysis, the Abernathy-Utterback model, innovation mapping and industry life-cycle modelling will be employed against the context of social buying in order to position it in respect to the broader electronic commerce and marketing background. Such analysis will establish its threats and opportunities for development and its potential for sustainable growth.

2.1 *Industry analysis*

Identifying the industry in which social buying brokers are positioned, whilst important, is not a straightforward matter. The social buying platform provides electronic commerce services to consumers, yet does not fit neatly in the electronic retail industry since the brokers do not hold their own inventory and do not support the majority of functions traditionally associated with retailing. Some incumbents would place themselves in the information technology services industry, since they employ the Internet and computer technology to provide their platform and services. However, their consumers do not purchase information technology-based services from the broker such as software, infrastructure hosting, computer equipment or maintenance or support. They purchase goods or services from the merchant, and so the fit is not neat.

The main reason why social buying exists is to provide a channel to new markets. Social buying brokers are essentially selling marketing services to the merchants, the traditional retailers, who then negotiate a revenue-share with the broker based on the success of the marketing opportunity they provide. If few customers are enticed by the merchant's deal offered on the platform, the broker is not rewarded. Social buying brokers should be considered as providing niche electronic marketing-related services, fulfilling the role of facilitating new relationships between retailers and market segments (Marsden, 2011).

Social buying's industry may therefore be identified as the electronic commerce/marketing industry and, subsequently, it is possible to perform an industry analysis. Porter's five forces framework is an influential tool for exploring the nature of an industry, based on the principles of the three horizontal forces: competition from

substitutes; new entrants; and established rivals; and the two vertical forces: power of suppliers and power of buyers (Grant, 2008). Porter developed his five forces model to provide insight for potential industry entrants into the likelihood of their success, in terms of profitability, based on the relative strengths of the five stresses (Bakhru, 2005). However, it can also be applied by incumbent organisations in order to measure the current state of competition within their industry. These forces, in the context of the electronic marketing, are summarised in Figure 1.

Supplier Power
- Forward integration: Unless developed in-house, at some expense, suppliers of the brokering platform technology could easily enter the market themselves.
- Platform suppliers can charge high license fees for technology, reducing profitability for brokers.

Threat of new entrants
- Low capital requirements – (platform license fees and small sales and development staff)
- Volume and geographical scaling can be achieved simply and with low operational cost.
- Low product differention in a new market. Little brand awareness or customer loyalty.
- No distribution channel barriers (electronically-delivered service)
- Few regulatory/legal barriers.
- Few retaliatory measures available to incumbents (Exception: Groupon's size permits a price-cutting strategy)

Industry rivalry
- Little diversity among competitors. The social buying model is simple, easily replicated. Incumbents driven by cost-cutting mindset.
- Little product differentiation. Most products related to luxury services (restaurant meals, spa treatments, hotel accommodation). Similar product mix offered across brokers.
- Excess capacity during lean economic cycles is not a factor. Recession will impact all brokers, since all deal in luxury items.
- No significant exit barriers.
- Low industry concentration. Difficult for oligopolies to form, since entry barriers are low and differentiation opportunities are limited.

Threat of substitutes
- The e-commerce/e-marketing industry is very young and dynamic subject to new fashions and opportunities. Substitute services pose a significant risk.
- 'Deal of the day' fatigue a real threat. Low loyalty increases threat of substitutes.
- Consumers highly price sensitive, seeking most discounted deals – low barrier to switching.
- Viability of social buying may be threatened by cost-effective substitute.

Buyer Power
Price sensitivity
- Little product differentiation between platforms. Buyers very likely to switch platforms based on price considerations.
- Social buying deals not essential purchases – seen as luxuries. Consumers can afford to wait or pick-and-choose.

Bargaining power
- Little bargaining power in buyer's hands. But social buying exists to bargain on behalf of buyers.
- Buyers have limited product information to aid decision-making. Reputation of the merchant or brand becomes important.
- No switching costs for buyers. Can choose between platforms with complete freedom.

Figure 1: Industry analysis of the social buying industry in South Africa (Source: Adapted from the template used in Grant, 2008)

The main conclusions of the industry analysis are:
- The social buying industry is still new, especially in South Africa. Incumbents stick to the traditional model closely and do not experiment. The result is homogenous products and services, low differentiation and low brand-awareness and loyalty.

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- There are very few barriers to entry. The costs of entry, being so low, have seen significant numbers of new arrivals. This pattern was seen in the North American market, and is now being repeated in South Africa. Little experience or capital is required to start up a social buying platform, and the technology is accessible. Forward and backward integration is a risk in addition to new entrants.

- Consumers see social buying deals as luxury buys, and often buy on the spur of the moment. There is very little 'stickiness' between impulsive consumers and a broker's platform. The success of social buying is tied to the prevailing economic cycle. In times of recession, social buying will suffer. Consumers are highly price sensitive and will change brokers if a better deal is sourced.

- There is increasing competition amongst incumbents and with little differentiation on which to base price premiums, this will result in price competition, cutting margins and reducing the overall profitability of the industry.

Social buying occupies a fragile place in the South African environment. Its future sustainability is uncertain and will depend on the ability of incumbents to find ways to differentiate. Driving customer loyalty will be vital to the future of social buying incumbent brokers.

2.2 Social buying as a disruptive process innovation

Many companies, internationally and within the South African environment, have started up around the social buying concept. The previous section positioned social buying within the electronic commerce/marketing industry, but it did not answer the question of what social buying is. Social buying leverages e-commerce technology applications. E-commerce, when introduced shortly after the advent of the Internet, was a radical product innovation. In the last two decades, its maturation has seen it achieve significant diffusion and critical mass, through the combination of pervasive use, a maturing generation of users comfortable with the technology, and the emergence of broadband (Walsh and Godfrey, 2000).

The Abernathy-Utterback model describes how process innovations are linked, in time and maturity, with an industry's product innovations (Open University, 2005). Figure 2 depicts the Abernathy-Utterback model in the case where the e-commerce

product innovation has led the social buying *process* innovation. E-commerce exhibits significant diffusion and is therefore seen as a mature innovation. Social buying is still experiencing substantial growth although the market is rapidly becoming saturated. The dotted line on Figure 2 establishes these relative positions of maturity within the industry.
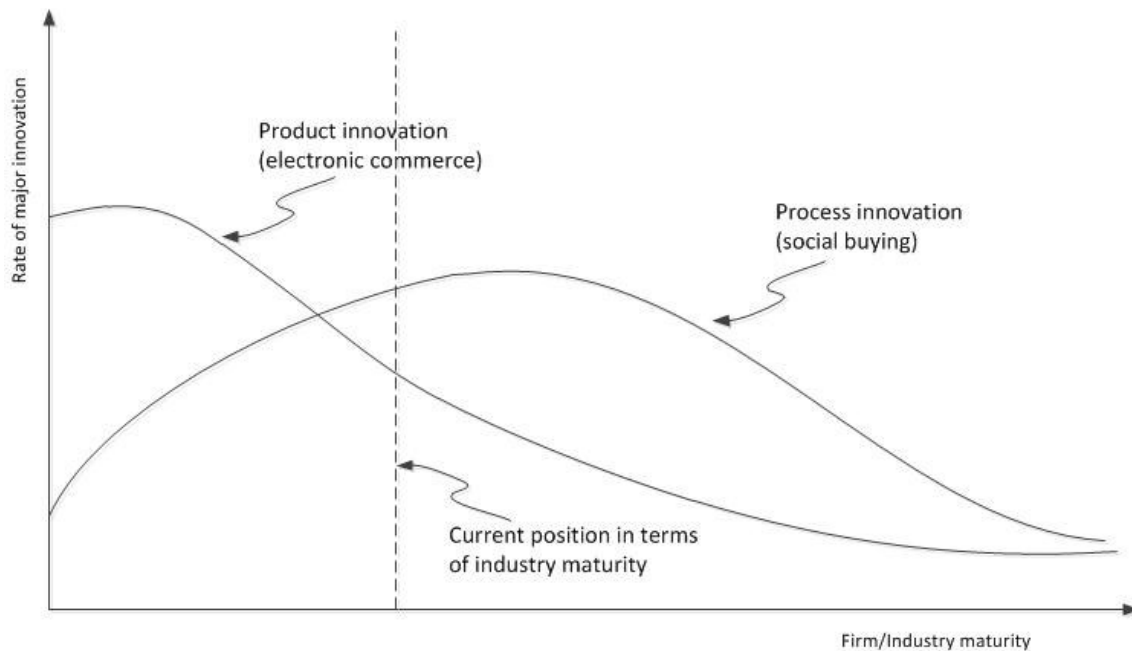
Figure 2: Abernathy-Utterback model depicting rate of product versus process innovation (Source: Open University, 2005)

Several reasons motivate why social buying is more of a *process* innovation driven by a product innovation (e-commerce) than a product innovation in its own right:

- Social buying introduces merchants to new markets in new *procedural* ways. The innovation is in the policies that govern the transactions, rather than the fulfilment of the transaction.
- Social buying is more of a marketing concept than a product.
- The fact that products and services are sold by the broker as coupons which need to be redeemed with a merchant at a later time is an example of a change in process.
- Similarly, the fact that social buying brokers hold no inventory and fulfil the role of facilitation between product and consumer is a process innovation.

Social buying is a process innovation, but is it an innovation that was pulled into development by market need, or was it pushed to an otherwise indifferent market due to the advent of technology? Understanding the way in which social buying relates to

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its market is critical to it following a strategic direction which provides for sustainable competitive advantage (Grant, 2008). Mapping an innovation against the dimensions of technology and market linkages provides valuable information in this regard (Open University, 2005).
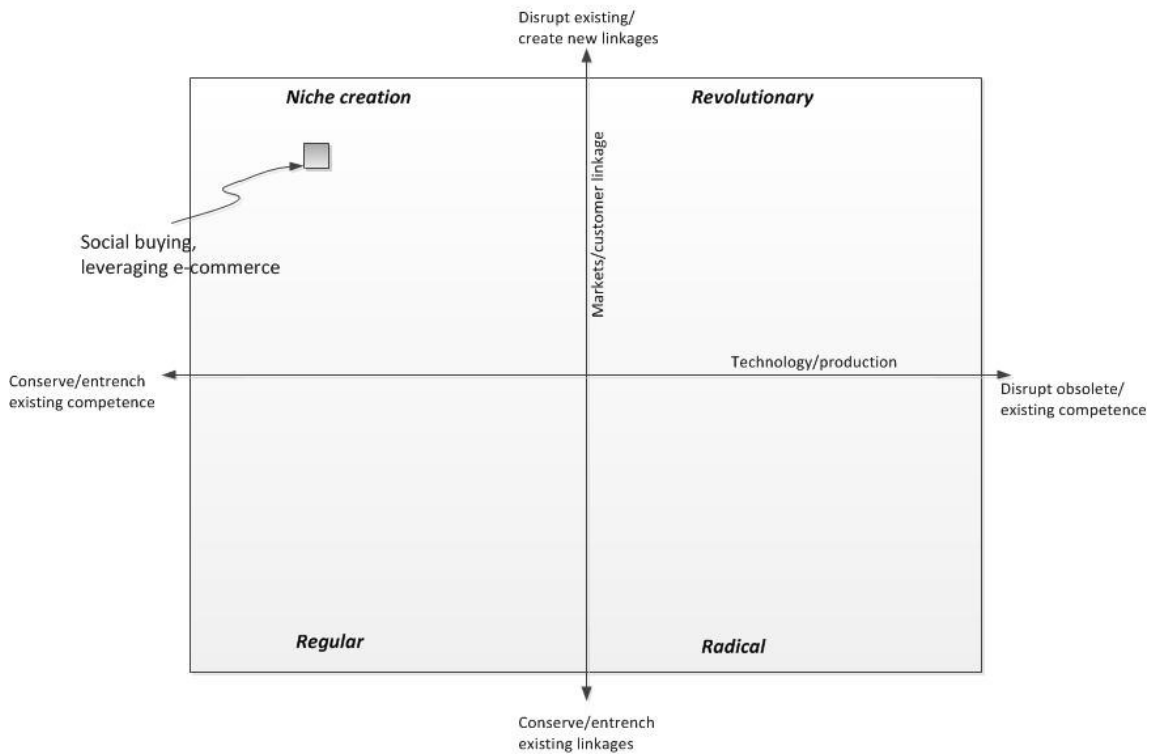
Figure 3: Locating social buying on the innovation map along the dimension of technology and market linkage (Source: Adapted from Open University, 2005)

Figure 3 positions social buying on the innovation map. Whilst e-commerce technology was certainly a prerequisite for social buying to evolve, social buying is not a technology innovation itself and leverages the existing competences in e-commerce. However, it may certainly be viewed as a disruptive technology-based marketing concept. Lyytinen and Rose (2003:301) define a disruptive technological innovation as one that leads "to changes in the application of ICT that are both pervasive and radical." Millions of consumers engage in social buying every day in markets that cover the globe in a multi-billion dollar industry. Groupon's status as the fastest growing company ever, being ample testament to this fact (Steiner, 2010). After a false start under the guise of group buying in the early nineties, social buying has grown rapidly in the last few years as a radical process innovation, changing the way consumers purchase products and, most especially, how consumers view themselves and the power they collectively hold. Social buying has significantly tipped the power into the hands of the consumer by bringing group discounts into the

reach of the individual (Anand and Aron, 2003; Bhagat, *et al.*, 2009; McIntosh, 2010). According to Marsden (2011:1), "Groupon is still the disruptive upstart redefining local online advertising."

The upper-left quadrant of identifies social buying as being a niche creation innovation, where existing technology is applied to create new market opportunities (Open University, 2005). A characteristic of such innovations is that they offer fairly short-term competitive advantage which can be imitated quickly by competitors (Open University, 2005). This is in agreement with the industry analysis of the previous section which highlighted the significant threat of new entrants and low entry barriers to the innovation. Whether social buying is a sustainable innovation is not yet clear. The sustainability of social buying will require the conceptual development of differentiators and loyalty drivers, otherwise price competition among price-sensitive consumers will drive profits down, threatening its viability.

2.3   *Incremental innovation and cumulative impact*

Social buying has low entry barriers for competitors and its consumer market exhibits low loyalty intentions. The previous section established social buying as occupying a niche position on the innovation map. Since its process innovation is easy to imitate, its profitability is not sustainable. Furthermore, as the industry analysis revealed, there are few opportunities for differentiation in the social buying context. Social buying needs to evolve into the broader field of social commerce. Sustainable competitive advantage will only emerge with incremental innovation from a niche social buying position towards a social commerce strategy aimed at creating product differentiation which will, over time, introduce competitive barriers and customer loyalty.

According to Grant (2008), the growth stage of the industry life-cycle is characterised by accelerating market penetration. This is clearly the stage at which social buying in South Africa finds itself. The maturity phase occurs when increasing market saturation is caused by increased competition and results in slowing growth. Finally, as substitute services are developed, the industry enters the decline stage. Cumulative improvements to the products or services which characterise the incumbents in the industry can extend the life-time of the industry, especially if this is established through incremental innovations which gradually move the industry into

new markets, as illustrated by Figure 4. Social buying, under a series of incremental innovations, needs to evolve into something broader than the process innovation which started the trend of exploiting social media for commercial gain.
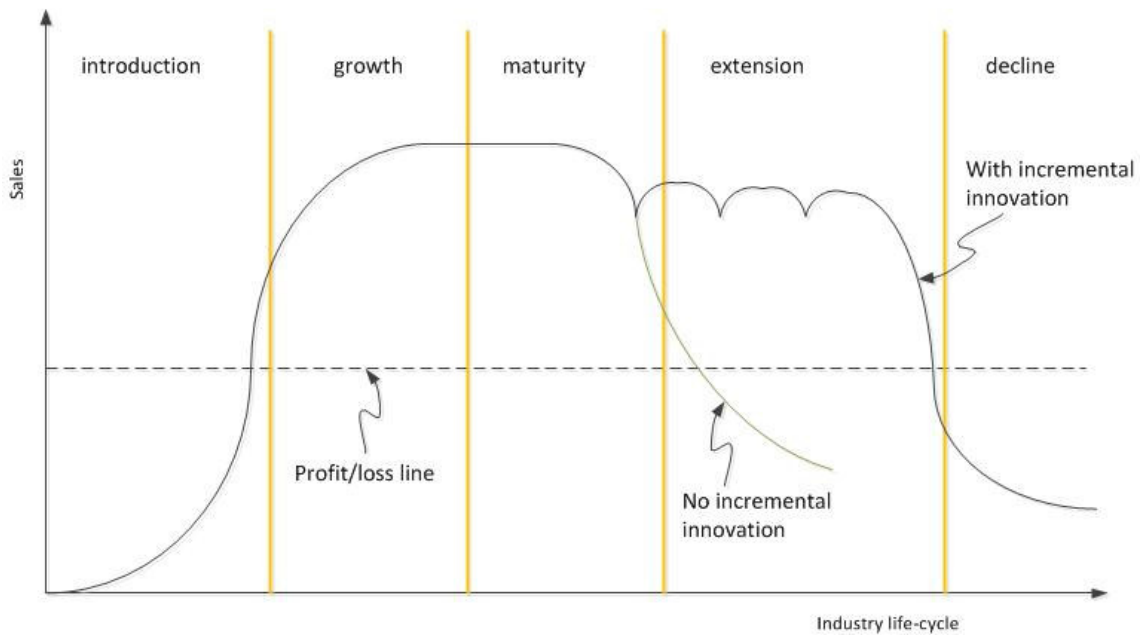
Figure 4: Cumulative impact of incremental innovation on the industry life-cycle (Source: Adapted from Grant, 2008; Open University, 2005)

Cecere (2010, cited in Solis, 2010:1) argues that "the effort no longer is social for the sake of being social, but gives rise to horizontal processes that extend beyond marketing to drive social commerce." Moving from social buying platforms to leveraging social commerce platforms is the natural progression for today's brokers. One of the shortcomings of social buying is that it doesn't attract the right kind of customers – those who demonstrate loyalty through repeat purchases. The value of social commerce is in the cost-effective acquisition of new customers, harnessing the power of referral by satisfied customers (Marsden, 2011). Burg (2011:3) states that "satisfied consumers cultivate confidence in their peers who are still in the decision-making process."

2.4   Strategic opportunities

The SWOT framework is a simple tool which allows the classification of strategic influences into four categories: strengths and weaknesses are internally focussed whilst opportunities and threats are externally focussed (Grant, 2008). Whilst SWOT analysis has been criticised for the rather simplistic view it offers (Grant, 2008), it remains a useful framework if it is used to help assess the strategic fit of the unit of

analysis (in this case the social buying innovation) to its internal and external environments. In Figure 5, SWOT analysis is applied to the social buying context with the aim of identifying its main threats and opportunities. Many of the results of the previous sections' analyses are presented succinctly by the SWOT matrix.

	Positives	Negatives
Internal factors	**Strengths** • Provides significant discounts • Rapid growth and large number of subscribers • Leverages the power of Social Media • Easy for consumers to understand • Simple process and policies • Can scale easily • Is a cost-effective way for merchants to market their goods and drive traffic to their stores	**Weaknesses** • Consumers do not show loyalty to brokers, but jump from deal to deal across brokers • Most deals are related to luxury purchases such as spa treatments and vacations • Susceptible to the vagaries of economic cycles • Whilst a disruptive innovation, its focus is very narrow – just around offering deals to 'impulsive' buyers • Subject to price-sensitive consumers
External factors	**Opportunites** • First foray into the broader opportunity of 'Social Commerce' • Significant subscriber lists are very powerful marketing assets • Can leverage the advances and strategic direction of Social Media • Can create a new way of relating to customers (i.e. from 'customer relationship management' to 'social relationship management') • Can develop excellent visibility on consumer trends and fashions • Can allow for more agility when dealing with large groups of individuals	**Threats** • Consumers may develop 'deal of the day' fatigue • An easy model to replicate • Easy to be substituted by more fashionable new developments • Few barriers to entry • Increasing number of competitors is beginning to saturate the market • Difficult to build differentiation • Difficult to build customer loyalty • Susceptible to price cutting strategies of competitors and falling profits

Figure 5: SWOT analysis of the social buying process innovation (Source: Adapted from Grant, 2008)

There are many negatives against the sustainability of social buying, both internally and externally. Most significant are: the narrow focus of social buying and the potential for consumers to develop fatigue with the 'deal of the day' concept; the tendencies of consumers to be disloyal; and the saturation of the market and the erosion of profits as price competition increases. However, with the right industry-focussed strategy, social buying has the potential to develop into something much broader. Among its significant positives are: its huge subscriber contact lists; its ability to integrate into the trends of social media and frameworks of social

networking; its novel way of engaging with groups of individuals; and its potential to mature into the more sustainable concept of social commerce.

2.5   Chapter summary

The purpose of chapter 2 was to establish the social buying mechanism within the electronic commerce and electronic marketing industries, and to position it as a disruptive process innovation. By so doing, the research problem of investigating the factors which influence consumers' loyalty intentions with respect to social buying has been better framed. The threats and opportunities which face all members of the industries identified, and social buying in particular, were examined, which provides greater context for the subsequent investigation of the research objectives of this study.

3   LITERATURE REVIEW

This chapter conducts a review of the literature relevant to the research problem which deals with an investigation into the marketing innovation of social buying and the factors which encourage its uptake amongst its target audience. The chapter is arranged as follows: Social buying is discussed first, including its origins, its characteristics and its development. The next section establishes the relationship between repurchase intention (a primary component of the research problem) and consumer satisfaction. Two relevant models of consumer satisfaction are then explored, each in their own section. First of these is the DeLone and McLeane IS success model (DeLone and McLean, 1992) which establishes the factors contributing to the success of information systems (IS). Its applicability to the research objectives are discussed in the section conclusion. Oliver's (1980) expectation-disconfirmation theory (EDT) is then identified from the literature as an appropriate consumer satisfaction model and its theoretical underpinnings and theory development are explored, and the section similarly concludes with a discussion of its limitations and appropriateness to the research objectives. The next section describes the synthesis in the literature of these two models and the application of the synthesised model to the online and e-commerce contexts. The antecedent constructs to satisfaction and repurchase intention are explored in the consumer satisfaction model sections.

3.1   Social buying

That social buying is becoming an important practice in the global and local economies is clear. An Internet search for South African social buying platforms reveals, in April 2011, at least 19 cases. A table listing these websites is presented in Appendix 1. New platforms are established each month. One of the platforms, U C It, is operated as entirely as a Facebook page, directly integrating into the social networking website. Another of the platforms, GroupBuying, has already failed. Aaron Toys, cofounder of Wicount and Tara Turkington, chief executive officer of CollectiveCow, both acknowledge the saturation of the South African market but predict that a mature market will see a few social buying platforms dominating the scene with most failing (Mofokeng, 2011). Social buying offers the savvy entrepreneur substantial opportunities, but the risks are not to be underestimated.

3.1.1 The origins of social buying lie in group buying

The early e-commerce paradigm was dominated by posted pricing strategies. Retailers posted their product catalogues online, including the product prices, and individual consumers would be invited to make online purchases at the advertised prices; a simple extension of the consumer retailing model to the Internet. Some entrepreneurs realised that the posted pricing mechanism was not necessarily the most efficient; either for consumers or retailers. Dynamic pricing mechanisms offer buyers and sellers a platform to engage in a price discovery process (Kauffman and Wang (2001). Kauffman and Wang's (2001) research was the seminal work in group buying (Anand and Aron, 2003).

Group buying allows consumers to pool their purchase volume together without any specific efforts of co-ordination (Kauffman and Wang (2001). The model involves the merchant offering increasing discounts with increasing numbers of consumers. Early purchasers are incentivised to entice other consumers to purchase leading to a cascade of more purchases and lower prices. Both consumers and sellers are better off, leading to Pareto-improving welfare gains (Anand and Aron, 2003).

By the spring of 2000 there were twelve websites and by 2003 there were more than 50 group-buying websites. Most, however, would ultimately fail. In the summer of 2000 the slowing digital economy yielded fierce competition, declining market interest, lower margins due to increasing supplier power and increasingly reluctant venture capitalists (Kauffman and Wang, 2001).

The theoretical underpinnings of group-buying are: i) the demand uncertainty faced by the seller; and ii) the quantity discount scheme offered by the seller (Anand and Aron, 2003). Game theory suggests it is in the interests of purchasers to entice other purchasers to buy the same product so that they may all experience the same utilities (Foss, Kristensen & Wilke, 2004), thus delivering Pareto-improving welfare gains (Anand and Aron, 2003), i.e. a win-win situation. In the social buying context, this is 'tipping the deal they want'. Merchants can quickly turnover unsold inventories thereby lowering both production costs and transaction costs, and service providers can fill unsold services during lean periods, smoothing their peaks and troughs of service utilisation (Bhagat, *et al.*, 2009).

3.1.2 The characteristics of social buying

Social buying, leveraging the power of social media, is different to group-buying as it brings in advertising capital to the merchants and is an efficient marketing tool for their products. Social buying advertising allows merchants to expand their audience, increase consumer awareness and increase the level of engagement with their consumers. Social buying promotions can help drive traffic to stores. Merchants often do social buying promotions to advertise their names to new markets and arouse interest among new customers. Merchants therefore view these promotions as advertising expenses (McIntosh, 2010).

Social buying is defined by several distinctive characteristics. One significant characteristic, contributing to its rapid growth and success, is that social buying generates Pareto-improving welfare gains. Social buying offers a triple-win solution for consumers, merchants and the broker who receives a significant cut of every deal without having to carry an inventory. The primary costs of the broker are technology infrastructure and sales. Human capital is still required to attract the deal-of-the-day merchants (Portsmouth, 2010).

Another social buying characteristic is that it is powered by large discounts being offered to large groups. The merchant considers the social buying deals it offers as advertising expenses which, if it is to deliver an acceptable return, needs to be as pervasive as possible in desirable markets. The uptake of social buying deals is directly measurable and drives traffic to merchant stores where merchants have the opportunity to cross- and up-sell (Bhagat, *et al*., 2009). The consumer is enticed into purchasing the deal through the large discounts offered (Woods, 2010).

Social buying promotes deals which are time-sensitive and usually expire within 24 hours or, at most, a few days. This encourages the immediate uptake of the deal and leverages the impulsive nature of the purchaser (Moosylvania, 2010).

The role of social media is a defining characteristic of social buying which helps drive additional interest and sales in merchants' deals through electronic versions of word of mouth advertising such as ratings and reviews; recommendations and referrals; and forums and communities (Bhagat, *et al*., 2009; McIntosh, 2010). Such word of mouth advertising through a network of peers is seen as inherently more trustworthy

and influential to the purchasing decision-making process. Social networks enable viral marketing tactics which generate demand as the message is pushed through the network from one interested member to the next (Gil-Or, 2010). The value of a particular member of a social network to merchants lies not only in the number of connections held with other members, but also in the activity levels within the network and most importantly the degree of *influence* the member exerts on the other members (Trusov, Bodapati and Bucklin, 2010). By integrating the social buying mechanism directly into the social networking platform, far more marketing opportunities are created for merchants who will be able to target influential consumers and leverage their ability to sway their peers, identify fashions and trends, and generate product awareness.

A final characteristic of social buying is the ability of the platforms to tailor the deals offered to specific localised regions, such as cities, providing significant value to local advertisers which receive effective local exposure. Deals can therefore appeal to different cultural characteristics and be seen as more relevant to specific communities (Woods, 2010).

The role of social media in commerce has seen a shift in power from the retailer to the consumer. This is evidenced by the increasing price-sensitivity of consumers and the growth of social buying, with the consequence that marketing messages created by traditional marketers no longer play the central role they once used to. Social networks allow word of mouth advertising to play a bigger role in the consumers' purchasing decisions. Such referrals are seen as being more impartial than retailer generated hype (Tan, 2010).

The social buying concept has seen rapid growth but there is concern about its sustainability as a business model. Salim Teja (cited in Portsmouth, 2010:16) sums up the sustainability challenge of the social buying phenomenon concisely: "There are low barriers to entry. Eventually consumers are going to get 'deal of the day' fatigue. How are you going to keep them interested?" Social buying needs to evolve in a market which is becoming saturated and undifferentiated. The next subsection discusses the development of social buying and the potential of social commerce.

3.1.3 The development of social buying

The trend in media is one of evolving from broadcast (radio, television, print) to interactive (feedback-driven) to social. Social media is where the audience becomes active participants and co-creators of content, context and connections (Bhagat, *et al.*, 2009). There are three types of social media: i) content specification (blogs, podcasts, videocasts); ii) content sharing (user-generated content, wikis, widgets, reviews); and iii) community building (social networks, online communities) (Bhagat, *et al.*, 2009).

Facebook recently entered the social buying market with the release of its 'Deals' service (McEleny, 2011). The significance of this announcement is that Facebook Deals will integrate social buying into the social networking platform, rather than the traditional and opposite strategy of incorporating social media elements into purpose-specific social buying platforms. Facebook Deals has the opportunity to apply significant differentiation to the social buying mechanism by leveraging other capabilities such as its social graph technology to track how individual consumers contribute to increased merchant sales through referrals. Facebook Deals establishes a unique way to reward specific consumer behaviours. It also adds the component of allowing Facebook Credits as a currency for payment of the deals (McEleny, 2011).

Social computing will lead to the new product innovation process shifting from the top-down to bottom-up, where the customer will become an active participant in the development process far earlier than the trial stage. Value for the consumer will shift from ownership to experience. Power will shift from institutions and retailers to communities of consumers (Tan, 2010). With the advent of social networking sites and the influence of the consumer online voice through blogging and other interactive communication tools, the role, involvement and power of the consumer is rising (Bhagat, *et al.*, 2009). Online referral by satisfied customers is becoming recognised as a powerful mechanism to cheaply acquire new customers (Marsden, 2011).

Burg (2011:2) defines social commerce as "the practice of driving sales or revenue-generating transactions by leveraging the social media dynamic." Understanding the value and the underlying characteristics of social commerce requires an appreciation not only of social marketing as a complementary concept but also of the digital

space, including online communities, social media dynamics and technology evolution (Burg, 2011). However, the rewards are high as organisations with an effective social commerce strategy will be exposed to explosive growth opportunities (Solis, 2010). Social buying occupies just one part of the social commerce spectrum, but to date it is its most successful element. The innovations spawned and the lessons learned from social buying will have far reaching consequences in the commercial landscape of tomorrow (Marsden, 2011).

3.1.4 Section summary

The introductory chapter introduced the background of social buying, and the problem analysis chapter helped position and frame social buying in the context of the larger industry, as well as raising the main threats and opportunities it faces. The aim of this literature review section has been to discuss the origins of social buying, identify some of its main characteristics, and explore its development and potential. One of the main challenges with social buying has been the difficulty in turning purchasers into loyal customers. The importance of customer loyalty is discussed in the next section.

3.2 Loyalty, satisfaction and the antecedent factors

The relationship in the literature between loyalty intention and consumer satisfaction will be established in this section, including a discussion on the current debate around the significance of the relationship. The satisfaction to loyalty intention link is an integral part of the research problem of this study. This section will also briefly consider the main theoretical approaches taken to consumer satisfaction. Finally, it will identify two of the relevant antecedents of consumer satisfaction from the extant literature, perceived value and reputation, in partial fulfilment of the research sub-objectives 1a and 2a. Further antecedents of satisfaction, specifically service quality and its electronic version, e-service quality, will be discussed in section 3.3.

3.2.1 The importance of customer loyalty

It is not difficult to understand why there has been a great deal of research into investigating what companies can do to create loyal customers. Reichheld (1993:64) asserted that "[t]he economic benefits of high customer loyalty are considerable and, in many industries, explain the differences in profitability among competitors." Loyal customers spend more on products and services per transaction than customers who have no loyalty relationship with a company, and they exhibit lower price sensitivity

meaning they are less inclined to switch to a competitor based on price alone (Buchanan and Gilles, 1990). Retaining existing customers means less money spent on marketing to attract new customers. Citing Peters (1988), Rust and Zahorik (1993) assert that it may be as much as five times as costly to attract new customers as it is to retain existing ones. Additionally, loyal customers are advocates who engage in intention behaviours such as referrals and positive word of mouth advertising (Casaló, Flavián, & Guinalíu, 2008; Kassim and Ismail, 2009). They are also less likely to be affected by individual episodes of poor satisfaction than non-loyal customers (Yi and La, 2004).

Customer loyalty is not a directly observable construct. It is a complex construct whose measurement requires companies to track multiple primary and secondary indicators. Primary indicators include how frequently and how recently purchases were made; the volume of the transaction (Jones and Sasser, 1995); customer retention rate; and market share (Reichheld, 1993). Secondary indicators include word of mouth endorsements and referrals; repurchase intention (Jones and Sasser, 1995; Reichheld, 1993); lower costs due to lower customer acquisition charges; and efficiencies of dealing with experienced customers (Reichheld, 1993).

3.2.2 The evolving view of customer satisfaction

Mittal and Kamakura (2001) cite the Wall Street Journal (1998) in arguing that consumer satisfaction was seen in the 1980s as an end goal alone. They suggest that "only during the 1990s was there a widespread realization that satisfaction ratings are a means to strategic ends, such as customer retention, that directly affects profits" (Mittal and Kamakura, 2001:131). This realisation is not as obvious as it may seem, since establishing a measurable link between the concepts has been difficult. Rust and Zahorik (1993) acknowledge that in times of recession, organisations such as retail banks will prefer cutting costs to spending money on improving service quality in the hope that the improved customer satisfaction will help retain existing customers. This is partly due to the fact that customer satisfaction and its links to profitability had not been established. Rust and Zahorik contended, however, that such links do exist. Evidence in support of this view was provided in a subsequent study by Rust, Zahorik & Keiningham (1995) where the effects of service quality were quantified in monetary terms, providing a management model for

improving customer satisfaction in ways that were cost effective and shown to deliver a financial return on the investment in service quality.

3.2.3 Establishing the satisfaction link

Hallowell (1996) argued that the literature on the relationship between customer satisfaction and loyalty can be divided into two groups. The first group takes a service management perspective towards satisfaction, whilst the second group takes a marketing perspective. The service management perspective argues that consumers make a value judgement on the transactions and if the perceived value is greater than competing alternatives, satisfaction with the transaction results. In the marketing literature, there are two approaches taken by researchers. The first approach sees loyalty as behaviour and measures behavioural effects of loyalty as related to customer satisfaction, such as repurchase intention. The first approach is conceptually similar to the view held by service management researchers (Hallowell, 1996). The second approach taken in the marketing literature contends that loyalty can be seen as being due to a sense of attachment between consumers and a brand.

This study will adopt the first view of the satisfaction-loyalty relationship, shared by the service management and marketing literature. This view, of value judgements and behavioural intentions, can be operationalized and measured more easily. It also is a natural fit for the application of expectancy-disconfirmation theory to the research problem. As McKinney, Yoon & Zahedi, (2002:298) argue, the "expectancy-disconfirmation paradigm … has been the popular approach for measuring customer satisfaction in marketing." This approach will be discussed in greater detail in section 3.4.

Yi and La (2004) found that customer satisfaction had a strong relationship with repurchase intention in the case of customers with no existing loyalty. Their results suggest that the nature of satisfaction is different between loyal and non-loyal customers. For non-loyal customers, satisfaction is formed based only on the current transaction. Therefore, satisfaction is fragile and experience-dependent. For loyal customers, the current transaction is only one aspect of satisfaction determination. According to Yi and La (2004), loyal customers will include the accumulation of past

experiences in their current satisfaction judgement which is, consequently, more robust to instances of disconfirmation.

Kenney and Khanfar (2009) argue that customer satisfaction and service quality are the main antecedents of repurchase intention. They suggest that there is both a direct relationship between these factors and repurchase intention, as well as an indirect one where switching costs mediate the relationship. This is an interesting suggestion, since loyalty and behaviour intentions might very well be affected by the expense of the purchased item. As Jones and Sasser (1995) note, loyalty is more often seen towards brands of expensive products such as car manufacturers and audio equipment, than towards commodities such as domestic cleaning products.

3.2.4 The satisfaction link revisited

In a review of the marketing satisfaction literature, Bennet and Rundle-Thiele (2004) conclude that researchers generally acknowledge a strong relationship between satisfied customers and loyal customers. They emphasise, however, that there remain contentious views. Their view is that though there does exist a relationship between satisfaction and loyalty, it is not always causal – there are often mediating factors which can result in satisfied customers switching to competitors.

Jones and Sasser (1995) argue that *merely* satisfied customers are not inclined to loyalty. Instead, only *completely* satisfied customers become loyal customers. The level of customer satisfaction is critical and organisations cannot assume neutral or satisfied customers will exhibit loyalty behaviours such as repurchase intention driving long-term financial performance. They contend that in the commodity driven markets, a focus on customer satisfaction does not drive commensurate returns on the incurred costs, since the returns will only become apparent with a significant increase in *completely* satisfied customers. The costs of achieving this goal typically drive the product or service out of the commodity segment.

Reichheld (1992:71) agrees, observing that "customer satisfaction is not a surrogate for customer retention … Between 65% and 85% of customers who defect say they were satisfied or very satisfied with their former supplier." He asserts that customer satisfaction measures do not provide insight into customer loyalty. Part of the problem is the type of customers that organisations attract and try to keep. A great

deal of time and money is often spent on attracting customers who will not remain loyal, no matter the level of satisfaction.

Jones and Sasser (1995) categorise customers according to their loyalty behaviours. Due to the expense of acquiring customers, organisations should follow a strategy of completely satisfying only certain types of customers. These customers already are, or have the potential to become, loyal customers. Jones and Sasser (1995) contend that organisations are unlikely to realise returns, in terms of increased loyalty or repurchase intention, on the expense of satisfying 'lost causes' – those customers who do not exhibit a good fit with the organisation's products or services.

3.2.5 Perceived value as an antecedent of satisfaction

Patterson and Spreng (1997) maintain that perceived value is a fundamental goal of all successful exchange transactions. In an empirical study examining the relationships between a number of post-purchase variables, they found that the effect of perceived value on repurchase intentions is completely mediated through satisfaction, supporting the assertion that satisfaction is an antecedent of loyalty intentions and that perceived value is a distinct antecedent of satisfaction. Hellier, Geursen, Carr & Rickard (2003) also found strong support for the relationships between perceived value and satisfaction, and satisfaction and repurchase intention. However, they also identified brand preference as a weaker, but significant, mediating factor between perceived value and repurchase intention. This supports the view that whilst satisfaction is an important antecedent to loyalty intentions, it is likely that it is not the only one.

Gounaris, Tzempelikos & Chatzipanagiotou (2007) highlight the role of both tangible and intangible qualities of customer perceived value as an important factor of customer satisfaction. They further found that customer satisfaction was positively related to brand loyalty which in turn drove intention behaviours such as repurchase intention, intention to promote through word-of-mouth, and intention to cross-buy. This finding is supported by Jones and Sasser (1995) who noted that increased perceived value will lead to customer satisfaction and therefore intention behaviours such as repurchase and word-of-mouth recommendations.

He, Chan & Tse (2008) studied the mediating effects of price change tolerance in the relationship between customer satisfaction and repurchase intention. Notably, both service quality and assessed value (in terms of quality and price) were modelled as antecedents to satisfaction, which they motivated from a review of recent studies on satisfaction. Whilst they found that even satisfied customers were fairly intolerant of price increases, they noted that "as it costs less for firms to keep satisfied consumers through service improvements than to attract the less satisfied through price cuts, consumer satisfaction endeavours do pay off in enhancing consumer loyalty and hence firm profitability" (He, *et al.*, 2008:249).

3.2.6 Reputation as an antecedent of satisfaction

Reputation, as perceived by the consumer, may be seen as the result of a comparison between the promises made by a company, and the experience of the consumer of their fulfilment, according to Casaló, *et al.* (2008). They emphasise the instability of a company's reputation with the suggestion that it is far easier to lose a good reputation than it is to create it. Due to the perceived higher risk of doing business online than in-store, companies should actively seek to improve their online reputation in order to reduce this perceived risk and help build trust online. Casaló, *et al.* (2008), in a study of a business-to-consumer e-commerce website, investigated the relationships between reputation, trust and consumer commitment to a website. They found that both satisfaction and reputation have an indirect association with website commitment, mediated by trust.

In e-commerce settings, the consumer is not exposed to the tangible nature of the product being purchased. Most studies examining antecedents of customer loyalty and satisfaction have focused on the evaluation of *intrinsic* criteria such as e-service quality, system quality and web site design. Jin, Park & Kim (2008) raise the need for increased focus on the *extrinsic* criteria. In a cross-cultural study (involving respondents from South Korea and the United States), Jin, *et al.* (2008) proposed company reputation as a critical extrinsic antecedent to customer satisfaction. Their results showed a strong relationship between reputation and satisfaction, and satisfaction and loyalty. Similarly, in a study on factors which influence repurchase intention in online auction settings, Yen and Lu (2008a) found that seller reputation had a significant effect on consumers' intentions to repurchase.

3.2.7 Section summary

This section has established the strong support in the literature for the view that satisfaction is an important antecedent to loyalty intention, although it is acknowledged that it might not be the only one, with other factors possibly mediating the relationship. Customer satisfaction has been identified as a critical focus for organisations who seek to reduce the cost of customer acquisition and retention. The point was argued that it is only *completely* satisfied customers who become loyal customers and who are worth the considerable expense of keeping satisfied. Two important antecedents of customer satisfaction were identified: perceived value and reputation.

Whilst section 3.2 has discussed the relationship between satisfaction and some of its antecedent factors, and between satisfaction and loyalty intention, it did not investigate how these relationships are formed. The next section provides a theoretical framework, based on cognitive theory, which describes the underlying mechanism of how these attitudes are formed.

3.3   Expectancy-disconfirmation theory (EDT)

This section explores the theoretical underpinnings of EDT which have established it in the literature as a suitable model for investigating satisfaction and consumer behaviour, including repurchase intention, in both the traditional marketing context and the information systems and e-commerce contexts. It further discusses the development of the theory into its present day form, some of the outstanding areas of debate, and issues and procedures of operationalizing the main theoretical constructs.

3.3.1 The theoretical underpinnings of EDT

Cardozo (1965) suggested that consumers' previous experiences, or their general expectations, form a judgemental standard about a product. When the consumers experience the product, it is intuitively evaluated against this standard. Failure of a product to measure up against that standard may result in no initial sale, no repeat purchase, or unfavourable word-of-mouth publicity. Cardozo applied Helson's (1948) adaptation level theory which argued that stimuli applied to a subject are measured against an adaptation level, the judgemental standard, and that the standard will

adapt to the judgements made by subsequent evaluations. The adaptation level or neutral position has a tendency to remain relatively stable over time.

Olson and Dover (1976) extended the theoretical concept of expectations being measured against a standard by placing it into a cognitive structure. This addressed the "conceptual vagueness regarding the expectation construct" which had previously been defined simply as 'product attitudes' (Olson and Dover, 1976:168). Olson and Dover (1976:169) redefined expectation as a "perceived likelihood that a product possesses a certain characteristic or attribute, or will lead to a particular event or outcome." This allowed expectation to be treated in terms of belief judgements and the application of cognitive structure as a theoretical underpinning, introducing the concepts of attitude formation and attitude change due to a disconfirmation experience. Importantly, a cognitive structure approach allows expectation to be theoretically linked to subsequent behaviours, such as purchase or repurchase intention. Olson and Dover (1976) conducted experiments to measure the effect of disconfirmation of expectations against subsequent changes in the belief expectations of the subjects, with the results showing evidence for the appropriateness of the cognitive structure as a theoretical model for expectations.

Oliver (1980) applied Helson's adaption level theory to the retail context. He posited that if a consumer's experience with a product or service is deemed by the consumer as not being different from the expectation level (adaptation level in Helson's language and judgemental standard in Cardozo's), then the resulting attitude is indifference since the consumer's initial expectation is confirmed. If the experience exceeds (falls below) the expectation level, a positive (negative) disconfirmation of the expectation is recorded. Using Olson and Dover's (1976) cognitive model of attitude formation, Oliver (1980) suggested that a consumer's initial attitude towards a product or service is a function of his expectations of that product or service. The same consumer's subsequent satisfaction can be said to be a combination of the consumer's initial expectations and the disconfirmation resulting from the consumer's experience with the product or service. This disconfirmation will modify a consumer's initial attitude but, in line with Helson's adaptation level theory, the resulting attitude is also moderated by the consumer's initial attitude; that is, the final attitude is a function of both the initial attitude and the consumer's satisfaction with the experience.

Oliver (1980) therefore suggested that consumers' expectations and the disconfirmation of their expectations were both antecedents of satisfaction, and that satisfaction was, in turn, an antecedent of attitude. Oliver (1980) noted Howard's (1974, cited in Oliver, 1980) results that a consumer's satisfaction with a retail experience would influence future repurchase intention and applied Olson and Dovers' (1976) cognitive model of attitude formation to repurchase intention. This application suggested that a consumer's initial repurchase intention is a function of the initial attitude held, and that a post purchase intention to repurchase is a function of his satisfaction with the purchasing experience, his resulting attitude and, again in line with adaptation level theory, is moderated by the initial intention to repurchase. Thus repurchase intention can be said to be a consequence of both attitude and satisfaction. This led to Oliver proposing a model of consumer satisfaction which can be represented by Figure 6.
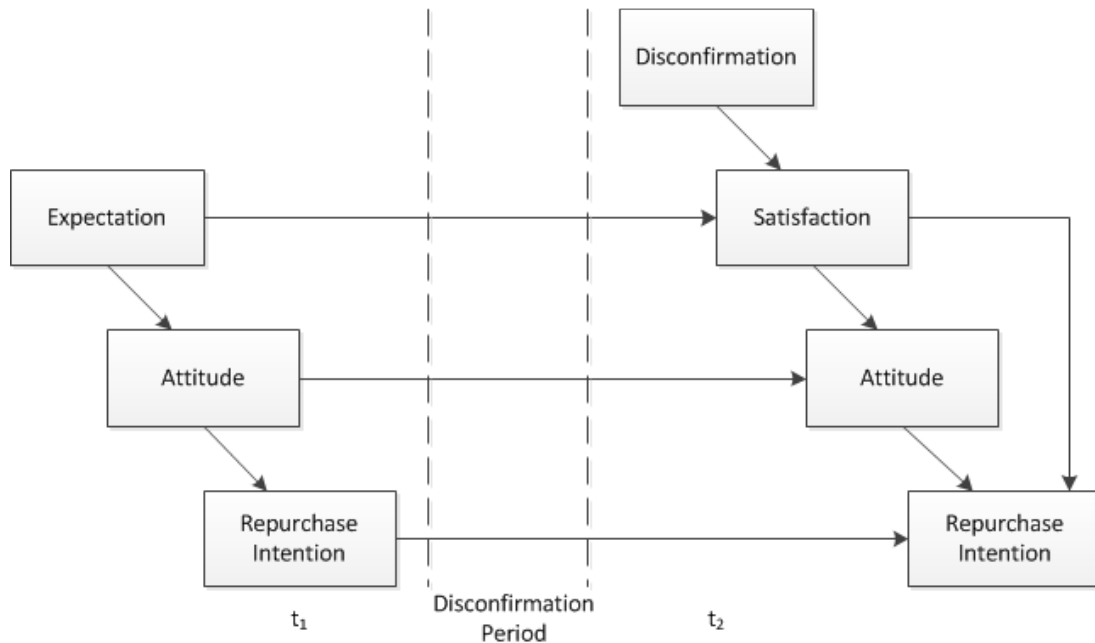
Figure 6: Cognitive model of consumer satisfaction (Adapted from Oliver, 1980)

This cognitive model of consumer satisfaction forms the origins of what has since become known as expectancy-disconfirmation theory (EDT), which comprises two processes: first, the formation of expectations (attitude formation) followed by the disconfirmation of those expectations when the perceived performance of the activity is compared against the expectations held by the consumer (Oliver and De Sarbo, 1988), leading directly to a feeling of satisfaction. The intention of the consumer to make a repeat purchase is a consequence of satisfaction with the initial purchase experience.

Oliver (1981) noted, however, that the consumer's feeling of satisfaction soon 'decays' into the consumer's post-purchase attitude. Thus, over the 'disconfirmation period', the consumer's expectation is adjusted by the new attitude. Subsequent satisfaction would therefore depend on disconfirmation of the customer's new expectation (Oliver 1980, 1981). Citing Fletcher (1942) and Solomon and Corbit (1974), Oliver (1981) proposed that the decay of the consumer's surprise could be modelled by opponent-process theory, which advocates that a stimulus which disrupts the condition of homeostasis (neutrality) will be opposed by an internal force to counter the disruption. The strength of the opposition force is a function of the initial disruption, or surprise, to the homeostatic condition as well as the subject's psychology – the subject's natural tendency to deal with surprise to his expectations. The result is that the initial satisfaction is damped somewhat in proportion to the disconfirmation (surprise) and that the satisfaction is soon incorporated into the consumer's new homeostatic state. This opponent-process theory provides an explanation for attitude formation, or creation of new belief states, as posited under Olson and Dover's (1976) cognitive construct view of expectations.

The value of EDT is that it provides a theoretical model for how feelings of satisfaction are formed in consumers. EDT provides an account of how attitudes and feelings (expectations) are subjected to direct experience at which point judgements are made with respect to how the experience measured up to the expectations. The resulting disconfirmation of the expectation gives rise to feelings of satisfaction (positive disconfirmation) or dissatisfaction (negative disconfirmation).

3.3.2 The development of EDT

Whilst EDT offers an explanation for the underlying processes, and has been demonstrated empirically in longitudinal studies (Bearden and Teal, 1983), it has also been the subject of some controversy. A review of the development of EDT is therefore necessary not only in order to establish its theoretical credentials for the context of this study, but to motivate for the *particular form* of EDT which is most applicable to the research problem.

Confirmation or disconfirmation

Spreng, MacKenzie & Olshavsky (1996) raise concerns with the logical consistency of expectations disconfirmation theory. For instance, citing La Tour and Peat (1979), they argue that the theory should predict that consumers who expect and then

receive *poor* product or service quality will be satisfied, because their expectations are neither positively nor negatively disconfirmed, merely confirmed. Whilst it is true that some researchers proposed a link between expectation *confirmation* and satisfaction (Swan and Combs, 1976), most researchers recognise that it is the *disconfirmation* of the consumer's expectation that will lead to satisfaction (or dissatisfaction) since it is the "surprise" effect which is important (Kennedy and Thirkell, 1988 and Erevelles and Leavitt, 1992, both cited in Khalifa and Liu, 2004; Yoon and Kim, 2000). In studies contrasting the effects of confirmation and disconfirmation, researchers have shown that confirmation has less of an effect on satisfaction than disconfirmation (Oliver, 1977; Swan and Trawick, 1981; Anderson and Sullivan, 1993).

The performance – disconfirmation debate

There are two main approaches to the measurement of the disconfirmation construct. The first, and established, approach in terms of theory development (McKinney, *et al.*, 2002) is to measure disconfirmation directly as a separate construct in its own right. Churchill and Surprenant (1982) argued for a second approach, that disconfirmation itself need not be included into a model of satisfaction, since its effect can be adequately captured through the consumer's initial expectation and the subsequent *perceptions of performance*; that is, disconfirmation is the simple difference between perceived performance and the consumer's expectation (McKinney, *et al.*, 2002). Churchill and Surprenant (1982) conducted two experimental studies with one showing that perceived performance and disconfirmation contribute to satisfaction, whilst the other showed that perceived performance alone was a contributory factor. However, other studies have shown a strong link between disconfirmation and satisfaction (Oliver, 1977; Swan and Trawick, 1981; Pitt, Watson & Kavan (1997); Yen and Lu, 2008a). In fact, Swan and Trawick's study provided support for Oliver's (1980) expectation-disconfirmation model where disconfirmation is the primary antecedent of satisfaction, and repurchase intention increases as satisfaction increases. However, Swan and Trawick did not test performance as a separate antecedent to satisfaction.

Tse and Wilton (1988) confirmed that perceived performance had a significant effect on consumer satisfaction, but that this effect was separate to that of expectancy-disconfirmation, suggesting that these two variables should be modelled separately.

Tse and Wilton use the example of a consumer forced to buy an alternative, inferior brand of product when their preferred brand is out of stock. The consumer's experience of the brand leads to dissatisfaction not because of an unfavourable disconfirmation of a judgemental standard, but because of the inferior *performance* of the alternative product. Thus, Tse and Wilton (1988) combined Oliver's (1980) expectation-disconfirmation model with findings by Churchill and Surprenant (1982) to *extend* EDT to include, as an independent construct, the perceived performance of the purchase experience.

In an investigation into the potential determinants of satisfaction and the formation of satisfaction judgements, Oliver and De Sarbo (1988) found that both disconfirmation and performance effects were present as determinants, but they appeared to work in tandem. Thus, whilst separate effects, they are still related. Oliver and De Sarbo (1988) suggest that this may be a result of the objective nature of the performance variable and the subjective nature of the disconfirmation variable. Disconfirmation is seen as a psychological interpretation, or comparison against, the initial performance effect. Oliver and De Sarbo (1988) speculated that the relative strength, and therefore dominance, of each effect may vary according to different conditions.

The literature suggests that the debate is not yet closed as to whether disconfirmation is mediated by perceived performance, or whether it is an independent construct affecting satisfaction. This is implicitly acknowledged by McKinney, *et al.* (2002:300) when they argue for taking the approach of including both constructs in their model of consumer satisfaction simply "because it has been the more established approach in the expectation-disconfirmation paradigm."

The role of expectations, desires and delights in EDT

There has been a lack of consensus regarding the conceptual definition of the expectation construct in the expectation-disconfirmation literature (Van Dyke, Kappelman & Prybutok, 1997; Kettinger and Lee, 1994; McKinney, *et al.,* (2002). Boulding, Kalra, Staelin & Zeithaml (1993) reviewed the current literature around how expectation was conceptualised and determined there were two standards. They defined the first expectation standard, used predominantly in the marketing literature dealing with the satisfaction construct, as a prediction of future events. Boulding, *et al.*, (1993) defined the second expectation standard, used predominantly in the

service quality literature, as a normative expectation of future events, expressed as desired, or ideal, outcomes.

Boulding, *et al.*, (1993) label the first standard as the 'will' expectations. They then subdivide the second normative standard into two groups: the 'should' expectations describe what consumers believe *ought* to happen in their next product or service encounter. The 'ideal' expectations describe the enduring wants and needs of consumers. Boulding, *et al.*, (1993) modelled the influence of the 'will' and 'should' expectations and showed that whilst both were significant contributors to the construct under investigation, service quality, they discovered that increasing 'will' expectations led to a higher perception of service quality, whilst increasing 'should' expectations led to a decrease in the perception of service quality. Thus, the more consumers believe they 'will' receive good service, the more they are likely to judge the level of service actually received in a positive light. In contrast, the more consumers believe they 'should' receive good service, the more likely they are to judge the actual service received poorly.

Van Dyke, *et al.* (1997) raised the concern that the different interpretations of expectations, and especially the subtlety of the phrasing of the scale items measuring expectations, could have significantly different (and even opposite) impacts on the measured construct. For example, simply replacing the phrase "the merchant will" with "the merchant should" will affect the results, in support of Boulding, *et al.*'s (1993) assertion. Teas (1993) suggests that a considerable portion of the variance in results could be attributed to different respondents' misinterpretations of the questions rather than to their different attitudes or perceptions, which could lead to discriminant problems. Small differences in phrasing suggest significant conceptual differences. It is therefore imperative that the phrasing used when operationalizing expectations is consistent to avoid opposite effects.

To date, the majority of practitioners have operationalized expectations using the first standard, where it is used to predict future events and is expressed as 'will' expectations. However, there has been a growing body of research supporting the second standard. Cadotte, Woodruff & Jenkins (1987:306) argue that perceived performance is not measured relative to a consumer's *expectations* of performance, but instead relative to "how well a consumer perceives that focal brand performance

fulfils needs, wants, or desires." Suh, Kim and Lee (1994) suggested that the expectations construct should be replaced with *desired expectations*. As also pointed out by Spreng, *et al.* (1996), if consumers have low expectations which are confirmed, it seems counterintuitive that EDT should predict they would be satisfied. By measuring *desired expectations*, Suh, *et al.* (1994) argue that consumers' disconfirmation judgements are measured as the difference between actual performance and the consumers' *desired* expectations, rather than their expectations of performance. In a study related to usage of Internet-based systems, Khalifa and Liu (2002) employed both expectations and desires in a version of EDT to measure their impact on consumer satisfaction, and reported that the former relationship (expectations) was not found to be significant, whilst the latter (desires) was found to be significant. However, Khalifa and Liu (2004:38) later observed that "it is yet not clear which standard is more prominent in explaining and predicting satisfaction."

3.3.3 Operationalising EDT

The previous subsections of section 3.4 have described the theoretical underpinnings of EDT, its development, and some of the as-yet unsettled differences in the interpretation and application of the theory by practitioners. This subsection will describe the form and operationalization of the theory in this study.

Loyalty intention behaviours

Loyalty will be operationalized in this study in terms of secondary indicators only (Jones and Sasser, 1995; Reichheld, 1993), since these are simpler to measure in a general sense and are the only ones which can be measured through consumer surveying. Primary indicators require analysis of a company's marketing and financial information. Because they are company-specific and help mainly to position the company within the industry, they are less generalisable. Using secondary indicators, allows loyalty to be operationalized as a set of behavioural intentions (Hallowell, 1996).

Satisfaction

Hallowell (1996) reported that the satisfaction was viewed in the literature from two main perspectives – the service management perspective and the marketing perspective. This study will take the former view, since it allows satisfaction to be operationalised as value judgements and behavioural intentions, which aligns very well with the tenets of EDT. Satisfaction can therefore be defined as an effective

state representing an emotional reaction to the entire consumer experience (Oliver, 1980; Cadotte *et al.*, 1987; Spreng *et al.*, 1996). The above definition focuses on the process evaluation associated with the purchase behaviour as opposed to the outcome-oriented approach, which emphasizes the buyer's cognitive state resulting from the consumption experience (McKinney, *et al.*, 2002).

Disconfirmation

The Tse and Wilton (1988) and McKinney, *et al.*, (2002) approach of including both disconfirmation and perceived performance as distinct antecedents to satisfaction will be taken in this study. As Oliver and De Sarbo (1988) noted, it is still unclear which construct exhibits the dominant effect, but they agree that they are separate effects. The nature and dominance of these effects within the context of this study will be discussed in the results and conclusions chapters.

Expectation

Khalifa and Liu (2004) point out that the debate is not over as to the whether *desired* expectations, rather than expectations alone accounts for more of a consumer's disconfirmation of a purchasing experience. Whilst the use of desires and delight is moving EDT in an encouraging direction, the precedence in research up until now has been to use the traditional definition of expectations as an antecedent to disconfirmation, and so will this study. The expectations construct will therefore be operationalized in terms of the 'will' sentiment, rather than the 'should' sentiment.
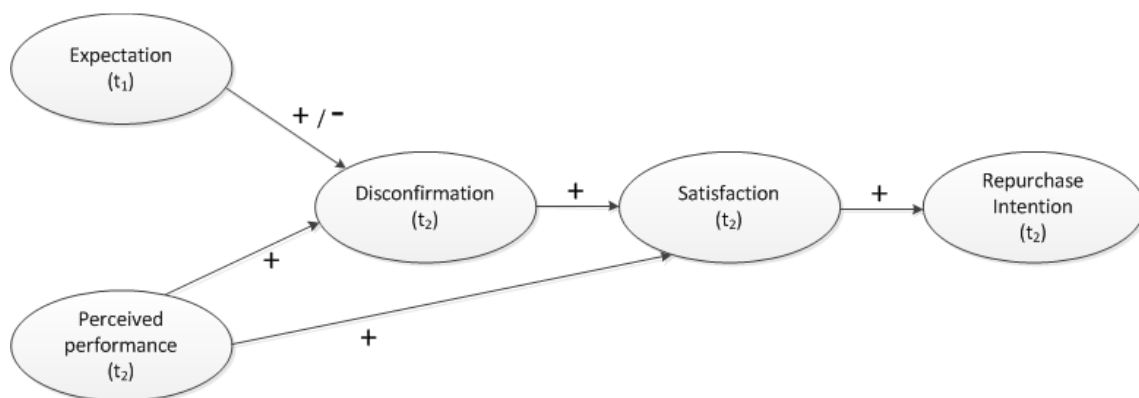
Figure 7: Expectation-disconfirmation theory and continued use (Source: Adapted from Bhattacherjee, 2001)

Figure 7 represents the expression of EDT as it will be used in this study. It is a fairly standard version, applied successfully to the information systems context by (Bhattacherjee, 2001) and is conceptually clear. It includes both disconfirmation and

perceived performance as distinct constructs, with disconfirmation the dependent variable and perceived performance the independent variable in the relationship. Expectation is present as an antecedent to disconfirmation and the presence of both positive and negative sign indicates that the relationship between the variables is representative of whether the 'will' standard or the 'should' standard is selected. This study will adopt the 'will' standard, implying that if consumer expectations (as future predictions) increase, a hypothesised increase in disconfirmation is expected (Boulding, *et al.*, (1993). If the 'should' standard was to be used instead, the relationship between expectation and disconfirmation would be negative and an increase in expectations would result in a decrease in disconfirmation.

3.3.4 Section summary

This section has discussed the theoretical underpinnings of EDT, its development over the last thirty years as a predominantly marketing-related framework, the areas of debate and its current alternatives. It has also discussed how EDT may be operationalized in terms of the requirements of the research problem of this study. Whilst EDT has been successfully held up to scrutiny in the traditional marketing context for the last thirty years and provides deeper insight into the formation of the satisfaction and consumer behaviour constructs than its alternatives, its applicability to the context of information systems (and specifically e-commerce) will need to be established.

Social buying leverages the phenomena of social media and electronic commerce, both of which are reliant on broadband connectivity delivered through the Internet as well as on the information systems (IS) which support them. The first stage of the end-to-end social buying transaction is conducted entirely online, and so information systems characteristics will play an important role in managing the relationship between the social buyer broker and the consumer. These characteristics are reported on in the next section.

3.4   *Factors contributing to information system (IS) success*

Section 3.2 discussed customer loyalty and how the extant literature regards customer satisfaction as being one of its primary causal influences. Customer perceived value in transaction exchanges was identified as an important antecedent to customer satisfaction, as was the reputation of the company involved. This section will review how the satisfaction construct has been operationalized within the context

of the information systems (IS) research field. This association is essential to the research problem since the success of the social buying innovation is deeply coupled to its exploitation of online information systems and electronic commerce. The section will further identify additional antecedents to the satisfaction construct, as they pertain to information systems, completing the fulfilment of research sub-objectives 1a and 2a.

3.4.1 The state of early IS research

Jarvenpaa, Dickson & DeSanctis (1985) highlight the problem which existed within experimentally based IS research in the 1970s and 1980s. They pointed to five problem areas including the lack of a theory base, a proliferation of measuring instruments (sometimes of questionable reliability or validity), inappropriate research designs, and inconsistency in experimental tasks. This section describes the evolution of IS research in terms of the identification of the variables which contribute to IS success, the measurement of the variables, and the organisation of the variables into sound theoretical models.

Khalifa and Liu (2004:38), in a report on the state of satisfaction research within the information systems (IS) context, concluded that "the importance of the online customer satisfaction topic to practitioners is mainly due to the strong relationship between satisfaction and retention". The growth in e-commerce in general, and e-retailing in particular, has meant that organisations are not only selling an increasing number of products and services from websites and portals, but are also offering secondary services such as support, after-sales services and self-service capabilities. The upsurge in perceived value of IS within the commercial context means customer satisfaction with IS systems is becoming progressively more important (Mahmood, Burn, Gemoets & Jacquez, 2000).

3.4.2 The problem of who and what to measure

Before the 1980s, direct users of computers were specialised computer operators whose main job function was to input data and program information systems to output the results required by managers (Doll and Torkzadeh, 1988; Khalifa and Liu, 2004). These users were termed secondary users, whilst the primary users were defined as managers who used the output from the systems to inform their decision making (Davis and Olson, 1985 cited in Doll and Torkzadeh, 1988). Thus, research into satisfaction with these management information systems was mainly focussed

on the managers, since organisational benefits were seen to derive from the interpretation of system information by the management function. Thus, satisfaction with the utility and value of the reports produced by the information systems was measured rather than the utility and value of the systems themselves (Ives, Olson & Baroudi, 1983 citing Gallagher, 1974; Larcker and Lessig, 1980, cited in Delone and McLean, 1992).

From a comprehensive review of the literature pertaining to computer user satisfaction up until that time, Bailey and Pearson (1983) specified an instrument to measure management satisfaction with information systems comprising a total of 38 factors. These included top management involvement, the relationship with data processing staff, degree of training, format of output, volume of output and vendor support. They found that most of the 38 factors were selected as the most important at least once by the sample of managers, and that the importance of any factor was variable across the respondents. Whilst it is acknowledged that the main aim of Bailey and Pearson's research to establish a complete instrument, the number of user satisfaction determinants limited the insights which could be drawn from this instrument.

Ives, *et al.*, (1983) noted the complexity of the Bailey and Pearson (1983) measurement instrument, and conducted a study of management satisfaction to reduce the number of scales in the instrument as well as the number of items in each scale. Empirical analysis of the reliability, content validity and construct validity of each scale resulted in a reduction from the original 38 to 22. The two items with the least correlation to the others in a scale were also eliminated, reducing the items in each scale from four to two. This resulted in a shorter and easier to administrate instrument measuring management satisfaction with information systems.

In the late 1970s and 1980s, however, the direct use of computers and applications by employees whose main job function was not related to the operation of the computers grew rapidly. Managers became the end users of the information systems themselves, rather than merely recipients of the summarised output of the systems at the same time that their line staff became consumers of information rather than merely producers. This blurring of distinction between primary and secondary users was termed end user computing (EUC) by Doll and Torkzadeh (1988). Doll and

Torkzadeh (1988) noted that for end users, several of the Bailey and Pearson items seemed less appropriate, including those which measure characteristics of the data processing staff such as relationships, attitudes, communication et cetera. Doll and Torkzadeh (1988) generated a list of items aimed at measuring end user computing satisfaction and, through exploratory factor analysis, identified a model comprising five factors which they interpreted as content, accuracy, format, ease of use, and timeliness. The robustness of the factors was established in retest studies across different population, industry and employee position subgroups. McHaney, Hightower & Pearson (2002) generalised the instrument to the Taiwanese context, demonstrating its validity across cultural boundaries.

McHaney, *et al.* (2002) observed that at the time, during the eighties and early nineties, a comprehensive measurement scale for measuring end user satisfaction with information systems did not yet exist. They did, however, acknowledge that the Doll and Torkzadeh (1988) instrument was a reasonable surrogate. It was only in the nineties that researchers began to achieve general consensus regarding the likely antecedents of IS satisfaction and consequently demonstrate reliability and validity within the measurement scales. DeLone and McLean were at the vanguard of this effort.

3.4.3 System and information quality

As observed by DeLone and McLean (1992), up until the early 1990s some researchers tended to focus on factors which described the *system* which produces the information (system quality) whilst others have tended to focus on characteristics of the *information* product (information quality).

Hamilton and Chervany (1981) were advocates of system quality influences on the overall success of information systems, including such items as response time, data currency, interface design, formatting, data characteristics, customer satisfaction and regulatory compliance. Kriebel and Raviv (1980) argued for the importance of performance measures and resource utilisation which would have the effect of improved productivity among users. Srinivasan (1985) asserted that perceived effectiveness characteristics and system effectiveness characteristics were of salient importance in establishing the effectiveness of information systems.

There were likewise many proponents of information quality as contributing to the success of information systems. Larcker and Lessig (1980, cited in Delone and McLean, 1992) measured the perceived importance and usefulness of information made available by information systems in a scale numbering 40 items. Bailey and Pearson (1983) included many information usage items in their measurement scale which was discussed earlier. Miller and Doyle (1987) specified information completeness, accuracy, currency and volume; and the relevance and availability of report contents as contributing to the success of information systems. In a study investigating the development of information systems, Mahmood (1987) pointed to a similar mix of information system characteristics to that identified by Miller and Doyle (1987), such as flexibility, adaptability and output quality (accuracy, reliability and timeliness).

The fact that these different approaches, comprising multiple measurement scales of varying scope, were adopted in attempts to measure the effectiveness of information systems pointed to the need for a more robust theoretical framework which would bring them into a more parsimonious model of information systems. DeLone and McLean (1992) provided the initial movement towards this goal.

3.4.4 DeLone and McLean's IS success model

In a seminal article, DeLone and Mclean (1992) found in their review of the IS literature at the time that there existed a large number of broadly arranged dependant variables which researchers had applied. They observed that this range of dependant variables needed to be reduced to a set which had been developed, validated and applied, with IS satisfaction measured as a multidimensional construct. DeLone and McLean (1992) introduced a classification of the dimensions of information systems (IS) success, comprising: system quality, information quality, use, user satisfaction, individual impact, and organisational impact. They further noted that the six categories of IS satisfaction can be arranged in a model to represent an interdependency of the satisfaction constructs while maintaining the temporal nature of the flow of information through to impact. Dividing the model along temporal lines yields three sections to the model: i) system and information quality, which influence ii) use and user satisfaction (which are self-affecting), influencing in turn iii) individual impact and organisational impact.
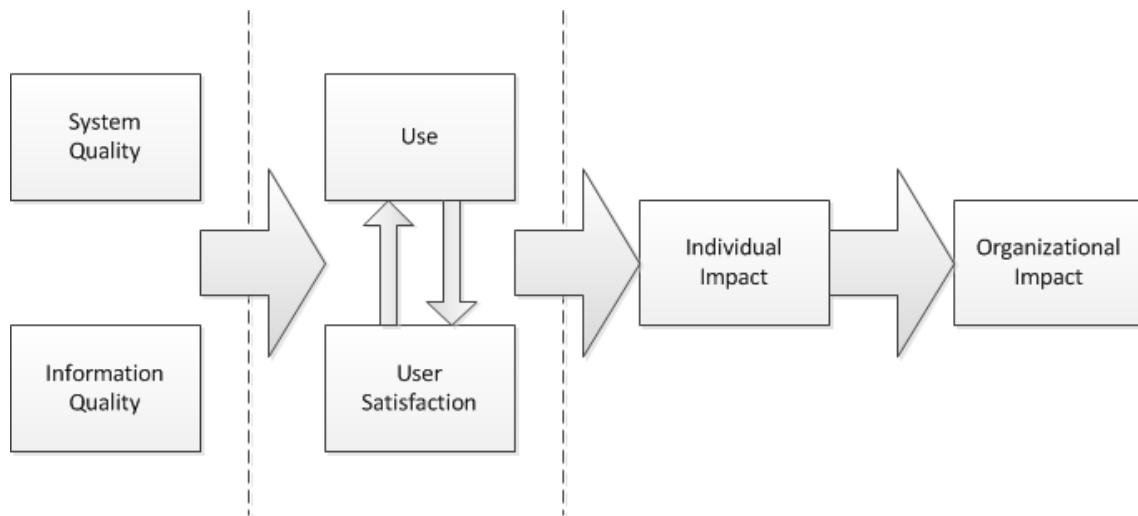
The DeLone and McLean (1992) (D&M) IS success model of Figure 8 was a significant advancement in modelling information system success, since it brought together a field which had until that time been fragmented in its approach. Furthermore it emphasised the role of user satisfaction as a dependent variable and proposed system quality and information quality as its antecedents.

As important a step forward as it was, the D&M model suffered from several weaknesses. First, as Pitt, Watson, & Kavan (1995) noted, the model adopted a *product*-centric view of information systems, whilst the field was rapidly changing to include the delivery of IS-related *services* to consumers. Pitt, *et al.*, (1995:175) argued that excluding service quality as a dimension in the model could potentially lead to an "inaccurate reading of overall IS effectiveness."

Other weaknesses, pointed out by Seddon (1997), included over-complexity (ambiguous meaning of the 'use' construct) and misspecification (by mixing process and causal relationships). Seddon (1997) suggested a respecified model but, since his proposed model suffered from its own complexity issues, his major contribution can be argued to be his critique of the D&M model. This critique was taken seriously by DeLone and McLean (2003:9) who, in a ten year review of their IS Success model, discussed the "research efforts that apply, validate, challenge, and propose enhancements" to their original model. Answering Seddon's (1997) criticisms directly, they proposed an updated version of the original model, given in Figure 9 below.
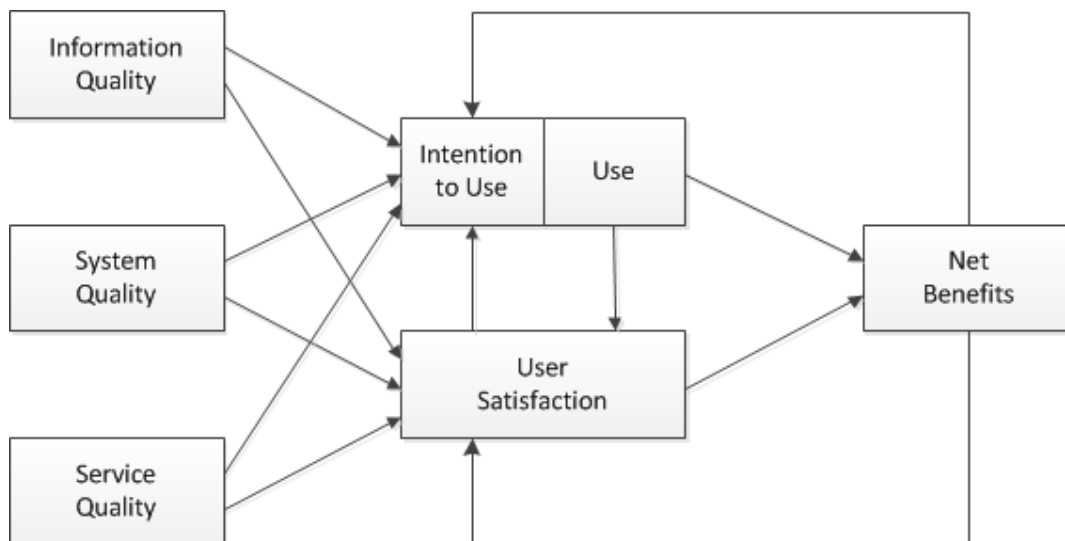
Whilst DeLone and McLean (2003) did make passing comment on the increasing role of the Internet and e-commerce in information systems, the updated D&M model failed to broaden the scope of the 'user satisfaction' construct to a 'consumer satisfaction' construct. This demonstrates that DeLone and McLean (2003) still saw IS success as being primarily concerned with system users (employees obliged to use the system as part of their job specification) of client-server information systems. In contrast, consumers include both system users and *customers*, who *choose* to use information systems, usually in web-based scenarios.

The most substantial and important update to the D&M IS success model is the inclusion, at the suggestion of Pitt, *et al.*, (1995), of the service quality factor into the field of information systems research, and its recognition as an antecedent to the satisfaction construct. The central role of service quality to information systems, and its importance to this research, is established in the next section.

3.4.5 Service quality and e-service quality

In a seminal article, Parasuraman, Zeithaml, & Berry (1988) proposed a measurement scale for operationalizing the service quality construct. Service quality was proposed as a means for businesses to differentiate themselves and, in many cases of intense competition, ensure survival. Five service dimensions were suggested in the form of tangibles, reliability, responsiveness, assurance and empathy, which were measured by 22 items. This SERVQAUL scale, arrived at through factor analysis and comprehensive testing for validity and reliability, was

specifically constructed for application in the product or service retail industry. Whilst the SERVQUAL measurement scale enjoyed widespread application it was not without criticism. Brown, Churchill & Peter (1993), Teas (1993) and Van Dyke, *et al.* (1997) criticised the scale based on practical, operational and conceptual concerns, and specifically around the validity of operationalizing service quality as the *gap* between two constructs, 'perceived service' and 'expected service', which were each measured by separate instruments. Parasuraman, Zeithaml, & Berry (1993) responded with a defence of the SERVQAUL standard. Pitt, *et al.* (1997) also defended the scale by contending that the questions raised about the validity of the perceptions-expectations gap calculation were overstated and that the practical use of the SERVQUAL instrument over the alternative 'perceptions-only' measurement scale advanced by Brown, *et al.* (1993) more than makes up for any potential construct ambiguity. Subsequent criticisms of SERVQUAL have resulted in its modification and improvement and it is considered the leading instrument for assessment of perceived service quality within the marketing literature (Kettinger and Lee, 1994).

In tandem with the growth of end user computing, there has been the commensurate decentralisation of information systems and a proliferation of choice in terms of products (Kettinger and Lee, 1994). Managers, who have become direct users of computing systems, will naturally seek to purchase and deploy a system which will meet not only the information storage and generation needs of the organisation, but also the human needs of the users. Kettinger and Lee (1994) therefore suggest that such users, with the discretion to choose one system over another, should be treated as customers. As such, the principles of marketing become important, including the concept of customer service quality. Kettinger and Lee (1994) introduced the SERVQUAL measurement of Parasuraman, *et al.* (1988) into the information systems function. They found that the SERVQAUL instrument complemented the traditional Doll and Torkzadeh (1988) user satisfaction instrument, capturing dimensions not specified under the latter.

Pitt, *et al.*, (1995) noted that with the decentralisation of the IS function, the role of the IS department has broadened from a provider of systems to a provider of information services, such as help desks. In an application of the SERVQUAL scale to the information systems function in three organisations across different industries,

they demonstrated that it is an appropriate instrument to measure service quality in the IS context and confirmed Parasuraman, *et al.*'s (1988) assertion that the *periodic* application of the instrument can incrementally improve IS service quality in firms. Van Dyke, *et al.* (1997), however, contended that the generalisation of the SERVQUAL measurement across industries or contexts is not feasible, since as many as 50 per cent of the SERVQUAL items may need to be replaced. They challenged Pitt, *et al.*'s (1995) findings of the suitability of SERVQUAL in the IS context, citing Kettinger and Lee's (1994) study that showed that whilst SERVQUAL could supplement other instruments, it did not account for all the factors contributing to service quality.

The generalisation concerns regarding the applicability of the SERVQUAL measurement instrument raised by Van Dyke, *et al.* (1997) to information systems context have been well noted by researchers, including those involved in its construction. Parasuraman, Zeithaml & Malhotra (2005:213) noted that "[i]f Web channels are to be accepted by consumers, companies must shift the focus of e-business from e-commerce – the transactions – to e-service – all cues and encounters that occur before, during, and after the transactions." Parasuraman, *et al.* (2005) noted that e-service has been an area businesses have overlooked, even those focussing on the e-business arena. The difference between delivering traditional service quality and e-service quality is that the former is through people and the latter is through information systems.

Acknowledging that adapting the scale from traditional retailing scenarios to e-business scenarios may be challenged on reliability and validity grounds, Parasuraman, *et al.* (2005) motivated for the development of a new scale to measure *e*-service quality. In the early 2000s, several instruments regarding websites and e-business were proposed, as reviewed by Parasuraman, *et al.* (2005). Most, however, dealt with specific areas, such as the quality of the sites themselves. One dealt with e-commerce websites without the requirement of transaction completion. Wolfinbarger and Gilly (2003, cited in Parasuraman, *et al.*, 2005) constructed a scale to test perceptions of e-tailing website quality, including online customer service. Zeithaml, Parasuraman & Malhotra (2002) proposed five broad criteria sets pertaining to e-service quality comprising information availability and content; ease of use or usability; privacy/security; graphic style; and reliability/fulfilment.

The E-S-QUAL scale was subsequently developed through a process of exploratory factor analysis to reduce the potential list of factors suggested by their review of the literature from 11 dimensions of 121 items down to four dimensions of 22 items, which were then assessed with confirmatory factor analysis to establish the goodness-of-fit of the factors with the sample data. The resulting dimensions were reported by Parasuraman, *et al.* (2005) as:

1. *Efficiency:* The ease and speed of accessing and using the site.
2. *Fulfilment:* The extent to which the site's promises about order delivery and item availability are fulfilled.
3. *System availability:* The correct technical functioning of the site.
4. *Privacy:* The degree to which the site is safe and protects customer information.

Parasuraman, *et al.* (2005) found that efficiency and fulfilment were the most important aspects of e-service quality, and also on perceived value and loyalty intentions, followed by system availability and privacy. Privacy may be the lowest in priority only because experienced e-commerce users will have built up trust with a site and have come to expect this as a 'hygiene factor'. E-S-QUAL is a parsimonious scale aimed at obtaining a global (as opposed to transaction-specific) assessment of a website's service quality.

The E-S-QUAL successfully combines the three separate quality dimensions (information, system and service quality) of the updated D&M IS success model into a single comprehensive and parsimonious measurement scale. Parasuraman, *et al.* (2005) do acknowledge, however, that owing to the breadth and scope of information systems applications and scenarios, the given scale may not be perfectly suited to all such scenarios. In these cases, they contend, some specific scale items may be adapted by researchers to fit the particular context of the investigation.

3.4.6 Section summary

This section began with a review on the development of information systems research from a fairly fragmented field in the 1980s to one exhibiting increasing rigour. It recorded the early attempts at establishing measurement scales which held explanatory power within field. It emphasised the contribution of the DeLone and

McLean (1992, 2003) IS success model and highlighted the role of user satisfaction. It identified the importance system quality, information quality and service (and e-service) quality as antecedents to a satisfaction construct.

The role of service quality in keeping customers satisfied should not be underestimated in information systems. Jeff Bezos, founder of Amazon.com, asserted that "[i]n the offline world ... 30% of a company's resources are spent providing a good customer experience and 70% goes to marketing. But online … 70% should be devoted to creating a great customer experience and 30% should be spent on 'shouting' about it" (Bezos, 1999, cited in Zeithaml, *et al.*, 2002:362).

Whilst the updated IS success model captures the important antecedents to a construct for satisfaction (of information system users), it has some shortcomings as far as the objectives of this study are concerned. Most importantly, the model does not capture the user's *behaviours* and *attitude formation* which lead to the decision to reuse the system and which are critical in investigating consumers' feelings of satisfaction and therefore loyalty intentions. Since prevailing information systems model dealing with consumer satisfaction, the DeLone and McLean (D&M) IS success model (DeLone and McLean, 2003) does not impart a great deal of insight into the *mechanism* by which satisfaction antecedents contribute to the user's satisfaction, whilst expectancy-disconfirmation theory (EDT) does. The next section will provide a theoretical foundation for the synthesis of EDT with the D&M IS success model.

3.5   The synthesis of the D&M IS success model and EDT

The social buying e-business transaction extends across two distinct stages. The first stage involves purchasers engaging with the online social buying platform, selecting the deal they want, and committing to an electronic commerce transaction subject to the deal 'tipping'. Once tipped, purchasers are emailed an electronic voucher. The second stage involves the consumer (who may or may not be the same individual as the purchaser) redeeming the voucher with the merchant who offered the deal on the social buying platform, as part of the fulfilment transaction. The first e-commerce transaction involves interaction with online information systems. The second fulfilment transaction is a more traditional commercial exchange of goods for money (represented by the voucher). In order to meet the research sub-objectives 2a and

2b, a theoretical framework is required which supports both types of transactions. This section reviews the work that has been done in terms of synthesising expectancy-disconfirmation theory with the D&M IS success model.

3.5.1 The applicability of EDT to the IS context

Bhattacherjee (2001) was one of the first researchers to adapt the expectation-disconfirmation theory of Oliver (1980) to the continued use of IS systems, as opposed to the mere acceptance of the IS system on first use. He noted that it is important to distinguish between the *ex-ante* and *ex-post* effects of expectation and disconfirmation when explaining IS continuance. In a study of online banking, he tested this version of EDT and found that the significant relationships hypothesised by EDT (between disconfirmation and satisfaction, and satisfaction and repurchase intention) were upheld by his results. This established EDT as a viable model for application in IS contexts.

In a follow-up study to Bhattacherjee's (2001) study, Bhattacherjee and Premkumar (2004) set out to test the applicability of EDT to the IS context with respect to *changing* expectations and attitudes over time in a longitudinal study. They asserted that the beliefs and attitudes held by a consumer before using an information technology (IT) system for the first time are likely to change with continued use. This will affect the disconfirmation construct as measured at these different times and therefore also consumer satisfaction. Their results showed that beliefs and attitudes do change over time and further confirmed that disconfirmation and satisfaction constructs played a significant role in driving the belief and attitude changes. They recommended that continued tracking of users' disconfirmation is required in order to determine when and why negative disconfirmation arises so that improvements may be applied before the resulting dissatisfaction leads to discontinuance of the system. Importantly, the study measuring changing beliefs and attitudes highlighted the risk of marketers creating hype around products or services by artificially inflating consumers' expectations since, whilst it may lead to an increase in new consumers in terms of 'first-usage', the resulting negative disconfirmation will very likely not lead to repurchases.

3.5.2 Extending EDT with IS success factors

In a much-cited article, McKinney, *et al.* (2002) further contributed to the application of EDT to the IS context, specifically engaging the website satisfaction construct with

respect to e-commerce sites such as those investigated in the study, online travel agents. They combined DeLone and McLean's (1992) IS success model with EDT to put forward a model of web-customer satisfaction which separated the EDT constructs of expectation, perceived performance, disconfirmation and satisfaction along the lines of the distinct IS success factors of information quality and system quality. Their model was the first synthesis of the D&M IS success model and EDT, advancing the applicability of EDT to the IS context.
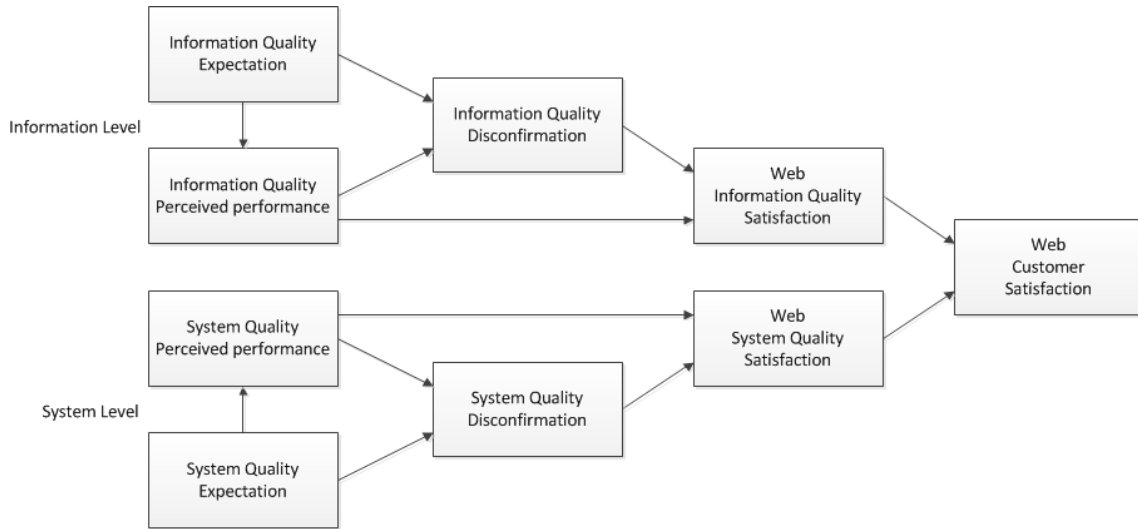
Figure 10: A synthesis of the IS success model and EDT for web-customers (Source: McKinney, *et al.*, 2002, p. 298)

In their study they followed DeLone and McLean's advice that the selection of the specific success measures should always be contingent on the nature of the research problem. Thus, in their development of an instrument to measure each of the information quality and system quality constructs, they reviewed the literature relevant to their research problem, regarding website satisfaction, to arrive a set of factors which factor analysis revealed was parsimonious (a characteristic touted by DeLone and McLean as being key to a successful application of their model) and demonstrated high discriminant validity.

Since the McKinney, *et al.*, (2002) study was published a year before DeLone and McLean (2003) published their updated version of their model, Figure 10 does not include service quality as a factor together with information quality and system quality. Furthermore, as discussed in section 3.3.5, both studies were published before the development of the E-S-QUAL measurement scale by Parasuraman, *et al.*, (2005) combined all aspects of information systems quality, including information,

system and service quality items, into a single instrument. The important contribution of McKinney, *et al.*, (2002) is regarded primarily as the synthesis of the principles of the D&M IS success model with the theoretical rigour of expectancy-disconfirmation theory.

Yen and Lu (2008a) adopted a similar approach in their study on the factors which influence the repurchase intention of users of online auction websites, such as eBay and Yahoo. Two differences in their model design are noteworthy. First, in McKinney, *et al.*'s (2002) model, disconfirmation and satisfaction were measured separately with each antecedent factor (information quality and system quality). In Yen and Lu's model, the disconfirmation and satisfaction constructs were measured not with respect to the antecedent factors, but with respect to the *auctioneer*; in other words, with respect to the broker. This is illustrated in Figure 11, representing their model.
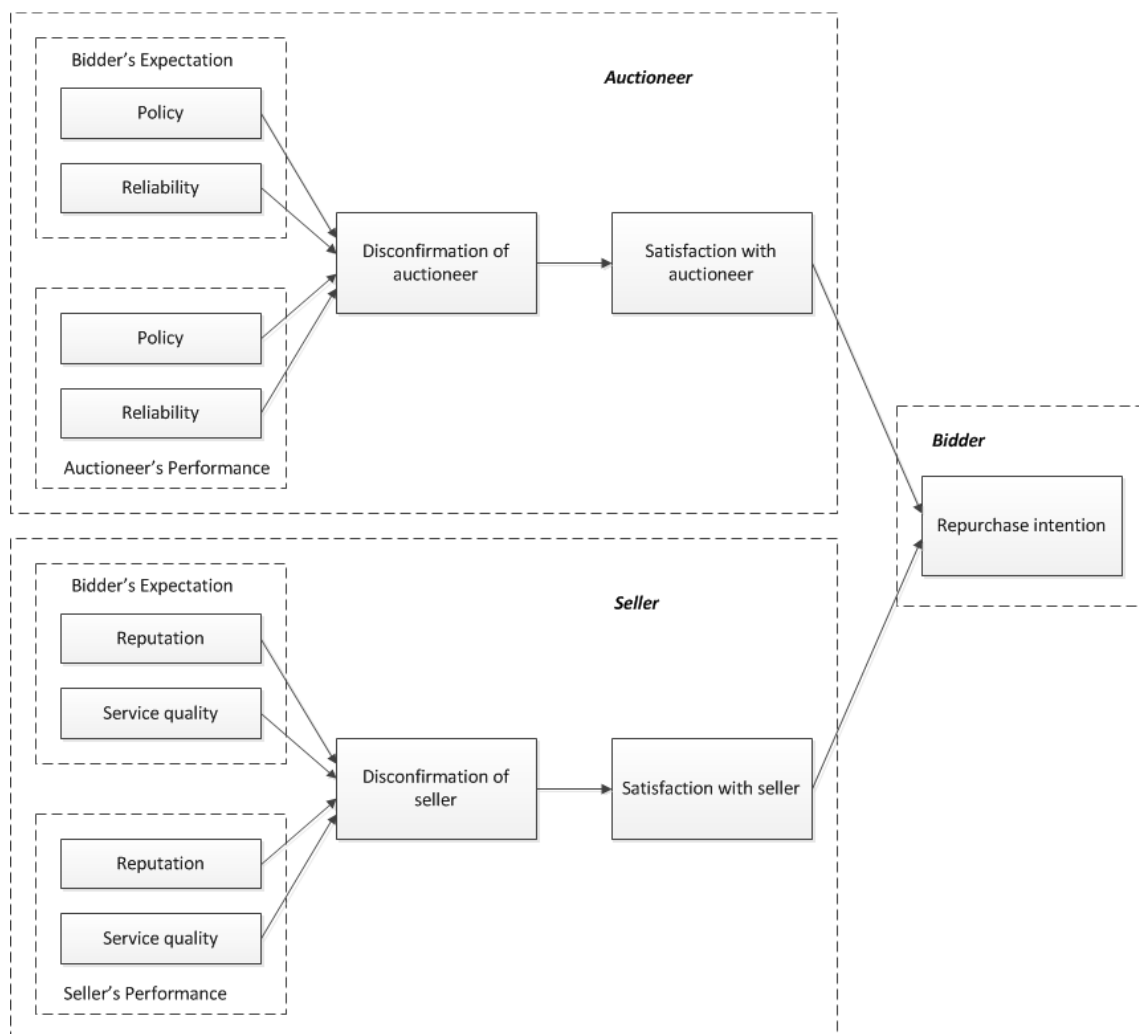
Figure 11: A synthesis of the IS success model and EDT for online auctions (Source: Yen and Lu, 2008a, p. 11)

The second difference between Yen and Lu's (2008a) model and McKinney, *et al.*'s (2002) model is especially important to the context of the research problem of this study. Yen and Lu (2008a) separated the expectation-disconfirmation model along the two stages of the transaction process involved in online auctions. This is an important separation. In the traditional e-retailing case, consumers typically purchase new goods from reputable merchants who then package and deliver the goods to the consumer. The relationship is between the consumer and the retailer. In the online auction case, there are two distinct relationships: between the consumer and the auctioneer, and between the consumer and the selling individual. The concepts of reputation and trust will apply differently in these two relationships. Yen and Lu's (2008a) model allows for consumers' expectation and disconfirmation to be modelled separately, leading to separate constructs for satisfaction: one measuring satisfaction with the auctioneer, and the other measuring satisfaction with the seller. Whilst there are two parts to the transaction, the consumer will modify his belief systems and form attitudes to reusing the online auction website for repurchase based on his satisfaction with both parts of the transaction. A similar approach will be taken in this study and is discussed in detail in section 4.7.1.

Yen and Lu (2008b), in a separate study on loyalty intention in online auction settings, again applied the McKinney, *et al.*, (2002) synthesised approach to IS success and expectancy-disconfirmation. In terms of IS success, they included an adaptation of the Parasuraman, *et al.*, (2005) E-S-QUAL measurement scale as well as including a perceived net benefits factor loading directly onto the satisfaction construct. In terms of EDT, they modelled the roles of e-service quality expectations on the disconfirmation, satisfaction and loyalty intention series. They found strong support for both IS success and EDT components of the synthesised model.

3.5.3 Section summary

This section discussed how expectancy-disconfirmation theory had been applied successfully to the information systems field; specifically how it incorporated elements of the DeLone and McLean (2003) IS success model. Two important applications of the synthesis of EDT and the D&M model were discussed. First, McKinney, *et al.*, (2002) are acknowledged to be the first practitioners to use the synthesised model. Second, Yen and Lu's (2008a) version was held up as having particular relevance to this study in that it established two features which will be

replicated: i) the application of disconfirmation and satisfaction constructs as they pertain to the participant in the transaction, rather than the independent variable; and ii) the application of a two-stage model which acknowledges the distinct characteristics of each stage, whilst still employing the principles of expectancy-disconfirmation to both.

3.6   Chapter summary

The research problem of this study involves an investigation into the factors which influence loyalty intention among consumers of online social buying platforms. In order to review the extant literature as it pertains to the objectives of the study, this chapter was broken into five sections. The first section discussed the origins, characteristics and development of social buying as a significant marketing innovation. The second dealt with loyalty intention, specifically arguing that satisfaction is seen, both in the marketing and service management literature, as a salient antecedent to loyalty intentions whilst acknowledging that there remain areas of debate. It further motivated why reputation and perceived value are considered important influences on satisfaction. Expectancy-disconfirmation theory (EDT) was established in section three as the most appropriate framework for relating loyalty intention and satisfaction with their antecedent factors, within the context of the research problem. It provides a cognitive theory which captures the formation of consumers' beliefs and attitudes and measures them against a judgemental standard, providing a mechanism for operationalizing the constructs. Section four brought the theory and application of information systems research into scope. It began with a review of the development of information systems research from a fairly fragmented field into its more rigorous treatment today. System and information quality were highlighted as early influences on information systems satisfaction, and the DeLone and McLean (2003) IS success model was positioned as being the prevailing theoretical framework for establishing the links. This was followed by a review of the work of Parasuraman, *et al.*, (2005) and others which led to the development of a comprehensive measurement scale for information systems contexts. The E-S-QUAL scale combined and rationalised the items of all information systems quality-related factors into a single instrument, including information quality, system quality and service quality. Section five described how, in the literature, EDT and the DeLone and McLean (2003) IS success model had been successfully synthesised for applications of EDT to information systems contexts. It discussed two

important applications of the synthesised model, and discussed some consequences of these applications which will be extended by this research, as will be discussed in the next section describing the research design.

4 RESEARCH DESIGN AND METHODOLOGY

The purpose of this formalised study is to contribute to the knowledge around the social buying marketing mechanism within the South African context. Specifically, it aims to satisfy the research objectives and questions identified in section 1.4 which, together with the research problem, are repeated below for convenience.

Neither the constructs which influence consumer loyalty intention behaviours on social buying websites in South Africa, nor their interrelationships, have yet been identified.

Research objectives:

1. To investigate how consumers' interactions with the social buying website influences their loyalty intention towards the social buying broker.
    a. To identify from the literature and propose potential factors affecting a consumer's experience with a social buying platform.
    b. To examine the interrelationships between the proposed factors and loyalty intention using a structural model informed by expectancy-disconfirmation theory.

2. To investigate how consumers' interactions with the merchants who fulfil the consumers' social buying vouchers influences their loyalty intention towards the social buying broker.
    a. To identify from the literature and propose potential factors affecting a consumer's experience with a merchant.
    b. To examine the interrelationships between the proposed factors and loyalty intention using a structural model informed by expectancy-disconfirmation theory.

Research questions:
- Is EDT an appropriate model for social buying in South Africa?
- To what extent does 'perceived performance' mediate disconfirmation?
- To what extent does e-service quality account for consumer satisfaction with social buying platforms?

- Does the E-S-QUAL measurement scale provide a suitable basis for measuring e-service quality in social buying platforms?
- To what extent do service quality, company reputation and perceived value account for consumer satisfaction with merchants?

4.1 Research paradigm and design

A debate, referred to in the literature as the 'paradigm wars', which has fumed amongst the practitioners of the social sciences, including the field of information systems, for over 20 years seems to have lately receded into an uneasy truce (Mingers, 2004). The main protagonists have taken the view of one of original positivism, the emerging interpretivism or, more recently, the more accommodating pluralism, although a number of alternative viewpoints have been put forward. Chen and Hirschheim (2004) regard positivists as those who believe that "reality exists objectively and independently from human experiences" and who are concerned with the "hypothetic-deductive testability of theories". They regard interpretivists as those who believe in the "subjective meaning of reality [which] is constructed and reconstructed through a human and social interaction process" and who "assume that scientific knowledge should be obtained through the understanding of human and social interaction" (Chen and Hirschheim, 2004:201). Pluralists acknowledge that there is a place for both viewpoints and that each might be appropriate for particular research scenarios.

Interestingly, in a paradigmatic comparison between US and European IS researchers over a ten year period between 1991 and 2001, Chen and Hirschheim (2004) noted a number of characteristics. These characteristics, summarised below, suggest that IS research remains a predominantly positivist field with empirical, quantitative studies dominating:

- Overall, positivism remained the dominant research approach in IS publications at 81%, although it observed a slight increase in interpretivist research.
- At the start of the ten year period, non-empirical research dominated empirical research, whilst at the end of the period the trend has seen empirical research dominate non-empirical research. Empirical studies rely on observations and data, whilst non-empirical studies emphasis ideas and concepts (Alavi, Carlson and Brooke, 1989, cited in Chen and Hirschheim, 2004).

- Quantitative IS research still dominates qualitative IS research although the gap is considerably less than in 2001. In 2001, there were slightly more qualitative studies published than quantitative studies. Quantitative research involves "the collection of numerical data, the summary of those data and the drawing of inferences from the data", whilst qualitative research may be regarded as the collection and description of non-mathematical information about behaviours, attitudes and situations (Coldwell and Herbst, 2004:15).
- Surveys and case studies are by far the most popular IS research designs, whilst laboratory experiments, action research and field experiments have remained less popular.

This study acknowledges the qualitative nature of the concepts and constructs under investigation, such as consumer satisfaction and intention behaviours. It also acknowledges the qualitative nature of the primary data collected, which deals with human attitudes, beliefs and perceptions. However, this research may be considered primarily a quantitative study in the positivist mode for the following reasons (Chen and Hirschheim, 2004):

- Its research design comprises a structured survey instrument which employs a summated Likert scale;
- It tests specific hypotheses;
- It employs quantitative statistical analysis methods;
- It attempts an objective, value-free interpretation of the data.

The research is cross-sectional in nature, taking a snapshot of the population at a particular point in time (Coldwell and Herbst, 2004). Due to the dynamic nature of the information systems field, especially the changing attitudes to, and acceptance of, computer and information technology (Khalifa and Liu, 2004), a longitudinal study would be most appropriate for this study. The timing of the snapshot survey can also affect the results (Coldwell and Herbst, 2004). In this study this is a real concern due to the two events (acknowledged in section 1.6.2 dealing with limitations of the research) which occurred close to the time that the research was carried out. First, Wicount suffered a security breach which was revealed in the media. Security and privacy are variables measured in this research. Second, the research was conducted at the time of Wicount's first birthday. Wicount celebrated with a free

promotional campaign which elicited a large take-up. As discussed in section 1.6.2, this could potentially have contributed to a temporary bias in responses.

Coldwell and Herbst (2004) assert that research may be descriptive or causal in nature. This quantitative study has both descriptive and causal elements to it. It first attempts to describe the nature and relevance of a number of variables. It then attempts to establish relationships between the variables as specified by path models. Care should be taken when asserting that these relationships are causal in nature. For instance, a correlation between two variables does not necessarily imply a cause-and-effect relationship. For instance, Tracz (1992, cited in Schumacker and Lomax, 2004) gives three necessary conditions for causality between two variables X and Y to be satisfied:

1. Temporal order (i.e. X precedes Y in time);
2. The existence of covariance or correlation between X and Y; and
3. Control for other causes.

Schumacker and Lomax (2004) argue that model testing within the ambit of structural equation modelling (SEM) depicts a causal assumption. SEM will be applied in satisfying research objectives 1b and 2b which deal with model testing and establish causal relationships between the model variables. Two *a priori* theoretical models are proposed and tested, one for each of objective 1b and 2b respectively. This process is discussed in greater detail in sections 4.6 *statistical analysis*; and 4.7 *research models and hypotheses*.

The first part of each research objective (1a and 2a) deals with the identification, from the extant literature, of suggested factors which will be included in the models tested. The literature review of chapter 3 satisfies these objectives, particularly sections 3.2 and 3.4 which deal with the main constructs of loyalty, satisfaction, service quality, perceived value and reputation.

4.2   Research instruments

The study will use two cross-sectional survey research instruments for quantitative data analysis. The first survey instrument will comprise a structured questionnaire quantifying the observed variables of a broker disconfirmation measurement model. Similarly, the second survey instrument will comprise a structured questionnaire

quantifying the observed variables of a merchant disconfirmation measurement model.

Each questionnaire will comprise two parts. The first part will consist of demographic items which will be employed for descriptive statistics (Coldwell and Herbst, 2004). The second part will consist of Likert-type scale items which will be employed in model testing.

The scales of each survey instrument (questionnaire) have been constructed with reliability and validity in mind. Each construct, or dimension, included in the instruments is measured by at least three items in order to satisfy a requirement of structural equation modelling (Kline, 1998, cited in McKinney *et al.*, 2002). The psychometric properties of the instruments, as they relate to reliability and validity, will be presented in section 4.5. Where possible, *a priori* scales designed by researchers to measure the constructs under consideration in this study are used. Preference is given to those scales which are supported by multiple studies or by longitudinal studies. Where such scales have been employed or adapted to the objectives of this study is discussed in sections 4.2.2 and 4.2.3.

4.2.1 Sample demographics questions

The first part of each questionnaire comprises sample demographic questions, and online demographic questions. The sample demographic questions will include: age group, sex, degree of schooling and race. The question relating to race is asked at the end of this list since it is a sensitive topic and the preceding questions may help to build confidence. StatsSA (2001) classifies race in South Africa as Indian/Asian; Black; Coloured; and White. This classification is used in this study. However, a 'prefer not to say' option is included to help establish trust in the purpose of the survey and mitigate the potential for respondents to drop out of the survey. An 'other' option is also included in the item, since respondents may choose to classify themselves differently from the standard options available in the South African literature. The online demographic questions will include: Internet usage in years, Internet access connection type and Internet access location. Table 1 below presents the sample demographic questions included in this study.

Sample Demographics

Please indicate your age group:
- < 26
- 26 - 35
- 36 - 45
- 46 - 55
- > 55

Please indicate your sex:
- Male
- Female

What is your highest schooling?
- Some schooling (primary or secondary)
- Matric or equivalent
- National diploma / National higher diploma
- Bachelor's degree or equivalent
- Postgraduate degree

What race would you classify yourself as?
- Asian
- Black
- Coloured
- White
- Other
- Prefer not to say

How many years have you been using the Internet?
- < 1
- 1 - 4
- 5 - 8
- > 8

I mainly access the Internet using the following type of connection:
- 3G
- ADSL
- Dial-up
- Other broadband

I mainly access the Internet from the following location:
- Home
- Work
- Mobile phone
- Internet café

Table 1: Sample demographic questions for both survey questionnaires

4.2.2 Broker disconfirmation questionnaire design

The first part of the broker disconfirmation questionnaire consists of the sample demographic questions presented in section 4.2.1. The second part of the questionnaire deals with the disconfirmation of the consumer's experience with the social buying broker. A six-point Likert-type scale, with anchors ranging from strongly disagree (1) to strongly agree (6), was employed. No middle option signifying attitude

neutrality was included. This was to prevent non-committal responses and encourage the respondents to consider more carefully which attitude they actually hold about the item (Coldwell and Herbst, 2004).

The broker disconfirmation scale comprises five constructs measured by 35 items. The constructs are e-service quality expectation, e-service quality performance, disconfirmation, consumer satisfaction, and loyalty intention. The first two constructs will employ an adapted version of Parasuraman, *et al.*'s (2005) E-S-QUAL scale for e-service quality, with respect to expectation and performance. This scale has been shown to be both reliable and valid when considering the entire e-business context where a global assessment of e-service quality is required, which includes an e-commerce transaction (Parasuraman, *et al.*, 2005).

The E-S-QUAL scale comprises four dimensions which are retained in the research instrument of this study. However, these dimensions in the E-S-QUAL scale were measured by 22 items, whilst in this study's research instrument this number has been reduced to 13 items. The basis for eliminating nine items across the four dimensions is twofold. First, the length of the questionnaire needed to be kept reasonable. The broker disconfirmation scale comprises 35 questions excluding the seven demographic questions. This is deemed to be at the upper limit of what respondents would find acceptable.

Second, several items pertaining to the fulfilment dimension were deemed to have poor face and content validity when considered in the context of social buying and were eliminated. For instance, four questions dealing specifically about the delivery of physical goods were dropped since the broker electronically transmits vouchers for the goods and services to be redeemed by the consumer at a later time. Additionally, four of the eight items pertaining to the efficiency dimension were eliminated because they shared a high content similarity to others, even though it should be noted that Parasuraman *et al.*'s (2005) confirmatory factor analysis yielded significant factor loadings for all eight items. For reference, the original E-S-QUAL measurement scale is included in Appendix 2.

The third and fourth constructs, disconfirmation with the broker and consumer satisfaction respectively, are measured by three items each which have been based

on similar items for disconfirmation and consumer satisfaction in a study of online auction websites (Yen and Lu, 2008a). The fifth construct, loyalty intention, is measured by three items which have been based on those used in a structural model employed by Parasuraman *et al.* (2005) to test the nomological validity of E-S-QUAL. The original items of the nomological study appear in Appendix 3. The broker disconfirmation questionnaire is presented in Table 2 below.

Construct	Measure
Efficiency expectation	
	Before I used the Social Buying website, I expected that:
EEB1	It would make it easy to find what I need
EEB2	It would make it easy to get anywhere on the website
EEB3	It would enable me to complete a transaction quickly
EEB4	It would be well organized
System availability expectation	
	Before I used the Social Buying website, I expected that:
SEB1	It will always be available for business
SEB2	It would not crash
SEB3	Pages at this website would not freeze after I enter my order information
Fulfilment expectation	
	Before I used the Social Buying website, I expected that:
FEB1	It will deliver the product voucher when promised
FEB2	It will be truthful about its offerings
FEB3	It will have in stock the products the company claims to offer
Privacy expectation	
	Before I used the Social Buying website, I expected that:
PEB1	It will protect information about my web-shopping behaviour
PEB2	It will not share my personal information with other websites
PEB3	It will protect information about my credit card
Efficiency performance	
	Having used the Social Buying website, my evaluation of its performance is that:
EPB1	It was easy to find what I needed
EPB2	It was easy to get anywhere on the website
EPB3	It did enable me to complete a transaction quickly
EPB4	It was well organized

System availability performance

Having used the Social Buying website, my evaluation of its performance is that:

SPB1   It has always been available for business

SPB2   It has not crashed

SPB3   Pages at this website did not freeze after I entered my order information

Fulfilment performance

Having used the Social Buying website, my evaluation of its performance is that:

FPB1   It did deliver the product voucher when promised

FPB2   It was truthful about its offerings

FPB3   It did have in stock the products the company claimed to offer

Privacy performance

Having used the Social Buying website, my evaluation of its performance is that:

PPB1   I believe it did protect information about my web-shopping behaviour

PPB2   I believe it did not share my personal information with other websites

PPB3   I believe it did protect information about my credit card

Disconfirmation of broker

DOB1   My experience of using the Social Buying website was better than I had expected

DOB2   Overall, most of my expectations of the Social Buying website were exceeded

DOB3   The Social Buying website operated better than I had expected

Satisfaction with broker

SWB1   I am satisfied with the experience of using this Social Buying website

SWB2   I am pleased with the experience of buying a deal on this Social Buying website

SWB3   My feelings with using this Social Buying website were good

Loyalty intention

LIB1   I intend to continue purchasing deals from this Social Buying website

LIB2   I intend to recommend this Social Buying website to others who seek my advice

LIB3   I consider this site to be my first choice for future Social Buying transactions

Before I used the

Table 2: Scale items of the broker disconfirmation questionnaire

4.2.3 Merchant disconfirmation questionnaire design

The first part of the merchant disconfirmation questionnaire consists of the sample demographic questions presented in section 4.2.1. The second part deals with the disconfirmation of the consumer's experience with the merchant offering the product or service as part of the end-to-end social buying experience. Again, a six-point

Likert-type scale, with anchors ranging from strongly disagree (1) to strongly agree (6), will be employed, with no middle, or neutral, option.

Whereas the broker disconfirmation questionnaire was specifically designed to quantify the observed variables relating to the online purchasing experience supported by the social buying broker's website, the merchant disconfirmation questionnaire deals with the more traditional consumer-retailer engagement. From a review of the satisfaction literature, three oft-cited antecedents to satisfaction have been identified for this branch of the social buying transaction. They are service quality (Hallowell, 1996; Kenney and Khanfar, 2009; Yi and La, 2004), perceived value (Jones and Sasser, 1994; Parasuraman, *et al.* 2005; Gounaris, *et al.*, 2007), and reputation (Anderson and Sullivan, 1993; Yen and Lu, 2008a).

Hence, the merchant disconfirmation scale comprises nine constructs measured by 27 items, three for each construct. The constructs are service quality expectation, service quality performance, perceived value expectation, perceived value performance, reputation expectation, reputation performance, disconfirmation, consumer satisfaction, and loyalty intention.

The service quality scale items (for both expectation and performance constructs) are adapted from those employed by Yen and Lu (2008a) in measuring the quality of service delivered through online auctions. Specific to this study, the concepts being investigated are the expectation and actual performance of service quality relating to the fulfilment by the merchant of the product or service with a discount voucher previously purchased by the consumer from the social buyer broker. Thus, Yen and Lu's (2008a) scale items have been modified to improve their face validity under the conditions of social buying.

The perceived value scale items (for both expectation and performance constructs) are adapted from those used by Parasuraman *et al.* (2005) in their nomological test of the E-S-QUAL measurement scale.

The reputation scale items (for both expectation and performance constructs) are adapted from Yen and Lu (2008a).

The disconfirmation, satisfaction, and loyalty intention scale items are either identical to, or slightly modified from, the same constructs used in the broker disconfirmation questionnaire. Modifications have been made only to capture the differences in context relating to the different stages of the social buying e-business transaction (with the focus moving from the broker to the merchant perspective). The merchant disconfirmation questionnaire is presented in Table 3 below.

Construct	Measure
Reputation expectation	
	Before I purchased a voucher from the Social Buying website, I expected that:
REM1	All companies offering deals on the website would have a good reputation
REM2	The companies featured on the website would live up to their reputations
REM3	I would only buy a deal on the website if I believe the company offering it had a good reputation
Perceived value expectation	
	Before I purchased a voucher from the Social Buying website, I expected that:
VEM1	The prices of the deals on this site would be significantly discounted
VEM2	Overall, the website would be convenient to use
VEM3	Overall, I would get value for the money and effort of using this website
Service quality expectation	
	Before I purchased a voucher from the Social Buying website, I expected that:
SEM1	In general, I would receive good service from the company when handing over the voucher
SEM2	I would not be treated differently from other customers because I used a voucher
SEM3	I would be happy with the service I received from the company
Reputation performance	
	Having purchased a voucher from the Social Buying website, my evaluation of the experience is that:
RPM1	All companies offering deals on the website did have a good reputation
RPM2	The companies featured on the website did live up to their reputations
RPM3	I did buy a deal on the website from a company I believed to have a good reputation
Perceived value performance	
	Having purchased a voucher from the Social Buying website, my evaluation of the experience is that:

VPM1	The prices of the deals on this site were significantly discounted
VPM2	Overall, the website was convenient to use
VPM3	Overall, I did get value for the money and effort of using this website
Service quality performance	
	<u>*Having purchased a voucher from the Social Buying website, my evaluation of the experience is that:*</u>
SPM1	In general, I did receive good service from the company when handing over the voucher
SPM2	I was not treated differently from other customers because I used a voucher
SPM3	I was happy with the service I received from the company
Disconfirmation of merchant	
DOM1	My experience of redeeming the voucher with the company was better than I had expected
DOM2	Overall, most of my expectations of the company's product or service were exceeded
DOM3	There were fewer problems with using a voucher with the company behind a deal than I had expected
Satisfaction with merchant	
SWM1	I am satisfied with the experience of using a voucher with a company offering a deal through this Social Buying website
SWM2	I am pleased with the experience of using a voucher with a company offering a deal through this Social Buying website
SWM3	My feelings with using a voucher for a company's product or service were good
Loyalty intention	Before I used the S
LIB1	I intend to continue purchasing deals from this Social Buying website
LIB2	I intend to recommend this Social Buying website to others who seek my advice
LIB3	I consider this site to be my first choice for future Social Buying transactions

Table 3: Scale items of the merchant disconfirmation questionnaire

4.2.4 Administration of the questionnaires

The questionnaires were administered through an email sent to the email address of each individual in each of the two samples. The email contained two covering notes, one from Wicount and one from the researcher, as well as multiple links to an online survey site, www.surveymonkey.com, with which the researcher had established an account. An example of the email sent out to respondents is exhibited in Appendix 4.

The email greeted each respondent by name. The email template was set up using Wicount's email provider's administrative application.

The first covering note, from Wicount, introduced the nature of the survey participation request. The first covering note was included because it was decided to send out the emails from the Wicount email account. There were three reasons for this. The first was to improve the response rate by having the email go out from a known source. It also highlighted an incentive for participation, generously provided by Wicount, which was in the form of R500 to spend at Wicount. The second was to protect the confidentiality of the respondents' details. By emailing from the Wicount account, there was no need to import the Wicount mailing list to a third party application or database. The third reason was to ensure the anonymity of the respondents' responses. Whilst summarised data will be shared with both Wicount and the respondents who request it, the detailed instrument responses will only be held on the online survey website. Even though the responses are collected anonymously, the survey does include an optional text field for an email address purely used for the purposes of randomly selecting a respondent for awarding the R500 incentive. There is no association between the response details and a particular respondent.

The second covering note was from the researcher, which explained the following aspects of the research:
- The importance of the research;
- Its sponsorship by Wicount;
- Comments regarding the confidentiality of the respondents' details and the anonymity of their responses;
- A link to the online survey;
- Instructions on completing the questionnaire including my contact details should there be queries;
- A sentence thanking the respondent for taking the time to complete the survey.

The questionnaires are hosted by the online survey site, www.surveymonkey.com, and by clicking on the link contained in the email the respondents were taken directly to the appropriate questionnaire. As described, two questionnaires were developed

(one investigating broker disconfirmation and the other merchant disconfirmation) and each one was administered to a separate sample of respondents. Using the Wicount email provider's administrative application, two mailing campaigns were created with the email addresses of each sample. An almost identical email template was created for each campaign with the only difference being the inclusion of a link to the appropriate online survey. The broker disconfirmation sample was emailed the template containing the link to the broker disconfirmation questionnaire whilst, similarly, the merchant disconfirmation sample was emailed the template containing the link to the merchant disconfirmation questionnaire.

The advantage of using email to administer the questionnaire is that respondents may choose a convenient time at which to complete the questionnaire which was expected to improve the response rate (Coldwell and Herbst, 2004). Since the nature of the research is related to the respondent's use of the Internet, an online survey should be a simple mechanism for the respondents to operate.

4.3   Research population and samples

According to Coldwell and Herbst (2004:74), "[s]ampling is the act, process or technique of selecting a representative part of a population for the purposes of determining parameters or characteristics of the whole population."

4.3.1 Population and sampling frame

The population of the study comprises all private individuals who use the Internet to engage in the social buying e-commerce activity in South African. The sampling frame is the registry of all subscribers of the Wicount social buying platform, as stored in the platform database. This was measured to be in excess of 15,000 individuals at the time of sample construction in March 2011, although the number of registered users of the platform was noted to be increasing significantly on a monthly basis (Toys, 2011). Whilst the study is limited to consumers of the Wicount social buying platform, there is support that the results are generalizable to the broader South African context through the principle behind the proximal similarity model (Campbell and Stanley, 1963, cited in Coldwell and Herbst, 2004) which proposes that by developing a gradient of similarity across the dimensions of people, places and times, the results of a particular study may be validly asserted to be generally applicable to contexts proximally similar to those under which the study was conducted.

4.3.2 Sampling methodology

Two survey instruments (questionnaires) were administered separately to different groups of respondents in order to measure variables related to the two distinct models (broker and merchant) which were based on expectancy-disconfirmation theory (EDT). Each group of respondents therefore required the construction of a separate sample. Several constraints and procedures were applied to the sampling frame of 15,000 individuals to arrive at the samples.

First, the sampling frame was sifted to remove all duplicate entries as well as entries with poor data quality. Poor quality data was defined as entries without a valid email address, first name and last name.

Second, all entries who had been identified as not having been active (i.e. purchased a social buying deal) within the last six months were excluded. This sample constraint was applied to mitigate the effects of the limitation highlighted by Oliver (1981) who suggests that previous disconfirmation is assimilated into consumers' expectation (i.e. current attitudes and beliefs) fairly rapidly.

Third, all entries who had made their first purchase within the last 30 days were excluded. This sample constraint was imposed in order to increase the likelihood that respondents would have experienced the end-to-end social buying transaction including both the online e-commerce transaction related to the purchase of a deal as well as its fulfilment by the merchant when the voucher is redeemed for the product or service. This, together with the previous constraint, provided a sampling window of five months during which subscribers needed to have been active.

The above constraints yielded a total sample size of 3,444 entries. The entries were imported into Microsoft's Excel spread sheet programme and the *random()* function was applied to each entry to yield a value of either 1 or 2, with each entry getting a 50% chance of being allocated one or the other value. This procedure yielded a group of 1722 entries which were assigned the value of 1 and 1722 entries which were assigned the value of 2. The first group was arbitrarily designated as the broker disconfirmation sample and the second group was designated as the merchant disconfirmation sample. Each unit in the sampling frame had an equal chance of

being selected for each sample. Thus, the sampling process used in this study was simple random, or probabilistic, sampling.

The data did not provide a means for ensuring that all the individuals assigned to the merchant disconfirmation sample had actually redeemed a voucher with a merchant – a prerequisite for the respondent to being able to complete the questionnaire. The constraint excluding first time purchasers within the 30 days leading up to the administration of the survey was designed to minimise this scenario. However, since this was no guarantee, a skip-logic, or screening, question was included in the merchant disconfirmation questionnaire immediately after the demographic questions section. This question was worded as follows:

> Have you *already* used/redeemed a Wicount voucher with a company before (i.e.
> handed it over for the product or service purchased)?

This screening question was designed to ensure that the merchant disconfirmation questionnaire was only administered to respondents who had redeemed a voucher with a merchant before. If respondents answered *no* to the above question, they were redirected to the broker disconfirmation questionnaire. Whilst they would not be able to complete the questionnaire for the *second* stage of the e-business transaction, respondents would still be able to complete the questionnaire for the *first* part of the e-business transaction.

Discussions with the Wicount owners revealed that their data indicated that there were potentially significant differences in consumer behaviour based on demographic features (Toys, 2011). For instance, it was asserted that over 70% of all consumers of the social buying platform were female. For this reason, a stratified sample was considered based on consumer demographics such as sex, age, education, race and location. However, the Wicount registration process does not contain fields for some of the potential strata (such as education and race) and does not enforce entry of the other fields (for birthday, sex and location). Thus, due to data limitations, a simple random sampling approach was applied.

4.3.3 Sampling bias

As was alluded to in section 1.6.2, this study contains indications of sampling bias. It is believed that the sample may have been negatively skewed (i.e. to the right, which indicates more favourable responses on the Likert-type scale) due to the Wicount

birthday promotion the week before the survey (which comprised free give-aways and was taken up by a large number of subscribers); the survey incentive of R500 to a randomly selected respondent; and the fact that the survey instrument was emailed with a Wicount cover letter. This may have contributed to 'the respondent effect', where respondents are more likely to give answers they believe the researcher seeks (Coldwell and Herbst, 2004). In addition to the 'respondent effect', a negatively skewed 'response set' bias may also have been present, since the survey did not include scale reversals or random ordering of questions.

Both of the above effects are likely to have biased the responses negatively and it is believed the combined bias may have had a significant effect on the sample responses. This is evidenced by the descriptive statistics of the samples, discussed in sections 5.2.1, 5.3.1 and 5.3.1 and presented in Appendix 5, which demonstrate a negative skewness and commensurate leptokurtic kurtosis. The result of the bias in the data may have contributed to the lack of multivariate normality with consequences on the type and effectiveness of the statistical methods subsequently applied.

4.4   Data collection

The email campaigns to each sample group were conducted simultaneously at mid-day on Wednesday 16th March 2011. The online survey website, www.surveymonkey.com, allows for different types of collectors to be configured for managing the response of the online surveys. Since the surveys were administered through a link in an email, each online survey was set up with a web-link collector. Both collectors were configured with identical settings. The following important configuration choices were applied:

- Only one response was allowed per computer (measured based on the Internet Protocol (IP) address of the computer connecting to the online survey website) to prevent a single respondent taking the survey multiple times. Respondents sharing a computer would therefore not be able to both take the survey from the same computer. Whilst this might have rejected valid submissions, the benefit of rejecting invalid submissions was seen as more important.

- Answers to questions were allowed to be edited before submission. This was enabled so that respondents who mistakenly selected an option could change

it. The item questions contained subtle differences in wording which the respondents were expected to appreciate and answer appropriately. This subtlety might have been interpreted incorrectly at first requiring subsequent modification.

- The survey results were not displayed after the submission by a respondent, although summarised results will be made available to respondents who request them. This research has been conducted with the assistance of Wicount and it would not be ethically appropriate for the results of the research to enter the public domain except with the approval of Wicount.
- Secure Sockets Layer (SSL) technology was enabled to encrypt the responses between the respondents and the online survey website.
- IP addresses of the respondents' computers were saved in the results. This configuration option was selected with the view of providing a unique identification mechanism which is anonymous.

The collectors remained open for ten days after the email campaigns were sent out. The majority of the data were collected in the first 24 hours of the campaign, with the response rate dropping sharply after that. This trend is consistent with email campaigns. Recipients of emails typically do not return to them after a few days, especially if they are marketing related. The broker disconfirmation survey had yielded 197 responses within the first 24 hours, and a total of 248 responses over the course of the ten day collection period. The merchant disconfirmation survey had yielded 211 responses within the first 24 hours, and a total of 275 responses over the course of the ten day collection period.

As discussed in the previous section, the merchant disconfirmation questionnaire can only be answered by respondents who have redeemed a voucher with a merchant. This scenario was catered for by skip logic in the merchant disconfirmation questionnaire directing respondents who had indicated that they had not redeemed a voucher to the broker disconfirmation questionnaire instead. A consequence of this is that the number of respondents from each *sample* is not the true number of respondents to each *survey instrument*.

A small percentage of each group of responses contained missing data. Some responses contained only on or two missing entries, whilst others contained a

significant number of omitted answers. This research employed *listwise* deletion of cases, meaning all responses with missing data on *any* variable were deleted from the resulting sample (Schumacker and Lomax, 2004). This missing data strategy was used since it simplified the subsequent structural equation modelling analysis which would otherwise have required mean substitution, regression imputation or maximum likelihood estimation techniques (Schumacker and Lomax, 2004). The following table summarises the statistics.

	Broker Disconfirmation	Merchant Disconfirmation
Sample size	1722	1722
Number of respondents (total)	248	275
Redirected responses	+38	-38
Number of respondents (survey-specific)	286	237
Response rate (survey-specific responses / sample size)	17%	14%
Responses containing missing data values	77	29
Total responses per survey (data complete)	209	207
Final response rate (completed responses / sample size)	12%	12%

Table 4: Summarised data collection statistics for each survey

As presented in the above table, the final response rate for surveys was 17% for the broker disconfirmation sample, and also 14% for the merchant disconfirmation sample. However, after removing all incomplete responses (listwise deletion), there was a 12% response rate for both questionnaires. The response rates are considered good, even for responses submitted online. The high response rate may be attributed to several factors:

- The covering email was sent from the Wicount email account and used the Wicount template. This might have allayed concerns that the email was unsolicited and that there might be risk associated with clicking on an email link.
- The incentive offered by Wicount of R500 to a randomly selected respondent.
- The use of humour in the subject line of the email, which read "Wicount supports starving MBA students, you should too!"
- The concerns of confidentiality and privacy which might have been satisfactorily addressed by the researcher's assertions in the covering letter.
- The presence of multiple links to the online survey website.

As discussed in previous sections the data have the following characteristics:

- It comprises at least three observations per latent construct in the model, which is a strong recommendation for structural equation model analysis (Kline, 1998, cited in McKinney *et al.*, 2002);
- The relationships between observations and constructs and between constructs are assumed to be linear;
- There are no outliers in the data as a consequence of the six-point Likert-type measurement scale being used as the data collection instrument;
- A listwise approach to missing data was applied, resulting in all items containing at least one missing data value being discarded from the analysis.

4.5   *Psychometric properties of the instruments*

In the social sciences, which deal with measures of human characteristics, the internal attributes of an instrument are termed its psychometric properties. Most commonly, the psychometric properties of an instrument are its reliability and its validity. Reliability will be presented in this study in terms of internal consistency. In reviewing validity, the concepts of convergent validity, discriminant validity, and nomological validity (theoretical formulation) will be discussed. The generalizability of the results through external validity will also be discussed.

As discussed in section 4.2, *a priori* scales developed by researchers in other studies to measure the same or similar constructs under consideration in this study are adapted where possible in order to improve the reliability and validity of the instruments applied in this study. The expectation is that the scale confirmation in these studies would then be applicable to other studies, including this one, to the extent that the results could be shown to be generalizable. Preference was therefore given to those scales which were supported by multiple studies or by longitudinal studies. The reliability and validity of these scales as they apply to this study are discussed next.

4.5.1 Reliability

The reliability of a measurement scale is indicated by the extent to which it is free from random error variances. Reliability of the scale will be supported if the scale items purported to measure an underlying construct are demonstrated to do so

through their internal consistency (Coldwell and Herbst, 2004). Two methods for assessing reliability will be applied in this study.

Cronbach's alpha coefficient measures how well the items of a construct actually measure that construct. Cronbach's alpha can be used to establish the internal consistency of Likert-type measurement scales (Coldwell and Herbst, 2004). A generally acceptable value for Cronbach's alpha is above 0.70, although some researchers contend that a value above 0.80 is desirable. An advantage of Cronbach's alpha is that the contribution of each specific item to the construct may be assessed by omitting each item in turn from the calculation of the value. If these values are less than the original value for Cronbach's alpha (all construct items included), then the scale can be shown to exhibit good internal consistency.

An often reported reliability statistic in the structural equation modelling (SEM) literature is Raykov's (1997) composite reliability score. The composite reliability score is estimated from the SEM factor model and, as Raykov (1997) asserts, is thus a truer indication of internal consistency than Cronbach's alpha which would tend to underestimate reliability in these cases. Raykov's composite reliability statistic will therefore also be reported in this study. A lower limit of 0.70 is defined as acceptable reliability for composite reliability (Raykov, 1997).

4.5.2 Construct validity

The biggest threat to the validity of the study lies in its internal validity. In the case of this study, which proposes and tests hypothetical models based on expectancy-disconfirmation theory, the key question is whether observed outcomes can be attributed to the identified factors. That is, whether the factors are true antecedents of the research variables, or whether there are other factors which would explain the outcomes better or more completely (Coldwell and Herbst, 2004). Internal validity is presented in this study in terms of construct (convergent and discriminant) validity, and nomological validity.

Construct validity is concerned with the extent to which the measurement scale item scores accurately define the construct (Coldwell and Herbst, 2004). Construct validity is important to researchers in allowing them to make inferences from the scores on the construct. Construct validity is defined in terms of unidimensionality, convergent

validity and discriminant validity. In order to demonstrate construct validity, unidimensionality, convergent validity and discriminant validity all need to be demonstrated.

Unidimensionality, a measure of whether a single factor accounts for the correlations among each group of the measurement scale items of the survey instrument, will be established through a principal component factor analysis utilising a Varimax rotation, which emphasises larger loadings and de-emphasises smaller loadings.

In SEM, convergent validity and discriminant validity are assessed through a confirmatory factor analysis of the *measurement* model. The assessment of the *structural* model will demonstrate nomological validity. Anderson and Gerbing (1988) advocate that the measurement model should be tested for validity first and, if found to be valid, only then should the theoretical model be tested. A theoretical predictive model will only make sense if it has first been shown to exhibit convergent and discriminatory validity. Consequently, this study will assess the convergent and discriminant validity of the measurement model before proceeding to assess the nomological validity of the structural model.

Convergent validity measures how well the *theoretically* correlated indicator variables of a particular construct are *actually* correlated (as evidenced by the data). The confirmatory factor analysis of the measurement model can assess convergent validity by determining whether each indicator variable's estimated pattern coefficient on the construct is significant (Anderson and Gerbing, 1988). Fornell and Larcker (1981) suggest two criteria to apply in the assessment of the measurement model, which will be used to assess convergent validity in this study. The first criterion asserts that the factor loadings of each indicator variable must exceed 0.70 and be significant. This criterion tells the researcher that the indicator variables are actually measuring the construct. However, it fails to account for measurement error (Fornell and Larcker, 1981). The second criterion asserts that the average variance extracted (AVE) by each construct should exceed the variance resulting from measurement error for that construct. This would be the case if the AVE for each construct is shown to exceed 0.50 (Fornell and Larcker, 1981). This second criterion tells the researcher that the indicator variables, and not measurement error, account for the variance.

Measurement error could include the presence of other, unspecified, indicator variables.

If a theory posits that indicator variables are *not* correlated with a particular construct, then discriminant validity assesses the extent to which they *actually are not* correlated, as evidenced by the data. A generally acceptable test for assessing the discriminant validity of SEM measurement models, according to Fornell and Larcker (1981), is if the squared correlation between any two constructs (posited not to correlate with each other by the theory) is less than either of their individual AVEs. This condition shows that the constructs exhibit greater internal variance than variance shared between the constructs. This study will therefore apply this condition in evaluating the discriminant validity of the measurement model.

Finally, nomological validity will be assessed by how well the specified models fit the data. The structural model, which establishes relationships between the latent variables, will be evaluated by model estimation methods. It is these relationships which form the basis of the research objectives and will be tested formally by the hypotheses listed in section 4.7. The SEM goodness-of-fit indexes will be used to determine how well the model fits the data and whether the hypothesised relationships are support.

4.5.3 Internal and external validity

Differences in people, places and times can all contribute to lower external validity to research. The proximal similarity model (Campbell and Stanley, 1963, cited in Coldwell and Herbst, 2004) proposes that by developing a gradient of similarity across the dimensions of people, places and times, the generalisation of a study's results may be validly asserted to contexts proximally similar to those under which the study was conducted. In the case of this study, since there is not expected to be significant variation in the characteristics of the online users of the Wicount social buying platform (a delineation of this study) and those of users of other platforms, motivation for the proximal similarity to the 'people' dimension of the gradient of similarity may be made. Since the 'location' dimension will be similar (i.e. the study comprises users from all major regions of South Africa, and the transaction itself takes place online which is location agnostic) it is expected that variance in location is not a significant threat to external validity. Since this study is cross-sectional in

nature, the 'time' dimension may have a significant impact on its external validity. In mature markets, with mature constructs, this may be less of an issue. However, this study specifically identifies the newness of the marketing mechanism of social buying, and raises the prospect of its evolution as it progresses along the industry life-cycle, with growth, innovation and differentiation contributing to its changing nature. Thus, it is likely that the belief systems held by social buying consumers may change over time. To counter this threat to the generalisation of the study over time, a longitudinal study is recommended as future research.

4.6   *Statistical analysis*

This section describes the statistical methods and analysis which will be employed to meet the research objectives of this study. The first section covers the descriptive statistics, whilst the second introduces structural equation modelling as the primary analytical method. This is explored further in section 4.6.3, including its applicability to the research problem. Section 4.6.4 discusses confirmatory factor analysis, a salient part of the SEM method, and emphasises the two-step approach which will be followed of reporting on the measurement model before proceeding to report on the structural model (Anderson and Gerbing, 1983). The value of structural models for establishing nomological value will be discussed next as will a description of the model fit indexes which will be employed to assess such validity. Finally, the levels of aggregation which pertain to confirmatory factor models will be discussed, since this study will present differently aggregated *a priori* models for testing, as explained later in section 4.7.1.

4.6.1 Descriptive statistics

According to Coldwell and Herbst (2004:92), descriptive statistics include "numbers (i.e. tallies, frequencies and percentages), measures of central tendency (i.e. mean, median and mode) and measures of variation (i.e. range and standard deviation)." An examination of these descriptive statistics helps the researcher to understand his/her data, including oddly shaped distributions, presence of outliers and missing data. This description of the data will inform the more advanced statistics which may follow. This is the case in this research, where qualities of the data including missing data and distribution effects such as non-normality, skewness and kurtosis, will affect the statistics used in structural equation modelling which are discussed next.

4.6.2 Inferential statistics

Parameters are the items of real interest to researchers in quantitative analysis. They are items which apply to the population as a whole. In contrast, statistics are items which apply only to the sample and are at best estimates of reality (Coldwell and Herbst, 2004). In most cases, it is impractical to consider the population in quantitative research and so sample statistics are calculated. Inferential statistics helps the researcher generalise the results of the statistics of a sample to an entire population (Coldwell and Herbst, 2004). In this study, the results of two samples will be used to investigate the validity and appropriateness of two models describing the two stages of the social buying e-business transaction. The statistics used in structural equation modelling (SEM) will be used to infer something about the population from the samples.

Typically in SEM, a researcher will begin with exploratory factor analysis (EFA) in order to *generate* an appropriate model. EFA performed on a sample of data will help identify the number and types of latent variables which are supported by the data and which factors are correlated and which observed variables load best on each identified factor. EFA is a process which has fewer model assumptions and is best applied when there is no obvious existing model to test (Schumacker and Lomax, 2004). Since social buying is a new and, as yet, relatively unexplored subject in South Africa, it would have been preferable to conduct EFA on a separate sample to help generate suitable models which may subsequently tested against a separate sample in a process called confirmatory factor analysis (CFA). However, due to the constraints of time, the EFA step was excluded from this study. Instead, the approach of this research is to propose two *a priori* models based on the extant literature and apply CFA to test their measurement and nomological validity. This approach has a significant limitation in that the chance of model misspecification is greatly increased, due to differences between the theoretical (implied) model and the true (sample-derived) model. This limitation was raised in section 1.6.2 on limitations. The consequences of this limitation will be further addressed in chapter 5 (results and discussion) and chapter 6 (conclusion and recommendations).

4.6.3 Structural equation modelling (SEM)

"Structural equation modelling (SEM) uses various types of models to depict relationships among observed variables, with the same basic goal of providing a

quantitative test of a theoretical model hypothesized by a researcher" (Schumacker and Lomax, 2004:2). Schumacker and Lomax give the following reasons for using SEM in quantitative research:

1. The need to use multiple observed variables to better understand an area of scientific inquiry;

2. SEM explicitly takes measurement error into account at the same time as the statistical analysis of the data is conducted; and

3. The sophisticated theoretical models which SEM techniques allow researchers to analyse.

The research problem of this study highlights the concern that the multiple underlying factors of social buying within the South African context are poorly understood, as are the relationships between them. It seems that SEM is ideally suited as a statistical approach to exploring the research problem. Furthermore, as evidenced in the literature review in chapter three, SEM has been successfully applied to the main underpinning theory applied to this research, expectancy-disconfirmation theory (EDT). There is therefore a solid body of evidence supporting the application of SEM to the context of this study.

SEM involves five basic building blocks, consisting of: model specification; model identification; model estimation; model testing; and finally model respecification (Schumacker and Lomax, 2004). This study will involve only the first four SEM blocks, since the research problem is specifically aimed at evaluating the viability of the two already specified *a priori* models and not with the *respecification* of the models. The interested reader is directed to Appendix 9 for a more general discussion on structural equation modelling.

4.6.4 Confirmatory factor-analytic models

SEM combines confirmatory factor models and structural, or path, models. Confirmatory factor models are discussed here and structural models are discussed in the next section. Confirmatory factor models consist of observed variables that are hypothesised to measure one or more latent variables. For this reason, confirmatory factor models are also called *measurement* models in SEM. Anderson and Gerbing (1988) argue for a two-step approach to SEM. The first step involves the analysis of the measurement model first, which specifies the relationships among observed

(measured) variables underlying the latent variables. The measurement model provides an assessment of convergent and discriminant validity. Confirmatory factor analysis (CFA) will reveal how well an observed variable will measure a latent variable, through factor loadings (validity coefficients), as well as the measurement error associated with each observed variable. In other words, that portion of each observed variable that is measuring something other than the hypothesised factor. This 'something other' could be some other latent variable, a higher order factor, or unreliability. Only once the measurement model has been 'confirmed' (demonstrates sufficient validity and reliability), is it permissible to proceed to the second step of SEM.

One of the advantages of SEM is the explicit inclusion of measurement (non-sampling) error in the analysis (Schumacker and Lomax, 2004). By including measurement error latent variables in the confirmatory factor analytic model, the analysis adjusts for the measurement error. Kline (1998, cited in McKinney, *et al.*, 2002) advises that at least three indicator variables need to load onto each latent construct in confirmatory factor analysis (CFA) in order for measurement error to be accurately assessed and the reliability of the model to be established. With a single indicator variable loading onto each construct, it would be assumed that the construct is *perfectly* measured by the single indicator variable, implying no measurement error – an unlikely situation (Schumacker and Lomax, 2004; Arbuckle, 2007), and there are related issues when only two indicator variables are included. The measurement models of this study therefore specify at least three indicator variables for each first-order latent construct. This is the reason, alluded to in section 4.2, that the two survey instruments contain at least three items per dimension.

4.6.5 Structural models

The second step involves the specification of the path relationships among the latent variables as suggested by theory. The structural model provides an assessment of nomological, or theoretical, validity. Schumacker and Lomax (2004:3) explain that "SEM tests theoretical models using the scientific method of hypothesis testing to advance our understanding of the complex relationships among constructs." From the factor loadings in the measurement model and all of the variance-covariances, a variance-covariance matrix for the overall model is generated through application of a model-fitting technique. This is the matrix *implied* by the structure and the

relationships hypothesised by the structural model. The aim of SEM is to estimate all of the parameters in the overall *implied* model and test its fit to the *sample-derived* variance-covariance data. The theory-suggested models, and their associated hypotheses, are discussed in the next section.

The goodness of fit of the implied and sample matrices will establish the explanatory power of the hypothesised model and its generalizability. There are a number of goodness-of-fit (GOF) indexes which may be measured. No single goodness of fit index is considered sufficient to establish the overall fit of a model since many are differently affected by the data characteristics such as sample size, skewness, kurtosis; by model characteristics such as complexity, degrees of freedom; and by different estimation methods such as ML, GLS and ADF (Hu and Bentler, 1999; Mueller, 1997; Fan, Thompson & Wang, 1999). A combination of indexes is therefore advocated. This study will employ the following:

- Chi-squared statistic;
- GFI (Goodness-Of-Fit) index;
- AGFI (Adjusted Goodness-Of-Fit) index;
- RMS (Root Mean Square residual);
- RMSEA (Root Mean Square Error of Approximation).

The Chi-squared statistic is very sensitive to sample size and violations of multivariate normality (Mueller, 1997; Finch, West & MacKinnon, 1997; Gao, Mokhtarian & Johnston, 2003). RMSEA measures how poorly a model fits the data. It also takes model complexity into account and is less dependent on data characteristics such as sample size and distribution shape (Fan, *et al.*, 1999; Hu and Bentler, 1999). Depending on the characteristics of the data which will be described in section 5, certain model fit indexes will be preferred over others.

It is valuable to report on information-theoretic measures such as the Akaike information criterion (AIC) and Browne-Cudeck criterion (BCC) when comparing models (Arbuckle, 2007). In the case of the broker disconfirmation stage, two models will be tested (discussed in the following subsection). In this case, the AIC and BCC statistics will be reported to evaluate the preferred model (Arbuckle, 2007). In the case of the merchant disconfirmation stage, one isolated model is tested and these statistics do not apply.

4.6.6 Levels of aggregation in hierarchical factor models

A structural model which includes the indicator variables loading onto exogenous latent constructs which in turn load onto higher order endogenous latent constructs is called a hierarchical factor model because it comprises multiple levels (Mulaik and Quartetti, 1997; Gribbons and Hocevar, 1998). Often, the researcher is concerned only with the relationships between the higher order constructs. In these cases, a number of options are available to the researcher in terms of structuring the factor analytic model in hierarchies. Gribbons and Hocevar (1998) posited four hierarchical forms which structural models could take: disaggregated, partially disaggregated, partially aggregated and aggregated.

The two forms which are applicable to this research are the disaggregated and partially aggregated forms. The disaggregated, or item-level, form includes all the measurement scale items as indicator variables in the model which will load onto first-order latent constructs, which in turn load onto higher order constructs. It is a useful form when the researcher is interested in the characteristics of the measurement scale itself. In the partially aggregated, or subscale-level, form, the measurement scale items have been summed to provide subscale composite scores. These scores are then treated as the indicator variables in the structural, or factor, model. This essentially removes the first-order constructs that were present in the disaggregated form. This approach is useful when the researcher is only interested in the hypothesised relationships between the higher order constructs and seeks to reduce the complexity of the structural model (Mueller, 1997).

The next section (section 4.7) motivates for each of the two stages (broker and merchant) of the end-to-end social buying process to be modelled and evaluated separately. The higher order path diagrams are presented for each of the broker disconfirmation and merchant disconfirmation stages. It should be noted, however, that broker disconfirmation model can be represented structurally in either the disaggregated (item-level) or partially aggregated (subscale-level) forms. This study will attempt to answer the hypotheses relating to the broker disconfirmation stage using first the disaggregated model structure, and then the partially aggregated model structure. The rationale is simple: the disaggregated model is the preferred model, since this study involved the adaptation and construction of new item-level measurement scales and it would be interesting to determine the characteristics of

the scale items in the model analysis itself. However, as Parasuraman, *et al.* (2005) found, this raises analytical difficulties, especially when the model becomes complex as a result. Furthermore, one of the 'rules of thumb' in structural equation modelling is that the ratio of sample cases to parameters of interest should be of the order of 10:1 if the parameter estimates are to be trusted (Bentler, 1993, cited in Mueller, 1997). Including all the un-summed scale items as indicator variables increases the parameters of interest and reduces the overall ratio.

4.7   *Research models and hypotheses*

The problem statement of this research highlights the lack of the identification of the constructs which capture the variance associated with the loyalty intentions of South African social buying consumers, as well as the lack of understanding of what the interrelationships between these constructs might be. The literature review has revealed that exploring this problem requires the researcher to consider two perspectives. The first deals with social buying as an emerging marketing phenomenon, and the second considers the role of information systems (IS) in the delivery, presentment and fulfilment of the social buying device to consumers. The problem review identified the need for a framework which can satisfactorily bring together the traditional marketing aspects with the IS aspects of the study.

A study of the literature has revealed a strong candidate in expectation-disconfirmation theory (EDT). The concept of consumer satisfaction has a central position within the marketing field (Khalifa and Liu, 2002; Yen and Lu, 2008). EDT provides a mechanism for investigating consumer satisfaction by testing potential expectation antecedents of perceived performance, and the disconfirmation of the expectations. It also establishes a theoretical framework for future behaviours based on customer satisfaction, such as repurchase and loyalty intention. Furthermore, it has been shown to integrate successfully with the principles which drive IS success (DeLone and McLean, 1992, 2003; McKinney, *et al.,* 2002). EDT, therefore, is considered to be the most appropriate theoretical framework for investigating the research problem and meeting the research objectives.

4.7.1 Two *a priori* models

The social buying process is a two-stage transaction, separated in at least two dimensions (time and place) and sometimes a third (person). Purchasing a voucher is done by accessing the social buying website (the time and place being at the

convenience of the purchaser). Once the deal has tipped and the purchaser receives the voucher via email, the voucher may then be redeemed at a later time and place (within the terms and conditions specified by the merchant). Usually the purchaser is the consumer, but this is not mandatory.

These different dimensions need to be taken into consideration when examining the end-to-end transaction which includes the initial online purchase and the final fulfilment. In a study of online auctions, Yen and Lu (2008a) faced a similar problem with the initial transaction taking place online and the fulfilment (packaging and delivery of the goods) taking place sometime later. The online auction buyer needed to be satisfied both with the online transaction experience with platform and the fulfilment of the transaction which was dependent on the performance of the seller, usually a private individual. Yen and Lu's (2008a) approach to capturing the distinct characteristics in the two parts to the transaction was to use a two-branched transaction model, measuring constructs applicable to each of the branches, with each leading into the hypothesised construct of repurchase intention.

This study will extend the two-branched approach of Yen and Lu (2008a) into a two-staged approach. Yen and Lu (2008a) used a single sample and administered a single instrument to the entire sample which measured, through its scale items, both branches of the end-to-end transaction which finally converged to the repurchase intention construct. In this study, the two branches, whilst both ending in the same hypothesised construct of loyalty intention, will not converge. That is, two samples were constructed and a separate measurement instrument was administered to the two samples. There are two reasons for this modification to the Yen and Lu (2008a) approach:

- Theoretical: The Yen and Lu (2008a) model involves two steps in a single commercial transaction. In contrast, social buying involves two distinct transactions (one in each stage). First the e-commerce transaction and second the redemption of the voucher for the product or service.
- Practical: A single sample would have increased the length and complexity of the questionnaire to the extent that many respondents would likely drop out before completing it online. Long and complex questionnaires are discouraged in terms of good survey design principles (Coldwell and Herbst, 2004). Also,

since each stage may involve different individuals (distinct purchaser and consumer), a single-sample approach is not practically possible.

Hence, the study will involve proposing and testing two *a priori* theoretical models – one for each transaction stage of the end-to-end e-business transaction.

4.7.2 Hypotheses – disconfirmation of the broker

The first stage of the social buying e-business transaction is completed online and introduces the consumer to the merchant and the goods and services offered. The role of information systems is crucial to the delivery of a satisfying experience in this stage. This is represented by the second order variables of e-service quality (as measured from the expectation and performance perspectives). E-service quality accounts for much of the variance captured by the first order variables of efficiency, system availability, fulfilment and privacy (Parasuraman, *et al.*, 2005). These first order variables have, in turn, been shown in the literature review (section 3.3) to capture many of the characteristics of the factors proposed in the extant literature as being important to a user's satisfaction with an online experience. The purchaser's disconfirmation of the quality of service rendered by the broker through the first stage e-commerce transaction is hypothesised to lead to a loading on the satisfaction construct which, in turn, is hypothesised to load onto the loyalty intention construct. This first stage path model is specified in Figure 12 and is based on expectancy disconfirmation theory and specifically the version represented by Figure 7 in section 3.3.3.
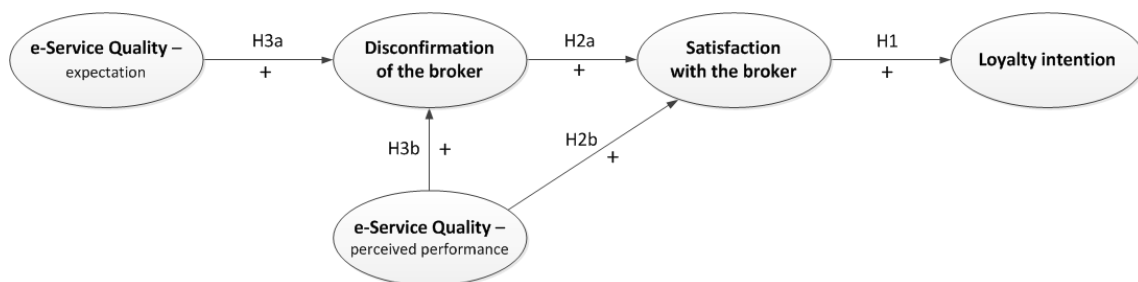
Figure 12: The path model for investigating consumer online social buying purchase behaviour (Source: Adapted from Bhattacherjee, 2001; McKinney, *et al.*, 2002)

The literature suggests that loyalty intention is positively associated with consumer satisfaction (Oliver, 1980; Yi and La, 2004; Khalifa and Liu, 2004). Hence, the hypothesis is:

> *H1.* Consumers' satisfaction with the broker is positively associated with their loyalty intentions.

According to expectancy-disconfirmation theory (EDT), satisfaction is partly established by the disconfirmation of the consumers' experience of the purchase transaction with their expectations of the experience (Oliver, 1980; Oliver and De Sarbo, 1988), and partly established by the perceived performance of purchasing experience (Tse and Wilton, 1988; McKinney, *et al.*, 2002), measured here by e-service quality (Parasuraman, *et al.*, 2005). Hence, the hypotheses are:

> *H2a.* Consumers' disconfirmation of the broker is positively associated with their satisfaction with the broker.
>
> *H2b.* Consumers' perceived performance of the e-service quality of the broker is positively associated with their satisfaction with the broker.

According to EDT, disconfirmation is determined by the subjective comparison of the actual performance against an expectation (Oliver, 1980; Oliver and De Sarbo; 1988; Bhattacherjee, 2001; Bhattacherjee and Prekumar, 2004). In this study, the expectation and performance of the e-service quality construct is hypothesised to predict disconfirmation (Parasuraman, *et al.*, 2005). Hence, the hypotheses are:

> *H3a.* Consumers' expectation of e-service quality is positively associated with their disconfirmation in respect to the broker.
>
> *H3b.* Consumers' perceived performance of e-service quality is positively associated with their disconfirmation in respect to the broker.

4.7.3 Hypotheses – disconfirmation of the merchant

The second stage of the social buying e-business transaction is completed at the merchant's normal location for fulfilment of the product or service. Apart from the use of pre-paid discount vouchers, the second stage transaction follows a traditional (i.e. non-electronic) commercial pattern where the product or service is provided by the merchant, usually at the merchant's place of business.

However, it is important to note that the second stage is still part of a social buying transaction, and that this study seeks to investigate the loyalty intentions of consumers to the social buying broker, and not the merchant. Whilst the consumer is at this stage engaging directly with the merchant, his beliefs and attitudes (in other

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words, expectations) are still being formed about the social buying transaction as a whole, and his expectations are being subjectively compared against the perceived performance of the holistic experience (Oliver and Dover, 1977; Oliver, 1980; Bhattacherjee, 2001). The selection of the factors which inform satisfaction need to be carefully selected in line with the research objectives so that they relate to the research problem and therefore loyalty intention to the social buying broker and not loyalty intention to the merchant.
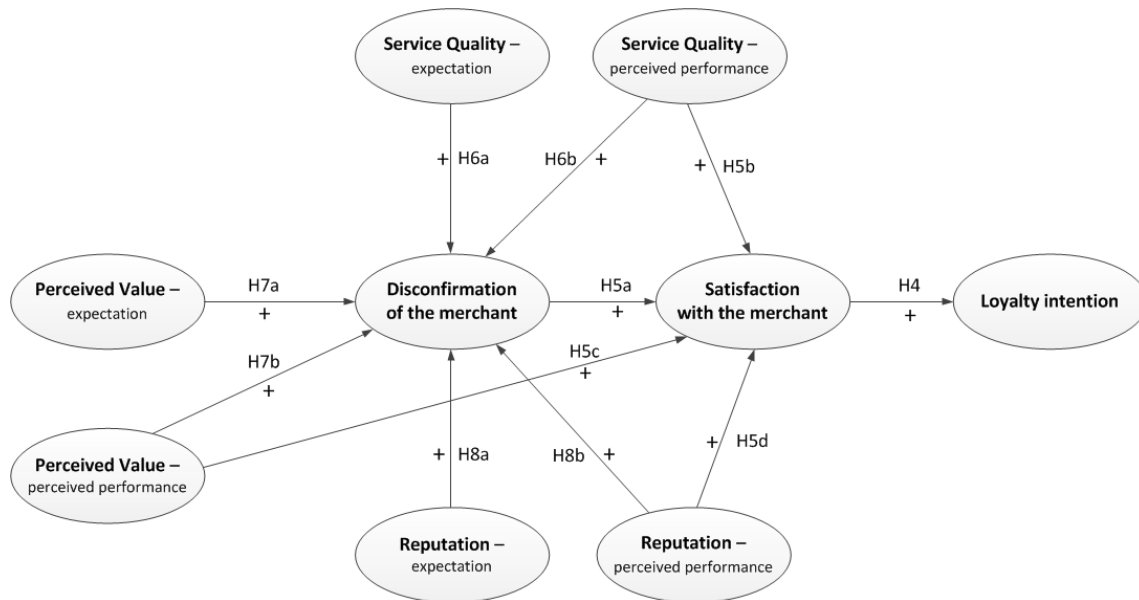
Figure 13: The research model for investigating consumer online social buying purchase behaviour (Source: Adapted from Yen and Lu, 2008; McKinney, *et al.*, 2002)

The path model illustrated in Figure 13, again based on expectancy disconfirmation theory as represented in Figure 7 of section 3.3.3, has been specified to investigate consumer behaviour with respect to the fulfilment transaction with the merchant. The path model has been specified with the third and fourth research objectives of this study in mind.

The reasoning for the hypotheses relating to loyalty intention, satisfaction, disconfirmation, perceived performance and expectations is analogous to that put forward in the first stage (broker disconfirmation) model discussed in the previous section, and is supported by the expectancy disconfirmation theory of Oliver (1980). Hence, the hypotheses for the second stage of the social buying transaction are listed below:

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Loyalty intentions:

H4. Consumers' satisfaction with the merchant is positively associated with their loyalty intentions towards the broker.

Satisfaction:

H5a. Consumers' disconfirmation of the merchant is positively associated with their satisfaction with the merchant.

H5b. Consumers' perceived performance of the service quality of the merchant is positively associated with their satisfaction with the merchant.

H5c. Consumers' perceived performance of perceived value of the merchant's product or service is positively associated with their satisfaction with the merchant.

H5d. Consumers' perceived performance of the reputation of the merchant is positively associated with their satisfaction with the merchant.

Service quality is an important factor of satisfaction and loyalty intention in situations of traditional retailing, supported by both the service management and the marketing literature (Hallowell, 1996; Kenney and Khanfar, 2009). The difference between traditional fulfilment and the social buying fulfilment lies in the fact that the consumer will redeem a voucher purchased online previously at a significant discount, whereas the traditional customer will pay the full cash price. This could negatively affect the quality of the service received by the consumer leading to lower satisfaction. Service quality, therefore, will play an important role in the formation of the consumers' attitudes towards the entire social buying e-business transaction, and therefore have an effect on loyalty intentions towards the social buying broker. Hence, the hypotheses are:

H6a. Consumers' expectation of service quality is positively associated with their disconfirmation in respect to the merchant.

H6b. Consumers' perceived performance of service quality is positively associated with their disconfirmation in respect to the merchant.

One of the unique elements of social buying is the triple-win principle. The broker wins by making a cut from each transaction without the overhead of carrying stock. The merchant benefits from increased traffic to his stores and marketing and advertising exposure at a significantly reduced cost. The consumer benefits from the heavily discounted service. The extant literature identifies perceived value to be a significant antecedent of satisfaction and loyalty intentions (Jones and Sasser, 1995; Parasuraman, *et al.* 2005; Gounaris, *et al.*, 2007). A discounted service is likely to be perceived by the consumer as value for money, when controlling for the quality of the service. Hence, the hypotheses are:

H7a. Consumers' expectation of perceived value is positively associated with their disconfirmation in respect to the merchant.

H7b. Consumers' perceived performance of perceived value is positively associated with their disconfirmation in respect to the merchant.

The relationship between the social buying organisation and the merchants is important. Merchants are selected because they have a high reputation in the industry, they can provide a good quality of service to the consumers and therefore not affect negatively the consumers' loyalty intentions towards the broker. Reputation is important to establish trust in the e-business environment where consumers are typically unable to experience the tangibles of the product or service before the purchasing decision is made (Casaló, Flavián, & Guinalíu, 2007; Jin, *et al.*, 2008) and particularly in reducing search and decision-making time (Sheehan and Stabel, 2006). Thus, merchants who have an existing reputation in the market will not only be more desirable to the consumers, increasing their perceived value of the product, but also be more desirable to the social buying broker, in order to reduce the risk of dissatisfaction and reduced loyalty intention (Jin, *et al.*, 2008). Reputation is included because of the nature of online transactions. Extrinsic intangible factors are hypothesised to be important in the satisfaction judgement of online consumers (Jin, *et al.*, 2008). Hence, the hypotheses are:

H8a. Consumers' expectation of reputation is positively associated with their disconfirmation in respect to the merchant.

H8b. Consumers' perceived performance of reputation is positively associated with their disconfirmation in respect to the merchant.

The three factors of service quality, perceived value and reputation have been selected, based on evidence provided in the extant literature, as suitable antecedents to satisfaction and loyalty intention within the context of the second stage of the social buying transaction. From the discussion above, it is clear that these factors will exhibit a degree of covariance between them. Also, it is likely that the variance of the satisfaction construct will not be fully explained by the three factors alone. The advantage of structural equation modelling is that it accounts for this type of measurement error (Schumacker and Lomax, 2004; Arbuckle, 2007). As already discussed, exploratory factor analysis would have been the preferred method to elicit the antecedent factors from the data and subsequently test their validity through confirmatory factor analysis using a separate sample. However, constraints of time have led to an approach of testing the above model as an *a priori* model suggested by the literature.

4.8   Chapter summary

This chapter described the development and administration of the research instruments for each of the broker disconfirmation and merchant disconfirmation samples. The third section discussed the sampling frame and methodology and, importantly, highlighted potential sources of sampling bias. The fourth section discussed the collection of the data and presented summary collection statistics in Table 5, describing some important characteristics of the data. Section five discussed the psychometric properties of the data, specifically how reliability and construct validity would be evaluated in the results chapter. Section six described the analytical methods that were applied to the data, whilst section seven presented formally the hypotheses which would be tested, in terms of the structural models.

5 RESULTS AND DISCUSSION

In this chapter, the results of the investigation into the research objectives of the study will be presented and interpreted. The chapter is organised into two parts, as illustrated in Figure 14. The first part comprises one section which presents the demographic profile of the sample. The second part comprises three sections, one each for a particular model which is tested under structural equation modelling:

- The first model relates to the disaggregated form of the model of the broker disconfirmation stage of the e-business social buying transaction introduced in the research methodology in section 4.6.2.
- The second model also relates to the broker disconfirmation stage of the social buying transaction, but presents the partially aggregated form of the model.
- The third model is the single, or isolated, model tested for the merchant disconfirmation stage, introduced in section 4.6.3.

Each of the model-testing sections is broken into several subsections, comprising i) a description of the data and treatment for multivariate non-normality; ii) the results of a principal component factor analysis of the observed variables; iii) the presentation of the results of the measurement model; and iv) the presentation of the results of the structural model. Finally, this chapter concludes with a summary.
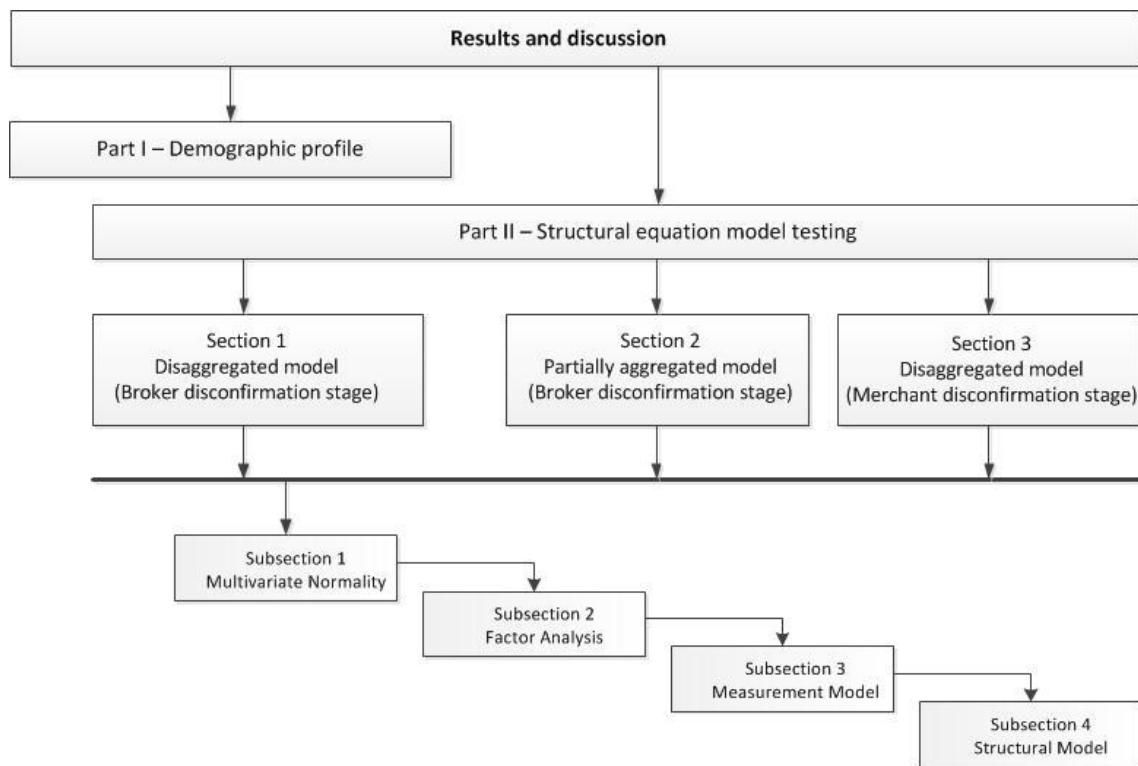
Figure 14: Organisation of Chapter 5 – Results and discussion

Mulaik and Millsap (2000) advocate a four-step approach to testing and presenting the results of structural equation models. The results of the second part of this study will follow the first three steps of their approach – the fourth step relates to a specification search for more parsimonious models and is beyond the scope of this report. These steps are covered in subsections two to four of each section pertaining to model-testing. Step one involves conducting a factor analysis on the variance-covariance matrix of observed variable in order to surface the number of latent variable which fit the data and helps assess the unidimensionality of constructs. Step two involves performing a confirmatory factor analysis (CFA) on the measurement model which specifies hypothesised relationships between the indicator (observed) variables and the latent constructs. The CFA results will report the composite reliability and convergent validity of the measurement model. Mulaik and Millsap (2000) argue, in accordance with Anderson and Gerbing (1988) that researchers should only proceed to step three if the results of step two are satisfactory. Step three entails the specification of the structural model comprising the hypothesised relationships between the latent constructs and will establish the nomological validity of these relationships. It is step three which covers the main purpose of this study and which is linked to the fulfilment of the research objectives.

5.1 Demographic profile of the samples

In this section, the results of the investigation into the demographic profile of the sample are presented and discussed. Since social buying is not yet a mature marketing mechanism in the South African context, it is important to appreciate the demographic profile of the consumer market in order to make better marketing decisions. This applies both to the social buying broker seeking appropriate and desirable products and services to attract consumers and the merchant seeking marketing exposure.

This study does not aim to conduct a full demographic profiling of the *consumer market*. However, the questionnaires do include a number of demographic items with the aim of describing the *samples*. The demographic information obtained will therefore be presented in this section as descriptive statistics. The sample demographics which are discussed include age group, sex, schooling level, race, Internet usage, Internet access medium and Internet access location. The demographic items are not used for the primary purpose of this research which is model testing.

5.1.1 Age group

The interpretation of the categorical data for the age question shows the majority of online purchasers fall within the 26 to 35 year old age group. This is over twice the number of respondents falling in the next age group of 36 to 45 years old. A reasonable explanation for this is that it is this group of respondents who satisfy two important criteria of e-commerce. First, the consumer must have sufficient wealth to not only be attracted by the products available in e-commerce, but also to be able to afford the products. The 26 to 35 year old age group would typically comprise individuals who would have completed their studies and embarked on their careers. The second criterion is that they should have significant exposure to the Internet and e-commerce settings. The oldest age groups, whilst likely having sufficient wealth, are less likely to engage in e-commerce or be attracted by the products available on the social buying website. The discussion later around education and Internet experience supports this assertion.
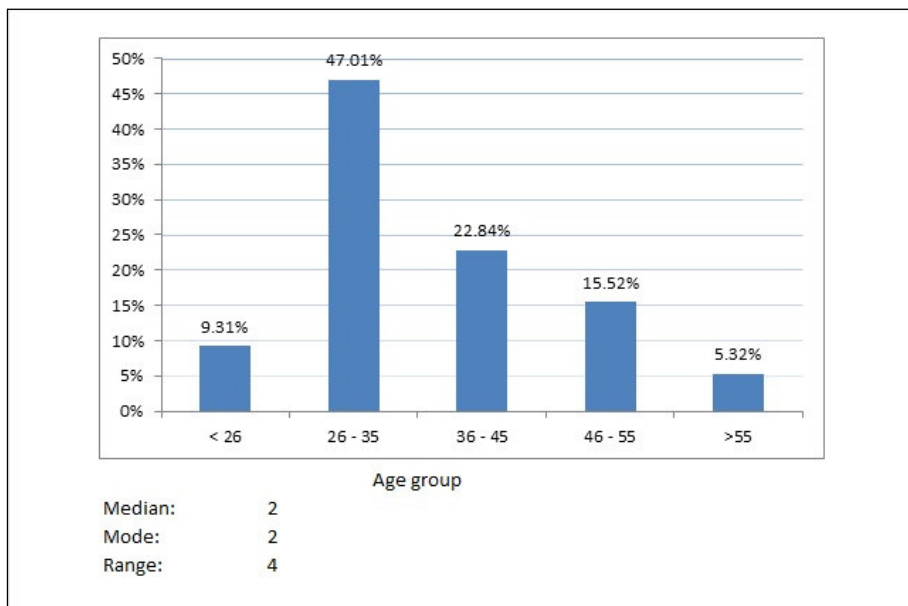
Figure 15: Distribution of sample in terms of age group (n = 451)

5.1.2 Sex

The majority (3:1) of the respondents are female. A plausible reason for this is that the products advertised on social buying platforms target this demographic, although it is unlikely that this is intentional. Discussions with the owners of Wicount show that the best-selling products are spa and beauty treatments, hotel stays and restaurant meals (Toys, 2011). These may appeal more to the female population. This raises more questions, though. Why are these products selected? Are they the most suitable for the social buying context, or are they what the largest (female) demographic want? This inequality may be due to a vicious circle – for instance, initially the most successful products were the ones which appealed to female consumers leading to more female consumer being attracted to the website, resulting in the broker selecting more deals of a similar type in order to increase the number of transactions, leading to more female consumers and so on.
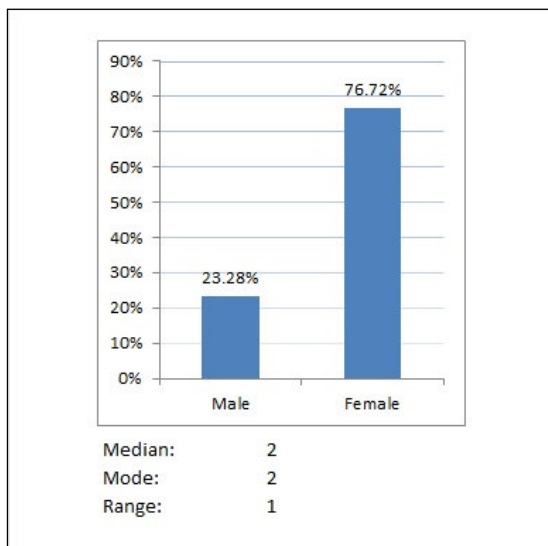
Figure 16: Distribution of sample in terms of sex (n = 451)

Interestingly, a recent study by Beneke, Scheffer & Du (2010) exploring online purchasing behaviour in South Africa concluded that males were significantly more likely to make online purchases than females. This seeming contradiction may be explained by noting that the focus of this study is on the narrow e-commerce mechanism of social buying where specific products are selected for their immediate appeal to consumers whilst the Beneke, *et al.* (2010) study considered the more general e-commerce retailing setting. The difference is that the former type of purchase is reactive and impulsive (i.e. in response to the appeal of an *unsolicited* deal) and the latter is proactive (i.e. the consumer conducts a *search* for a particular product in order to fulfil an existing need). The premise beneath each type of e-commerce (social buying versus online retailing) is different and this may manifest a gender difference. At the very least, the gender bias of the population suggests that there is an underlying dynamic to social buying which warrants further investigation.

5.1.3 Schooling level

The results of this demographic are surprising. Whilst the users of Internet, especially in the unequal society of South Africa, would be expected to come from a more privileged and, consequently, educated background, it is unexpected that the education level of consumers is reported to be so high. Seventy per cent of the respondents had some form of tertiary education. Even more surprising is the result that over a quarter of respondents had a post-graduate degree. Compared with the national average in South Africa of individuals holding a tertiary degree of only three per cent (StatsSA, 2001) this is significant. The overwhelming majority of

respondents are white (over 70%, see next section) who historically have had better access to education. However, StatsSA (2001) reports that only 15% of whites hold a tertiary degree. This is still far below the 70% reported by the sample in this study. Beneke, *et al.* (2010) also reported that the typical respondent held at least an undergraduate degree.
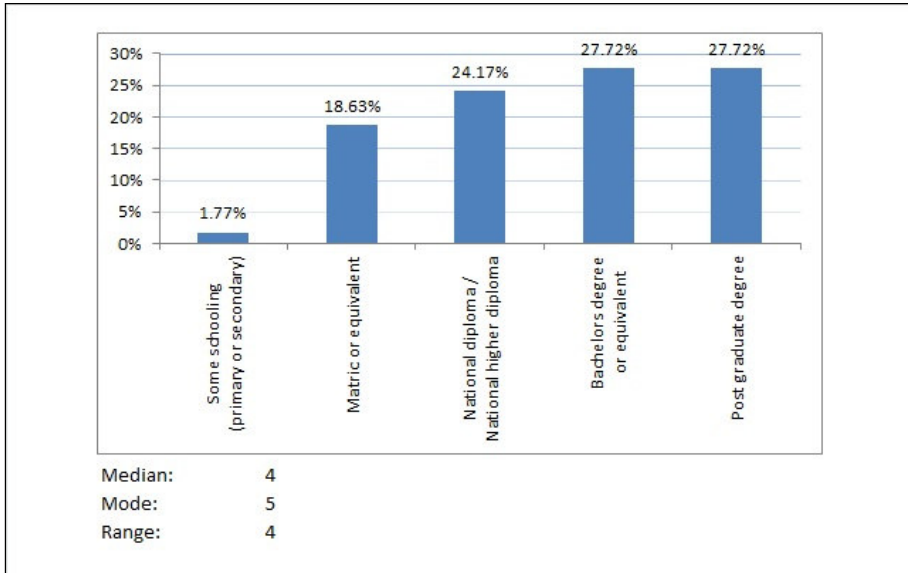
Figure 17: Distribution of sample in terms of level of education (n = 451)

It is unlikely that this result is due to a misunderstood question, since the phrasing was simple and the scale was ordinal, with clear, ranked categories. It should be clear from the question that post graduate qualification is higher than a bachelor's degree. This result may be an example of response bias. If not, this implies that the target market is highly educated, well above the national average. This would have implications for advertising medium and product selection.

5.1.4 Race group

Notwithstanding the small samples and issues with generalizability of these results to the general population, the concentration of respondents in the white demographic raises both concerns and opportunities. It is concerning that electronic commerce related activity seems to still be dominated by the previously advantaged, signifying that there remain significant inequalities in South Africa due to the past practices of economic discrimination. However, it illustrates an opportunity for social buying brokers and merchants alike in that the vast majority of the population remains untapped for electronic commerce.

Median:	4
Mode:	4
Range:	5
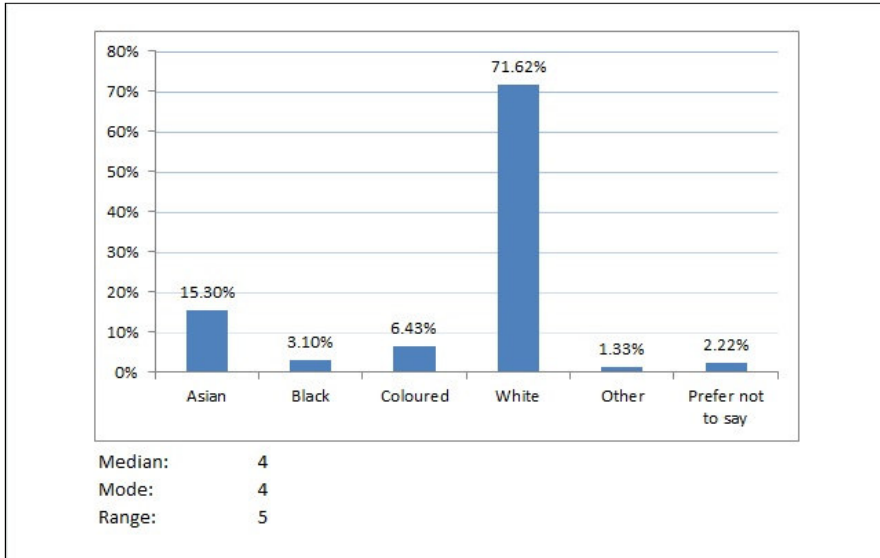
Figure 18: Distribution of sample in terms of race group (n = 451)

With the emerging black middle class and increasing sophistication of consumerism in this demographic, a well-attuned social buying broker may drive significant competitive advantage over its peers through careful selection of merchants and their products to appeal to the specific desires of other population groups.

5.1.5 Internet experience

This study finds that almost 80 per cent of respondents had over eight years of Internet experience, and almost 97 per cent have five years or more Internet experience. This points to a sample sophisticated in the use of computers and online technologies. The results of general online experience suggest that the respondents would be experienced in e-commerce transaction, although this study did not measure this directly. Beneke, *et al.* (2010) reported in their study on South African online purchasing behaviour that the average respondent had between one and two years of actual e-commerce related experience.
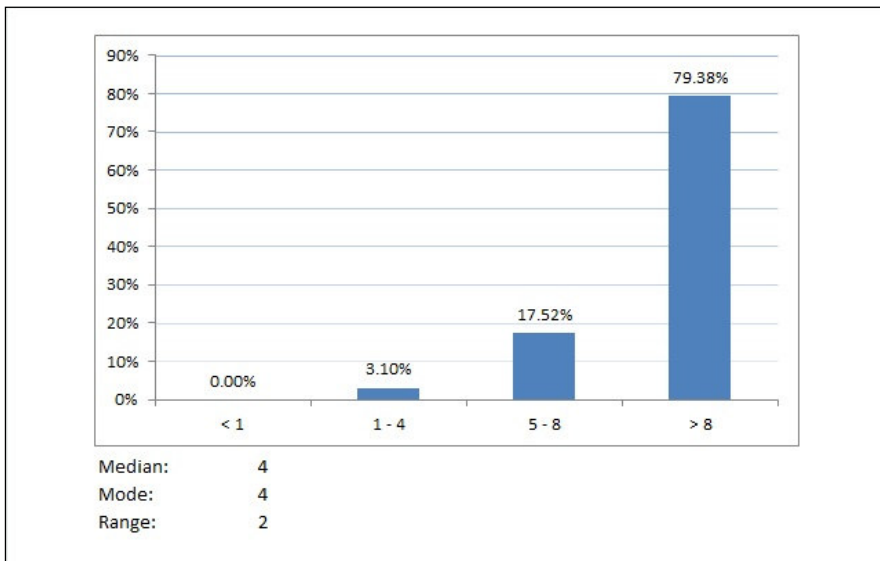
Figure 19: Distribution of sample in terms of years of Internet experience (n = 451)

5.1.6 Internet access location

The majority of respondents declared that they used the Internet mainly at work, with the second largest group using the Internet from home. Only two per cent of users accessed the Internet from their mobile phones. This suggests that the effort to set up and maintain a mobile phone version of an Internet website is not likely to be rewarded.
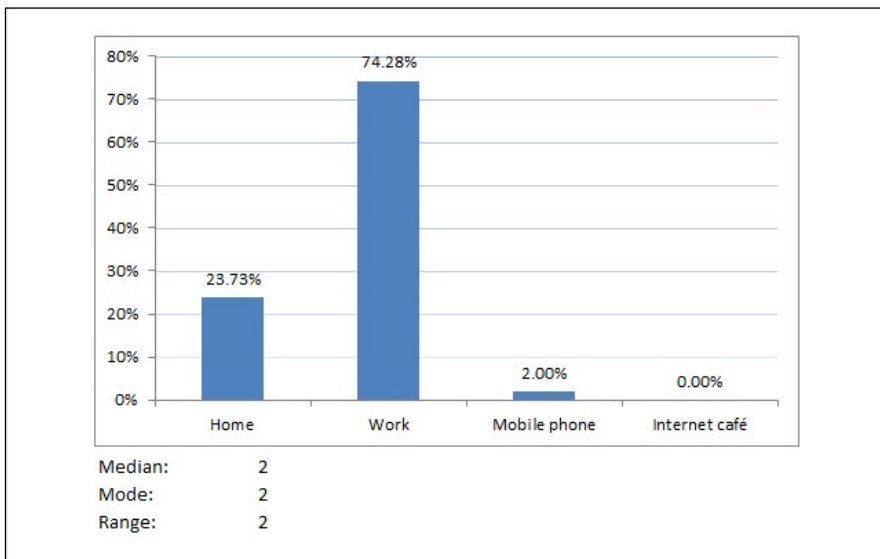
Figure 20: Distribution of sample in terms of Internet access location (n = 451)

Not surprisingly, considering the sophistication of the respondents both in terms of Internet experience and education, not a single respondent answered that he or she

accessed the Internet from Internet cafés. Public Internet access is particularly unsecure and inappropriate for e-commerce transactions, both from privacy and security points of view.

5.1.7 Internet access medium

Traditional broadband access categories dominated the access medium demographic, with about 65 per cent choosing ADSL and 16 per cent 3G. Other broadband access mediums, which would include WIMAX and satellite, contributed to about 18 per cent of responses. Dial-up contributed to less than two per cent which was expected considering the frequency of Internet usage and the location of Internet access (very few places of work still rely on dial-up access to the Internet).
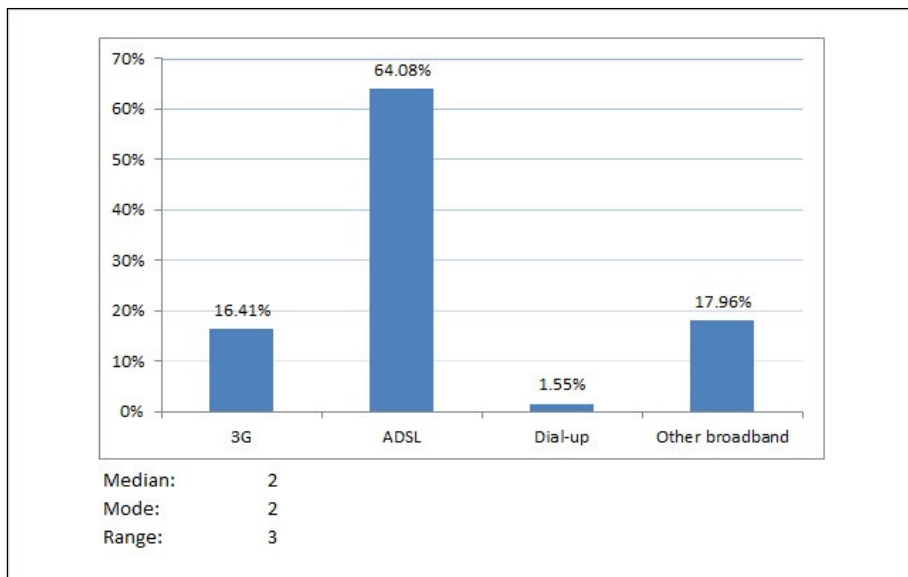
Figure 21: Distribution of sample in terms of Internet access medium (n = 451)

5.2   Broker disconfirmation – disaggregated model

The *a priori* path model presented as Figure 12 in section 4.6.2 deals with the broker disconfirmation stage of the social buying e-business transaction. As introduced in section 4.6.6 and discussed in the introduction to this chapter, two structural versions of the model will be tested. This section presents the results of the SEM analysis of the first structural model version – the disaggregated, or item-level, model. The structural representation of the disaggregated model is illustrated by Figure 22 below. The advantage of this version of the model is that it includes the first-order latent constructs of the modified E-S-QUAL measurement scale, including their measurement error terms. Since one of the stated advantages of structural equation

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modelling is to measure the error term variance simultaneously as the path relationships are measured (section 4.6.3; Schumacker and Lomax, 2004), it will provide better validation of applicability of the modified E-S-QUAL scale to the social buying context.
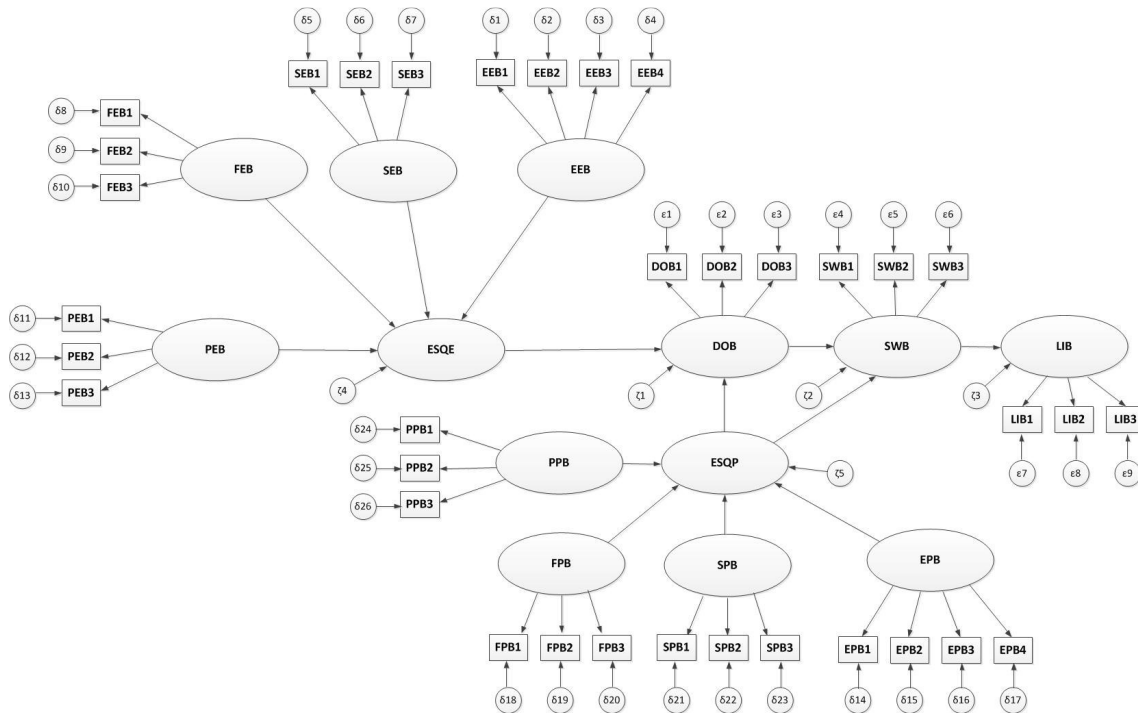
Figure 22: Disaggregated (item-level) structural model of the broker disconfirmation stage of the end-to-end social buying e-business transaction

The model represented by Figure 22 is an example of a disaggregated, or item-level, model. It contains indicator (observed) variables which load onto the exogenous latent constructs of privacy (PEB, PPB), fulfilment (FEB, FPB), service availability (SEB, SPB) and efficiency (EEB, EPB). These in turn factor load onto the higher order endogenous e-service quality constructs (ESQE, ESQP) which are not directly measured by Likert-type scale items (they are not indicated by observed variables). This is called a hierarchical factor model (Mulaik and Quartetti, 1997; Gribbons and Hocevar, 1998). According to Gribbons and Hocevar (1998) specified four forms of model aggregation are possible in hierarchical factor models: full aggregation; partial aggregation (subscale-level); partial disaggregation (testlet-level); and disaggregation (item-level). Figure 22 shows a disaggregated hierarchical factor model because the measurement scale items and their measurement errors are represented in the model as loading onto higher-order constructs. A partially aggregated version of the broker disconfirmation model will be evaluated in section 5.3.

The following sub-sections will describe the data, present a factor analysis of the observed variables, report on the results of the measurement model, and test the hypotheses relating to the disaggregated broker disconfirmation structural model.

5.2.1 Description of the model data and treatment of non-normality

Once collected, the data need to be examined and visually assessed with the aid of descriptive statistics. With outliers and missing data posing no issues (section 4.4), the focus on descriptive statistics is to identify oddly shaped distributions, since the choice of inferential statistics will be influenced by considerations of normality.

An inspection of Figure 22 reveals that there are 35 indicator variables in the disaggregated model, all of which are measured directly by the broker disconfirmation survey instrument, and 88 free parameters of interest (to be estimated). The model needs to be over-identified if model estimation is to be successful. One necessary condition for model identification is that the degrees of freedom must be greater than zero. The degrees of freedom value is calculated as the difference between the number of distinct variables in the variance-covariance matrix and the number of parameters of interest. The number of distinct matrix variables is given by the equation: $n = p (p + 1) / 2$, where p is the number of observed variables in the model (Schumacker and Lomax, 2004) and is calculated to be 630 for the model in Figure 22. There are therefore 630 – 88, or 542, degrees of freedom – a sufficient number for model identification.

Distributions of the sample for each variable are presented in Appendix 5. Inspection of these distributions suggests that the sample data is, in general, highly negatively skewed (towards the right) across the 35 variables. This suggests that the data are not univariate normal. Univariate normality is a necessary condition for multivariate normality (Burdenski, 2000) and the latter is an assumption for many of the procedures used for model estimation such as maximum likelihood (ML) and generalised least squares (GLS) as part of the structural equation modelling process (Finch, *et al.*, 1997). The following table shows the multivariate normality statistics for the raw data, indicating significant non-normality.

Statistic of normality	Value
Mardia Coefficient of Multivariate Kurtosis (should be near 0)	412.136
Normalized Multivariate Kurtosis (> 2.58 is sig)	58.537

Mardia-Based Kappa (should be close to 0)	0.318
Mean Scaled Univariate Kurtosis (should be close to 0)	0.812
Adjusted Mean Scaled Univariate Kurtosis (should be close to 0)	0.815
Relative Multivariate Kurtosis (should be close to 1)	1.318

Table 5: Multivariate normality statistics of the raw (untransformed) data (Source: Adapted from the Statistica statistical analysis program)

A consequence of multivariate non-normality is the overestimation of the chi-squared statistic which indicates the degree of discrepancy between the model-implied and sample-derived covariance matrices. This could lead to Type I errors where the overall model is falsely rejected (Mueller, 1997; Finch, *et al.*, 1997; Gao, *et al.*, 2003). In a study comparing normal and non-normal distributions, Lei and Lomax (2005) also found that kurtosis and skewness had a significant effect on the chi-squared statistic, but not on the means of the standard errors for the parameter estimates.

Finch, *et al.* (1997) suggested that, under conditions of poor multivariate normality, the asymptotically distribution free (ADF) model estimation method should be preferred, which has less stringent normality assumptions regarding distributions. However, this technique requires very large sample sizes for accurate estimation (~ 1000 responses) – larger than each of the samples for the broker and disconfirmation models (~ 200 responses).

Other approaches to improving non-normal data distributions include transforming the raw data or deleting outliers. In this study, a six-point Likert-type scale is used for all model data collection. Outliers are therefore not an issue. This leaves us with the option to transform the raw data through one of several legal techniques, including square root, logarithm, Box-Cox or Johnson transformations. The natural logarithmic transformation will be performed in this analysis because it is a straightforward transformation and works well in cases of very positively skewed data. Since the data is highly negatively skewed, the data will be converted to its mirror image first. Thus, the transformation that will be applied to the raw data will take the following form:

$$y = \ln{(7 - x)}$$

Since the data represents choices on a six-point Likert-type scale coded with values of one representing 'strongly disagree' and six representing 'strongly agree' and since one can only take the logarithm of positive numbers, each sample value is subtracted from seven. This yields the positive mirror image of the negatively skewed

data against which the natural logarithmic transformation is then applied. The table below presents the multivariate normality statistics for the transformed data. As is clear, the transformation has improved the statistics somewhat, but they remain significant, indicating multivariate non-normality.

Statistic of normality	Value
Mardia Coefficient of Multivariate Kurtosis (should be near 0)	221.67
Normalized Multivariate Kurtosis (> 2.58 is sig)	31.485
Mardia-Based Kappa (should be close to 0)	0.171
Mean Scaled Univariate Kurtosis (should be close to 0)	-0.235
Adjusted Mean Scaled Univariate Kurtosis (should be close to 0)	-0.035
Relative Multivariate Kurtosis (should be close to 1)	1.171

Table 6: Multivariate normality statistics of the transformed data, y=ln(7-x) (Source: Adapted from the Statistica statistical analysis program)

In light of multivariate non-normality, and since the sample is too small to use ADF, the GLS model estimation method will be used. The GLS model estimation method still applies the assumption of multivariate normality but is more forgiving under conditions of skewness and kurtosis than ML (Schumacker and Lomax, 2004). The consequence of overestimation of the chi-squared statistic and possible false rejection of overall model fit must therefore be taken into consideration when interpreting the results of the model estimation.

5.2.2 Factor analysis of model indicators

A principal component factor analysis, with a Varimax rotation, was performed on the transformed data in order to identify the underlying factors which the observed variable measurements describe, and assess the unidimensionality of the measurement scale. The Varimax rotation emphasises the larger loadings and de-emphasises the smaller loadings. The figure below presents a scree plot of the factors suggested by the transformed data.
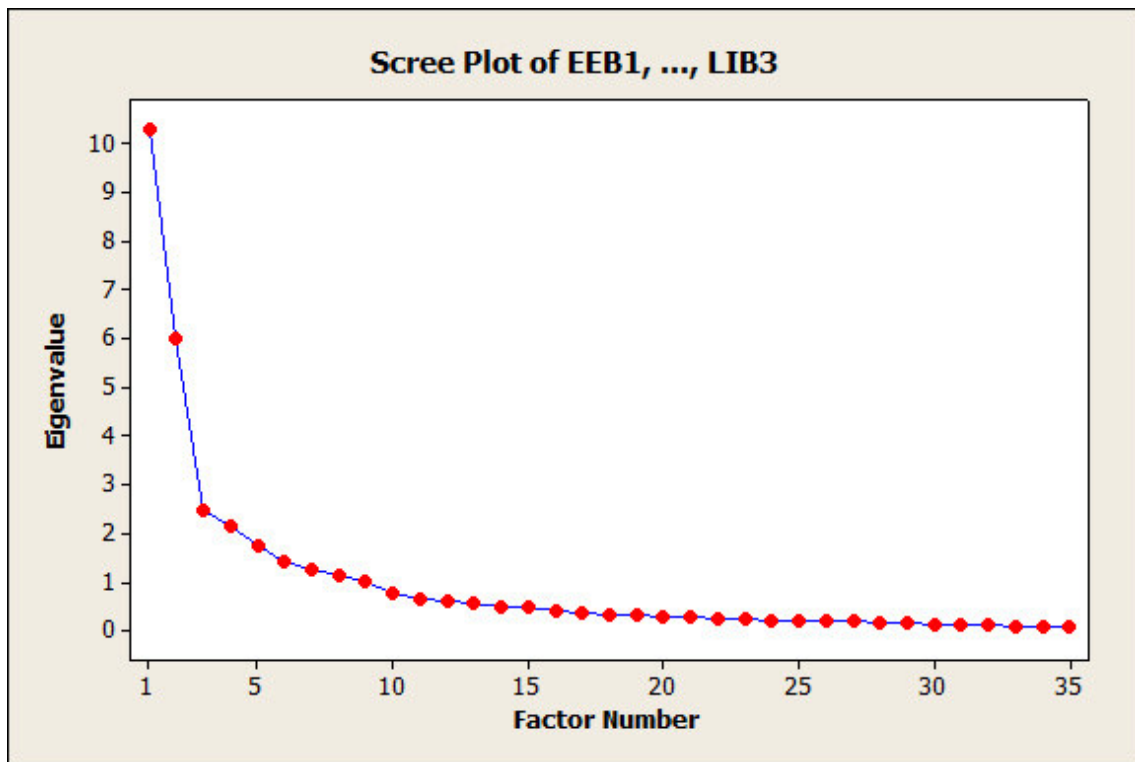
Figure 23: Scree plot of factors of Broker disconfirmation model – transformed data (Source: Minitab, 2007)

A common rule of thumb is for all factors with an eigenvalue above 1 to be used in the factor analysis. The above scree plot identifies eight factors which meet this criterion. Factor 8 has an eigenvalue of 1.138 whilst Factor 9 has an eigenvalue of 0.9947. Table 7 highlights the factor loadings of the observed variables on the emergent factors under the Varimax rotation in red italics.

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Communality
EEB1	0.026	-0.104	*0.815*	0.249	0.062	-0.083	0.108	0.065	*0.764*
EEB2	-0.029	-0.15	*0.835*	0.149	-0.118	0.002	-0.021	0.077	*0.763*
EEB3	0.113	-0.205	*0.761*	-0.001	0.102	0.197	-0.011	-0.252	*0.747*
EEB4	0.038	-0.276	*0.737*	0.003	0.092	0.068	-0.059	-0.28	*0.716*
SEB1	0.205	-0.371	0.362	0.224	-0.058	0.019	0.181	-0.405	0.562
SEB2	0.029	-0.478	0.173	0.107	0.034	0.005	0.1	*-0.726*	0.809
SEB3	-0.011	-0.533	0.116	0.01	-0.048	0.016	0.138	*-0.697*	0.806
FEB1	-0.04	*-0.796*	0.111	0.084	0.03	0.185	0.033	-0.304	*0.783*
FEB2	-0.015	*-0.862*	0.081	0.108	0.002	0.134	-0.014	-0.138	*0.799*
FEB3	0.025	*-0.813*	0.113	0.059	-0.048	0.131	-0.06	-0.227	*0.752*
PEB1	0.003	*-0.815*	0.159	0.029	0.067	-0.005	0.108	0.084	*0.714*
PEB2	-0.01	*-0.837*	0.11	-0.009	0.049	-0.056	0.015	-0.036	*0.72*
PEB3	0.011	*-0.808*	0.124	-0.041	0.103	0.008	-0.041	-0.023	*0.683*
EPB1	0.271	-0.058	0.321	*0.759*	0.117	-0.041	0.091	0.037	*0.781*
EPB2	0.142	-0.156	0.176	*0.832*	0.082	-0.013	0.056	0.01	*0.778*
EPB3	0.252	-0.026	-0.018	*0.637*	0.17	0.307	0.187	-0.125	*0.644*
EPB4	0.238	0.035	0.035	*0.734*	0.13	0.296	0.175	-0.145	*0.753*
SPB1	0.234	-0.027	0.074	0.349	0.049	0.106	*0.722*	-0.021	*0.719*

SPB2	0.106	0.012	-0.019	0.038	0.043	0.053	*0.867*	-0.02	*0.77*
SPB3	0.144	-0.052	0.006	0.094	0.093	0.276	*0.778*	-0.157	*0.747*
FPB1	0.269	-0.043	0.003	0.149	0.112	*0.776*	0.156	0.024	*0.736*
FPB2	0.301	-0.18	0.043	0.129	0.164	*0.779*	0.133	0.009	*0.793*
FPB3	0.367	-0.122	0.115	0.059	0.137	*0.752*	0.155	-0.088	*0.783*
PPB1	0.302	-0.049	0.03	0.157	*0.875*	0.102	0.066	-0.053	*0.903*
PPB2	0.275	-0.075	0.022	0.16	*0.871*	0.128	0.034	0.044	*0.886*
PPB3	0.387	-0.096	0.049	0.093	*0.769*	0.187	0.115	0.021	*0.81*
DOB1	*0.708*	0.077	0.043	0.13	0.264	0.14	0.012	-0.26	*0.683*
DOB2	*0.762*	0.166	0.034	0.233	0.192	0.143	0.045	-0.213	*0.768*
DOB3	*0.731*	0.215	0.031	0.17	0.232	0.121	0.02	-0.173	*0.709*
SWB1	*0.801*	0.063	0.037	0.145	0.143	0.139	0.135	-0.041	*0.728*
SWB2	*0.827*	-0.055	0.064	0.105	0.077	0.204	0.125	0.023	*0.766*
SWB3	*0.87*	-0.026	0.001	0.084	0.173	0.108	0.124	0.05	*0.824*
LIB1	*0.816*	-0.175	-0.06	0.125	0.074	0.203	0.111	0.09	*0.783*
LIB2	*0.837*	-0.078	0.038	0.052	0.041	0.188	0.092	0.059	*0.76*
LIB3	*0.776*	-0.076	0.063	0.082	0.092	-0.035	0.031	0.095	*0.639*
Variance	6.6429	5.0888	2.9215	2.7819	2.5514	2.4395	2.209	1.7465	26.3815
% Var	0.19	0.145	0.083	0.079	0.073	0.07	0.063	0.05	0.754

Table 7: Principal component factor analysis of eight identified factors (Source: Adapted from Minitab, 2007)
* Loadings marked in red have an absolute magnitude greater than 0.60.

The results of the factor analysis provide good support for the unidimensionality of the broker disconfirmation measurement scale. In almost all cases, all of the observed variables measuring the hypothesised construct load strongly on a particular factor.

There are a couple exceptions, however. The SEB1 variable's loading on Factor 8 is only 0.4 (negative), whereas the commonly applied cut-off is 0.6. This suggests that the SEB1 variable does not measure the factor as well as SEB2 and SEB3, although the value of 0.4 is still not bad and is higher for Factor 8 than any other factor. SEB1 to SEB3 where designed to measure the system availability expectation construct. The SEB1 scale item is worded as follows:

> *Before I use the Social Buying website, I expected that it will always be available for business.*

SEB1 has good face validity for the system availability construct and since the loading is not much lower than the others, the SEB1 item is maintained in the subsequent analysis. However, it should be noted that the tense is slightly different than the other items measuring system availability, and it was highlighted in section 3.4.3 that slight changes in tense or phrasing could significantly affect the measurement of construct (Van Dyke, *et al.*, 1997).

The other exception is highlighted in the Factor 2 column, with FEB (fulfilment expectation) and PEB (privacy expectation) items all loading strongly against it, even though FEB and PEB are hypothesised to measure different constructs. The reason for this may be that fulfilment expectation can be associated in general terms with the keeping of promises made, and therefore the concept of trust. Privacy is also associated with the trust concept. Whilst this reasoning has a certain logical consistency to it, it should imply that fulfilment performance (FPB) and privacy performance (PPB) constructs also load strongly on the same factor. In fact, FPB and PPB are shown to each load strongly on distinct factors.

5.2.3 Measurement model results

Two statistics are calculated to determine the internal consistency, or reliability, of the instruments, Cronbach's alpha and Raykov's composite reliability score (section 4.5.1). First, Cronbach's alpha for each of the constructs is calculated and presented in Table 8. The resulting values are then compared against the generally accepted lower limit criterion of 0.70. Table 8 presents these results, for both the raw data and the transformed data.

Item code	Item summary	Number of items	Cronbach Alpha (raw)	Cronbach Alpha (transformed)
EEB	Efficiency expectation (e-service quality)	4	0.82	0.85
SEB	System Availability expectation (e-service quality)	3	0.77	0.82
FEB	Fulfilment expectation (e-service quality)	3	0.93	0.94
PEB	Privacy expectation (e-service quality)	3	0.86	0.88
EPB	Efficiency performance (e-service quality)	4	0.81	0.85
SPB	System Availability performance (e-service quality)	3	0.73	0.80
FPB	Fulfilment performance (e-service quality)	3	0.80	0.87
PPB	Privacy performance (e-service quality)	3	0.91	0.93
DOB	Disconfirmation of Broker	3	0.91	0.92
SWB	Satisfaction with Broker	3	0.93	0.93
LIB	Loyalty intention	3	0.83	0.86
		35	0.91	0.92

Table 8: Internal consistency of scale items - Cronbach Alpha statistic (Source: Adapted from Minitab, 2007)

In all item cases except the SWB case (marginal), Cronbach's alpha is higher in the transformed data than in the raw data. All values for Cronbach's alpha are significantly higher than the common benchmark of 0.70. In fact, in most cases they are in the upper point eighties or point nineties, which indicates that the scale items

which are meant to measure a particular construct do actually measure that construct – that is, they are internally consistent.

The omitted item statistics were also calculated for each construct. Only in five out of the 35 measurement variables did Cronbach's alpha yield a higher value in the case of its omission. These are presented in the table below:

Item to be omitted	Cronbach Alpha with no omitted items	Cronbach Alpha if item omitted
SEB1	0.82	0.85
FPB1	0.87	0.87*
PPB3	0.93	0.93*
DOB1	0.92	0.93
LIB3	0.86	0.91

Table 9: Omitted item statistics - cases of improved Cronbach's alpha (Source: Adapted from Minital statistical analysis program)
* Difference is only visible in the third decimal

It is clear that the first four values for Cronbach's alpha were only marginally improved due to an omission of one of the items. Even though the last case, LIB3, shows a larger increase from 0.86 to 0.91, it is still not sufficient to warrant the removal of the item case from the analysis. It is also important to note that reducing the number of items measuring the loyalty intention construct from three to two would have a far greater negative impact to the construct's reliability since, as was argued in section 5.2.1, at least three indicator variables are required to load onto each latent variable in a structural equation model in order to reduce measurement error and thereby improve reliability.

A confirmatory factor analysis is conducted against the measurement model, presented in the Figure 24, which provides an assessment of composite reliability and convergent and discriminant validity. Composite reliability is evaluated by ensuring that Raykov's composite reliability value for each construct is at least 0.60 and preferably greater than 0.70. As the first data column, CR, in Table 10 shows, all composite reliability values are greater than 0.70. These results, together with the Cronbach alpha results, demonstrate good reliability for the broker disconfirmation measurement scale.
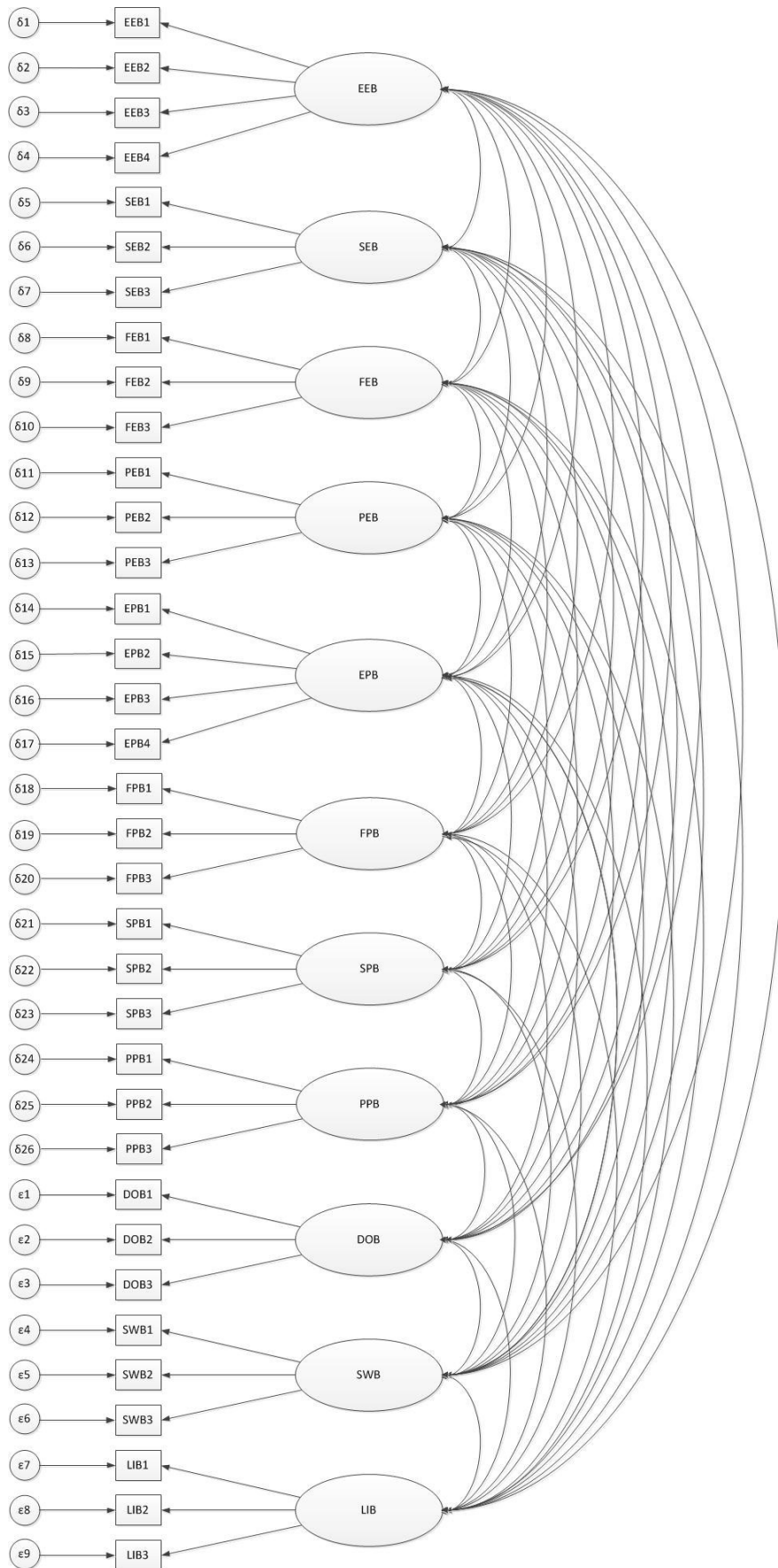
Figure 24: Measurement model of the Broker disconfirmation disaggregated (item-level) model

	CR	AVE	EEB	SEB	FEB	PEB	EPB	SPB	FPB	PPB	DOB	SWB	LIB
EEB	0.89	0.67	*0.82*										
SEB	0.85	0.66	0.30	*0.81*									
FEB	0.93	0.81	0.20	0.53	*0.90*								
PEB	0.90	0.75	0.33	0.48	0.69	*0.87*							
EPB	0.82	0.53	0.47	0.35	0.29	0.28	*0.73*						
SPB	0.78	0.55	0.01	0.14	0.09	0.08	0.03	*0.74*					
FPB	0.82	0.60	0.10	0.11	0.21	0.21	0.04	0.11	*0.78*				
PPB	0.93	0.81	0.07	-0.02	0.09	0.15	0.26	0.05	0.41	*0.90*			
DOB	0.92	0.79	0.09	0.12	0.08	0.12	0.28	0.03	0.45	0.51	*0.89*		
SWB	0.93	0.81	-0.02	0.08	0.05	0.08	0.13	0.10	0.35	0.49	0.73	*0.90*	
LIB	0.90	0.75	-0.05	0.07	0.13	0.19	0.21	0.09	0.44	0.39	0.68	0.85	*0.87*

Table 10: Composite reliability scores and average variance extracted for each construct, and inter-construct correlations
Diagonal italics values are the square root of the AVE values on the same row

Table 11 presents the results for the indicator (observed variable) loadings on their construct. According to Fornell and Larcker (1981), and as discussed in section 4.5, the first necessary condition for convergent validity is that all factor loadings should exceed 0.70. With a few exceptions, most factor loadings are greater than 0.70. The loading of SEB1 indicator variable onto the SEB (system availability expectation) construct is measured to be 0.60, which supports the result of the factor analysis in section 5.2.2 which revealed that SEB1 does not load as strongly as SEB2 and SEB3. For the EPB (efficiency performance) construct, the EPB3 and EPB4 factor loadings were 0.52 and 0.60. For the SPB (system availability performance) construct, the factor loadings for both SPB1 (0.61) and SP3 (0.66) were lower than 0.70. Finally, for FPB (fulfilment performance) construct, the FPB1 factor loading of 0.64 was lower than 0.70.

Construct (Items)	Factor loading of each item				
EEB (EEB1, EEB2, EEB3, EEB4)	(0.81,	0.92,	0.83,	0.71	)
SEB (SEB1, SEB2, SEB3)	(0.60,	0.98,	0.82	)	
FEB (FEB1, FEB2, FEB3)	(0.83,	0.94,	0.93,	)	
PEB (PEB1, PEB2, PEB3)	(0.88,	0.89,	0.83,	)	
EPB (EPB1, EPB2, EPB3, EPB4)	(0.85,	0.89,	0.52,	0.60,	)
SPB (SPB1, SPB2, SPB3)	(0.61,	0.91,	0.66,	)	
FPB (FPB1, FPB2, FPB3)	(0.64,	0.81,	0.86,	)	
PPB (PPB1, PPB2, PPB3)	(0.95,	0.91,	0.84,	)	
DOB (DOB1, DOB2, DOB3)	(0.84,	0.93,	0.90,	)	
SWB (SWB1, SWB2, SWB3)	(0.83,	0.91,	0.95,	)	
LIB (LIB1, LIB2, LIB3)	(0.94,	0.90,	0.74,	)	

Table 11: Factor loadings of each construct item on the construct

The second necessary condition for convergent validity is that the average variance extracted (AVE) values for each construct should exceed 0.50. The second data column of Table 10 reports that all such AVE values are well in excess of 0.50 as required, suggesting that the items do measure the construct they purport to measure. Thus, even though a few of the factor loadings were below 0.70 (but all at least 0.60), in general the disaggregated broker disconfirmation measurement model demonstrates good convergent validity.

Discriminant validity is assessed by establishing whether all inter-construct correlations between a particular construct and the other constructs in the measurement model are less than the square root of the AVE for the construct in question. The square roots of the AVEs for each construct are displayed along the diagonal in Table 10. To compare this value to the inter-construct correlations, look at the inter-construct correlations that appear both directly below and to the left of the value, if applicable. All such inter-construct correlations should be less than the value in the diagonal for the construct in question. Inspection of Table 10 reveals that this is the case for all constructs and, therefore, the measurement model demonstrates that the survey instrument exhibits good discriminant validity.

Thus, reliability and convergent validity have been shown to be acceptable. According to Anderson and Gerbing (1988) and Mulaik and Millsap (2000), if the psychometric properties of the measurement model can be established within acceptable limits, then the structural model may then be assessed. The results of the structural model assessment will thus be presented next.

5.2.4 Structural model results

The model was estimated using the generalised least squares (GLS) model estimation method, owing to the poor multivariate normality remaining in the data even after transformation. Version 7.1 of the Statistica data analysis software system (StatSoft, 2005) was used and the SEM program can be found in Appendix 6. The correlation matrix contains Pearson-moment correlations among the 35 variables, using the transformed data, with a sample size of n = 209. The correlation matrix can also be found in Appendix 6, with means and standard deviations reported.

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Certain constraints were applied to remove boundary conditions (Heywood cases) and reduce over-parameterisation. A Haywood case arises when a negative or non-zero variance is reported in the model estimation results. One possible resolution to Haywood cases, and the one adopted here, is to "eliminate a *bad* observed variable that indicates linear dependence or multicollinearity" (Schumacker and Lomax, 2004:48). The error term of the offending variable was set to 0.05 and the model re-estimated. This iterative procedure was repeated four times until no boundary conditions were reported, with the SEB2, SEB3, SPB3 and ESQE error terms all constrained.

The normalised residual matrix was inspected for evidence of model misspecification. The residual matrix is the difference between the sample-derived and model-implied covariance matrices. For a well-specified model, the values should be small and should not be larger for one variable relative to the others (Schumacker and Lomax, 2004). Since there were many large residuals, the intuitive indication is that the model is misspecified. Further inspection revealed some residuals are larger than others, suggesting that the model would possibly benefit from introducing covariance relationships between them. Covariance constraints were introduced between the exogenous variables leading into each of the endogenous constructs for e-service quality expectation (ESQE) and e-service quality performance (ESQP). Figure X in Appendix 6 illustrates the covariances which were introduced.

The modified model was then re-estimated. This time no boundary conditions (Haywood cases) were reported, although two parameters with a standard error of zero suggested that the model was still over-parameterised model. The error term for ESQE was set to 0.05, leaving only one remaining standard error equal to zero.

The goodness-of-fit (GOF) indicators for the model are reported in Table 12 below. The Chi-squared can be misleading due to the sample size and the lack of multivariate normality of the sample and, for fear of false rejection of the model (Type I errors), can be discounted providing the other goodness-of-fit (GOF) indexes offer sufficient support (Mueller, 1997; Finch, *et al.*, 1997; Gao, *et al.*, 2003). Unfortunately, the RMS value is also well above the upper limit for good fit, and the GFI and AGFI indexes are somewhat lower than would be expected for a good fit. The RMSEA index, which unlike the chi-squared statistic is not dependent on sample

distribution characteristics, is indicative of an exceptional fit of the model to the data. The consensus of fit indexes, however, point to a poorly fitting model.

GOF indexes for the Disaggregated Broker Disconfirmation Model (n =209)			
GOF index	**Value**	**Rule of thumb***	**Notes**
Chi-squared (df; p)	? (?, ?)	Chi-square / df. = < 2 : Excellent fit < 3 : Good fit < 5 : Adequate fit	Chi-squared may be discounted when sample size is reasonable (> 200), sample does not exhibit multivariate normality, and if other GOF indexes are acceptable. Based on the minimum sample discrepancy function.
SRMR (Standardised Root-Mean-square Residual)	0.213	< 0.06 : Excellent < 0.08 : Good < 0.1 : Adequate	SRMR measures the average differences between the sample-derived and the estimated population variance-covariance matrices.
RMSEA (Root mean square error of approximation)	0.046	< 0.05 : Excellent < 0.06 : Good < 0.08 : Adequate	RMSEA corrects for model complexity due to the presence of degrees of freedom in its denominator. Based on the population discrepancy.
GFI (Goodness-of-Fit Index)	0.786	> 0.95 : Excellent > 0.90 : Good	Biased downwards in complex models where degrees of freedom are high w.r.t. sample size
AGFI (Adjusted Goodness-of-Fit Index)	0.749	> 0.95 : Excellent > 0.90 : Good	Adjusts the GFI index for model complexity
AIC (Akaike Information Criterion)	4.634	Smaller the better	Only to be used in model comparison. Favours parsimonious models.
BCC (Browne-Cudeck Criterion)	4.822	Smaller the better	Only to be used in model comparison. Favours parsimonious models even more than AIC.

Table 12: Results of model fit indexes for the disaggregated broker disconfirmation model (Source: Adapted from Statistica)

* The rules of thumb are from several authors, most cited in Hu and Bentler (1999), Schumacker and Lomax (2004) and Arbuckle (2007)

With the GOF indexes indicating a fairly poor fir of the model to the data, the results of hypothesis testing should therefore be treated with caution. As Table 13 reports, though, the hypotheses relating to the relationships between disconfirmation and satisfaction and between satisfaction and loyalty intention were both supported at the 0.02 significance level, in general agreement with the extant literature.

Disaggregated Broker Disconfirmation Model (n=209)			
Hypothesis	**Path relationship**	**Path coefficient**	**Significance**
H1	SWB → LIB	0.892	$p < 0.02$
H2a	DOB → SWB	0.707	$p < 0.02$
H2b	ESQP → SWB	0.112	Not significant
H3a	ESQE → DOB	0.170	Not significant

| H3b | ESQP → DOB | 0.641 | p < 0.02 |

Table 13: Results of hypothesis testing relating to the disaggregated broker disconfirmation model (Source: Adapted from Statistica)

Several expectancy-disconfirmation studies examining the roles of performance, disconfirmation and satisfaction in traditional retailing settings have reported that performance fully mediates disconfirmation (Churchill and Surprenant, 1982; McKinney, *et al.,* 2002). In this study, the relationship between e-service quality performance (ESQP) and satisfaction (SWB) was not found to be significant whilst that between ESQP and disconfirmation (DOB) was found to be significant, suggesting that performance does not mediate disconfirmation. This is in general agreement with the consensus view that performance and disconfirmation are distinct constructs (Tse and Wilton, 1988; Pitt, *et al.*, 1997; Yen and Lu, 2008a).

The relationship between e-service quality expectation (ESQE) and disconfirmation is not reported as significant, whilst that between ESQP and disconfirmation is reported as significant. Again, there are studies which report a similar result (Cadotte, *et al.*, 1987) and which conclude that performance alone is a determinant of disconfirmation. In fact, Spreng, *et al.* (1996) raised logical consistency concerns with the role of expectations in the theory, arguing that it was counterintuitive for customers expecting poor service, and then receiving it, to be satisfied. However, the result remains surprising, since the modern consensus is for expectation to be included in any EDT model (Yoon and Kim, 2000; Khalifa and Liu, 2004). It is important to note that expectation is operationalized in this study according to the 'will' semantic. In other words, expectation represents the consumer's *prediction* of future events, not the consumer's *desire* of future events. It may be that operationalizing expectations according to the 'should' semantic may have yielded a significant relationship for hypothesis H3a, as recent studies have suggested (Suh, *et al.,* 1994; Spreng, *et al.,* 1996; Khalifa and Liu, 2002).

Disaggregated Broker Disconfirmation Model (n=209)			
Construct	**Path relationship**	**Path coefficient**	**Significance**
Efficiency expectation	EEB → ESQE	-0.479	Not significant
Fulfilment expectation	FEB → ESQE	-0.855	Not significant
Service Availability expectation	SEB → ESQE	0.893	Not significant
Privacy expectation	PEB → ESQE	0.035	Not significant

Efficiency performance	EPB → ESQP	0.153	p < 0.02
Fulfilment performance	FPB → ESQP	0.469	p < 0.02
Service Availability performance	SPB → ESQP	0.029	Not significant
Privacy performance	PPB → ESQP	0.577	p < 0.02

Table 14: Results of first-order construct loadings onto second-order constructs relating to the disaggregated broker disconfirmation model (Source: Adapted from Statistica)

Table 14 presents the relationships of the first-order quality dimensions onto the second order e-Service Quality constructs. Whilst these are not related to hypotheses in this study, nor are part of the explicit research problem, it is important to understand their role in establishing the second-order constructs. As discussed in chapter 4, the first-order constructs, and the indicator variables which measure them, are based closely on the measurement scale suggested by Parasuraman, *et al.* (2005) for service quality in electronic commerce settings. It is very surprising that only three of the first-order relationships were reported as significant, since it makes intuitive sense that the first-order quality dimensions should combine well into e-service quality latent constructs. It should be noted, however, (and as mentioned in section 5.4.5) that Parasuraman, *et al.* (2005) in their *own* study treated the e-service quality constructs as *first*-order variables with the four service quality dimensions of fulfilment, system availability, efficiency and privacy each summated to become indicators onto the e-service quality variable. This they did due to the complexity of the model and limited sample sizes available, two constraints shared by this study. This provides further justification for the partially aggregated model approach which will be evaluated in section 5.4.5.

Estimating the disaggregated model resulted in over-parameterisation and boundary conditions being reported. Gustafsson and Stahl (2000) argue that in such cases the best approach is usually to reduce the number of parameters to be estimated. This view is supported by Mueller (1997) who suggested that complex models may run into analytical difficulties if the ratio of sample cases to parameters of interest (n:p) is not in the order of 10:1. In the disaggregated model, the ratio is only about 3:1. Gustafsson and Stahl's (2000) approach will therefore be taken in this study. In order to reduce the number of parameters to be estimated, but maintain the nomological integrity of the hypotheses, the structural model in Figure 18 was reworked from a disaggregated model into a partially-aggregated model. The results of the partially aggregated model will be reported in the next section.

5.3   Broker disconfirmation – partially aggregated model

This section evaluates the partially aggregated, or subscale-level, version of the broker disconfirmation model presented as Figure 9 in section 4.6.3. The item-level scores have been summed for each relevant dimension such as Efficiency, Fulfilment, Service Availability and Privacy. Thus, for the higher-order construct of ESQE, the item-level variables loading into the lower-order constructs EEB, FEB, SEB and PEB were summed, resulting in these former latent exogenous variables being treated as observed (measured) variables (represented in Figure 22 as EEBSum, FEBSum, SEBSum and PEBSum respectively). A consequence of this is that the higher-order ESQE construct changes from an endogenous latent variable to an exogenous one. The process was applied analogously to the higher-order construct of ESQP and its lower-order constructs, EPB, FPB, SPB and PPB (giving EPBSum, FPBSum, SPBSum and PPBSum respectively). The disaggregated model contains 88 parameters, whilst the partially aggregated model, represented below, contains 42 parameters. This improves Mueller's (1997) n:p ratio to just above 5:1.
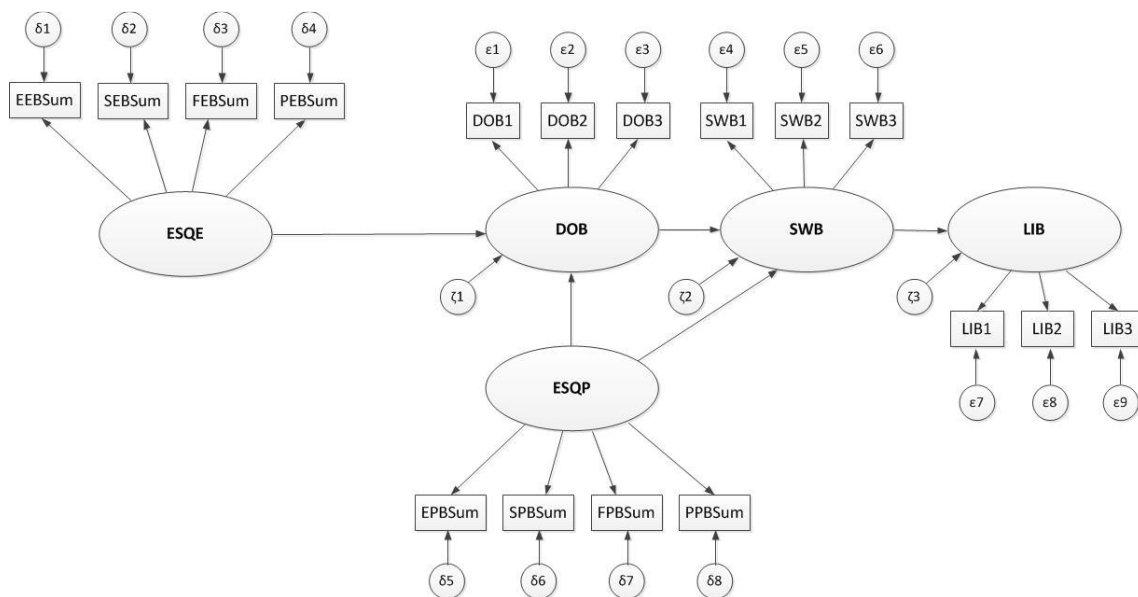
Figure 25: Partially aggregated (sub-scale level) broker disconfirmation model

The disaggregated model of Figure 22 was initially preferred to the partially aggregated model of Figure 25 because it includes the measurement of errors relating to the first-order constructs of Efficiency, Fulfilment, Service Availability and Privacy. Since these represent a modification of Parasuraman, *et al.'s* (2005) E-S-QUAL measurement scale, it would is useful to examine the behaviour of the modified scale directly in the model. However, due to issues of over-parameterisation

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and poor overall model fit, a partially aggregated model was specified. This is a valid decision if, as Mueller (1997:379) points out, "researchers are concerned with only the higher order construct and not clear identification of first-order factors." Since the research problem and associated hypotheses of this study are specifically related to the higher order constructs and not the first-order ones, this approach is justified.

The following sub-sections will describe the data, present a factor analysis of the observed variables, report on the results of the measurement model, and test the hypotheses relating to the partially aggregated broker disconfirmation structural model.

5.3.1 Description of the model data and treatment of non-normality

As illustrated by Figure 25, there 17 indicator variables and therefore 153 distinct variance-covariance matrix variables. Since the model comprises 42 parameters of interest, the degrees of freedom are calculated to be 111, sufficiently larger than zero for model identification.

The indicator variables relating to the broker disconfirmation (DOB), satisfaction (SWB) and loyalty intention (LIB) constructs are measured directly by items in the broker disconfirmation survey instrument. Those indicator variables relation to e-service quality expectation (ESQE) and e-service quality performance (ESQP) are the subscale indicator variables newly created by summing the item-level scores. Since the same sample is used for both disaggregated and partially aggregated model testing, the sample size remains at 209 usable responses, with no missing data (listwise deletion of cases) and no outliers (Likert-type scale data). Distributions of the new summated indicator variables are presented in Appendix 5. Inspection reveals that the sample data remains highly negatively skewed across the eight new summated variables, as expected since summation should not alter these data characteristics. Thus, the multivariate normality statistics for the raw data are identical to those of the disaggregated model as presented in Table 5, which indicates significant non-normality.

The same logarithmic transformation was applied to the raw data as was used in the disaggregated model. The table below presents the multivariate normality statistics for the transformed data. Once again, the transformation has improved the statistics somewhat, but they remain significant, indicating multivariate non-normality. The GLS

model estimation method will therefore be used and it will again be noted that the overestimation of the chi-squared statistic and possible false rejection of overall model fit will need to be taken into consideration when interpreting the results of the model estimation.

Statistic of normality	Value
Mardia Coefficient of Multivariate Kurtosis (should be near 0)	141.236
Normalized Multivariate Kurtosis (> 2.58 is sig)	25.675
Mardia-Based Kappa (should be close to 0)	0.180
Mean Scaled Univariate Kurtosis (should be close to 0)	-0.291
Adjusted Mean Scaled Univariate Kurtosis (should be close to 0)	-0.069
Relative Multivariate Kurtosis (should be close to 1)	1.180

Table 15: Multivariate normality statistics of the transformed data, y=ln(7-x) (Source: Adapted from the Statistica statistical analysis program)

5.3.2 Factor analysis of model indicators

The unidimensionality of the summated measurement scale was assessed by performing a principal component factor analysis, with a Varimax rotation, on the transformed data in order to identify the underlying factors which the observed variable measurements describe. The figure below presents a scree plot of the factors suggested by the transformed data.
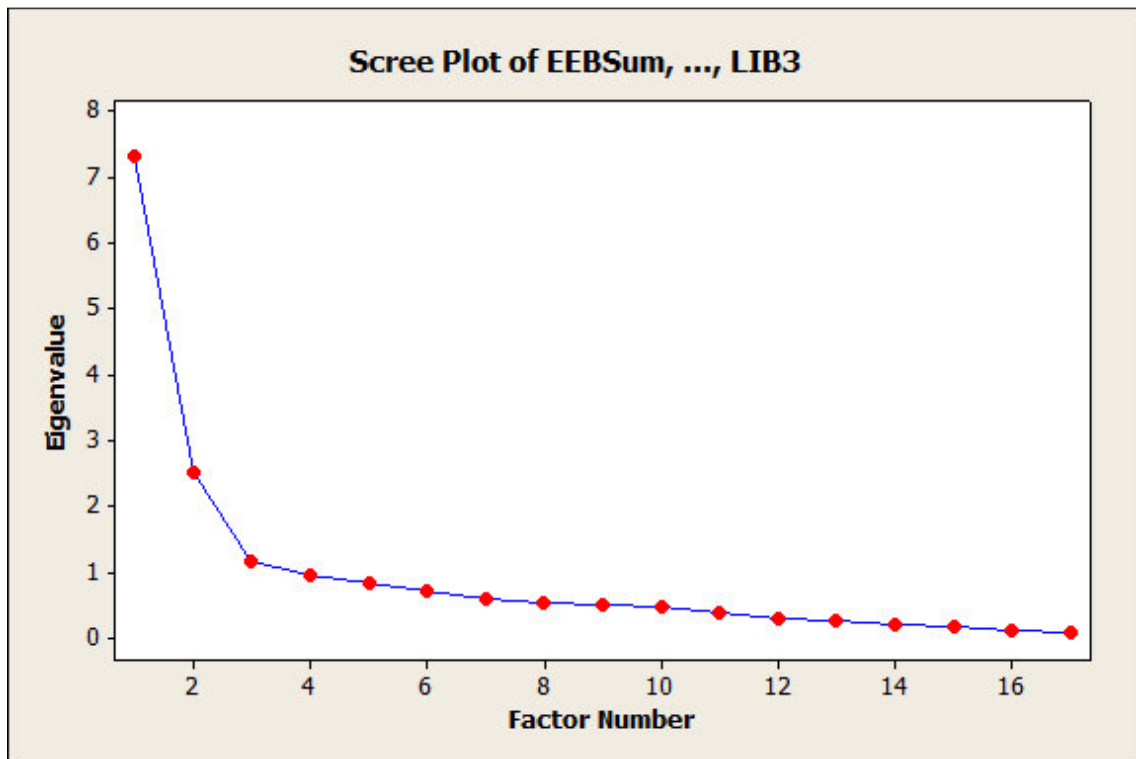
Figure 26: Scree plot of factors of Merchant disconfirmation model – transformed data (Source: Minitab, 2007)

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Inspecting the above graph shows three factors which meet the criterion of having eigenvalues above 1. Factor 3 has an eigenvalue of 1.1492 whilst Factor 4 has an eigenvalue of 0.9452. Table 16 highlights the factor loadings of the observed variables on the emergent factors under the Varimax rotation in red italics.

Variable	Factor 1	Factor 2	Factor 3	Communality
EEBSum	-0.04	-0.49	0.464	0.457
SEBSum	0.052	*-0.726*	0.329	*0.637*
FEBSum	0.047	*-0.892*	0	*0.798*
PEBSum	0.036	*-0.837*	-0.044	*0.704*
EPBSum	0.269	-0.17	*0.725*	*0.628*
SPBSum	0.172	-0.066	*0.604*	0.398
FPBSum	0.493	-0.168	0.385	0.419
PPBSum	0.501	-0.053	0.331	0.364
DOB1	*0.688*	0.058	0.406	*0.641*
DOB2	*0.727*	0.151	0.468	*0.771*
DOB3	*0.697*	0.218	0.433	*0.721*
SWB1	*0.807*	0.046	0.261	*0.722*
SWB2	*0.843*	-0.071	0.182	*0.749*
SWB3	*0.898*	-0.013	0.127	*0.822*
LIB1	*0.871*	-0.147	0.052	*0.783*
LIB2	*0.867*	-0.086	0.05	*0.762*
LIB3	*0.771*	-0.076	0.026	*0.601*
Variance	6.367	2.443	2.168	10.977
% Var	0.375	0.144	0.128	0.646

Table 16: Principal component factor analysis of three identified factors (Source: Adapted from Minitab statistical analysis program)
* Loadings marked in red have an absolute magnitude greater than 0.60.

The results of the factor analysis provide mixed support for the unidimensionality of the summated version of the broker disconfirmation measurement scale. In five out of the eight indicator variable cases, the observed variables measuring the hypothesised construct load strongly on a particular factor. However, the indicator variable EEBSum (summated version of the EEB1 to EEB4 indicator variables) loads weakly onto the factor on which the other expectation-related indicators (SEBSum, FEBSum and PEBSum) load. Similarly, the FPBSum and PPBSum indicator variables load weakly onto the factor the on which the other performance-related indicators (EPBSum and SPBSum) load. All of the disconfirmation, satisfaction and loyalty intention indicators load strongly onto the same factor as predicted by expectancy-disconfirmation theory (EDT).

5.3.3 Measurement model results

Cronbach's alpha for each of the constructs is calculated for both the raw and transformed data sets and presented in Table 17. The resulting values are then compared against the generally accepted lower limit criterion of 0.70.

Item code	Item summary	Number of items	Cronbach Alpha (raw)	Cronbach Alpha (transformed)
ESQE	e-service quality expectation	4	0.74	0.78
ESQP	e-service quality performance	4	0.68	0.67
DOB*	Disconfirmation of Broker	3	0.91	0.92
SWB*	Satisfaction with Broker	3	0.93	0.93
LIB*	Loyalty intention	3	0.83	0.86
		17	0.80	0.90

Table 17: Internal consistency of scale items – Cronbach's Alpha statistic (Source: Adapted from Minitab, 2007)
* DOB, SWB and LIB items are the same as for the disaggregated model since they are not summed

Cronbach's alpha is higher in the transformed data than in the raw data for the ESQE construct, but slightly lower for the ESQP construct. The ESQE construct has a Cronbach alpha above 0.70 whilst the ESQP construct has a Cronbach alpha just below 0.70. The summated scale demonstrates poorer internal consistency than the disaggregated scale although, with the exception of the ESQP construct, the values are acceptable.

Only three of the 17 measurement variables did Cronbach's alpha yield a higher value in the case of its omission. These are presented in the table below. Note that for DOB1 and LIB3, the results are the same as for the disaggregated model, since these items were not summed. The omission of the EEBSum item would improve the internal consistency of the summated scale from 0.7784 to 0.8024. This is consistent with the results of the factor analysis in the previous section which identified EEBSum as loading only weakly on the same construct as the other e-service quality expectation (ESQE) indicators. EEBSum includes all the efficiency expectation items. The implication is that there is justification for efficiency expectation not to be included as a measure for e-service quality expectation.

Item to be omitted	Cronbach Alpha with no omitted items	Cronbach Alpha if item omitted
EEBSum	0.78	0.80
DOB1	0.92	0.93
LIB3	0.86	0.91

Table 18: Omitted item statistics - cases of improved Cronbach Alpha (Source: Adapted from Minital statistical analysis program)

A confirmatory factor analysis was then performed against the partially aggregated measurement model, presented in Figure 27 over page, which provides an assessment of composite reliability and convergent and discriminant validity.

Composite reliability was evaluated by ensuring that the Raykov composite reliability value for each construct is at least 0.60 and preferably greater than 0.70. As the first data column, CR, in Table 19 shows, all composite reliability values are greater than 0.70. These results, together with the Cronbach alpha results, demonstrate good reliability for the broker disconfirmation measurement scale.

	CR	AVE	ESQE	ESQP	DOB	SWB	LIB
ESQE	0.79	0.50	*0.71*				
ESQP	0.71	0.39	0.38	*0.62*			
DOB	0.93	0.82	0.04	0.69	*0.91*		
SWB	0.95	0.86	0.11	0.69	0.76	*0.93*	
LIB	0.90	0.76	0.19	0.69	0.71	0.89	*0.87*

Table 19: Composite reliability scores and average variance extracted for each construct, and inter-construct correlations Diagonal italics values are the square root of the AVE values on the same row
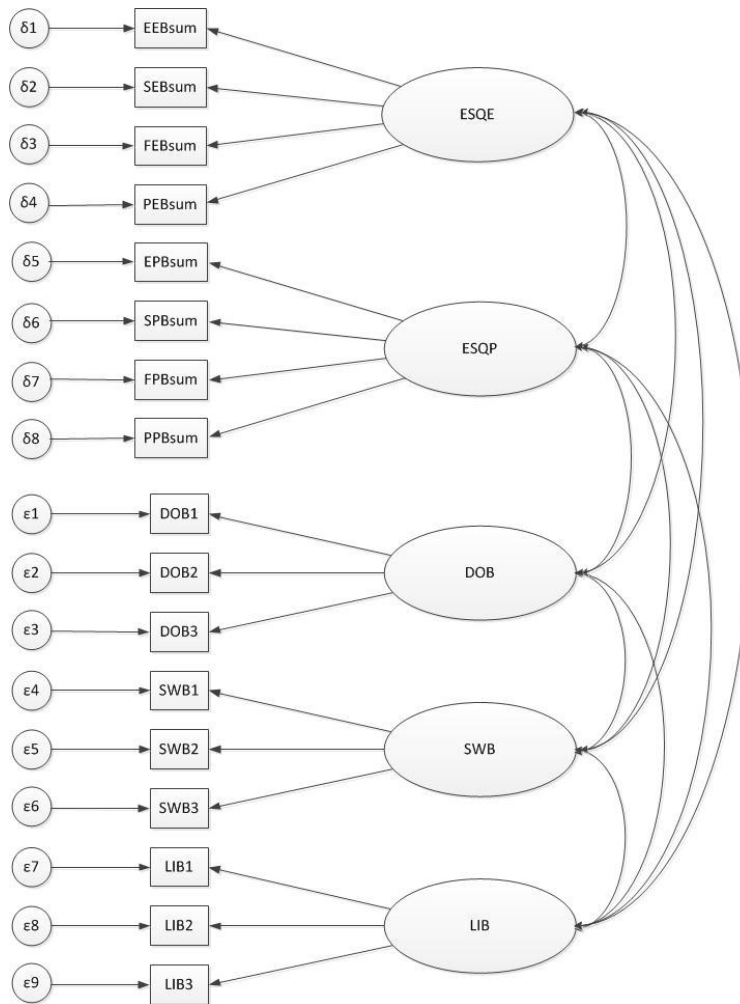
Figure 27: Measurement model of the Broker disconfirmation disaggregated (item-level) model

According to Fornell and Larcker (1981), and as discussed in section 4.5, the first necessary condition for convergent validity is that all factor loadings should exceed 0.70. Table 20 presents the results for the indicator (observed variable) loadings on their construct. For the ESQE (e-service quality expectation) construct, the EEBSum (summated efficiency expectation) loading is measured to be only 0.46, well below 0.70, and the SEBSum (summated service availability expectation) loading is measured to be 0.67, marginally below 0.70. For the ESQP (e-service quality performance) construct, the SPBSum (summated service availability performance) loading is 0.43, well below 0.70, and the EPBSum (summated efficiency performance) loading is 0.60, below 0.70, and the PPBSum (privacy performance) loading is 0.68, marginally below 0.70.

The second necessary condition for convergent validity is that the average variance extracted (AVE) values for each construct should exceed 0.50. The second data

column of Table 19 reports that all such AVE values are at least 0.50 as required, except the ESQP construct which is reported with a value 0.39. In light of the results of the first condition where only one indicator variable of the ESQP construct was reported as having a factor loading of at least 0.70, this ESQP AVE value is not surprising. It demonstrates that the ESQP construct demonstrates fairly poor convergent validity. Apart from the ESQP construct, however, the partially aggregated broker disconfirmation measurement model demonstrates good convergent validity.

Construct (Items)		Factor loading of each item				
ESQE	(EEBSum, SEBSum, FEBSum, PEBSum)	(	0.46,	0.67,	0.89,	0.72,)
ESQP	(EPBSum, SPBSum, FPBSum, PPBSum)	(	0.60,	0.43,	0.74,	0.68)
DOB	(DOB1, DOB2, DOB3)	(	0.86,	0.96,	0.91,)	
SWB	(SWB1, SWB2, SWB3)	(	0.88,	0.94,	0.96,)	
LIB	(LIB1, LIB2, LIB3)	(	0.95,	0.91,	0.74,)	

Table 20: Factor loadings of each construct item on the construct

Discriminant validity is assessed by establishing whether all inter-construct correlations between a particular construct and the other constructs in the measurement model are less than the square root of the AVE for the construct in question. The square roots of the AVEs for each construct are displayed along the diagonal in Table 19. Comparing this value to the inter-construct correlations for each construct in turn, it is clear that except for the ESQP construct, all constructs demonstrate good discriminant validity.

The poor results for ESQP suggest that it demonstrates acceptable reliability but fairly poor convergent validity. For the disaggregated broker model, the first-order performance constructs exhibited far better reliability and validity with respect to the item-level indicator variables. It is therefore a little surprising that the partially aggregated model exhibits such poor validity (both convergent and discriminatory). A possible reason for this is suggested by the residual matrix for the partially aggregated broker model. Indicating a good model fit, there are very few significant residuals. Those that are present, however, are for the SEBSum, EEBSum, EPBSum and SPBSum indicator variables which are precisely those indicators which exhibited poor factor loading coefficients. Examining the relationships of these correlations in the residual matrix suggests that the structural model estimation would benefit from the inclusion of the following additional covariance relationships:

- SEBSum $\leftrightarrow$ EEBSum;
- SEBSum $\leftrightarrow$ EPBSum;
- SEBSum $\leftrightarrow$ SPBSum;
- EPBSum $\leftrightarrow$ SPBSum.

To strictly conform to the Anderson and Gerbing (1988) and Mulaik and Millsap (2000) advocated approach of establishing the psychometric properties of the measurement model before assessing the structural model, these covariances should be introduced into the structural model. However, due to time constraints, the original structural model, *sans* these covariances, was estimated, and is reported in the following section.

5.3.4 Structural model results

The partially aggregated structural model presented in Figure 25 was estimated using the generalised least squares (GLS) model estimation method, owing to the poor multivariate normality remaining in the data even after transformation and summation of the item-level scores. The correlation matrix contains Pearson-moment correlations among the 17 variables, using the transformed and summated data, with a sample size of n = 209. The correlation matrix can be found in Appendix 7, with means and standard deviations reported. The Satistica SEM program used to run the GLS estimation of the model can also be found in Appendix 7.

No Haywood cases were reported, but one parameter (ζ_3 in Figure 19) with a standard error of zero was indicated, suggesting that the model is still over-parameterised. The error term for ζ_3 was set to 0.05 and the model re-estimated. The normalised residual matrix was inspected. Note that the normalised, rather than the standardised, residual matrix is considered since it gives a more conservative view of model misspecification. The standardised residual matrix yielded no significant (> 2.58) values, whilst the normalised residual matrix yielded several. However, these were much fewer and much smaller in size than the disaggregated model, empirically indicating that the partially aggregated model is a better fit to the data.

GOF indexes for the Partially Aggregated Broker Disconfirmation Model (n =209)			
GOF index	**Value**	**Rule of thumb***	**Notes**
Chi-squared (df; p)	? (?, ?)	Chi-square / df. = < 2 : Excellent fit < 3 : Good fit < 5 : Adequate fit	Chi-squared may be discounted when sample size is reasonable (> 200), sample does not exhibit multivariate normality, and if other GOF indexes are acceptable. Based on the minimum sample discrepancy function.
SRMR (Standardised Root-Mean-square Residual)	0.133	< 0.06 : Excellent < 0.08 : Good < 0.1 : Adequate	SRMR measures the average differences between the sample-derived and the estimated population variance-covariance matrices.
RMSEA (Root mean square error of approximation)	0.065	< 0.05 : Excellent < 0.06 : Good < 0.08 : Adequate	RMSEA corrects for model complexity due to the presence of degrees of freedom in its denominator. Based on the population discrepancy.
GFI (Goodness-of-Fit Index)	0.878	> 0.95 : Excellent > 0.90 : Good	Biased downwards in complex models where degrees of freedom are high w.r.t. sample size
AGFI (Adjusted Goodness-of-Fit Index)	0.837	> 0.95 : Excellent > 0.90 : Good	Adjusts the GFI index for model complexity
AIC (Akaike Information Criterion)	1.408	Smaller the better	Only to be used in model comparison. Favours parsimonious models.
BCC (Browne-Cudeck Criterion)	1.443	Smaller the better	Only to be used in model comparison. Favours parsimonious models even more than AIC.

Table 21: Results of model fit indexes for the partially aggregated broker disconfirmation model (Source: Adapted from Statistica)

* The rules of thumb are from several authors, most cited in Hu and Bentler (1999), Schumacker and Lomax (2004) and Arbuckle (2007)

The goodness-of-fit (GOF) indicators for the model are reported in Table 21. Whilst the Chi-squared statistic indicates a poor model fit, it is to be noted that the size of the sample (greater than 200 cases) and the skewness and kurtosis exhibited by even the transformed data will both result in increased values and therefore increase the chance of Type I errors where a model is falsely rejected (Mueller, 1997; Finch, *et al.*, 1997; Gao, *et al.*, 2003). Under these circumstances, the Chi-squared statistic may be discounted as long as the other goodness- (and badness-) of-fit indexes are within acceptable limits. Table 21 reports that the RMSEA value of 0.065 is within the adequate-fit upper limit of 0.08 and marginally outside the good-fit limit of 0.05. Similarly, the GFI and AGFI statistics of 0.878 and 0.837 respectively are marginally outside the good-fit lower limits of 0.90. These statistics indicate a reasonable fit of the model to the data. However, the RMS value of 0.133 is above the adequate fit upper limit of 0.08 and well outside the good-fit upper limit of 0.05. In general, the GOF statistics are considerably better for the partially aggregated model than the

disaggregated model and the consensus is that a reasonable, if not good, fit is indicated.

When the AIC and BCC statistics reported for the disaggregated model (4.634 and 4.822 respectively) are compared with those here of the partially aggregated model (1.408 and 1.443 respectively), it is clear that the latter model is a better fit to the sample data and also demonstrates superior parsimony.

Table 22 reports that all of the hypotheses for the broker disconfirmation model were supported at the $p < 0.01$ level of significance. It is interesting to contrast these results with those of the disaggregated version of the model, in which hypotheses 2a and 3b were not supported. As Parasuraman, *et al.* (2005) found, this may be attributed to the complexity of the model and small sample size and specifically, the sample size to parameters of interest (n:p) ratio. The implication is that the n:p ratio of the disaggregated model was too small for the parameter estimates to be trusted (Mueller, 1997).

Partially Aggregated Broker Disconfirmation Model (n=209)			
Hypothesis	Path relationship	Path coefficient	Significance
H1	SWB → LIB	0.448	p < 0.01
H2a	DOB → SWB	0.537	p < 0.01
H2b	ESQP → SWB	0.331	p < 0.01
H3a	ESQE → DOB	-0.216	p < 0.01
H3b	ESQP → DOB	0.700	p < 0.01

Table 22: Results of hypothesis testing relating to the partially aggregated broker disconfirmation model (Source: Adapted from Statistica)

The direction of the relationship between ESQE and DOB, whilst significant, is reversed to that hypothesised. One possible reason for this was raised in section 3.4.3 of the literature review which dealt with the challenges of operationalizing the expectation construct and the consequences of choosing one or other 'standards' (Boulding, *et al.*, 1993). One standard was labelled the 'will' expectations and the other the 'should' expectations. According to Boulding, *et al.* (1993), adopting the 'will' standard generally results in a positive relationship between expectations and disconfirmation, whilst adopting the 'should' standard results in a negative relationship. As noted in section 3.4.3, this research adopts the 'will' expectations

standard and therefore a positive relationship was expected. One possible reason for reporting the opposite effect to that expected is given by Van Dyke, *et al.* (1997) who warned that subjects' interpretation of the expectation definition and phrasing subtleties could have significantly different and potentially opposite impacts on the construct. A second reason could be reflective of human nature: consumers' with high initial expectations are more likely to be disappointed.

5.4   Merchant disconfirmation model

The full structural model representing the merchant disconfirmation stage of the end-to-end e-business transaction is given below. This is an elaboration on the path model that was presented in Figure 9 in section 4.6.3 and includes the indicator (observed) variables and measurement error terms. Its form is that of a disaggregated factor model, with the measurement scale items being represented as indicator variables. Since no second-order latent constructs are present in the hierarchy, no summation of scale item scores is desirable. Whereas the broker disconfirmation model was tested in both its disaggregated and partially aggregated forms, the merchant disconfirmation model will be tested as an isolated model, of the form represented in Figure 28 below.
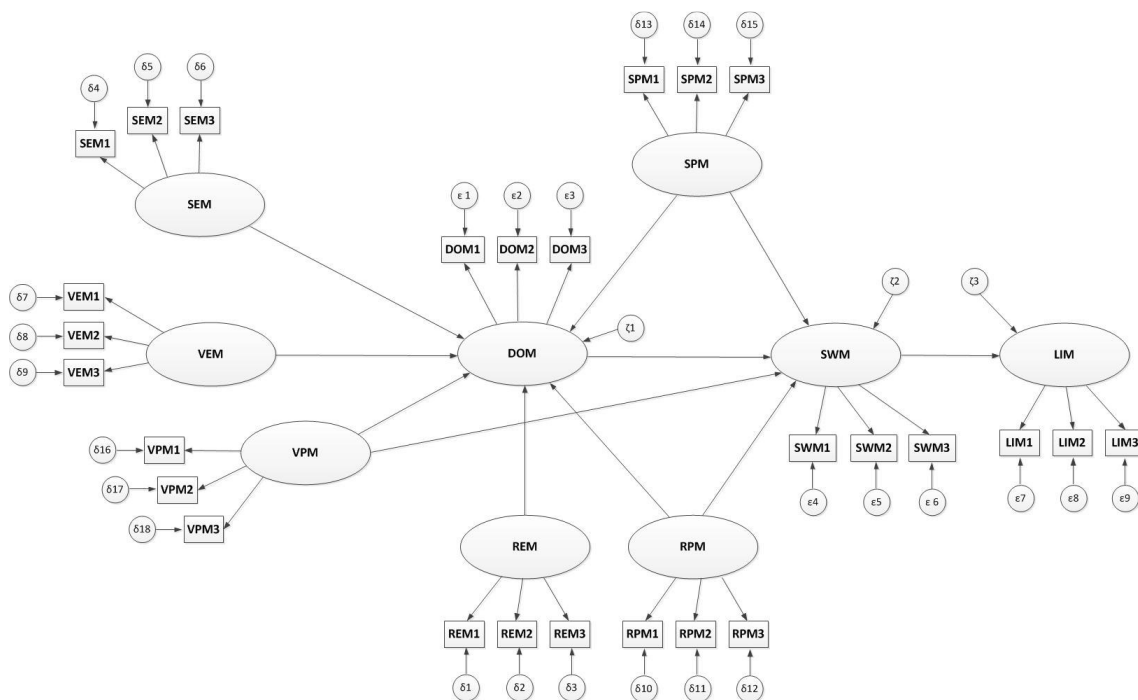
Figure 28: Full structural model of the merchant disconfirmation stage of the end-to-end social buying e-business transaction

The following sub-sections will describe the data, present a factor analysis of the observed variables, report on the results of the measurement model, and test the hypotheses relating to the merchant disconfirmation structural model.

5.4.1 Description of the model data and treatment of non-normality

As illustrated by Figure 28, there are 27 indicator variables which are measured directly through the merchant disconfirmation survey instrument, giving 378 distinct variance-covariance matrix values. Since there are 68 parameters of interest, the degrees of freedom are calculated to be 310, sufficiently greater than zero for model identification.

Application of the instrument to the sample yielded 207 usable responses, with no missing data (listwise deletion of cases) and no outliers (Likert scale data). Distributions of the sample for each variable are presented in Appendix 5. Inspection of these distributions suggests that the sample data is, in general, highly negatively skewed (towards the right) across the 27 variables. The following table shows the multivariate normality statistics for the raw data, indicating significant non-normality.

Statistic of normality	Value
Mardia Coefficient of Multivariate Kurtosis (should be near 0)	299.062
Normalized Multivariate Kurtosis (> 2.58 is sig)	54.365
Mardia-Based Kappa (should be close to 0)	0.382
Mean Scaled Univariate Kurtosis (should be close to 0)	0.807
Adjusted Mean Scaled Univariate Kurtosis (should be close to 0)	0.813
Relative Multivariate Kurtosis (should be close to 1)	1.382

Table 23: Multivariate normality statistics of the raw (untransformed) data (Source: Adapted from the Statistica statistical analysis program)

Since a six-point Likert scale was used in both the broker and merchant disconfirmation models, the same logarithmic transformation was applied to the raw data as was used in the broker disconfirmation model. The table below presents the multivariate normality statistics for the transformed data. Once again, the transformation has improved the statistics somewhat, but they remain significant, indicating multivariate non-normality.

Statistic of normality	Value
Mardia Coefficient of Multivariate Kurtosis (should be near 0)	141.236
Normalized Multivariate Kurtosis (> 2.58 is sig)	25.675
Mardia-Based Kappa (should be close to 0)	0.180
Mean Scaled Univariate Kurtosis (should be close to 0)	-0.291
Adjusted Mean Scaled Univariate Kurtosis (should be close to 0)	-0.069
Relative Multivariate Kurtosis (should be close to 1)	1.180

Table 24: Multivariate normality statistics of the transformed data, y=ln(7-x) (Source: Adapted from the Statistica statistical analysis program)

The GLS model estimation method will therefore be used. It will again be noted that the overestimation of the chi-squared statistic and possible false rejection of overall model fit will need to be taken into consideration when interpreting the results of the model estimation.

5.4.2 Factor analysis of the model indicators

The unidimensionality of the merchant disconfirmation measurement scale was assessed by performing a principal component factor analysis, with a Varimax rotation, on the transformed data in order to identify the underlying factors which the observed variable measurements describe. Figure 29 over page presents a scree plot of the factors suggested by the transformed data.
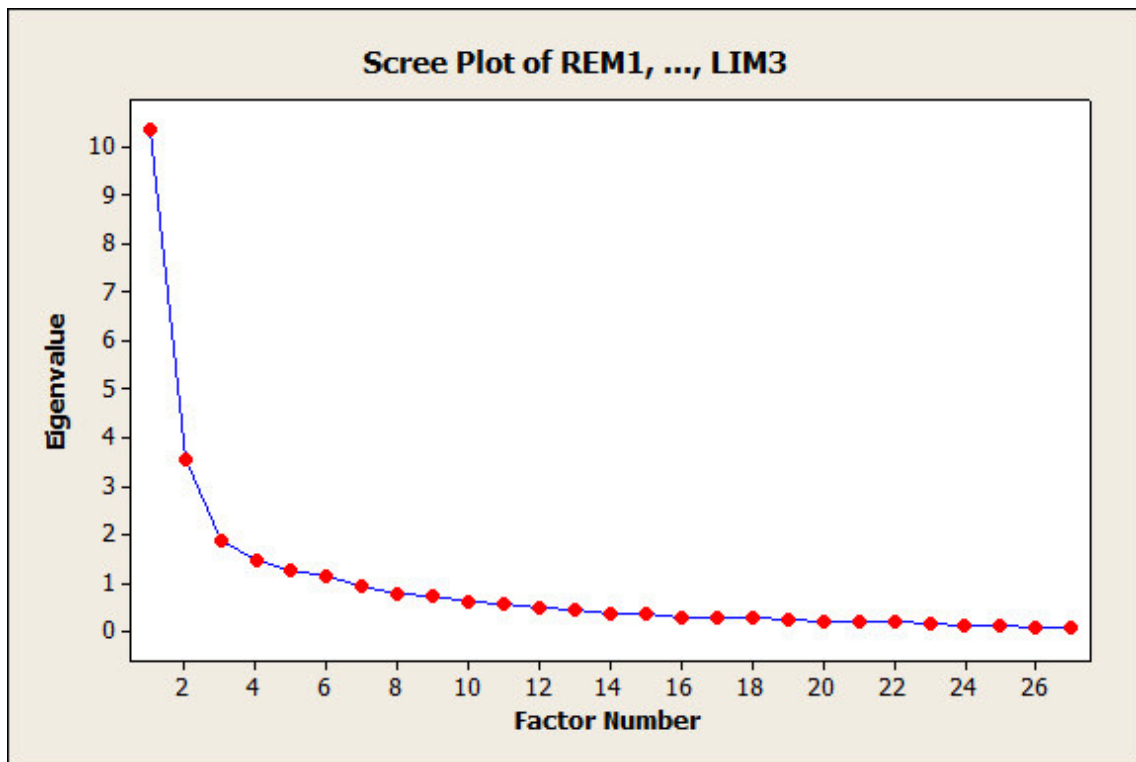
Figure 29: Scree plot of factors of Merchant disconfirmation model – transformed data (Source: Minitab statistical analysis program)

Inspecting the above graph shows six factors which meet the criterion of having eigenvalues above 1. Factor 6 has an eigenvalue of 1.1301 whilst Factor 7 has an eigenvalue of 0.9169. Again, a principal component factor analysis was run against the transformed data, using the Varimax rotation. Table 25 highlights the factor loadings of the observed variables on the emergent factors under the Varimax rotation in red italics.

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Communality
REM1	0.082	-0.125	-0.068	-0.243	*0.803*	0.177	*0.763*
REM2	0.063	-0.167	-0.099	-0.276	*0.745*	0.175	*0.703*
REM3	0.15	-0.095	-0.051	-0.153	*0.723*	0.202	*0.62*
SEM1	0.035	-0.097	-0.049	*-0.817*	0.274	0.186	*0.79*
SEM2	0.175	-0.096	0.026	*-0.794*	0.175	0.156	*0.725*
SEM3	0.147	-0.115	-0.147	*-0.811*	0.259	0.219	*0.829*
VEM1	0.081	0.025	-0.041	-0.027	0.27	*0.779*	*0.689*
VEM2	0.029	-0.174	-0.162	-0.318	0.092	*0.759*	*0.744*
VEM3	0.052	-0.059	-0.081	-0.255	0.187	*0.827*	*0.797*
RPM1	*0.691*	-0.168	-0.202	-0.191	0.311	-0.016	*0.679*
RPM2	*0.793*	-0.257	-0.198	0.025	0.231	0.081	*0.794*
RPM3	0.553	-0.016	-0.343	-0.138	0.417	0.135	*0.635*
SPM1	*0.767*	-0.43	-0.035	-0.092	0.031	0.076	*0.789*
SPM2	*0.761*	-0.358	-0.151	-0.132	-0.11	-0.015	*0.759*

SPM3	*0.788*	-0.408	-0.146	-0.066	0.014	0.104	*0.823*
VPM1	0.412	0.072	*-0.651*	-0.168	0.106	0.07	*0.643*
VPM2	0.163	-0.023	*-0.648*	-0.276	-0.017	0.243	0.582
VPM3	0.449	-0.242	*-0.678*	-0.117	0.053	0.056	*0.739*
DOM1	0.246	*-0.766*	-0.082	-0.067	0.191	0.058	*0.698*
DOM2	0.367	*-0.722*	-0.119	-0.028	0.246	-0.008	*0.732*
DOM3	0.132	*-0.756*	-0.141	-0.1	0.069	0.103	*0.635*
SWM1	0.411	*-0.658*	-0.39	-0.139	0.054	0.057	*0.779*
SWM2	0.381	*-0.708*	-0.36	-0.158	0.007	0.044	*0.803*
SWM3	0.406	*-0.684*	-0.312	-0.145	0.022	0.033	*0.752*
LIM1	0.021	-0.471	*-0.754*	0.077	0.066	0.058	*0.804*
LIM2	0.022	-0.445	*-0.758*	0.088	0.087	0.001	*0.788*
LIM3	0.141	-0.384	-0.567	0.119	0.175	0.02	0.534
Variance	4.4055	4.4037	3.5062	2.593	2.5106	2.2101	19.629

Table 25: Principal component factor analysis of six identified factors (Source: Adapted from Minitab, 2007)
* Loadings marked in red have an absolute magnitude greater than 0.60.

The results of the factor analysis provide good support for the merchant disconfirmation measurement scale. In almost all cases, all of the observed variables measuring the hypothesised construct load strongly on a particular factor. As was the case with the factor analysis for the broker disconfirmation data, there are once more a couple of exceptions. The RPM3 variable's loading on Factor 1 is 0.553, only a little lower than the commonly accepted cut-off of 0.60. RPM1 to RPM3 where designed to measure the reputation performance construct. The RPM3 scale item is worded as follows:

I did buy a deal on the website from a company I believed to have a good reputation.

RPM3 has good face validity for the reputation performance construct and since the loading is not much lower than the others, the RPM3 item is maintained in the subsequent analysis. One difference which can be pointed out is that RPM1 and RPM2 deal with the reputation of *all* companies on the website, whilst RPM3 deals with the reputation of the actual company for which the consumer purchased a voucher. The reputation performance items and the service quality performance items were revealed in the factor analysis to load on the same underlying factor. This could indicate that the respondents' judgements of a company's reputation are correlated with their judgements of the company's ability to deliver high quality service. Whilst the extant literature certainly suggests that service quality and reputation are associated, it generally argues that *trust* captures a significant portion of the reputation construct. It is therefore surprising to see service quality and

reputation load onto the same factor, since it was expected that reputation would embody a larger conceptual meaning to the respondent.

The LIM3 variable's loading on Factor 3 is 0.567 (negative), again only a little lower than the 0.60 cut-off. LIM1 to LIM3 measure the loyalty intentions of the consumer to the broker. The LIM3 scale item is worded as follows:

I consider this site to be my first choice for future Social Buying transactions.

Since LIM3 has good face validity for the loyalty intention construct and is close to 0.60, it will be maintained in the model. What is interesting to note is that whereas in the broker disconfirmation model the loyalty intention construct loaded on the same factor as the disconfirmation and satisfaction constructs, in the merchant disconfirmation model the loyalty intention construct loads onto a distinct factor, whilst the disconfirmation and satisfaction constructs share a factor. This is not surprising, since in the broker disconfirmation model, the context of each construct is the broker. In the merchant disconfirmation model, the context of all constructs, except loyalty intention, is the merchant. The loyalty intention construct still measures loyalty intention towards the broker and not the merchant, since the aim and scope of the study is with the broker.

5.4.3 Measurement model results

Cronbach's alpha for each of the constructs is calculated for both the raw and transformed data sets and presented in Table 26. The resulting values are then compared against the generally accepted lower limit criterion of 0.70.

Item code	Item summary	Number of items	Cronbach Alpha (raw)	Cronbach Alpha (transformed)
REM	Reputation expectation	3	0.8065	0.8216
VEM	Perceived Value expectation	3	0.7602	0.8008
SEM	Service Quality expectation	3	0.8255	0.8680
RPM	Reputation performance	3	0.7500	0.8433
VPM	Perceived Value performance	3	0.7134	0.7814
SPM	Service Quality performance	3	0.9099	0.9264
DOM	Disconfirmation of Merchant	3	0.8433	0.8632
SWM	Satisfaction with Merchant	3	0.9344	0.9530
LIM	Loyalty intention (towards Broker)	3	0.8121	0.8488
		27	0.9221	0.9334

Table 26: Internal consistency of scale items – Cronbach's Alpha statistic (Source: Adapted from Minitab, 2007)

In all item cases, the Cronbach Alpha is higher in the transformed data than in the raw data. All values for the Cronbach Alpha are significantly higher than the common benchmark of 0.70. In fact, in most cases they are in the point eighties or point nineties, which indicates very good internal consistency of the merchant disconfirmation measurement scale.

The omitted item statistics were also calculated for each construct. Five out of the 27 measurement variables yielded a higher Cronbach Alpha value in the case of its omission. These are presented in the table below:

Item to be omitted	Cronbach Alpha with no omitted items	Cronbach Alpha if item omitted
REM3	0.8216	0.8400
VEM1	0.8008	0.8051
SEM2	0.8680	0.8663
SPM2	0.9264	0.9307
LIM3	0.8488	0.9507

Table 27: Omitted item statistics – cases of improved Cronbach's Alpha (Source: Adapted from Minital statistical analysis program)

The first four values for the Cronbach Alpha are only marginally improved due to an omission of one of the items. In the last case, LIM3, a larger increase from 0.8488 to 0.9507 is seen. In the broker disconfirmation scale, loyalty intention was similarly improved by the removal of LIB3. Note that both the LIB and the LIM items measure the same construct – loyalty intention to the *broker*, but from two different samples. This suggests that it may be worth pursuing removing or replacing this item from the measurement scale in future research. There are two other items from Parasuraman, *et al.*'s (2005) E-S-QUAL scale which may demonstrate better internal consistency with the first two items. For the purposes of this study, LIM3 was retained in the merchant disconfirmation model analysis for similar reasons LIB3 was retained in the broker disconfirmation model analysis – measurement error reduction and improving reliability as discussed in section 5.2.1.

A confirmatory factor analysis was conducted against the merchant disconfirmation measurement model, presented in Figure 30, which provides an assessment of composite reliability, as measured by the Raykov composite reliability score, and convergent and discriminant validity. As the first data column, CR, in Table 28 shows, all composite reliability values are greater than 0.70. These results, together with the

Cronbach alpha results, demonstrate good reliability for the merchant disconfirmation measurement scale.

	CR	AVE	REM	SEM	VEM	RPM	SPM	VPM	DOM	SWM	LIM
REM	0.85	0.65	*0.81*								
SEM	0.89	0.72	0.58	*0.85*							
VEM	0.83	0.62	0.50	0.55	*0.79*						
RPM	0.88	0.70	0.41	0.38	0.32	*0.84*					
SPM	0.94	0.84	0.33	0.37	0.29	0.84	*0.92*				
VPM	0.78	0.56	0.28	0.28	0.25	0.57	0.59	*0.75*			
DOM	0.88	0.70	0.44	0.34	0.32	0.63	0.59	0.46	*0.84*		
SWM	0.97	0.90	0.35	0.32	0.26	0.70	0.70	0.64	0.76	*0.95*	
LIM	0.90	0.75	0.23	0.08	0.15	0.40	0.40	0.63	0.53	0.62	*0.87*

Table 28: Composite reliability scores and average variance extracted for each construct, and inter-construct correlations Diagonal italics values are the square root of the AVE values on the same row

Table 29 presents the results for the indicator (observed variable) loadings on their construct. According to Fornell and Larcker (1981), and as discussed in section 4.5, the first necessary condition for convergent validity is that all factor loadings should exceed 0.70, which most do. For the REM (reputation expectation) construct, the REM3 factor loading is reported as 0.66, marginally below 0.70. For the VPM (perceived value performance) construct, the VPM1 factor loading is 0.59, well below 0.70, and the VPM2 factor loading is 0.65, marginally below 0.70. Similarly, for the LIM (loyalty intention) construct, the factor loading for LIM3 is also 0.65.
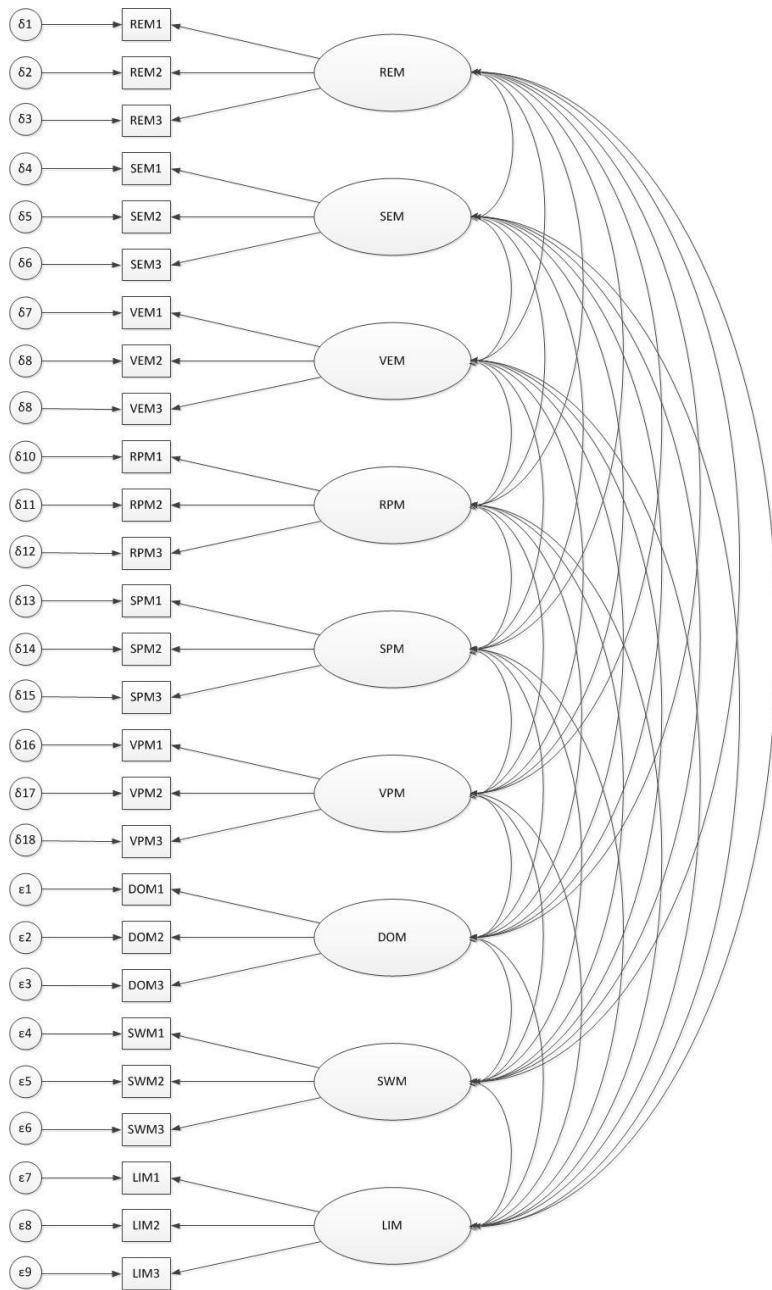
Figure 30: Measurement model of the Merchant disconfirmation model

The second necessary condition for convergent validity is that the average variance extracted (AVE) values for each construct should exceed 0.50. The second data column of Table 28 reports that all such AVE values are in excess of 0.50 as required. Thus, the partially aggregated broker disconfirmation measurement model demonstrates reasonable convergent validity. Only VPM1 has a particularly low factor loading. Inspection of the residual matrix reveals only a few significant values, with these values relating, once more, to the constructs with relatively low factor loading coefficients.

Construct (Items)	Factor loading of each item		
REM (REM1, REM2, REM3)	(0.89,	0.86,	0.66,)
SEM (SEM1, SEM2, SEM3)	(0.84,	0.79,	0.91,)
VEM (VEM1, VEM2, VEM3)	(0.72,	0.77,	0.87,)
RPM (RPM1, RPM2, RPM3)	(0.83,	0.90,	0.78,)
SPM (SPM1, SPM2, SPM3)	(0.93,	0.85,	0.87,)
VPM (VPM1, VPM2, VPM3)	(0.59,	0.65,	0.95,)
DOM (DOM1, DOM2, DOM3)	(0.85,	0.88,	0.78,)
SWM (SWM1, SWM2, SWM3)	(0.94,	0.98,	0.92,)
LIM (LIM1, LIM2, LIM3)	(0.95,	0.97,	0.65,)

Table 29: Factor loadings of each construct item on the construct

Discriminant validity is assessed by establishing whether all inter-construct correlations between a particular construct and the other constructs in the measurement model are less than the square root of the AVE for the construct in question. The square roots of the AVEs for each construct are displayed along the diagonal in Table 28. Inspection of the table reveals that all inter-construct correlations are less than the value in the diagonal (square root of AVE) for the construct in question and, therefore, the measurement model demonstrates that the survey instrument exhibits good discriminant validity.

Since excellent reliability and reasonable validity (both convergent and discriminatory) has been established, according to the two-step approach advocated by Anderson and Gerbing (1988) and Mulaik and Millsap (2000), the structural model may be assessed, the results of which will be presented next.

5.4.4 Structural model results

The structural model for the merchant disconfirmation stage, presented in Figure 28, was estimated using the generalised least squares (GLS) model estimation method, owing to the poor multivariate normality remaining in the data even after transformation and summation of the item-level scores. The correlation matrix contains Pearson-moment correlations among the 27 variables, using the transformed and summated data, with a sample size of n = 207. The correlation matrix can be found in Appendix 8, with means and standard deviations reported as can the Satistica SEM program used to run the GLS estimation of the model.

The normalised residual matrix was inspected for evidence of model misspecification. Quite a few large residuals were present, indicating some degree of model

misspecification. As suggested by the pattern of large residuals, covariance constraints were introduced between the performance-related exogenous variables of SPM, VPM and RPM and similarly between the expectation-related exogenous variables of SEM, VEM and REM. Figure X in Appendix 8 illustrates the covariances which were introduced.

The modified model was then re-estimated. This time no boundary conditions (Haywood cases) were reported, although two parameters with a standard error of zero suggested that the model was still over-parameterised model. The error term for ESQE was set to 0.05, leaving only one remaining standard error equal to zero. One Haywood case was reported for the VPM3 indicator variable, which was constrained to 0.05. No further boundary conditions were reported. Inspection of the normalised residual matrix demonstrated a much better model fit with the introduced covariances, although there remained a few significant residuals. Note that the normalised, rather than the standardised, residual matrix was considered since it gives a more conservative view of model misspecification.

GOF indexes for the isolated Merchant Disconfirmation Model (n =207)			
GOF index	Value	Rule of thumb*	Notes
Chi-squared (df; p)	? (?, ?)	Chi-square / df. = < 2 : Excellent fit < 3 : Good fit < 5 : Adequate fit	Chi-squared may be discounted when sample size is reasonable (> 200), sample does not exhibit multivariate normality, and if other GOF indexes are acceptable. Based on the minimum sample discrepancy function.
SRMR (Standardised Root-Mean-square Residual)	0.233	< 0.06 : Excellent < 0.08 : Good < 0.1 : Adequate	SRMR measures the average differences between the sample-derived and the estimated population variance-covariance matrices.
RMSEA (Root mean square error of approximation)	0.051	< 0.05 : Excellent < 0.06 : Good < 0.08 : Adequate	RMSEA corrects for model complexity due to the presence of degrees of freedom in its denominator. Based on the population discrepancy.
GFI (Goodness-of-Fit Index)	0.830	> 0.95 : Excellent > 0.90 : Good	Biased downwards in complex models where degrees of freedom are high w.r.t. sample size
AGFI (Adjusted Goodness-of-Fit Index)	0.791	> 0.95 : Excellent > 0.90 : Good	Adjusts the GFI index for model complexity

Table 30: Results of model fit indexes for the isolated merchant disconfirmation model (Source: Adapted from Statistica)

* The rules of thumb are from several authors, most cited in Hu and Bentler (1999), Schumacker and Lomax (2004) and Arbuckle (2007)

The same conditions of multivariate non-normality are applicable to the merchant disconfirmation data set as were applicable to the broker disconfirmation data set,

even after transformation. The interpretation of the Chi-squared statistic, which indicates a poor model fit, should therefore be treated with caution since there will be increased likelihood of reporting Type I errors where a model is falsely rejected (Mueller, 1997; Finch, *et al.*, 1997; Gao, *et al.*, 2003). Table 30 reports a RMSEA fit index of 0.051 which is certainly reasonable, and marginal values for the GFI and AGFI statistics of 0.830 and 0.791 respectively. The SRMR value of 0.233 is well above the adequate fit upper limit of 0.1. Overall, the model fit indexes suggest a marginal, at best, fit of the model to the data. However, when considered together with the large residual matrix values (both in magnitude and variation), the conclusion should be that the merchant disconfirmation model is a poor fit to the sample data.

This conclusion should be considered when interpreting the hypothesis testing results, presented in Table 31. Only three of the eleven hypotheses were supported. Two of the hypotheses related the satisfaction to loyalty intention constructs and the disconfirmation to satisfaction constructs, respectively. Both were supported at the 0.02 level of significance, providing further evidence that the underlying premise of expectancy-disconfirmation theory can be applied soundly to the social buying setting.

The only other supported hypothesis related the reputation expectation and disconfirmation constructs, but only at the 0.05 level of significance. This suggests the importance of merchant reputation as an effect on whether the consumers' expectations are likely to be positively disconfirmed and therefore satisfied, as the significant disconfirmation to satisfaction relationship (hypothesis 5a) implies. It should also be noted that the factor analysis of the measurement instrument items revealed reputation to load on the same underlying factor as service quality. Thus, any conclusions about the role of reputation should be treated with caution as it is not clear how the respondents interpreted the reputation concept from the survey questions.

Isolated Merchant Disconfirmation Model			
(n=207)			
Hypothesis	Path relationship	Path coefficient	Significance
H4	SWM → LIM	0.672	p < 0.02
H5a	DOM → SWM	0.349	p < 0.02

H5b	SPM → SWM	-0.317	Not significant
H5c	VPM → SWM	0.980	Not significant
H5d	RPM → SWM	-0.043	Not significant
H6a	SEM → DOM	-0.020	Not significant
H6b	SPM → DOM	-0.023	Not significant
H7a	VEM → DOM	0.074	Not significant
H7b	VPM → DOM	0.435	Not significant
H8a	REM → DOM	0.194	$p < 0.05$
H8b	RPM → DOM	0.207	Not significant

Table 31: Results of hypothesis testing relating to the isolated merchant disconfirmation model (Source: Adapted from Statistica)

Most hypotheses (H5b, H5c, H5d, H6a, H6b, H7a, H7b and H8b) were not supported which would normally be attributed to the fact that the hypothesised relationships are simply not significant in the sample data. The antecedent factors of reputation, service quality and perceived value were identified from a literature search. The antecedent factors were selected based on evidence from other studies as having a likely effect on satisfaction, and so it is somewhat surprising that only reputation expectation was supported as having a significant effect on disconfirmation and hence satisfaction. There is strong evidence in the literature for perceived value (Jones and Sasser, 1995; Hellier, *et al.*, 2003; Gounaris, *et al.*, 2007) and service quality (Hallowell, 1996; Kenney and Khanfar, 2009; Yi and La, 2004) as impacting a consumer's judgements on satisfaction. A possible explanation could be that the size and complexity of the merchant disconfirmation model cannot be suitably tested with a sample comprising only 207 cases. Since the merchant disconfirmation structural model comprises 56 parameters of interest, the resulting n:p ratio is around 4.6:1, well below the 10:1 suggested Mueller (1997) as a lower bound for the parameter estimates to be sufficiently trusted.

5.5   Chapter summary

Chapter five presented and discussed the results of the analysis of the sample data. It was organised into four main sections. The first presented the demographic profile of the sample. The next three sections presented the results of each of the three models tested. The first two models represented different forms of the broker disconfirmation stage of social buying. The disaggregated model results were presented first, followed by the partially aggregated form. The third model represented the merchant disconfirmation stage of the social buying transaction. Each of the sample data sets exhibited multivariate non-normality and so needed to

be treated with a transformation before proceeding with the model estimations. The results of each model were presented in two parts: first the measurement model results were discussed followed by the structural model results.

6 <u>CONCLUSION AND RECOMMENDATIONS</u>

In section 1.4 the research aims and objectives were listed, together with the following research questions:

- Is EDT an appropriate model for social buying in South Africa?
- To what extent does e-service quality account for consumer satisfaction with social buying platforms?
- To what extent does 'perceived performance' mediate disconfirmation?
- Does the E-S-QUAL measurement scale provide a suitable basis for measuring e-service quality in social buying platforms?
- To what extent do service quality, company reputation and perceived value account for consumer satisfaction with merchants?

This section will present the main conclusions suggested by the results and answer the above questions. Recommendations for further research are also made.

6.1 *The suitability of EDT*

The main aim of this study was to investigate the factors which influence social buying in South Africa. Expectancy-disconfirmation theory (EDT) was identified in the literature as having the most potential for modelling the relationships. It is believed that this is the first study to employ EDT to the context of social buying. Two structural *a priori* path models were specified to denote the two distinct stages in the social buying e-business transaction for broker disconfirmation and merchant disconfirmation. The broker disconfirmation path model was tested using two structural equation models denoting two forms of aggregation: disaggregated and partially aggregated. In both structural model forms, the hypotheses representing the central EDT premise of disconfirmation being positively associated to satisfaction and satisfaction being positively associated with loyalty intentions were upheld. The merchant disconfirmation path model was tested using a single, isolated, structural equation model. The hypotheses positively associating disconfirmation to satisfaction to loyalty intentions were similarly upheld.

Based on the above results, it may be concluded that EDT, a traditionally marketing-related theory, has been successfully applied to the South African social buying context. This is consistent with many prior studies in the traditional marketing

literature and also with more recent applications to the information systems field (Bhattacherjee, 2001, Bhattacherjee and Premkumar, 2004; McKinney, *et al.*, 2002; Yen and Lu, 2008a and 2008b).

Two implications may be drawn from this conclusion. First, EDT demonstrates a good theoretical fit to social buying and this should be pursued in further research. Second, the role of consumer satisfaction in social buying, and especially in determining loyalty intention behaviours, is an important one. Consumers will need to have their expectations consistently exceeded in order to establish consumer loyalty. Social buying brokers will need to establish mechanisms to enable this. It is unlikely that positive disconfirmation of expectations can be sustained under the existing business model. It is likely that differentiators will need to be found to drive competitor advantage and maintain consumer loyalty. With the rapid saturation of the South African social buying market, the brokers who can find and implement these differentiators the soonest and most effectively will have a greater chance of surviving the inevitable succession of failures that will define the market in the next few years, as taught by the lessons of group buying (Portsmouth, 2010).

6.2   *The role of expectations in social buying*

6.2.1 Expectations versus perceived performance

The association between e-service quality expectations (ESQE) and disconfirmation of the broker (DOB) was found to be not significant in the case of the disaggregated model. In the case of the partially aggregated model, the relationship was found to be significant, but negative. A positive relationship between the constructs was hypothesised. A positive association between e-service quality perceived performance (ESQP) and DOB was found in both the disaggregated and partially aggregated models. The ESQP to DOB relationships were also the stronger effects. The conclusion that can be drawn from these results is that perceived performance accounts for more of the variance in disconfirmation than expectation. This supports the view of Cadotte, *et al.* (1987) who questioned the relationship between expectation and disconfirmation, asserting, instead, that perceived performance should be the main antecedent of disconfirmation in EDT models, since it would mediate the consumers' expectations. In other words, consumers' judgements about perceived performance are implicitly made against consumers' original *desired*

expectations, and it is not necessary, or parsimonious, to model expectations separately.

In the merchant disconfirmation model, however, none of the three perceived performance variables loaded significantly on the disconfirmation of the merchant (DOM) construct, whilst one of the expectation variables (reputation expectation) did. Therefore, the merchant model does not strongly support the conclusion drawn from the broker model. However, it is recommended that it is a fruitful avenue for further research.

6.2.2 Expectations as predictions or desires

Another interesting result with respect to expectations was that the association between expectation and disconfirmation was found to be opposite to that hypothesised. This *negative* association was confirmed in both the broker model and the merchant model. It should be noted that the broker model association was found to be significant, whilst the merchant model association was not found to be significant. However, since it was found in a separate stage of the social buying transaction and reported from a distinct data set, it is at least suggestive of support for the broker model finding.

Based on Boulding, *et al.*'s (1993) findings, confirmed by Khalifa and Liu (2002), if the 'will' standard for operationalizing expectations is adopted, as was the case for this study, then an increase in consumers' expectations of good service will result in an increase in disconfirmation as consumers' are more likely to judge performance more favourably. The results of this study did not support this assertion. Instead, a significant, but negative, relationship was found between expectations and perceived performance. Boulding, *et al.* (1993) contended a negative association would be present only if the 'should' standard was adopted, which expresses consumers' *desired* expectations rather than their predictions of actual service.

One conclusion which may be drawn is that in the case of social buying, the 'will' standard will, in fact, exert a negative influence on disconfirmation as reported in this study and under the conditions of the study. If such an assertion is to be made, it must demonstrate logical consistency. There is a case to be made for this. When consumers have a genuine expectation of good service then this implies that the

judgemental standard of Cardozo (1965) and Olsen and Dover (1976) is stricter in the minds of the consumer – in other words, the bar has been raised. In order to be *positively* disconfirmed, consumers' already high expectations will need to be *exceeded*. The opportunity for negative disconfirmation is much higher. This argument is applicable only when initial expectations are high to begin with. This clearly seems to be the case for subjects in this study – Appendix 5, Figures 33 and 34 reveals extremely high expectations evidenced by the negatively skewed item distributions. In data sets which are more normally distributed, the scope for positive disconfirmation will be greater, since consumers' original expectations would be more moderate, and Boulding, *et al.*'s (1993) findings might be supported.

The conclusion that there exists a significant *negative* association between expectation and disconfirmation is therefore a reasonable one for the South African social buying context. Social buying is a relatively new phenomenon and has generated much excitement in the media. Consequently, expectations are high. This is unlikely to be a sustainable situation. As increasing numbers of poor quality brokers enter the market, consumers' expectations will be disappointed and will tend to become more normally distributed. A similar study in the more mature United States social buying market, may report results more aligned to Boulding, *et al.*'s (1993) findings.

An important implication of this conclusion is that the associations between the constructs in EDT may be more temporal than thought and are subject to the prevailing market conditions. They may not generally be reflective of an unchanging, underlying 'truth'. The pursuit of this avenue of research, with respect to EDT in general, is therefore highly recommended. Whilst Bhattacherjee and Premkumar (2004) show that there exist effects of time and continued usage on expectations (beliefs) and changing consumers' attitudes, the conclusion of this study is that temporal effects are not limited to differences in the knowledge gained by individual users, but are also present due to changing market conditions.

6.3   The disconfirmation – perceived performance debate

Just as perceived performance has been contended by some researchers to mediate the effects of expectations (Cadotte, *et al.*, 1987), perceived performance has also been contended to mediate disconfirmation (Churchill and Surprenant, 1982).

Relationships between perceived performance and disconfirmation and also directly between perceived performance and satisfaction were included in both the broker and merchant structural equation models in order to shed some light on the role of each within the social buying context.

The perceived performance to satisfaction relationship was found to be not significant in the disaggregated model of the broker stage whilst it was found to be significant in the partially aggregated model. The perceived performance to disconfirmation relationship was, however, found to be significant, and to exhibit a much stronger effect, in both structural models. This suggests that disconfirmation should not only be treated as a distinct factor in EDT models, but that, in the case of social buying, it is not significantly mediated by perceived performance. Oliver and De Sarbo (1988) argued that the strength of disconfirmation and perceived performance effects would vary under different contexts. This study can therefore conclude that, under the South African social buying context, disconfirmation and perceived performance should be modelled as distinct variables. It is further recommended that future research in this field should consider omitting the perceived performance to satisfaction relationship from the model.

6.4   E-S-QUAL and social buying broker disconfirmation

The first research objective of this study relates to the broker disconfirmation stage of the social buying e-business transaction. Sub-objective 1a states that it is a specific objective of this study to identify from the literature potential factors affecting a consumer's experience with a social buying platform with respect to the broker disconfirmation stage. An extensive review of the literature revealed information quality, system quality and service quality as being primary factors contributing to satisfaction in information systems. Parasuraman, *et al.* (2005) developed a comprehensive measurement scale for information systems, E-S-QUAL, bringing into one instrument the previously disparate perspectives of information quality, system quality and service quality. Consequently, the dimensions of the E-S-QUAL scale were posited as antecedent factors to consumer satisfaction and loyalty intention behaviours.

6.4.1 The efficacy of the measurement scale

The E-S-QUAL scale was adapted for use in this study for the first, broker, stage of the social buying transaction since it involved online, e-commerce activity. The

adaptions that were made were done firstly to improve the face validity of some of the items with respect to social buying, and secondly to reduce the number of items from 22 to 13. The type and number of dimensions did, however, remain unchanged. These dimensions (efficiency, system availability, fulfilment ad privacy) were measured by the scale items and the disaggregated form of the broker model hypothesised these dimensions, as first order exogenous constructs, would load onto the second order construct of e-service quality (ESQE in the case of expectations and ESQP in the case of perceived performance), and e-service quality was hypothesised to be positively associated with disconfirmation and, therefore, satisfaction.

In the disaggregated model, none of the individual dimensions loaded significantly onto the ESQE construct, whilst only fulfilment (FPB) and privacy (PPB) loaded significantly onto ESQP. The lack of significant relationships between the first-order constructs and the second-order constructs may be due to the complexity, large number of parameters to estimate, and relatively small sample size exhibited by the disaggregated model. Parasuraman, *et al.* (2005) suffered from a similar problem in their study which defined the E-S-QUAL scale. In fact, their approach was to sum the individual item-level scores to yield a summated score for each dimension. A similar approach was taken in this study represented by the partially aggregated form of the broker model.

It was hoped that a conclusion could be reached as to the efficacy of the E-S-QUAL measurement scale when applied to the online social buying context in South Africa. In fact, the partially aggregated model did demonstrate significant relationships between ESQE and ESQP and disconfirmation. Even in the disaggregated model, a significant relationship between ESQP (but not ESQE) and disconfirmation was found. Parasuraman, *et al.* (2005) constructed the E-S-QUAL scale rigorously, demonstrating excellent reliability and validity. Likewise, this study confirmed these results for the modified version of the scale. The modified scale exhibited excellent reliability, both in terms of Cronbach's alpha and Raykov's composite reliability score. Furthermore, the scale was shown to have excellent discriminant validity and good convergent validity. This study can therefore conclude that there is good support for the applicability of the modified E-S-QUAL scale, as a measurement instrument for the social buying context, and that the modifications that were made are appropriate

for the social buying context. There is reason to believe that the scale may be successfully applied to future social buying research.

6.4.2 Conclusions for brokers

Whilst most dimensions of the E-S-QUAL loaded weakly onto the second-order constructs of ESQE and ESQP for reasons discussed in the previous section, there are two notable exceptions. Fulfilment perceived performance (FPB) and privacy perceived performance (PPB) were reported to have significant positive association to the ESQP construct. It may be concluded that privacy (of consumers' personal, banking and behavioural information) is of crucial importance to brokers in establishing consumer satisfaction and loyalty. With a saturated market, it is unlikely that consumers will be tolerant of violations of privacy. Fulfilment relates to brokers delivering on their promises, being truthful about their offerings, and accurately reporting on the nature and availability of the deals. The results of this study suggest that consumers who are disappointed by the broker not fulfilling their transaction will likely take their business elsewhere. Brokers are advised to ensure that they pay particular attention to privacy and fulfilment when implementing their e-service policies which are considered particularly important factors for consumer satisfaction and loyalty intention behaviours.

6.5 The factors of merchant disconfirmation

The second research objective of this study relates to the merchant disconfirmation stage of the social buying e-business transaction. Sub-objective 2a states that it is a specific objective of this study to identify from the literature potential factors affecting a consumer's experience with a social buying platform with respect to the merchant disconfirmation stage. An extensive review of the literature revealed merchant reputation, perceived value and service quality as being primary factors contributing to satisfaction in information systems.

The merchant model results reported non-significant associations between most of the posited factors and merchant disconfirmation. It may therefore be concluded that most of the factors do not significantly contribute to consumer satisfaction with the merchant, or loyalty intention to the broker. The only exception was the significant (at the 0.05 level) association between reputation expectation (REM) and disconfirmation (DOM). One possible reason may be due to model misspecification. That is, the factors don't actually influence satisfaction and loyalty intention

significantly, and that other factors need to be searched for and specified in a new model for merchant disconfirmation. This would be a surprising conclusion, since a comprehensive literature review revealed these factors to be important in the satisfaction literature. It makes intuitive sense that service quality and perceived value, especially, should contribute to consumer satisfaction. Whilst it is by no means asserted that the identified factors account for all of the variance of merchant disconfirmation, it seems unlikely that none of them (apart from REM) should have a significant influence.

The other possible reason is that the results of the merchant model are unreliable due to a combination of a relatively small sample size, a complex model comprising many parameters of interest, and a data set exhibiting poor multivariate normality. In this case, very few conclusions could be drawn without repeating the study and controlling for the limitations mentioned above.

The one significant relationship reported deserves mention. Merchant reputation was found to be significantly associated with disconfirmation. This would suggest that brokers should choose with care the merchants that they decide to court. The current tendency is for new entrants to get sufficient deals to appear as viable platforms to consumers. Quality may therefore be secondary to quantity, especially as broker platforms seeks to establish themselves in the market and acquire large subscription bases. The result that consumers regard the reputation of the merchant from whom they purchase deals as important should serve as a warning to operators of social buying platforms.

6.6   *Recommendations*

6.6.1 A revised model for EDT in the social buying context

Future research into social buying in the South African context should consider a slightly modified EDT model to the one which was applied in this study. Figure 31 illustrates the revised model, with the original aspects visible opaquely. The revised model represents some of the main findings of this study regarding EDT specification: i) perceived performance mediates expectations which may be omitted; and ii) perceived performance does not mediate disconfirmation and the direct relationship between perceived performance and satisfaction can therefore be omitted.

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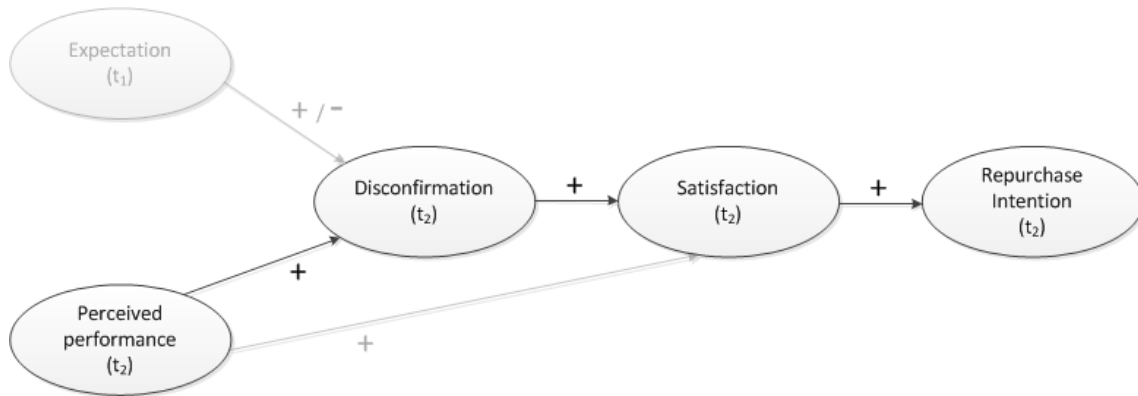
Figure 31: Revised EDT model for future investigation in the social buying context

Figure 31 represents a simpler, more parsimonious model of expectancy-disconfirmation with fewer parameters of interest.

6.6.2 A longitudinal study

A longitudinal study of social buying in South Africa is highly recommended for two reasons. First, the social buying innovation is still fairly new in the South African market. Attitudes, beliefs and expectations are likely to be very dynamic and subject to change as the market becomes more experienced with social buying and as the growth of new entrants into the market slows and those which are unable to compete begin to disappear. Over the next 12 to 18 months, the market will exit the 'honeymoon' period and will have developed more realistic attitudes towards the marketing mechanism. A longitudinal study may capture valuable information regarding these attitudinal changes. The second reason is that information systems are also undergoing rapid change, especially with respect to social media and social commerce. Innovations in these areas are likely to be implemented as differentiators in the social buying platforms over time. Technologies and user requirements change so rapidly that satisfaction should be assessed using longitudinal studies to reflect the changing attitudes over the usage period (Khalifa and Liu, 2004; Mahmood, *et al.*, 2000).

6.6.3 Social buying reputation systems

The development of a reputation system, similar to that which exists in online auction sites, may be valuable where consumers can rate the delivery of service and fulfilment of the voucher on the social buying website. Since the broker is only involved in the first stage of the transaction, the consumers' only recompense is to

add comments on the social buyer broker's website. By introducing a reputation system, consumers can report back via ratings of the merchant. This may impact a merchant's willingness to market on the broker's site if they get poor ratings and these poor ratings are exposed to the general market. Whilst reputation systems are essential in online auctions which is a C2C (consumer-to-consumer) environment where trust of the seller is a critical component of every transaction, social buying is a B2C (business-to-consumer) environment. The reputation system may be made available to consumers for rating purposes, whilst the results are only made available to the broker to help it make the best decisions regarding which merchants to court, and also to the merchants themselves as a value added service. Since social buying is a marketing activity, this type of feedback can be very useful to merchants to improve their service levels and adapt their offerings to what the consumer wants.

6.6.4 Recommendations for further research topics

There are two particularly interesting avenues for further research in the social buying context, which were beyond the scope of this study:

- Does the *merchant* receive any loyalty for the exposure, or is it purely a marketing exercise, introducing products to new markets? This research focussed on loyalty intention behaviours towards the *broker* and did not deeply investigate the effects/benefits of social buying on the merchant.

- What is the dynamic underlying the gender bias in e-retailing and social buying? Beneke, *et al.* (2010) found in South Africa that men are far more likely to shop online than females. However, in this study on social buying, and supported by Groupon statistics, female shoppers were at least three times more likely to purchase deals than men. Could the difference lie in the fact that the latter type of purchase is reactive (i.e. in response to the appeal of an *unsolicited* deal) whilst the former is proactive (i.e. the consumer is conducting a *search* for a particular product in order to fulfil an existing need). The premise beneath each type of e-commerce (social buying versus online retailing) is different and this may manifest a gender difference. At the very least, the gender bias of the population suggests that there is an underlying dynamic to social buying which warrants further investigation.

7 <u>APPENDICES</u>

Appendix 1: Table of South African social buying websites

The results of a search of the Internet for current South African social buying websites are presented in the table below. Over the four months it took to write this report, the number almost doubled, suggesting each month there are two or three new sites which begin operating. Note that one site, GroupBuying, has already failed. The website of another has been unavailable for some time. The expectation is that over the next 12 to 18 months many others will fail.

Name	Website	Status
Wicount	www.Wicount.co.za	Active
Twangoo	www.Twangoo.co.za	Active
Groubo	www.Groubo.co.za	Active
WhataDeal	www.WhataDeal.co.za	Active
Skoop	www.Skoop.co.za	Active
CollectiveCow	www.CollectiveCow.co.za	Active
UbuntuDeal	www.UbuntuDeal.co.za	Active
EishCoupon	www.EishCoupon.co.za	Active
Justhenga	www.Justhenga.com	Active
Vuvuplaza	www.VuvuPlaza.com	Active
U C It	http://www.facebook.com/UCit.South.Africa	Active
Zappon	www.zappon.co.za/	Active
24HoursOnly	www.24HoursOnly.co.za/	Active
Dealio	www.Dealio.co.za/	Active
OneDayOnly	www.OneDayOnly.co.za/	Active
OpenDeal	www.OpenDeal.co.za/	Active
CitySlicker	www.CitySlicker.co.za/	Active
GroupBuying	http://groupbuying.co.za/	Defunct
YouScoop	www.YouScoop.co.za/	Unavailable

Table 32: Results of Internet search (conducted April 2011) for South African social buying platforms

Appendix 2: E-S-QUAL measurement scale

The original E-S-QUAL measurement scale which was adapted for the purposes of this study in order to exhibit better face validity with the social buying context is presented below.

Construct	Measure
Efficiency	
EFF1	This site makes it easy to find what I need
EFF2	It makes it easy to get anywhere on the site
EFF3	It enables me to complete a transaction quickly
EFF4	Information at this site is well organized
EFF5	It loads its pages fast
EFF6	This site is simple to use
EFF7	This site enables me to get on to it quickly
EFF8	This site is well organized
System availability	
SYS1	This site is always available for business
SYS2	This site launches and runs right away
SYS3	This site does not crash
SYS4	Pages at this site do not freeze after I enter my order information
Fulfilment	
FUL1	It delivers orders when promised
FUL2	This site makes items available for delivery within a suitable time frame
FUL3	It quickly delivers what I order
FUL4	It sends out the items ordered
FUL5	It has in stock the items the company claims to have
FUL6	It is truthful about its offerings
FUL7	It makes accurate promises about delivery of products
Privacy	
PRI1	It protects information about my Web-shopping behavior
PRI2	It does not share my personal information with other sites
PRI3	This site protects information about my credit card

Table 33: The final scale items and dimensions of the E-S-QUAL measurement scale (Source: Adapted from Parasuraman, *et al.*, 2005)

Appendix 3: Nomological test items of the E-S-QUAL scale

Parasuraman, *et al.*, (2005) used the following items to measure the observed variables of perceived value and loyalty intentions. These items were adapted by this study to the context of social buying.

Construct	Measure

Perceived value

The value measure consisted of four items; respondents rated the Web site on each item using a scale of 1 (*poor*) to 10 (excellent).

1	The prices of the products and services available at this site (how economical the site is)
2	The overall convenience of using this site
3	The extent to which the site gives you a feeling of being in control
4	The overall value you get from this site for your money and effort

Loyalty intentions

The loyalty measure consisted of five behavioural items; respondents indicated their likelihood of engaging in each behaviour on a 5-point scale (1 = *very unlikely*, 5 = *very likely*).

How likely are you to…

1	Say positive things about this site to other people?
2	Recommend this site to someone who seeks your advice?
3	Encourage friends and others to do business with this site?
4	Consider this site to be your first choice for future transactions?
5	Do more business with this site in the coming months?

Table 34: Scale items used to measure constructs in the nomological test of the E-S-QUAL measurement scale (Source: Adapted from Parasuraman, *et al.*, 2005)

Appendix 4: Survey instrument email template

The email template which was used to send out the emails to the two samples is reproduced in Figure 31 below.

We support starving MBA students, you should too!

Dear << Test First Name >>,

Wicount is always looking at ways to improve the services it offers to its valued customers. With this in mind, we are supporting research being conducted by Anthony Harris, an MBA student who is completing his dissertation on the exciting phenomenon of **social buying**. We are hoping you will read his request below and complete his online questionnaire by clicking here. One lucky respondent will receive R500 to spend at **Wicount**.

Kind regards,

The Wicount Team

Take the survey now.

Dear << Test First Name >>,

I am a Masters of Business Administration (MBA) student the UNISA's Graduate School of Business Leadership and I am conducting a study of social buying platforms, such as Wicount. The objective of this research project is to attempt to understand the factors

which influence consumers to buy more than once through social buying platforms, with a focus on Wicount in particular. Through your participation, I hope to understand how social buying platforms can better serve the interests of consumers.

I hope you will take a few minutes to complete an anonymous online questionnaire. Without the help of people like you, MBA students would find it very difficult to conduct research and earn their degrees. The information obtained will be used solely for research purposes, and is subject to the ethical rules of research at the University of South Africa.

Please begin the questionnaire by *clicking here*. The questionnaire comprises two parts. The first part contains standard demographic questions. The second part contains the questions related to the research objectives. Instructions are provided and should be followed as closely as possible. There is no correct or incorrect answer to these questions as they are intended to determine perceptions of individuals. Please answer all the questions with the answer you think appropriate. Completing the questionnaire should not take more than ten minutes.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me at (082) 453-3892 or at tony.harris@dariel.co.za.

Thank you for your participation.

Sincerely,

Anthony Harris

MBA Student (student number: 72092750)

Graduate School of Business Leadership, UNISA

Our mailing address is:
Wicount
33 Scott Street
Waverley
Johannesburg, Gauteng 2090

Add us to your address book

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Figure 32: Survey instrument email template

Appendix 5: Distributions of raw data

The broker disconfirmation and merchant disconfirmation summary descriptive statistics are presented in the following two sections. The statistics are for the raw data, prior to transformation (by natural logarithm). The transformation improved the skewness and leptokurtic characteristics of the data set, but not sufficiently to establish multivariate normality.

Broker disconfirmation sample

Summary statistics for each of the 35 observed variables in the disaggregated (item-level) broker disconfirmation model are presented below.

Summary for SEB3

A-Squared 15.05
P-Value < 0.005

Mean 5.1148
StDev 0.8913
Variance 0.7944
Skewness -1.00938
Kurtosis 0.86487
N 209

Minimum 2.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.9933 5.2364
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.8133 0.9861

95% Confidence Intervals
Mean
Median

Summary for FEB1

Anderson-Darling Normality Test
A-Squared 21.43
P-Value < 0.005

Mean 5.3828
StDev 0.7576
Variance 0.5739
Skewness -1.17006
Kurtosis 1.41848
N 209

Minimum 2.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.2795 5.4861
95% Confidence Interval for Median
5.0000 6.0000
95% Confidence Interval for StDev
0.6913 0.8381

95% Confidence Intervals
Mean
Median

Summary for FEB2

Anderson-Darling Normality Test
A-Squared 21.90
P-Value < 0.005

Mean 5.3971
StDev 0.8087
Variance 0.6540
Skewness -1.72684
Kurtosis 4.70670
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.2868 5.5074
95% Confidence Interval for Median
5.0000 6.0000
95% Confidence Interval for StDev
0.7379 0.8947

95% Confidence Intervals
Mean
Median

Summary for FEB3

Anderson-Darling Normality Test
A-Squared 20.28
P-Value < 0.005

Mean 5.3541
StDev 0.8257
Variance 0.6817
Skewness -1.67212
Kurtosis 4.33135
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.2415 5.4667
95% Confidence Interval for Median
5.0000 6.0000
95% Confidence Interval for StDev
0.7534 0.9134

95% Confidence Intervals
Mean
Median

Summary for PEB1

Anderson-Darling Normality Test
A-Squared 22.34
P-Value < 0.005

Mean 5.3493
StDev 0.9027
Variance 0.8149
Skewness -1.58046
Kurtosis 2.90586
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.2262 5.4724
95% Confidence Interval for Median
5.0000 6.0000
95% Confidence Interval for StDev
0.8237 0.9987

95% Confidence Intervals
Mean
Median

Summary for PEB2

Anderson-Darling Normality Test
A-Squared 27.81
P-Value < 0.005

Mean 5.4450
StDev 0.8538
Variance 0.7289
Skewness -1.60530
Kurtosis 2.08783
N 209

Minimum 2.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.3285 5.5614
95% Confidence Interval for Median
6.0000 6.0000
95% Confidence Interval for StDev
0.7790 0.9445

95% Confidence Intervals
Mean
Median

Summary for PEB3

Anderson-Darling Normality Test
A-Squared 40.39
P-Value < 0.005

Mean 5.6651
StDev 0.6671
Variance 0.4450
Skewness -2.34098
Kurtosis 6.33541
N 209

Minimum 2.0000
1st Quartile 5.5000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.5741 5.7560
95% Confidence Interval for Median
6.0000 6.0000
95% Confidence Interval for StDev
0.6087 0.7380

95% Confidence Intervals
Mean
Median

Summary for EPB1

Anderson-Darling Normality Test
A-Squared 13.17
P-Value < 0.005

Mean 4.8804
StDev 1.0143
Variance 1.0289
Skewness -1.37601
Kurtosis 2.94428
N 209

Minimum 1.0000
1st Quartile 4.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.7421 5.0187
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.9255 1.1222

95% Confidence Intervals
Mean
Median

Summary for FPB3

Anderson-Darling Normality Test
A-Squared 25.89
P-Value < 0.005

Mean 5.4880
StDev 0.7728
Variance 0.5972
Skewness -2.16840
Kurtosis 7.15504
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 6.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.3827 5.5934
95% Confidence Interval for Median
6.0000 6.0000
95% Confidence Interval for StDev
0.7051 0.8549

Summary for PPB1

Anderson-Darling Normality Test
A-Squared 14.14
P-Value < 0.005

Mean 5.0526
StDev 0.8945
Variance 0.8001
Skewness -1.36538
Kurtosis 3.65509
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.9307 5.1746
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.8162 0.9896

Summary for PPB2

Anderson-Darling Normality Test
A-Squared 13.19
P-Value < 0.005

Mean 4.9904
StDev 0.9405
Variance 0.8845
Skewness -1.27624
Kurtosis 2.84795
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.8622 5.1187
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.8581 1.0405

Summary for PPB3

Anderson-Darling Normality Test
A-Squared 16.40
P-Value < 0.005

Mean 5.2105
StDev 0.7928
Variance 0.6285
Skewness -1.15453
Kurtosis 2.97637
N 209

Minimum 1.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.1024 5.3186
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.7234 0.8771

Summary for DOB1

Anderson-Darling Normality Test
A-Squared 16.93
P-Value < 0.005

Mean 5.2344
StDev 0.8248
Variance 0.6803
Skewness -1.13511
Kurtosis 1.58275
N 209

Minimum 2.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.1220 5.3469
95% Confidence Interval for Median
5.0000 5.1483
95% Confidence Interval for StDev
0.7526 0.9125

Summary for DOB2

Anderson-Darling Normality Test
A-Squared 13.21
P-Value < 0.005

Mean 5.0431
StDev 0.9318
Variance 0.8683
Skewness -0.805975
Kurtosis 0.172925
N 209

Minimum 2.0000
1st Quartile 4.5000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.9160 5.1701
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.8503 1.0309

Summary for DOB3

Anderson-Darling Normality Test
A-Squared 13.11
P-Value < 0.005

Mean 5.0383
StDev 0.9600
Variance 0.9216
Skewness -0.834082
Kurtosis 0.228105
N 209

Minimum 2.0000
1st Quartile 4.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
4.9074 5.1692
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
0.8759 1.0620

Summary for SWB1

Anderson-Darling Normality Test
A-Squared 21.88
P-Value < 0.005

Mean 5.3923
StDev 0.6858
Variance 0.4703
Skewness -1.04997
Kurtosis 1.79237
N 209

Minimum 2.0000
1st Quartile 5.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 6.0000

95% Confidence Interval for Mean
5.2988 5.4859
95% Confidence Interval for Median
5.0000 6.0000
95% Confidence Interval for StDev
0.6258 0.7587

Figure 33: Graphical representation of summary statistics for 35 Likert-type scale items of the Broker disconfirmation model (Source: Minitel, 2007)

Merchant disconfirmation sample

Summary statistics for each of the 27 observed variables in the isolated merchant disconfirmation model are presented below.

Summary for VEM3

Summary for RPM1

Summary for RPM2

Summary for RPM3

Summary for SPM1

Summary for SPM2

Summary for SPM3

Summary for VPM1

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Summary for VPM2

Anderson-Darling Normality Test	
A-Squared	24.69
P-Value <	0.005
Mean	5.4686
StDev	0.6881
Variance	0.4735
Skewness	-1.19486
Kurtosis	1.17706
N	207
Minimum	3.0000
1st Quartile	5.0000
Median	6.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
5.3743   5.5629
95% Confidence Interval for Median
5.0000   6.0000
95% Confidence Interval for StDev
0.6276   0.7617

95% Confidence Intervals

Summary for VPM3

Anderson-Darling Normality Test	
A-Squared	23.83
P-Value <	0.005
Mean	5.4638
StDev	0.7356
Variance	0.5412
Skewness	-2.16399
Kurtosis	8.29780
N	207
Minimum	1.0000
1st Quartile	5.0000
Median	6.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
5.3630   5.5646
95% Confidence Interval for Median
5.0000   6.0000
95% Confidence Interval for StDev
0.6709   0.8142

95% Confidence Intervals

Summary for DOM1

Anderson-Darling Normality Test	
A-Squared	10.67
P-Value <	0.005
Mean	4.7633
StDev	1.0644
Variance	1.1330
Skewness	-1.02628
Kurtosis	1.34269
N	207
Minimum	1.0000
1st Quartile	4.0000
Median	5.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
4.6174   4.9091
95% Confidence Interval for Median
5.0000   5.0000
95% Confidence Interval for StDev
0.9708   1.1782

95% Confidence Intervals

Summary for DOM2

Anderson-Darling Normality Test	
A-Squared	9.20
P-Value <	0.005
Mean	4.6329
StDev	1.0706
Variance	1.1461
Skewness	-0.87773
Kurtosis	1.24244
N	207
Minimum	1.0000
1st Quartile	4.0000
Median	5.0000
3rd Quartile	5.0000
Maximum	6.0000

95% Confidence Interval for Mean
4.4861   4.7796
95% Confidence Interval for Median
5.0000   5.0000
95% Confidence Interval for StDev
0.9764   1.1850

95% Confidence Intervals

Summary for DOM3

Anderson-Darling Normality Test	
A-Squared	12.88
P-Value <	0.005
Mean	4.9130
StDev	0.9513
Variance	0.9050
Skewness	-1.15703
Kurtosis	2.23296
N	207
Minimum	1.0000
1st Quartile	4.0000
Median	5.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
4.7827   5.0434
95% Confidence Interval for Median
5.0000   5.0000
95% Confidence Interval for StDev
0.8677   1.0530

95% Confidence Intervals

Summary for SWM1

Anderson-Darling Normality Test	
A-Squared	17.69
P-Value <	0.005
Mean	5.2609
StDev	0.8241
Variance	0.6792
Skewness	-1.51649
Kurtosis	3.98308
N	207
Minimum	1.0000
1st Quartile	5.0000
Median	5.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
5.1479   5.3738
95% Confidence Interval for Median
5.0000   6.0000
95% Confidence Interval for StDev
0.7517   0.9122

95% Confidence Intervals

Summary for SWM2

Anderson-Darling Normality Test	
A-Squared	17.68
P-Value <	0.005
Mean	5.2657
StDev	0.7956
Variance	0.6329
Skewness	-1.39018
Kurtosis	3.69900
N	207
Minimum	1.0000
1st Quartile	5.0000
Median	5.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
5.1567   5.3747
95% Confidence Interval for Median
5.0000   5.0872
95% Confidence Interval for StDev
0.7256   0.8806

95% Confidence Intervals

Summary for SWM3

Anderson-Darling Normality Test	
A-Squared	17.86
P-Value <	0.005
Mean	5.2077
StDev	0.8246
Variance	0.6799
Skewness	-1.66236
Kurtosis	5.06732
N	207
Minimum	1.0000
1st Quartile	5.0000
Median	5.0000
3rd Quartile	6.0000
Maximum	6.0000

95% Confidence Interval for Mean
5.0947   5.3207
95% Confidence Interval for Median
5.0000   5.0000
95% Confidence Interval for StDev
0.7521   0.9127

95% Confidence Intervals

Figure 34: Graphical representation of summary statistics for 27 Likert-type scale items of the Merchant disconfirmation model (Source: Minitel, 2007)

Appendix 6: Broker disconfirmation – Disaggregated model

The fully disaggregated (item-level) model for broker disconfirmation was tested first, since this would give some indication of the loading of the modified E-S-QUAL scale onto the constructs of the model themselves. This appendix will present the Statsistica structural equation model (SEM) relationships that were set up to estimate the disaggregated model, as well as the correlation matrix used as input data. The last section illustrates the covariances introduced in order to improve model fit and reduce the magnitude of values in the residual matrix.

Statistica SEM program

Below is the Statistica specification of the disaggregated broker disconfirmation structural equation model.

```
(EEB)-1->[EEB1t]
(EEB)-2->[EEB2t]
(EEB)-3->[EEB3t]
(EEB)-4->[EEB4t]
(SEB)-5->[SEB1t]
(SEB)-6->[SEB2t]
(SEB)-7->[SEB3t]
(FEB)-8->[FEB1t]
(FEB)-9->[FEB2t]
(FEB)-10->[FEB3t]
(PEB)-11->[PEB1t]
(PEB)-12->[PEB2t]
(PEB)-13->[PEB3t]
(EPB)-14->[EPB1t]
(EPB)-15->[EPB2t]
(EPB)-16->[EPB3t]
(EPB)-17->[EPB4t]
(SPB)-18->[SPB1t]
(SPB)-19->[SPB2t]
(SPB)-20->[SPB3t]
(FPB)-21->[FPB1t]
(FPB)-22->[FPB2t]
(FPB)-23->[FPB3t]
(PPB)-24->[PPB1t]
(PPB)-25->[PPB2t]
(PPB)-26->[PPB3t]
(DELTA1)-->[EEB1t]
(DELTA2)-->[EEB2t]
(DELTA3)-->[EEB3t]
(DELTA4)-->[EEB4t]
(DELTA5)-->[SEB1t]
(DELTA6)-->[SEB2t]
(DELTA7)-->[SEB3t]
(DELTA8)-->[FEB1t]
(DELTA9)-->[FEB2t]
(DELTA10)-->[FEB3t]
```

(DELTA11)-->[PEB1t]
(DELTA12)-->[PEB2t]
(DELTA13)-->[PEB3t]
(DELTA14)-->[EPB1t]
(DELTA15)-->[EPB2t]
(DELTA16)-->[EPB3t]
(DELTA17)-->[EPB4t]
(DELTA18)-->[SPB1t]
(DELTA19)-->[SPB2t]
(DELTA20)-->[SPB3t]
(DELTA21)-->[FPB1t]
(DELTA22)-->[FPB2t]
(DELTA23)-->[FPB3t]
(DELTA24)-->[PPB1t]
(DELTA25)-->[PPB2t]
(DELTA26)-->[PPB3t]
(DELTA1)-27-(DELTA1)
(DELTA2)-28-(DELTA2)
(DELTA3)-29-(DELTA3)
(DELTA4)-30-(DELTA4)
(DELTA5)-31-(DELTA5)
(DELTA6)-32-(DELTA6)
(DELTA7)-33-(DELTA7)
(DELTA8)-34-(DELTA8)
(DELTA9)-35-(DELTA9)
(DELTA10)-36-(DELTA10)
(DELTA11)-37-(DELTA11)
(DELTA12)-38-(DELTA12)
(DELTA13)-39-(DELTA13)
(DELTA14)-40-(DELTA14)
(DELTA15)-41-(DELTA15)
(DELTA16)-42-(DELTA16)
(DELTA17)-43-(DELTA17)
(DELTA18)-44-(DELTA18)
(DELTA19)-45-(DELTA19)
(DELTA20)-46-(DELTA20)
(DELTA21)-47-(DELTA21)
(DELTA22)-48-(DELTA22)
(DELTA23)-49-(DELTA23)
(DELTA24)-50-(DELTA24)
(DELTA25)-51-(DELTA25)
(DELTA26)-52-(DELTA26)
(SEB)-53-(EEB)
(FEB)-54-(EEB)
(PEB)-55-(EEB)
(FEB)-56-(SEB)
(PEB)-57-(SEB)
(PEB)-58-(FEB)
(SPB)-59-(EPB)
(FPB)-60-(EPB)
(PPB)-61-(EPB)
(FPB)-62-(SPB)
(PPB)-63-(SPB)
(PPB)-64-(FPB)
(DOB)-65->[DOB1t]
(DOB)-66->[DOB2t]
(DOB)-67->[DOB3t]

(SWB)-68->[SWB1t]
(SWB)-69->[SWB2t]
(SWB)-70->[SWB3t]
(LIB)-71->[LIB1t]
(LIB)-72->[LIB2t]
(LIB)-73->[LIB3t]
(EPSILON1)-->[DOB1t]
(EPSILON2)-->[DOB2t]
(EPSILON3)-->[DOB3t]
(EPSILON4)-->[SWB1t]
(EPSILON5)-->[SWB2t]
(EPSILON6)-->[SWB3t]
(EPSILON7)-->[LIB1t]
(EPSILON8)-->[LIB2t]
(EPSILON9)-->[LIB3t]
(EPSILON1)-74-(EPSILON1)
(EPSILON2)-75-(EPSILON2)
(EPSILON3)-76-(EPSILON3)
(EPSILON4)-77-(EPSILON4)
(EPSILON5)-78-(EPSILON5)
(EPSILON6)-79-(EPSILON6)
(EPSILON7)-80-(EPSILON7)
(EPSILON8)-81-(EPSILON8)
(EPSILON9)-82-(EPSILON9)
(ZETA1)-->(DOB)
(ZETA2)-->(SWB)
(ZETA3)-->(LIB)
(ZETA1)-83-(ZETA1)
(ZETA2)-84-(ZETA2)
(ZETA3)-85-(ZETA3)
(DOB)-86->(SWB)
(SWB)-87->(LIB)
(FEB)-88->(ESQE)
(PEB)-89->(ESQE)
(SEB)-90->(ESQE)
(EEB)-91->(ESQE)
(EPB)-92->(ESQP)
(FPB)-93->(ESQP)
(PPB)-94->(ESQP)
(SPB)-95->(ESQP)
(ZETA4)-->(ESQE)
(ZETA5)-->(ESQE)
(ZETA4)-96-(ZETA4)
(ZETA5)-97-(ZETA5)
(ESQE)-98->(DOB)
(ESQP)-99->(DOB)
(ESQP)-100->(SWB)

Correlation matrix

The next two pages present the correlation matrix for the broker disconfirmation disaggregated (item-level) model. The data was transformed prior to the calculation of the correlation matrix, using the natural logarithm transformation. Figure 35 shows the left hand side of the matrix, and Figure 36 shows its right hand side.

Correlations (Broker)
Marked correlations are significant at p < .01000
N=209 (Casewise deletion of missing data)

Variable	Means	Std.Dev.	EEB1t	EEB2t	EEB3t	EEB4t	SEB1t	SEB2t	SEB3t	FEB1t	FEB2t	FEB3t	PEB1t	PEB2t	PEB3t	EPB1t	EPB2t	EPB3t	EPB4t
EEB1t	0.827227	0.455280	1.000000	0.715196	0.503595	0.500485	0.349840	0.219150	0.170423	0.181826	0.167744	0.154588	0.235456	0.186154	0.173439	0.443334	0.344106	0.145396	0.212588
EEB2t	0.824918	0.424355	0.715196	1.000000	0.548677	0.475608	0.313170	0.207720	0.194218	0.205524	0.205991	0.210420	0.244056	0.214545	0.203215	0.307647	0.328683	0.017477	0.069809
EEB3t	0.621642	0.411574	0.503595	0.548677	1.000000	0.744811	0.398016	0.369742	0.319489	0.364132	0.315832	0.363926	0.253868	0.250380	0.313075	0.294998	0.163074	0.241580	0.181652
EEB4t	0.590222	0.419372	0.500485	0.475608	0.744811	1.000000	0.473346	0.401431	0.348945	0.394529	0.350650	0.386421	0.335835	0.326659	0.314477	0.280050	0.164030	0.093968	0.159532
SEB1t	0.607254	0.475308	0.349840	0.313170	0.398016	0.473346	1.000000	0.540447	0.477636	0.476880	0.433361	0.442441	0.285456	0.293194	0.282519	0.342660	0.308587	0.249809	0.269988
SEB2t	0.579340	0.459877	0.219150	0.207720	0.369742	0.401431	0.540447	1.000000	0.805962	0.588147	0.489181	0.491257	0.413324	0.436149	0.433553	0.166519	0.255683	0.145696	0.182658
SEB3t	0.528775	0.458425	0.170423	0.194218	0.319489	0.348945	0.477636	0.805962	1.000000	0.592860	0.516712	0.544382	0.405874	0.503964	0.470607	0.049405	0.146036	0.101279	0.104181
FEB1t	0.383971	0.429967	0.181826	0.205524	0.364132	0.394529	0.476880	0.588147	0.592860	1.000000	0.810673	0.800874	0.568452	0.592238	0.606546	0.109607	0.195413	0.150816	0.132356
FEB2t	0.368765	0.436992	0.167744	0.205991	0.315832	0.350650	0.433361	0.489181	0.516712	0.810673	1.000000	0.876338	0.595072	0.616321	0.631329	0.149347	0.206453	0.134546	0.093712
FEB3t	0.394733	0.440548	0.154588	0.210420	0.363926	0.386421	0.442441	0.491257	0.544382	0.800874	0.876338	1.000000	0.574275	0.582032	0.542330	0.102828	0.196273	0.083168	0.066569
PEB1t	0.381218	0.468801	0.235456	0.244056	0.253868	0.335835	0.285456	0.413324	0.405874	0.568452	0.595072	0.574275	1.000000	0.792426	0.647429	0.153130	0.175057	0.054260	0.031408
PEB2t	0.325900	0.453140	0.186154	0.214545	0.250380	0.326659	0.293194	0.436149	0.503964	0.592238	0.616321	0.582032	0.792426	1.000000	0.730663	0.085712	0.118358	0.037600	-0.005570
PEB3t	0.204815	0.374681	0.173439	0.203215	0.313075	0.314477	0.282519	0.433553	0.470607	0.606546	0.631329	0.542330	0.647429	0.730663	1.000000	0.070143	0.086703	0.101800	-0.025595
EPB1t	0.646044	0.460794	0.443334	0.307647	0.294998	0.280050	0.342660	0.166519	0.049405	0.109607	0.149347	0.102828	0.153130	0.085712	0.070143	1.000000	0.726788	0.502779	0.543453
EPB2t	0.630334	0.435893	0.344106	0.328683	0.163074	0.164030	0.308587	0.255683	0.146036	0.195413	0.206453	0.196273	0.175057	0.118358	0.086703	0.726788	1.000000	0.447600	0.562844
EPB3t	0.440351	0.432064	0.145396	0.017477	0.241580	0.093968	0.249809	0.145696	0.101279	0.150816	0.134546	0.083168	0.054260	0.037600	0.101800	0.502779	0.447600	1.000000	0.701971
EPB4t	0.502047	0.429051	0.212588	0.069809	0.181652	0.159532	0.269988	0.182658	0.104181	0.132356	0.093712	0.066569	0.031408	-0.005570	-0.025595	0.543453	0.562844	0.701971	1.000000
SPB1t	0.605872	0.456501	0.204180	0.067562	0.096801	0.061165	0.392780	0.118742	0.120739	0.115973	0.074681	0.027669	0.122799	0.015644	0.011873	0.384981	0.344121	0.415590	0.482362
SPB2t	0.779340	0.535139	0.061079	-0.019542	0.027502	-0.028535	0.118533	0.110087	0.092019	0.046207	0.019567	-0.009907	0.033827	0.007784	-0.023359	0.142979	0.113073	0.258810	0.240589
SPB3t	0.615085	0.507832	0.098689	-0.018007	0.158252	0.049110	0.180686	0.211993	0.246683	0.179535	0.112365	0.104032	0.151147	0.050167	-0.008484	0.222048	0.183054	0.363826	0.327281
FPB1t	0.344303	0.431822	0.023833	0.031867	0.180278	0.053293	0.100988	0.097748	0.064305	0.154613	0.124751	0.083621	0.096292	0.036130	0.089557	0.194190	0.197492	0.401105	0.414598
FPB2t	0.292420	0.388419	0.088948	0.073050	0.197227	0.121523	0.225767	0.161414	0.148179	0.278110	0.245283	0.234590	0.187743	0.128543	0.143601	0.220167	0.233440	0.379850	0.410573
FPB3t	0.316199	0.416814	0.106711	0.081177	0.261400	0.186938	0.314851	0.210007	0.173248	0.243480	0.188542	0.201901	0.159758	0.101159	0.115026	0.222372	0.169901	0.367700	0.378433
PPB1t	0.568637	0.444237	0.132229	-0.043693	0.164607	0.141228	0.133635	0.134619	0.033268	0.124127	0.091376	0.052237	0.106105	0.067588	0.075767	0.293189	0.264707	0.335666	0.381860
PPB2t	0.595424	0.455440	0.139352	-0.035419	0.142938	0.104765	0.109690	0.078132	-0.005821	0.118657	0.115755	0.070753	0.096086	0.050452	0.101329	0.293712	0.272272	0.341360	0.318005
PPB3t	0.489345	0.430857	0.092515	-0.028902	0.225025	0.136069	0.189283	0.102312	0.033096	0.116418	0.116482	0.075565	0.105927	0.059274	0.182678	0.302917	0.244888	0.379055	0.297115
DOB1t	0.468514	0.443360	0.074434	0.024399	0.203605	0.109902	0.176654	0.131498	0.084731	0.037997	-0.008542	0.049521	0.023175	0.031722	0.008414	0.319231	0.212808	0.396544	0.343141
DOB2t	0.560064	0.475279	0.110063	-0.000450	0.165690	0.069819	0.143467	0.099368	0.024249	-0.034644	-0.090523	-0.037971	-0.029945	-0.035972	-0.078158	0.407421	0.278182	0.424365	0.449915
DOB3t	0.557003	0.485890	0.095955	-0.002334	0.106050	0.028881	0.077685	0.057468	-0.015979	-0.111291	-0.143960	-0.104384	-0.086708	-0.064653	-0.078256	0.384512	0.212094	0.357137	0.365879
SWB1t	0.390853	0.405412	0.084536	-0.012562	0.176052	0.070036	0.221642	0.059882	-0.004357	-0.007397	0.001040	0.015248	-0.035785	-0.088854	-0.026191	0.335140	0.249629	0.402055	0.391919
SWB2t	0.344671	0.400297	0.083632	0.026139	0.221084	0.112281	0.268255	0.078058	0.021238	0.070167	0.077948	0.093114	0.082641	0.006117	0.052244	0.322125	0.246782	0.392789	0.373174
SWB3t	0.324209	0.394278	0.053587	-0.014892	0.138263	0.047353	0.211529	0.061780	-0.003681	0.009829	0.043714	0.035875	0.029397	-0.020928	0.004823	0.313245	0.233836	0.355977	0.351966
LIB1t	0.261504	0.373436	0.028820	-0.043179	0.128872	0.051404	0.241449	0.070172	0.069289	0.132277	0.148506	0.137320	0.115460	0.101567	0.097321	0.318020	0.263021	0.398121	0.353778
LIB2t	0.251804	0.356362	0.058023	0.016272	0.192106	0.092360	0.226124	0.084282	0.028655	0.062307	0.096942	0.086234	0.014097	-0.024230	0.083597	0.296176	0.214368	0.341880	0.302886
LIB3t	0.533592	0.487873	0.145573	0.026358	0.095314	0.083872	0.237925	0.040756	0.004222	0.025149	0.034189	0.068441	0.066949	0.025318	0.043344	0.283507	0.190065	0.213528	0.311535

Figure 35: Left hand side of broker disconfirmation correlation matrix, transformed data. (Source: StatSoft, 2005)

SPB1t	SPB2t	SPB3t	FPB1t	FPB2t	FPB3t	PPB1t	PPB2t	PPB3t	DOB1t	DOB2t	DOB3t	SWB1t	SWB2t	SWB3t	LIB1t	LIB2t	LIB3t
0.204180	0.061079	0.098689	0.023833	0.088948	0.106711	0.132229	0.139352	0.092515	0.074434	0.110063	0.095955	0.084536	0.083632	0.053587	0.028820	0.058023	0.145573
0.067562	-0.019542	-0.018007	0.031867	0.073050	0.081177	-0.043693	-0.035419	-0.028902	0.024399	-0.000450	-0.002334	-0.012562	0.026139	-0.014892	-0.043179	0.016272	0.026358
0.096801	0.027502	0.158252	0.180278	0.197227	0.261400	0.164607	0.142938	0.225025	0.203605	0.165690	0.106050	0.176052	0.221084	0.138263	0.128872	0.192106	0.095314
0.061165	-0.028535	0.049110	0.053293	0.121523	0.186938	0.141228	0.104765	0.136069	0.109902	0.069819	0.028881	0.070036	0.112281	0.047353	0.051404	0.092360	0.083872
0.392780	0.118533	0.180686	0.100988	0.225767	0.314851	0.133635	0.109690	0.189283	0.176654	0.143467	0.077685	0.221642	0.268255	0.211529	0.241449	0.226124	0.237925
0.118742	0.110087	0.211993	0.097748	0.161414	0.210007	0.134619	0.078132	0.102312	0.131498	0.099368	0.057468	0.059882	0.078058	0.061780	0.070172	0.084282	0.040756
0.120739	0.092019	0.246683	0.064305	0.148179	0.173248	0.033268	-0.005821	0.033096	0.084731	0.024249	-0.015979	-0.004357	0.021238	-0.003681	0.069289	0.028655	0.004222
0.115973	0.046207	0.179535	0.154613	0.278110	0.243480	0.124127	0.118657	0.116418	0.037997	-0.034644	-0.111291	-0.007397	0.070167	0.009829	0.132277	0.062307	0.025149
0.074681	0.019567	0.112365	0.124751	0.245283	0.188542	0.091376	0.115755	0.116482	-0.008542	-0.090523	-0.143960	0.001040	0.077948	0.043714	0.148506	0.096942	0.034189
0.027669	-0.009907	0.104032	0.083621	0.234590	0.201901	0.052237	0.070753	0.075565	0.049521	-0.037971	-0.104384	0.015248	0.093114	0.035875	0.137320	0.086234	0.068441
0.122799	0.033827	0.151147	0.096292	0.187743	0.159758	0.106105	0.096086	0.105927	0.023175	-0.029945	-0.086708	-0.035785	0.082641	0.029397	0.115460	0.014097	0.066949
0.015644	0.007784	0.050167	0.036130	0.128543	0.101159	0.067588	0.050452	0.059274	0.031722	-0.035972	-0.064653	-0.088854	0.006117	-0.020928	0.101567	-0.024230	0.025318
0.011873	-0.023359	-0.008484	0.089557	0.143601	0.115026	0.075767	0.101329	0.182678	0.008414	-0.078158	-0.078256	-0.026191	0.052244	0.004823	0.097321	0.083597	0.043344
0.384981	0.142979	0.222048	0.194190	0.220167	0.222372	0.293189	0.293712	0.302917	0.319231	0.407421	0.384512	0.335140	0.322125	0.313245	0.318020	0.296176	0.283507
0.344121	0.113073	0.183054	0.197492	0.233440	0.169901	0.264707	0.272272	0.244888	0.212808	0.278182	0.212094	0.249629	0.246782	0.233836	0.263021	0.214368	0.190065
0.415590	0.258810	0.363826	0.401105	0.379850	0.367700	0.335666	0.341360	0.379055	0.396544	0.424365	0.357137	0.402055	0.392789	0.355977	0.398121	0.341880	0.213528
0.482362	0.240589	0.327281	0.414598	0.410573	0.378433	0.381860	0.318005	0.297115	0.343141	0.449915	0.365879	0.391919	0.373174	0.351966	0.353778	0.302886	0.311535
1.000000	0.545231	0.554915	0.312537	0.297172	0.360772	0.227769	0.200134	0.298716	0.286601	0.309617	0.265348	0.359271	0.357127	0.332268	0.303779	0.279472	0.231727
0.545231	1.000000	0.611277	0.220229	0.213186	0.204684	0.141095	0.103607	0.157762	0.125090	0.188138	0.179584	0.186592	0.169774	0.199781	0.203545	0.193921	0.119350
0.554915	0.611277	1.000000	0.389365	0.379054	0.366874	0.220238	0.191432	0.261565	0.253449	0.272032	0.206889	0.309383	0.299335	0.263895	0.277768	0.247313	0.113598
0.312537	0.220229	0.389365	1.000000	0.650363	0.640809	0.288793	0.308792	0.355004	0.329783	0.409404	0.388535	0.375211	0.400320	0.354582	0.404804	0.387059	0.252216
0.297172	0.213186	0.379054	0.650363	1.000000	0.764578	0.353768	0.362396	0.436243	0.380927	0.379782	0.351854	0.390167	0.452714	0.409520	0.452987	0.414275	0.287830
0.360772	0.204684	0.366874	0.640809	0.764578	1.000000	0.358181	0.342862	0.420748	0.422022	0.421723	0.400835	0.411008	0.487219	0.437650	0.502145	0.471465	0.304327
0.227769	0.141095	0.220238	0.288793	0.353768	0.358181	1.000000	0.876399	0.772163	0.474102	0.430342	0.432170	0.409130	0.380262	0.459571	0.366683	0.326017	0.360522
0.200134	0.103607	0.191432	0.308792	0.362396	0.342862	0.876399	1.000000	0.768092	0.396075	0.377700	0.388845	0.421402	0.348439	0.431644	0.380581	0.336940	0.329800
0.298716	0.157762	0.261565	0.355004	0.436243	0.420748	0.772163	0.768092	1.000000	0.472628	0.437797	0.437549	0.448094	0.457762	0.526287	0.466876	0.454621	0.373413
0.286601	0.125090	0.253449	0.329783	0.380927	0.422022	0.474102	0.396075	0.472628	1.000000	0.798096	0.745316	0.617685	0.594772	0.589330	0.569065	0.560097	0.468085
0.309617	0.188138	0.272032	0.409404	0.379782	0.421723	0.430342	0.377700	0.437797	0.798096	1.000000	0.865543	0.675430	0.622895	0.666185	0.596503	0.576673	0.557891
0.265348	0.179584	0.206889	0.388535	0.351854	0.400835	0.432170	0.388845	0.437549	0.745316	0.865543	1.000000	0.605307	0.586090	0.642813	0.523104	0.560833	0.534508
0.359271	0.186592	0.309383	0.375211	0.390167	0.411008	0.409130	0.421402	0.448094	0.617685	0.675430	0.605307	1.000000	0.810338	0.749977	0.651871	0.668627	0.577102
0.357127	0.169774	0.299335	0.400320	0.452714	0.487219	0.380262	0.348439	0.457762	0.594772	0.622895	0.586090	0.810338	1.000000	0.853462	0.684483	0.688810	0.578863
0.332268	0.199781	0.263895	0.354582	0.409520	0.437650	0.459571	0.431644	0.526287	0.589330	0.666185	0.642813	0.749977	0.853462	1.000000	0.773561	0.749818	0.649474
0.303779	0.203545	0.277768	0.404804	0.452987	0.502145	0.366683	0.380581	0.466876	0.569065	0.596503	0.523104	0.651871	0.684483	0.773561	1.000000	0.838856	0.633601
0.279472	0.193921	0.247313	0.387059	0.414275	0.471465	0.326017	0.336940	0.454621	0.560097	0.576673	0.560833	0.668627	0.688810	0.749818	0.838856	1.000000	0.655014
0.231727	0.119350	0.113598	0.252216	0.287830	0.304327	0.360522	0.329800	0.373413	0.468085	0.557891	0.534508	0.577102	0.578863	0.649474	0.633601	0.655014	1.000000

Figure 36: Right hand side of broker disconfirmation correlation matrix, transformed data. (Source: StatSoft, 2005)

Introduced covariances

Once the initial broker disconfirmation model was estimated using the GLS method, the residual matrix was inspected for evidence of model misspecification. Some large residuals were present suggesting the introduction of covariances between the first-order exogenous latent constructs representing expectation and performance variables. The figure below illustrates the introduced covariances
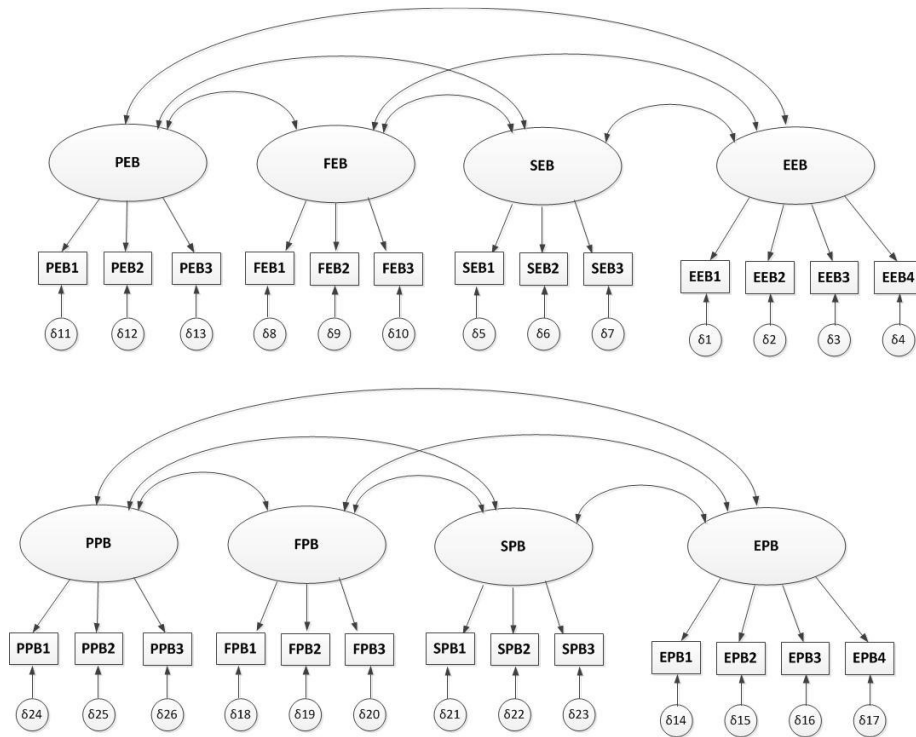
Figure 37: Partial measurement model exhibiting the introduction of covariances between constructs suggested by the normalised residual matrix

Appendix 7: Broker disconfirmation – Partially aggregated model

The partially aggregated (subscale-level) model for broker disconfirmation was tested second. This model represents the summated scores for the original first-order exogenous constructs representing the E-S-QUAL scale dimensions. This appendix will present the Statsistica structural equation model (SEM) relationships that wereset up to estimate the partially aggregated model, as well as the correlation matrix used as input data.

Statistica SEM program

Below is the Statistica specification of the partially aggregated broker disconfirmation structural equation model.

```
(ESQE)-1->[EEBsum_t]
(ESQE)-2->[SEBsum_t]
(ESQE)-3->[FEBsum_t]
(ESQE)-4->[PEBsum_t]
(ESQP)-5->[EPBsum_t]
(ESQP)-6->[SPBsum_t]
(ESQP)-7->[FPBsum_t]
(ESQP)-8->[PPBsum_t]
(DELTA1)-->[EEBsum_t]
(DELTA2)-->[SEBsum_t]
(DELTA3)-->[FEBsum_t]
(DELTA4)-->[PEBsum_t]
(DELTA5)-->[EPBsum_t]
(DELTA6)-->[SPBsum_t]
(DELTA7)-->[FPBsum_t]
(DELTA8)-->[PPBsum_t]
(DELTA1)-9-(DELTA1)
(DELTA2)-10-(DELTA2)
(DELTA3)-11-(DELTA3)
(DELTA4)-12-(DELTA4)
(DELTA5)-13-(DELTA5)
(DELTA6)-14-(DELTA6)
(DELTA7)-15-(DELTA7)
(DELTA8)-16-(DELTA8)
(DOB)-17->[DOB1t]
(DOB)-18->[DOB2t]
(DOB)-19->[DOB3t]
(SWB)-20->[SWB1t]
(SWB)-21->[SWB2t]
(SWB)-22->[SWB3t]
(LIB)-23->[LIB1t]
(LIB)-24->[LIB2t]
(LIB)-25->[LIB3t]
(EPSILON1)-->[DOB1t]
(EPSILON2)-->[DOB2t]
(EPSILON3)-->[DOB3t]
(EPSILON4)-->[SWB1t]
(EPSILON5)-->[SWB2t]
```

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```
(EPSILON6)-->[SWB3t]
(EPSILON7)-->[LIB1t]
(EPSILON8)-->[LIB2t]
(EPSILON9)-->[LIB3t]
(EPSILON1)-26-(EPSILON1)
(EPSILON2)-27-(EPSILON2)
(EPSILON3)-28-(EPSILON3)
(EPSILON4)-29-(EPSILON4)
(EPSILON5)-30-(EPSILON5)
(EPSILON6)-31-(EPSILON6)
(EPSILON7)-32-(EPSILON7)
(EPSILON8)-33-(EPSILON8)
(EPSILON9)-34-(EPSILON9)
(ZETA1)-->(DOB)
(ZETA2)-->(SWB)
(ZETA3)-->(LIB)
(ZETA1)-35-(ZETA1)
(ZETA2)-36-(ZETA2)
(ZETA3)-37-(ZETA3)
(ESQE)-38->(DOB)
(ESQP)-39->(DOB)
(ESQP)-40->(SWB)
(DOB)-41->(SWB)
(SWB)-42->(LIB)
```

Correlation matrix

The next two pages present the correlation matrix for the broker disconfirmation partially aggregated (subscale-level) model. The data was transformed prior to the calculation of the correlation matrix, using the natural logarithm transformation and summing the item-level indicator variables to yield summated scores. Figure 38 shows the left hand side of the matrix, and Figure 39 shows its right hand side.

Correlations (Broker)
Marked correlations are significant at p < .01000
N=209 (Casewise deletion of missing data)

Variable	Means	Std.Dev.	DOB1t	DOB2t	DOB3t	SWB1t	SWB2t	SWB3t	LIB1t	LIB2t
DOB1t	0.468514	0.443360	1.000000	0.798096	0.745316	0.617685	0.594772	0.589330	0.569065	0.560097
DOB2t	0.560064	0.475279	0.798096	1.000000	0.865543	0.675430	0.622895	0.666185	0.596503	0.576673
DOB3t	0.557003	0.485890	0.745316	0.865543	1.000000	0.605307	0.586090	0.642813	0.523104	0.560833
SWB1t	0.390853	0.405412	0.617685	0.675430	0.605307	1.000000	0.810338	0.749977	0.651871	0.668627
SWB2t	0.344671	0.400297	0.594772	0.622895	0.586090	0.810338	1.000000	0.853462	0.684483	0.688810
SWB3t	0.324209	0.394278	0.589330	0.666185	0.642813	0.749977	0.853462	1.000000	0.773561	0.749818
LIB1t	0.261504	0.373436	0.569065	0.596503	0.523104	0.651871	0.684483	0.773561	1.000000	0.838856
LIB2t	0.251804	0.356362	0.560097	0.576673	0.560833	0.668627	0.688810	0.749818	0.838856	1.000000
LIB3t	0.533592	0.487873	0.468085	0.557891	0.534508	0.577102	0.578863	0.649474	0.633601	0.655014
EEBsum_t	1.616116	0.672437	0.118903	0.102501	0.077688	0.091989	0.122392	0.065496	0.046247	0.096614
SEBsum_t	1.148347	0.713738	0.153668	0.109315	0.058548	0.129633	0.160272	0.127196	0.163549	0.147389
FEBsum_t	0.763651	0.762230	0.037562	-0.052676	-0.120652	-0.005601	0.087616	0.033944	0.151090	0.092383
PEBsum_t	0.628493	0.751990	0.018195	-0.039714	-0.080030	-0.056398	0.059759	0.012648	0.118133	0.021289
EPBsum_t	1.317142	0.749380	0.350326	0.436741	0.365946	0.369828	0.352182	0.324093	0.341403	0.291617
SPBsum_t	1.310887	0.737758	0.227479	0.274085	0.220561	0.302449	0.286679	0.272800	0.282856	0.262666
FPBsum_t	0.664350	0.721317	0.402146	0.449621	0.426355	0.419319	0.464273	0.420419	0.479211	0.447282
PPBsum_t	1.075717	0.754698	0.450612	0.416522	0.425261	0.433437	0.398464	0.466724	0.399877	0.371185

Figure 38: Left hand side of broker disconfirmation correlation matrix, transformed and summated data. (Source: StatSoft, 2005)

LIB3t	EEBsum_t	SEBsum_t	FEBsum_t	PEBsum_t	EPBsum_t	SPBsum_t	FPBsum_t	PPBsum_t
0.468085	0.118903	0.153668	0.037562	0.018195	0.350326	0.227479	0.402146	0.450612
0.557891	0.102501	0.109315	-0.052676	-0.039714	0.436741	0.274085	0.449621	0.416522
0.534508	0.077688	0.058548	-0.120652	-0.080030	0.365946	0.220561	0.426355	0.425261
0.577102	0.091989	0.129633	-0.005601	-0.056398	0.369828	0.302449	0.419319	0.433437
0.578863	0.122392	0.160272	0.087616	0.059759	0.352182	0.286679	0.464273	0.398464
0.649474	0.065496	0.127196	0.033944	0.012648	0.324093	0.272800	0.420419	0.466724
0.633601	0.046247	0.163549	0.151090	0.118133	0.341403	0.282856	0.479211	0.399877
0.655014	0.096614	0.147389	0.092383	0.021289	0.291617	0.262666	0.447282	0.371185
1.000000	0.126988	0.109445	0.053173	0.056957	0.272360	0.167161	0.313149	0.360654
0.126988	1.000000	0.401968	0.348531	0.315862	0.354879	0.091741	0.130398	0.101208
0.109445	0.401968	1.000000	0.567606	0.419981	0.288586	0.267161	0.183238	0.109232
0.053173	0.348531	0.567606	1.000000	0.665906	0.189287	0.085757	0.219134	0.135946
0.056957	0.315862	0.419981	0.665906	1.000000	0.122857	0.063524	0.151945	0.116065
0.272360	0.354879	0.288586	0.189287	0.122857	1.000000	0.355470	0.330500	0.352255
0.167161	0.091741	0.267161	0.085757	0.063524	0.355470	1.000000	0.333690	0.170158
0.313149	0.130398	0.183238	0.219134	0.151945	0.330500	0.333690	1.000000	0.410313
0.360654	0.101208	0.109232	0.135946	0.116065	0.352255	0.170158	0.410313	1.000000

Figure 39: Right hand side of broker disconfirmation correlation matrix, transformed and summated data. (Source: StatSoft, 2005)

Appendix 8: Merchant disconfirmation

The third model to be tested was the isolated model for merchant disconfirmation. This appendix will present the Statsistica structural equation model (SEM) relationships that were set up to estimate the merchant disconfirmation model, as well as the correlation matrix used as input data. The last section illustrates the covariances introduced in order to improve model fit and reduce the magnitude of values in the residual matrix.

Statistica SEM program

Below is the Statistica specification of the disaggregated broker disconfirmation structural equation model.

```
(REM)-1->[REM1]
(REM)-2->[REM2]
(REM)-3->[REM3]
(SEM)-4->[SEM1]
(SEM)-5->[SEM2]
(SEM)-6->[SEM3]
(VEM)-7->[VEM1]
(VEM)-8->[VEM2]
(VEM)-9->[VEM3]
(RPM)-10->[RPM1]
(RPM)-11->[RPM2]
(RPM)-12->[RPM3]
(SPM)-13->[SPM1]
(SPM)-14->[SPM2]
(SPM)-15->[SPM3]
(VPM)-16->[VPM1]
(VPM)-17->[VPM2]
(VPM)-18->[VPM3]
(DELTA1)-->[REM1]
(DELTA2)-->[REM2]
(DELTA3)-->[REM3]
(DELTA4)-->[SEM1]
(DELTA5)-->[SEM2]
(DELTA6)-->[SEM3]
(DELTA7)-->[VEM1]
(DELTA8)-->[VEM2]
(DELTA9)-->[VEM3]
(DELTA10)-->[RPM1]
(DELTA11)-->[RPM2]
(DELTA12)-->[RPM3]
(DELTA13)-->[SPM1]
(DELTA14)-->[SPM2]
(DELTA15)-->[SPM3]
(DELTA16)-->[VPM1]
(DELTA17)-->[VPM2]
(DELTA18)-->[VPM3]
(DELTA1)-19-(DELTA1)
```

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(DELTA2)-20-(DELTA2)
(DELTA3)-21-(DELTA3)
(DELTA4)-22-(DELTA4)
(DELTA5)-23-(DELTA5)
(DELTA6)-24-(DELTA6)
(DELTA7)-25-(DELTA7)
(DELTA8)-26-(DELTA8)
(DELTA9)-27-(DELTA9)
(DELTA10)-28-(DELTA10)
(DELTA11)-29-(DELTA11)
(DELTA12)-30-(DELTA12)
(DELTA13)-31-(DELTA13)
(DELTA14)-32-(DELTA14)
(DELTA15)-33-(DELTA15)
(DELTA16)-34-(DELTA16)
(DELTA17)-35-(DELTA17)
(DELTA18)-36-(DELTA18)
(DOM)-37->[DOM1]
(DOM)-38->[DOM2]
(DOM)-39->[DOM3]
(SWM)-40->[SWM1]
(SWM)-41->[SWM2]
(SWM)-42->[SWM3]
(LIM)-43->[LIM1]
(LIM)-44->[LIM2]
(LIM)-45->[LIM3]
(EPSILON1)-->[DOM1]
(EPSILON2)-->[DOM2]
(EPSILON3)-->[DOM3]
(EPSILON4)-->[SWM1]
(EPSILON5)-->[SWM2]
(EPSILON6)-->[SWM3]
(EPSILON7)-->[LIM1]
(EPSILON8)-->[LIM2]
(EPSILON9)-->[LIM3]
(EPSILON1)-46-(EPSILON1)
(EPSILON2)-47-(EPSILON2)
(EPSILON3)-48-(EPSILON3)
(EPSILON4)-49-(EPSILON4)
(EPSILON5)-50-(EPSILON5)
(EPSILON6)-51-(EPSILON6)
(EPSILON7)-52-(EPSILON7)
(EPSILON8)-53-(EPSILON8)
(EPSILON9)-54-(EPSILON9)
(ZETA1)-->(DOM)
(ZETA2)-->(SWM)
(ZETA3)-->(LIM)
(ZETA1)-55-(ZETA1)
(ZETA2)-56-(ZETA2)
(ZETA3)-57-(ZETA3)
(REM)-58->(DOM)
(SEM)-59->(DOM)
(VEM)-60->(DOM)
(RPM)-61->(DOM)
(RPM)-62->(SWM)
(SPM)-63->(DOM)
(SPM)-64->(SWM)

(VPM)-65->(DOM)
(VPM)-66->(SWM)
(DOM)-67->(SWM)
(SWM)-68->(LIM)
(REM)-69-(SEM)
(REM)-70-(VEM)
(SEM)-71-(VEM)
(RPM)-72-(SPM)
(RPM)-73-(VPM)
(SPM)-74-(VPM)

Correlation matrix

The next two pages present the correlation matrix for the broker disconfirmation partially aggregated (subscale-level) model. The data was transformed prior to the calculation of the correlation matrix, using the natural logarithm transformation and summing the item-level indicator variables to yield summated scores. Figure 40 shows the left hand side of the matrix, and Figure 41 shows its right hand side.

Correlations (Merchant)
Marked correlations are significant at p < .01000
N=207 (Casewise deletion of missing data) CumulativePe

Variable	Means	Std.Dev.	REM1t	REM2t	REM3t	SEM1t	SEM2t	SEM3t	VEM1t	VEM2t	VEM3t	RPM1t	RPM2t	RPM3t
REM1t	0.619884	0.533004	1.000000	0.728505	0.590258	0.455818	0.347537	0.440149	0.312566	0.334415	0.408943	0.361812	0.269124	0.350062
REM2t	0.513032	0.477875	0.728505	1.000000	0.498291	0.486478	0.366644	0.448302	0.339212	0.355330	0.363268	0.321901	0.295730	0.323638
REM3t	0.510958	0.504944	0.590258	0.498291	1.000000	0.336503	0.326230	0.410606	0.308365	0.329201	0.335604	0.276494	0.286026	0.447005
SEM1t	0.460839	0.424610	0.455818	0.486478	0.336503	1.000000	0.623987	0.764239	0.302609	0.428010	0.399642	0.288527	0.162882	0.282533
SEM2t	0.450679	0.526020	0.347537	0.366644	0.326230	0.623987	1.000000	0.715671	0.259683	0.350492	0.403530	0.331170	0.192010	0.290531
SEM3t	0.449404	0.430059	0.440149	0.448302	0.410606	0.764239	0.715671	1.000000	0.305467	0.465587	0.464547	0.370629	0.269407	0.396294
VEM1t	0.302003	0.395432	0.312566	0.339212	0.308365	0.302609	0.259683	0.305467	1.000000	0.465892	0.589853	0.151674	0.204956	0.293481
VEM2t	0.307814	0.360553	0.334415	0.355330	0.329201	0.428010	0.350492	0.465587	0.465892	1.000000	0.673847	0.181630	0.153650	0.276020
VEM3t	0.279636	0.365832	0.408943	0.363268	0.335604	0.399642	0.403530	0.464547	0.589853	0.673847	1.000000	0.181196	0.186458	0.243496
RPM1t	0.560223	0.418291	0.361812	0.321901	0.276494	0.288527	0.331170	0.370629	0.151674	0.181630	0.181196	1.000000	0.687786	0.666775
RPM2t	0.498128	0.479145	0.269124	0.295730	0.286026	0.162882	0.192010	0.269407	0.204956	0.153650	0.186458	0.687786	1.000000	0.590047
RPM3t	0.497613	0.399588	0.350062	0.323638	0.447005	0.282533	0.290531	0.396294	0.293481	0.276020	0.243496	0.666775	0.590047	1.000000
SPM1t	0.492760	0.459141	0.213871	0.235720	0.215255	0.193530	0.263065	0.266139	0.094457	0.183379	0.166601	0.573495	0.666849	0.416540
SPM2t	0.506669	0.512447	0.125528	0.125973	0.127023	0.140654	0.242598	0.242753	0.012076	0.146229	0.066219	0.534293	0.641813	0.346005
SPM3t	0.471908	0.499385	0.213023	0.234681	0.227573	0.171167	0.246037	0.285104	0.101168	0.225184	0.199173	0.554544	0.742976	0.403753
VPM1t	0.309269	0.404011	0.201970	0.248393	0.194432	0.199286	0.200432	0.291206	0.153103	0.245717	0.184447	0.396184	0.418072	0.475803
VPM2t	0.338837	0.406083	0.213593	0.204051	0.172774	0.253797	0.162802	0.339974	0.136104	0.405012	0.297570	0.297839	0.234613	0.423986
VPM3t	0.340166	0.404966	0.201114	0.249304	0.201800	0.167229	0.215168	0.302846	0.141065	0.247493	0.155366	0.460136	0.564227	0.467525
DOM1t	0.694372	0.477899	0.273335	0.292558	0.248887	0.160175	0.219061	0.241205	0.042323	0.282717	0.165313	0.393194	0.425245	0.344631
DOM2t	0.756730	0.471755	0.265883	0.308255	0.267161	0.163328	0.226692	0.274182	0.106941	0.176823	0.121188	0.485822	0.565180	0.394385
DOM3t	0.636364	0.450799	0.163902	0.223429	0.164142	0.193550	0.152791	0.252000	0.127254	0.262721	0.126684	0.338464	0.355247	0.314553
SWM1t	0.455472	0.435778	0.259274	0.242092	0.249030	0.234486	0.241284	0.302544	0.110997	0.276380	0.187390	0.510304	0.603431	0.430992
SWM2t	0.456353	0.429782	0.242748	0.220476	0.224398	0.239580	0.230208	0.299094	0.100859	0.240973	0.177498	0.474718	0.544614	0.387019
SWM3t	0.491113	0.425617	0.216259	0.259622	0.224901	0.226191	0.196332	0.270300	0.087558	0.247845	0.141431	0.515815	0.554746	0.379718
LIM1t	0.276604	0.379325	0.141855	0.205900	0.139972	0.075605	0.046717	0.165962	0.109705	0.207476	0.147392	0.262211	0.343894	0.251282
LIM2t	0.258472	0.378378	0.141234	0.202446	0.104813	0.068933	0.032373	0.145034	0.102264	0.133626	0.107317	0.287122	0.334897	0.274624
LIM3t	0.506712	0.486769	0.205084	0.154210	0.176231	0.047214	0.053545	0.155688	0.043008	0.166426	0.138545	0.296924	0.343582	0.318383

Figure 40: Left hand side of merchant disconfirmation correlation matrix, transformed data. (Source: StatSoft, 2005)

SPM1t	SPM2t	SPM3t	VPM1t	VPM2t	VPM3t	DOM1t	DOM2t	DOM3t	SWM1t	SWM2t	SWM3t	LIM1t	LIM2t	LIM3t
0.213871	0.125528	0.213023	0.201970	0.213593	0.201114	0.273335	0.265883	0.163902	0.259274	0.242748	0.216259	0.141855	0.141234	0.205084
0.235720	0.125973	0.234681	0.248393	0.204051	0.249304	0.292558	0.308255	0.223429	0.242092	0.220476	0.259622	0.205900	0.202446	0.154210
0.215255	0.127023	0.227573	0.194432	0.172774	0.201800	0.248887	0.267161	0.164142	0.249030	0.224398	0.224901	0.139972	0.104813	0.176231
0.193530	0.140654	0.171167	0.199286	0.253797	0.167229	0.160175	0.163328	0.193550	0.234486	0.239580	0.226191	0.075605	0.068933	0.047214
0.263065	0.242598	0.246037	0.200432	0.162802	0.215168	0.219061	0.226692	0.152791	0.241284	0.230208	0.196332	0.046717	0.032373	0.053545
0.266139	0.242753	0.285104	0.291206	0.339974	0.302846	0.241205	0.274182	0.252000	0.302544	0.299094	0.270300	0.165962	0.145034	0.155688
0.094457	0.012076	0.101168	0.153103	0.136104	0.141065	0.042323	0.106941	0.127254	0.110997	0.100859	0.087558	0.109705	0.102264	0.043008
0.183379	0.146229	0.225184	0.245717	0.405012	0.247493	0.282717	0.176823	0.262721	0.276380	0.240973	0.247845	0.207476	0.133626	0.166426
0.166601	0.066219	0.199173	0.184447	0.297570	0.155366	0.165313	0.121188	0.126684	0.187390	0.177498	0.141431	0.147392	0.107317	0.138545
0.573495	0.534293	0.554544	0.396184	0.297839	0.460136	0.393194	0.485822	0.338464	0.510304	0.474718	0.515815	0.262211	0.287122	0.296924
0.666849	0.641813	0.742976	0.418072	0.234613	0.564227	0.425245	0.565180	0.355247	0.603431	0.544614	0.554746	0.343894	0.334897	0.343582
0.416540	0.346005	0.403753	0.475803	0.423986	0.467525	0.344631	0.394385	0.314553	0.430992	0.387019	0.379718	0.251282	0.274624	0.318383
1.000000	0.753114	0.873528	0.286487	0.214935	0.482519	0.526809	0.541529	0.408041	0.564986	0.595749	0.593125	0.298946	0.283543	0.336052
0.753114	1.000000	0.805536	0.399176	0.263787	0.510835	0.440385	0.501725	0.377315	0.567121	0.597210	0.566995	0.324540	0.304909	0.319981
0.873528	0.805536	1.000000	0.380880	0.241584	0.566113	0.481915	0.579727	0.367777	0.636845	0.629067	0.615391	0.379819	0.347344	0.407767
0.286487	0.399176	0.380880	1.000000	0.465562	0.613882	0.232836	0.261908	0.192094	0.400515	0.367763	0.372600	0.375892	0.371629	0.387675
0.214935	0.263787	0.241584	0.465562	1.000000	0.551646	0.235886	0.158072	0.303595	0.343530	0.350119	0.353335	0.376006	0.356411	0.298622
0.482519	0.510835	0.566113	0.613882	0.551646	1.000000	0.398512	0.487896	0.363622	0.638333	0.571916	0.586394	0.586394	0.576331	0.478414
0.526809	0.440385	0.481915	0.232836	0.235886	0.398512	1.000000	0.731560	0.665098	0.570684	0.591947	0.593153	0.381447	0.344771	0.421626
0.541529	0.501725	0.579727	0.261908	0.158072	0.487896	0.731560	1.000000	0.635756	0.634649	0.618398	0.601947	0.421103	0.430898	0.435912
0.408041	0.377315	0.367777	0.192094	0.303595	0.363622	0.665098	0.635756	1.000000	0.557829	0.572691	0.586816	0.369650	0.365869	0.390686
0.564986	0.567121	0.636845	0.400515	0.343530	0.638333	0.570684	0.634649	0.557829	1.000000	0.898476	0.830921	0.581712	0.544166	0.471883
0.595749	0.597210	0.629067	0.367763	0.350119	0.571916	0.591947	0.618398	0.572691	0.898476	1.000000	0.884317	0.579205	0.578281	0.425138
0.593125	0.566995	0.615391	0.372600	0.353335	0.586394	0.593153	0.601947	0.586816	0.830921	0.884317	1.000000	0.523630	0.502468	0.367846
0.298946	0.324540	0.379819	0.375892	0.376006	0.586394	0.381447	0.421103	0.369650	0.581712	0.579205	0.523630	1.000000	0.906005	0.584316
0.283543	0.304909	0.347344	0.371629	0.356411	0.576331	0.344771	0.430898	0.365869	0.544166	0.578281	0.502468	0.906005	1.000000	0.562109
0.336052	0.319981	0.407767	0.387675	0.298622	0.478414	0.421626	0.435912	0.390686	0.471883	0.425138	0.367846	0.584316	0.562109	1.000000

Figure 41: Right hand side of merchant disconfirmation correlation matrix, transformed data. (Source: StatSoft, 2005)

Introduced covariances

Once the initial broker disconfirmation model was estimated using the GLS method, the residual matrix was inspected for evidence of model misspecification. Some large residuals were present suggesting the introduction of covariances between the first-order exogenous latent constructs representing expectation and performance varibales. The figure below illustrates the introduced covariances
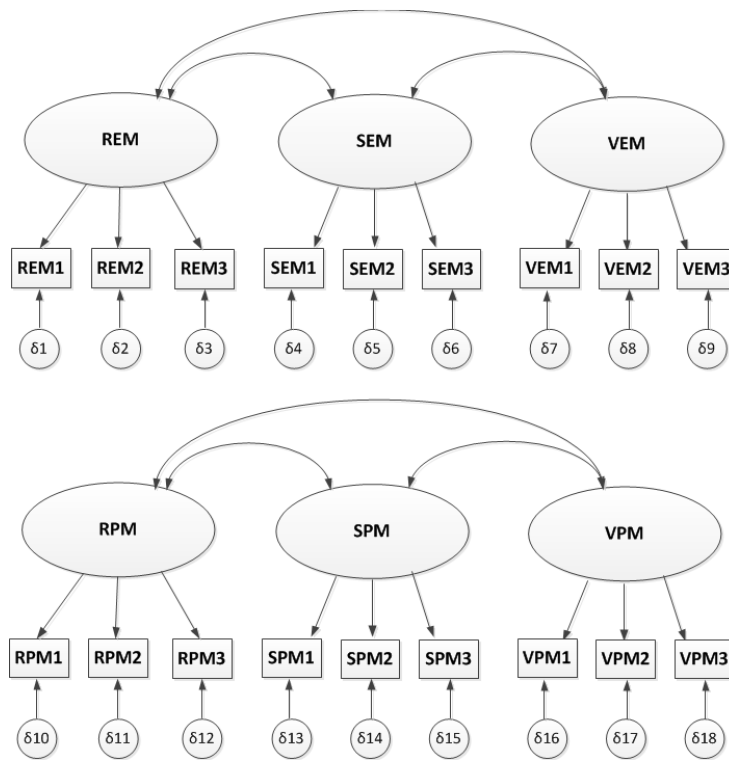

Figure 42: Partial measurement model exhibiting the introduction of covariances between constructs suggested by the normalised residual matrix

Appendix 9: The five building blocks of SEM

SEM involves five basic building blocks. The following discussion of these SEM building blocks is adapted from Schumacker and Lomax (2004). First is model specification which involves the development of an *a priori* model based on all the relevant theory and research. The extant literature provides a rich source of support for model specification. The researcher specified model is also called an implied theoretical model. The aim of the researcher is to determine whether the implied model is consistent with the true model which generated the sample data, often called the sample-derived model. If there is inconsistency between the theoretically implied and sample-derived models, then the theoretical model is said to be misspecified.

The second building block is called model identification. This involves ensuring that there exists a unique set of parameter estimates in the model which support the sample data. If multiple solutions are possible then data may fit more than one implied theoretical model equally well. A discussion on model identification is beyond the scope of this study. The interested reader is referred to Schumacker and Lomax (2004) for a detailed discussion on model identification. This study will achieve model identification by satisfying the order condition (discussed in chapter 5) and setting the factor loading of one arbitrary indicator variable of each latent variable to 1.

Model estimation is the process of estimating the population parameters specified in the model that produces the theoretical implied covariance matrix such that this matrix resembles as closely the sample covariance matrix as possible. This would support the assertion that the theoretical model is a good proxy for the true model and that the results may be generalised to the population. The process involves application of a fitting function to minimise the differences between the implied and sample matrices. There are a number of procedures including unweighted or ordinary least squares (ULS or OLS); generalised least squares (GLS); and maximum likelihood (ML). Chapter 5 discussed the selection of the most appropriate fitting function for the characteristics of this research.

Model testing involves determining how well the data fit the model. The previous block yielded population parameters *estimated* by the theoretical model. The model testing block determines whether the theoretical model is *actually* supported by the

sample data. Two types of model fit will need to be considered. The first deals with the fit of the entire model as a unit to the data, and the second deals with the individual parameters of the model. The model fit indexes were discussed in greater detail in section 4.6.4 on confirmatory factor-analytic models.

The final SEM building block, model modification, deals with the respecification of a misspecified model. If the model testing revealed a poor fit of the theoretical model, the researcher may attempt to, through a specification search procedure, develop a model which better fits the sample data. This research will note undertake a specification search. Its scope is delineated by the testing of the *a priori* models.

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