THE ROLE OF RISK PERCEPTION IN INTERNET PURCHASING BEHAVIOUR AND INTENTION

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I the undersigned, declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Abstract

In recent years the importance and number of users of electronic commerce and its medium, the Internet, have grown substantially. Despite this, the Business-to-Consumer sector has shown slow expansion and limited growth, with the majority of consumers slow to adopt the Internet as a medium for purchase. A probable factor affecting the purchasing behaviour of individuals is the perception of risk of a breach in (credit card) security and/or a violation of privacy. The research discussed here indicates that two closely related constructs, namely perceived privacy risk and perceived security risk exerts an influence on the Internet purchasing behaviour of Internet users, and more importantly, the intention to purchase. In addition, the role of social pressures regarding the provision of personal and credit card information is indicated to be of considerable importance.

Opsomming

Die afgelope aantal jare het die belangrikheid en gebruik van eletroniese handel en die Internet aansienlik toegeneem. Ongeag hierdie groei het die sektor gemoeid met die handel tussen besighede en verbruikers egter beperkte groei getoon. 'n Waarskynlike rede vir die tendens in Internet aankoop gedrag is die persepsie dat daar 'n risiko is van misbruik van 'n krediet kaart sowel as misbruik en skending van privaatheid. Die studie wat hier bespreek word toon aan dat twee nou verwante kostrukte, naamlik persepsie van sekuriteits- en persepsie van privaatheidsrisiko 'n rol speel in die bepaling van Internet aankoop gedrag, sowel as die intensie om te koop. Verder is die rol van sosiale druk rakende die verskaffing van persoonlike en krediet kaart inligting uitgelig as 'n faktor van uiterste belang.

Table of Contents

List of Tables and Figures

1. Introduction

In recent years the Internet has grown exponentially in several areas. The number of regular users has increased dramatically and the usage of the Internet as a communication medium is widespread. As an information transfer network it has increased significantly in terms of its importance to business. Forrester Research (1999) claims that in 1999 there were in excess of 72 million users on the Internet in Western Europe only. Figures from the United States of America reflect the same trends with 130 million estimated Internet users (ACNielsen, 2000). Furthermore, businesses in virtually every sector have benefited from the technologies associated with the Internet and e-commerce (Westland & Chalk, 2000). Websites have become important marketing tools and marketplaces for companies, and the total revenue from Internet sales exceeded 20 billion dollars in the United States of America alone in 1999 with the potential to rise dramatically in the years to come (Modahl, 2000).

Although the growth of the Internet and commercial Internet activities has been substantial, the bulk of the commercial interchange has been between businesses, and the expansion of business-to-consumer retailing constituted only a small portion of total revenues. Nearly all of the Fortune 500 companies in the United States have commercial websites, but less than 10% conduct transactions with consumers on the Web (Westland & Chalk, 2000). The proportion of Internet users that purchase online varies greatly between the source of information and country being surveyed. The number of American Internet users that purchase through the Internet range between 34% (Business Wire, 1999) and 42% (Business Wire, 2000a) depending on the source of information. European figures are significantly lower, and only about 9% of European Internet users purchase online (Forrester Research, 1999). Furthermore, although significant numbers of potential consumers start a purchasing process through the Internet, 65% of online shoppers abandon the process before the sale is completed (Renwick, 2000). South African figures currently mirror overseas findings, and according to Webchek (2000) 76% of South African Internet users have never bought online. Of the proportion who have purchased online, only 34% have done so more than five times. It is clear that the

business-to-consumer retailing sector is not growing to its full potential despite relatively fast growth in Internet use by the general population.

The question can thus be asked as to the possible reasons why the purchase figures are low among Internet users. A probable cause for the slow growth in retail purchasing activity on the Internet is the continued concern about security and privacy issues related to purchasing on the Internet. According to Ernst and Young (2001) concern for security and privacy is the biggest inhibitor of expansion of both Business-to-Business and Business-to-Consumer e-commerce in Europe according to directors and business executives. A poll conducted in the United States of America indicated that 67% of Americans were threatened by or concerned with crime on the Internet as a result of insufficient security, and that 61% where less likely to do business through the Internet as a result (Business Wire, 2000b). Palfini (2001) specifies that 58% of North Americans have at one time decided not to go ahead with an online purchase because of security concerns. In addition it is indicated that an exaggerated fear of credit card information theft is a major barrier to widespread acceptance of e-commerce (Palfini, 2001). According to Ben-Ur and Winfield (2000) risk of personal data misuse and credit card misuse are the most important reasons why existing Internet users do not purchase through the Internet. Recent media has been rife with stories of security violations, including reports regarding a youth who stole approximately 23000 credit card numbers including the credit card number of the chairman of the Microsoft Corporation, Bill Gates (CNN.com, 2001).

Many of the problems regarding consumer confidence have been associated with the use of credit cards as a method of payment. Although safer methods of payment through the Internet are available, such as E-cash and Digital Cash (Watson, Berthon, Pitt, & Zinkhan, 2000), these require special software or hardware additions that are not universally available. Also, the E-cash, Digital Cash and Credit Card formats are not interchangeable. A significant challenge according to Westland and Chalk (2000) will be to provide payment mechanisms that consumers perceive as sufficiently secure to induce them to complete transactions online.

In order to provide a possible answer to the problem of low proportions of online purchasing among Internet users, the central investigation in this research study focuses on the perception of online purchasing as being a risky activity due to insufficient security and privacy. The research study also undertakes to determine the intention of South African Internet users to purchase online by using perceived risk in an established theoretical context.

2. Research objectives

The objective of this research study is to determine the nature of the relationship between attitude as a function of perceived risk and online purchasing behaviour. This information will be used to investigate the future intention to purchase, as well as to explain past purchasing behaviour. This research study therefore proposes that the perception of security risk and perception of privacy risk are significant determinants in attitude relating to Internet purchasing and that attitude is in turn a factor influencing the online purchasing behaviour of an individual. The research question can thus be phrased as the following:

Is there a significant relationship between attitude towards purchasing on the Internet as determined by security and privacy risk perception, and Internet purchasing behaviour as well as the future intention to purchase?

3. Literature study

3.1 Definition of concepts

3.1.1 Internet purchasing behaviour and Intention

The purpose of this study is to investigate the relationship between purchase behaviour and security and privacy related risk. The purchasing behaviour that is investigated does not, however, refer to behaviour in relation to a purchasing a specific product or service.

Rather, the behaviour is defined in relation to a specific aspect of choosing whether or not to purchase through the Internet. The aspect of purchasing behaviour relevant to this study refers to the past decision of whether to enter personal information and/or a credit card number in order to complete an Internet purchase or not to do so. The second construct of importance, purchasing intention, therefore refers to the intention of an individual to enter personal information and/or a credit card number to complete an Internet transaction in the future or not to do so. A credit card has been specified as the method of payment because it is the only universal and globally accepted method currently available.

The other constructs that determine the choice to purchase on the Internet relevant to this research study can now be defined.

3.1.2 The role of attitude in determining Internet purchasing behaviour and intention

Several theorists including Shiffman and Kanuk (1994) propose that attitude is an important element in explaining and predicting purchasing behaviour. Allport (1967, p. 7) defines attitude as "a mental and neutral state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations with which it is related". Forrester Research claims that attitude is the main factor used to predict which active Internet users will purchase through the Internet (Modahl, 2000). The attitude dimension of technology optimism developed and used by Forrester Research is, according to Modahl (2000), the key factor in determining Internet purchasing behaviour. Crisp, Javenpaa and Todd (1997) found that attitude played a significant role not only in shaping Internet shopping behaviour, but also the intention to shop. The findings of Javenpaa and Tractinsky (1999) indicate that attitude is an important factor in the formation of trust in an Internet store, and subsequently willingness to buy online. Furthermore, research indicates that early adopters of Information Technology have more positive attitudes than late adopters (Agarwal, Ahuja, Carter & Gans, 1998). Crisp et al. (1997) constructed and empirically tested the

following model to determine all the elements that play a role in determining attitude towards Internet purchasing:

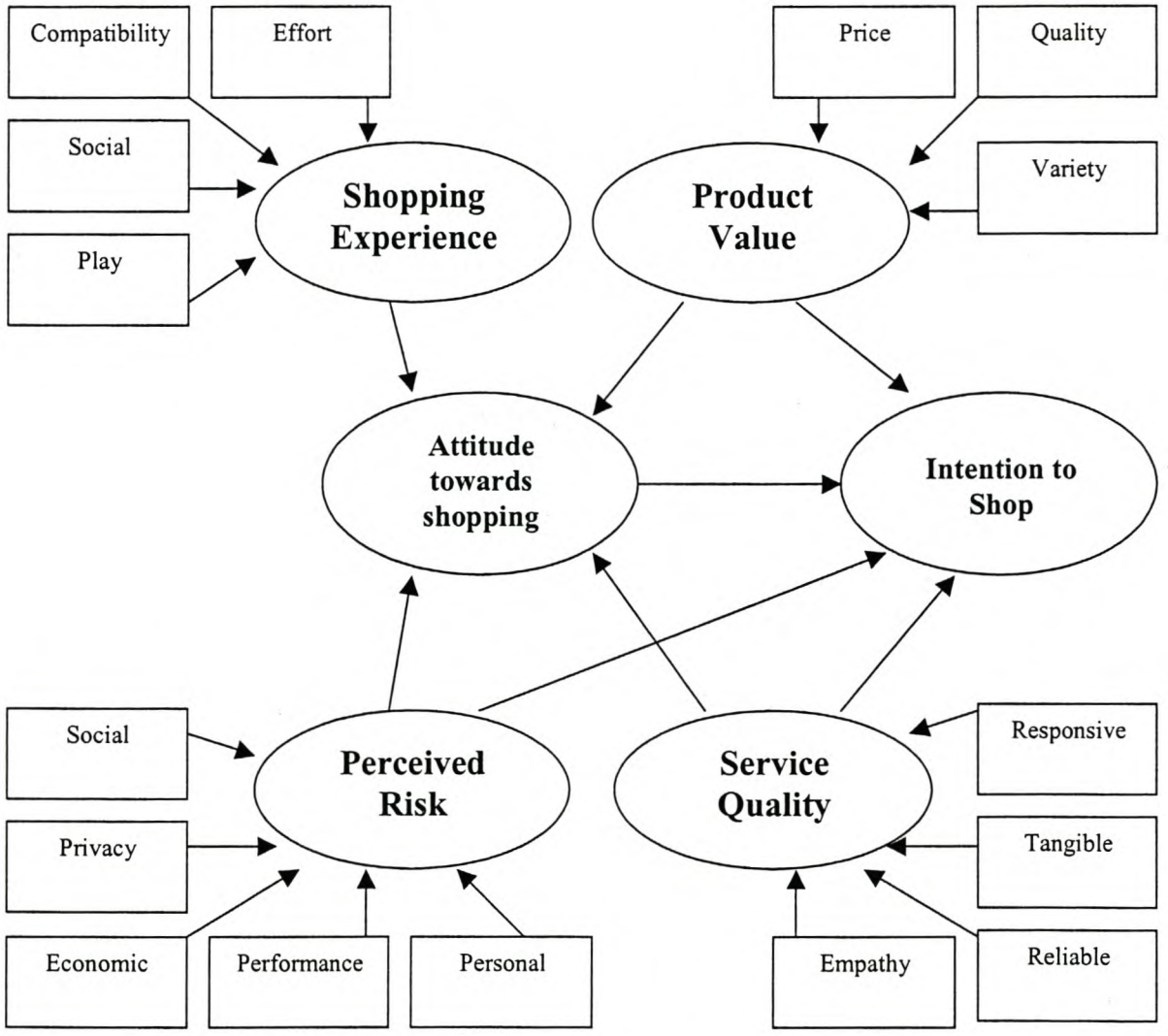

Fig.1 The Integrated Model of Attitude and Intention towards Internet Shopping. (Adapted form Crisp et al., 1997)

One of the factors that can significantly influence both Attitude and the Intention to shop according to Crisp et al. (1997) is perceived risk. Different types of risk can be distinguished according to this model, including risk of violation of privacy, risk of personal loss, and risk of social norm violation.

3.1.3 Attitude as a function of perceived risk

As a result of investigations into the elements that constitute attitude toward Internet purchasing Crisp et al. (1997) and Javenpaa and Tractinsky (1999) identified perceived risk as a significant determinant of attitude in relation to purchasing through the Internet. In addition, Dahlen (1999) indicates that attitude toward Internet shopping can be measured by focusing on risk perception. Shiffman and Kanuk (1994, p. 562) defines perceived risk as "uncertainty consumers face due to an inability to foresee the consequences of purchase." The uncertainty mentioned by Shiffman and Kanuk (1994) is a likely determinant in the state of readiness as part of attitude proposed by Allport (1967). Hawkins, Best & Coney (2001) indicate that attitudes serve primarily as a means of organising beliefs about objects or activities. It is probable that the perception of risk regarding purchasing through the Internet is an important element included in beliefs about the suitability of purchasing through the Internet.

3.1.4 Perceived privacy and security risk

Although several types of perceived risk have been related to characteristics of both products and situations according to Spoelstra (1999) as well as Hawkins et al. (2001) and Shiffman and Kanuk (1994), two types of risk are specifically important in terms of behaviour in the Internet purchasing situation, namely privacy and security risk. Although there are slight variations in the naming and definition of risk between authors such as Ben-Ur and Winfield (2000), Bhatnagar, Misra and Rao (2000), Javenpaa and Tractinsky (1999), Paraschiv and Zaharia (2000), the concept behind these definitions refer to some form of financial and personal information violation if provided via the Internet and the possible consequences thereof. Security and privacy risk thus corresponds to the personal and privacy risk categories as defined by Crisp et al. (1997) in Fig. 1. For the purpose of this study, privacy risk refers to the possibility of obtainment and/or distribution of private personal information through the Internet by intended or unintended parties. It also refers to the possibility of unnecessary contact as a result of obtainment. Security risk refers to the possibility of obtainment through the

Internet and/or financial misuse of a credit card number by intended or unintended parties. Ben-Ur and Winfield (2000), Bhatnagar et al. (2000), and Paraschiv and Zaharia (2000) have identified security and/or privacy as important perceived risk considerations when investigating purchase behaviour regarding the Internet.

3.2 Theoretical model

In order to determine the relationship between attitude, as a function of perceived risk, and behaviour, as well as intention, it is necessary to place the constructs into a viable theoretical framework. Fishbein devised the Attitude-Towards-Behaviour model in order to measure attitudes that correspond to actual behaviours (Shiffman & Kanuk, 1994).

More specifically, Aizen and Fishbein (1980) indicate that the Attitude-Towards-Behaviour model is used for measurement of attitudes directed toward behaviour with respect to an object. For the purposes of consumer behaviour investigation, the "object" referred to in the model proposed by Fishbein is either a product or service (Aizen & Fishbein 1980). Allport (1967) states that attitudes affect not only responses towards objects, but also toward situations. For the purposes of this research study the attitude towards behaviour in relation to a situation will hence be measured.

According to Shiffman and Kanuk (1994) the Attitude-Towards-Behaviour model is often depicted using the following equation:

$$A_{beh} = \Sigma b_i e_i$$

where $\mathbf{A_{beh}}$ is the separately assessed overall measure of attitude for or against carrying out a certain action or behaviour. $\mathbf{b_i}$ Is the strength of the belief that the **i**th specific action will lead to a specific outcome. $\mathbf{e_i}$ Is the evaluation of the outcome specified in $\mathbf{b_i}$ in terms of favourableness. Σ Indicates there are a number of salient outcomes over which $\mathbf{b_i}$ and $\mathbf{e_i}$ are summated.

Outcomes are measured for the two types of perceived risk, namely privacy and security risk, and thus two Attitude-Towards-Behaviour scores will be calculated. Given that the outcomes associated with these two types of risk can be considered violations of individual financial security and privacy (Swaminathan, Lepowska-White & Rao, 1999); it is probable that the Internet consumer see the outcomes as unfavourable. The level of unfavourableness of these outcomes may vary, however. Once A_{beh} for each type of risk is calculated, a relationship can be established between past behaviour in terms of providing personal and credit card information, and each A_{beh} measure.

For measurement of intention, the two A_{beh} measures are considered together with additional aspects in a model referred to as the Theory of Reasoned Action. Aizen & Fishbein (1980) further presents the following graphic representation of the Theory of Reasoned Action:

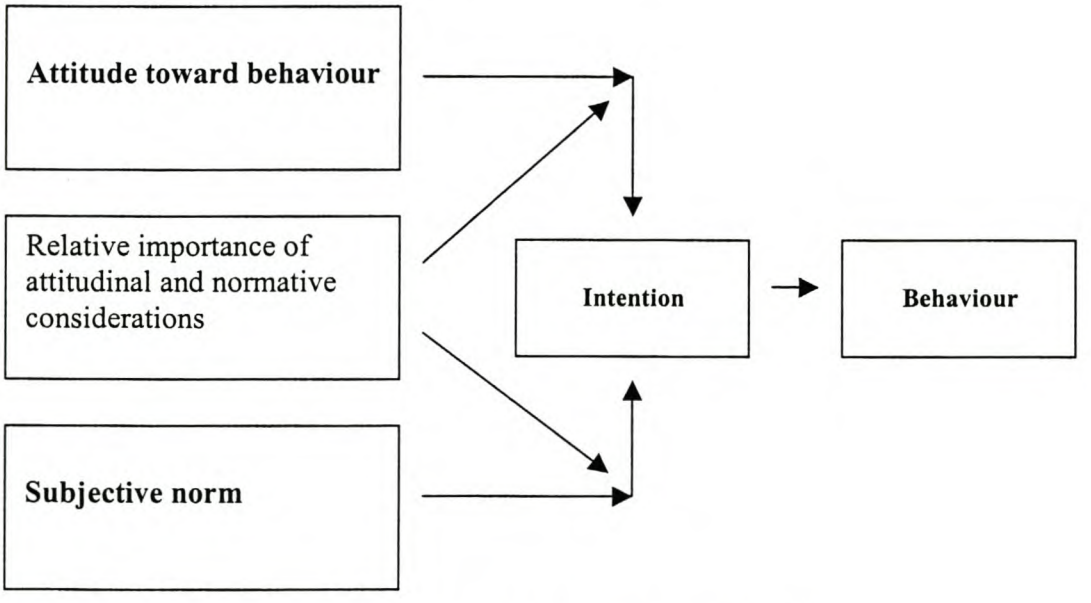

Fig.2 The Theory of Reasoned Action. (Adapted form Aizen & Fishbein, 1980)

The additional factor considered in determining intention, termed Subjective Norm, refers to the social pressures that are put on an individual to perform or not to perform a specific behaviour. For the purposes of this research these social pressures are relevant to the

provision of personal and credit card information as part of purchasing behaviour. Foxall & Goldsmith (1990) indicate that Subjective Norm can be depicted with the following equation:

$$SN=\Sigma n_i m_i$$

where **SN** indicates the influence of others on the individuals' intention to act or display certain behaviour. $\mathbf{n}_i$ Refers to the normative belief that the **i**th referent expects an individual to perform or not to perform a certain behaviour. $\mathbf{m}_i$ Refers to the motivation to comply with the **i**th referent. Σ Indicates there are a number of referent groups over which $\mathbf{n}_i$ and $\mathbf{m}_i$ are summated. Two Subjective Norm measures are calculated to determine the pressure on respondents to provide both credit card information and personal information, or not to do so.

According to Aizen & Fishbein (1980) this model can be used as a framework to determine the relationship between two factors, specifically Attitude-Towards-Behaviour and Subjective Norm in determining intention. Intention to provide information is then directly measured. The model further allows for the relative importance of each factor to be adjusted according to its statistical characteristics obtained through measurement (Aizen & Fishbein, 1980). The intention to provide a credit card number as well as the intention to provide personal information is measured separately as the two aspects of purchasing behaviour that is relevant to this study. The Attitude-Towards-Behaviour measure for each type of risk is considered together with the relevant intention measure as well as the relevant Subjective Norm measure.

Although there are social considerations relevant to entering on-line purchasing, previous research by Swaminathan et al. (1999) and Crisp et al. (1997) has found this factor to be of lesser importance in determining online purchasing behaviour. However, within this research study normative considerations are investigated in order to test a complete application of the Theory of Reasoned Action, as the theoretical model was initially developed to measure social behaviour. Also, such application will assist in determining

the exact nature of the role of attitude in determining Internet purchasing intention with the framework of the Theory of Reasoned Action. Further evidence of the role of subjective norm in purchasing behaviour is obtained by investigation of the relationship between subjective norm and past behaviour.

4. Research problem and hypotheses

To accurately organise the goals of the research study it is necessary to state the research problem and substantive hypotheses. The research problem is initiated by the occurrence of low levels of Internet purchasing by active Internet users, and can be defined as follows:

Information provision as an aspect of online purchasing behaviour is strongly influenced by attitude as a function of security and privacy risk perception.

Review of current information suggests that attitude, as a function of security and privacy risk perception, is a significant factor influencing credit card and personal information provision as part of Internet purchasing behaviour. Furthermore, attitude is important in determining future intention to purchase. The significance of Subjective Norm related to both intention constructs is also considered. We can therefore define the hypotheses as the following:

H1: There is a statistically significant relationship between attitude as a function of perceived security risk, and past credit card information provision as part of Internet purchasing behaviour.

H2: There is a statistically significant relationship between attitude as a function of perceived privacy risk, and past personal information provision as part of Internet purchasing behaviour.

H3: There is a statistically significant relationship between credit card information related subjective norm, and past credit card information provision as part of Internet purchasing behaviour.

H4: There is a statistically significant relationship between personal information related subjective norm, and past personal information provision as part of Internet purchasing behaviour.

H5: There is a statistically significant relationship between attitude as a function of perceived security risk and intention to provide credit card information as part of Internet purchasing behaviour.

H6: There is a statistically significant relationship between attitude as a function of perceived privacy risk and intention to provide personal information as part of Internet purchasing behaviour.

To investigate the relationship between attitude and behaviour in the model proposed by Aizen and Fishbein (1980), it is further necessary to investigate the link between subjective norm and intention. Thus hypotheses H7 and H8 can be stated:

H7: There is a statistically significant relationship between credit card information related subjective norm and intention to provide credit card information as part of Internet purchasing behaviour.

H8: There is a statistically significant relationship between personal information related subjective norm and intention to provide personal information as part of Internet purchasing behaviour.

Considering hypotheses H5, H6, H7 and H8 we can therefore specify that the variance explained by each of the constructs is unique within the theoretical model. Subsequently, the following hypotheses can be specified:

H9: Attitude as a function of perceived security risk explains unique variance in intention within the theoretical model containing credit card information related subjective norm.

H10: Credit card information related subjective norm explains unique variance in intention within the theoretical model containing attitude as a function of perceived security risk.

H11: Attitude as a function of perceived privacy risk explains unique variance in intention within the theoretical model containing personal information related subjective norm.

H12: Personal information related subjective norm explains unique variance in intention within the theoretical model containing attitude as a function of perceived privacy risk.

5. Research methodology

5.1 Research design

To determine the nature of the relationship between the constructs an ex post facto correlational design, with construct measurement using the survey method, will be used for this study. Kerlinger (1992) states that surveys are appropriate for gathering data regarding opinions and attitudes on the one hand, and behaviour on the other. According to Shiffman and Kanuk (1994) the survey is an accepted method of measuring both attitudes and behaviours. There are several weaknesses that accompany the use of survey methods including low response frequency and incomplete response information (Kerlinger, 1992). The effect of the above limitations will be minimised by conducting the survey using the Internet, and utilising selective inclusion, so that only completed questionnaires will be accepted.

5.2 Statistical Hypotheses

The statistical hypotheses can now be stated for each of the research hypotheses:

$H0_1$: $\rho[A_{beh(s)}, B_{credit}] = 0$

Ha_1: $\rho[A_{beh(s)}, B_{credit}] > 0$

where B_{credit} refers to past credit card information provision,

and $A_{beh(s)}$ refers to the Attitude-Towards-Behaviour measure for security.

$H0_2$: $\rho[A_{beh(p)}, B_{person}] = 0$

Ha_2: $\rho[A_{beh(p)}, B_{person}] > 0$

where B_{person} refers to past personal information provision,

and $A_{beh(p)}$ refers to the Attitude-Towards-Behaviour measure for security.

$H0_3$: $\rho[SN_{credit}, B_{credit}] = 0$

Ha_3: $\rho[SN_{credit}, B_{credit}] > 0$

where SN_{credit} refers to the Subjective Norm measure for credit card information.

$H0_4$: $\rho[SN_{person}, B_{person}] = 0$

Ha_4: $\rho[SN_{person}, B_{person}] > 0$

where SN_{person} refers to the Subjective Norm measure for personal information.

$H0_5$: $\rho[A_{beh(s)}, I_{credit}] = 0$

Ha_5: $\rho[A_{beh(s)}, I_{credit}] > 0$

where I_{credit} refers to the intention to provide credit card information.

$H0_6$: $\rho[A_{beh(p)}, I_{person}] = 0$

Ha_6: $\rho[A_{beh(p)}, I_{person}] > 0$

where I_{person} refers to the intention to provide personal information.

$H0_7$: $\rho[SN_{credit}, I_{credit}] = 0$

Ha_7: $\rho[SN_{credit}, I_{credit}] > 0$

$H0_8$: $\rho[SN_{person}, I_{person}] = 0$

Ha_8: $\rho[SN_{person}, I_{person}] > 0$

$H0_9$: $\beta_1[A_{beh(s)}] = 0 | \beta_2[SN_{credit}] \neq 0$

Ha_9: $\beta_1[A_{beh(s)}] > 0 | \beta_2[SN_{credit}] \neq 0$

$H0_{10}$: $\beta_2[SN_{credit}] = 0 | \beta_1[A_{beh(s)}] \neq 0$

Ha_{10}: $\beta_2[SN_{credit}] > 0 | \beta_1[A_{beh(s)}] \neq 0$

$H0_{11}$: $\beta_1[A_{beh(p)}] = 0 | \beta_2[SN_{person}] \neq 0$

Ha_{11}: $\beta_1[A_{beh(p)}] > 0 | \beta_2[SN_{person}] \neq 0$

$H0_{12}$: $\beta_2[SN_{person}] = 0 | \beta_1[A_{beh(p)}] \neq 0$

Ha_{12}: $\beta_2[SN_{person}] > 0 | \beta_1[A_{beh(p)}] \neq 0$

5.3 Sampling

The sample comprises a group of Internet users who visited a high traffic South African website, namely iAfrica.com. The main page of the website contained a notice regarding an online survey being conducted by the University of Stellenbosch. From this notice respondents accessed the questionnaire, which was completed and submitted online. All responses where gathered during a four day window period. iAfrica.com was chosen as it is considered a reputable website by South African users (Webchek, 2000). In addition, the website contains its own purchase section, which can be accessed directly from the main page. Respondents thus willingly accessed a website with a possibility of purchase. A total of 216 responses where gathered during the four day window period. Of these 195 where fully completed and fulfilled the sampling requirements, as specified below.

Three qualifying conditions where set in order for respondents to be contained in the sample, namely ownership or access to a credit card, previous presence in an online purchasing environment and a minimum frequency of Internet use. This serves the

purpose of selecting individuals that are familiar with the Internet environment and who are able to provide credit card information in order to purchase through the Internet. Demographic factors such as race, age and geographic location are not considered during sampling as all website users are anonymous. These factors have been shown to be of lesser importance in investigating the characteristics and behaviour of Internet consumers (Modahl, 2000). Income is not considered as the research focuses on the characteristics of the purchase situation and not on the product or service. The actual purchase amount is thus not relevant to this segment of the purchasing process.

The Internet can be regarded as an acceptable research medium, as it has been used for gathering information from respondents regarding Internet issues (GVU, 1998) and has also been used in several investigations of attitudes and perceived risk relating to the Internet (Bhatnagar et al., 2000; Dahlen, 1999; Swaminathan et al., 1999). There are several definite disadvantages to sampling using the Internet, including non-accessible population data and non-random sampling. However, this technique assists in targeting the right respondents namely active South African Internet users.

5.4 Data Gathering

Data was gathered using a structured questionnaire, which can be found in Appendix A. The questionnaire was coded as a web page using Hypertext Markup Language (HTML) and consisted of three sections. Section One of the questionnaire contains questions referring to previous behaviour and intention. Section Two contains questions for measuring Attitude-Towards-Behaviour. Section Three contains questions for determination of the Subjective Norm measure. Specific questionnaire items are sourced from previous research that has investigated similar relationships between perceived risk and Internet purchase behaviour. One question in Section One was included on request of the host website iAfrica.com.

Three questionnaire items designed to measure certain negative outcomes relating to security risk were sourced and adapted from Bhatnagar et al. (2000) and Paraschiv and

Zaharia (2000). The questions were chosen due to their reference to specific outcomes as a result of providing credit card information and were adapted according to guidelines specified in Aizen and Fishbein (1980) and Shiffman and Kanuk (1994). Three questions pertaining to the measurement of specific negative outcomes relating to privacy risk were obtained and adapted from the GVU's 10th Internet Survey (GVU, 1998) as well as from Paraschiv and Zaharia (2000). The questions were selected due to their reference to specific consequences or outcomes as a result of entering personal information and were adapted according to guidelines specified in Aizen and Fishbein (1980) and Shiffman and Kanuk (1994). All questions sourced from previous literature have been used in research to determine relationships with Internet purchase behaviour.

Six questionnaire items relating to the measurement of the favourableness of outcomes relating to security and privacy risk were developed for this research study. This was done for each type of perceived risk according to guidelines specified in Aizen and Fishbein (1980) and Shiffman and Kanuk (1994). Three questionnaire items for the measurement of subjective norm were developed for this research study, based on examples described in Aizen and Fishbein (1980) and Shiffman and Kanuk (1994). Questions regarding purchase facts as well as the intention to purchase were also sourced and adapted from the GVU's 10th Internet Survey (GVU, 1998) and from Crisp et al. (1997).

Questions measuring intention, attitude and subjective norm are presented as statements utilising the Semantic Differential scale format as described by Rosnow and Rosenthal (1996). Respondents were asked to select a response on a 7-point scale. Attitude questionnaire items are formulated to trigger responses regarding the possible consequences of using a credit card as well as submitting personal information and the evaluation of these consequences in terms of favourableness. This corresponds to the possibility of certain outcomes as a result of behaviour as proposed by Fishbein and Aizen (1980). Thus the A_{beh} and SN measures were calculated from the scores on the relevant items in the questionnaire.

Cronbach's coefficient alpha was calculated for the A_{beh} and SN related questionnaire items in order to give an indication of the consistency with which related questions were answered. The scores for each question group are as follows:

Security risk related belief questions (3 Items): $\alpha = .861$
Privacy risk related belief questions (3 Items): $\alpha = .757$
Security risk related outcome questions (3 Items): $\alpha = .853$
Privacy risk related outcome questions (3 Items): $\alpha = .768$
Subjective norm related normative belief questions (2 Items): $\alpha = .938$

5.5 Statistical analysis and computer package

The results of the survey were stored as quantitative data as the respondents completed the individual forms. This information was then statistically analysed using the SPSS (v. 10, 1999) computer package.

The determination of the relationships between variables by means of analysis of correlation is an important statistical consideration when the model proposed by Aizen and Fishbein (1980) is used. Correlations between several factors are investigated including correlation between the types of risk, determinants of subjective norm, intention and past behaviour. The relative importance of the two factors specified in the Theory of Reasoned Action is determined by linear regression.

6. Results

The results of this research comprise the interpretation of the descriptive statistics for the questionnaire and the consideration of significance values related to the relevant correlation and regression coefficients.

6.1 Descriptive statistics

The descriptive statistics for the past behaviour and intention questions are summarised as follows. Please refer to Appendix A for the wording of the actual questionnaire items.

Table 1: Descriptive statistics for the historical behaviour and intention questions

N=195	Yes	No
Question 2 (B_{credit})	122	73
Percentage	62.6%	37.4%
Question 3 (B_{person})	138	57
Percentage	70.2%	29.8%

N=195	Mean	Std. Deviation
Question 5 (I_{credit}) Very likely (3) to Very unlikely (-3)	.05	2.42
Question 6 (I_{person}) Very likely (3) to Very unlikely (-3)	.22	2.34

Considering the descriptive statistics for the previous behaviour and intention questions it is clear that the majority of the respondents have provided personal information and/or credit card numbers in the past in order to purchase goods or services. However, the means for the two questions responsible for measuring intention (.05 and .22) are, considering the range of possibilities (3 to –3), relatively close to zero. Taking into consideration the high standard deviation (the highest response frequencies where on the extreme values on the scale) a number of persons who have provided the information in the past seem to have indicated that they are to some extent less likely to do so in the future. This might indicate some dissatisfaction with the actual online purchasing process

The mean values on the likelihood of certain negative privacy and security outcomes are as follows. Please refer to Appendix A for the wording of the actual questionnaire items.

Table 2: Descriptive statistics for the belief of privacy and security outcome questions

N=195	Mean	Std. Deviation
Question 7 (b_1) Very likely (7) to Very unlikely (1)	4.07	2.01
Question 8 (b_2) Very likely (7) to Very unlikely (1)	4.87	1.82
Question 9 (b_3) Very likely (7) to Very unlikely (1)	4.76	1.85
Question 10 (b_4) Very likely (7) to Very unlikely (1)	4.43	1.99
Question 11(b_5) Very likely (7) to Very unlikely (1)	5.47	1.62
Question 12 (b_6) Very likely (7) to Very unlikely (1)	5.71	1.55

Examinations of the mean scores for all the questions above reveal that the perception of possible negative outcomes, or risk, is above average. This effect increases markedly for questions 11 and 12, where the majority of the respondents indicated that their personal information is likely to be misused and their privacy violated. When this set of means is then compared with those on the intention and past behaviour measures, it suggests some respondents who have indicated that they are likely to purchase in the near future have also indicated that certain negative outcomes are likely to occur to some extent when they do provide either personal or credit card information to purchase. Thus respondents intend to provide information to purchase on the Internet despite a belief of possible security and, more markedly, privacy violation.

In order to further understand the variation of the belief questions as a function of the intention measures, the means of the belief measures can be viewed separately according to the respondents' scores on the intention measures. To do this, the intention measure is re-coded into three categories, namely 1 for a high intention (3 or 2), 0 for a medium intention (1 to –1) and –1 for a low intention (-2 or –3). The means on the belief items, sorted according to intention category yield the results on Tables 3 and 4.

Table 3: Descriptive statistics of the security belief questions recoded according to intention to provide credit card information

Question 5 (Revised)		N	Mean	Std. Deviation
-1	b_1	72	5.26	1.92
	b_2	72	5.82	1.60
	b_3	72	5.74	1.64
0	b_1	43	3.84	1.74
	b_2	43	4.88	1.45
	b_3	43	4.88	1.37
1	b_1	80	3.13	1.67
	b_2	80	4.00	1.77
	b_3	80	3.83	1.81

Table 4: Descriptive statistics of the privacy belief questions recoded according to intention to provide personal information

Question 6 (Revised)		N	Mean	Std. Deviation
-1	b_4	64	5.39	1.84
	b_5	64	6.06	1.33
	b_6	64	6.23	1.44
0	b_4	49	4.43	1.68
	b_5	49	5.61	1.48
	b_6	49	5.80	1.38
1	b_4	82	3.68	1.98
	b_5	82	4.93	1.73
	b_6	82	5.26	1.60

As can be seen in both tables above, the means for each belief question decreases as the recoded intention measure increases. In effect this indicates that the stronger the likelihood of providing information to purchase in the future, the weaker the belief in respondents that the outcomes are to occur. As these outcomes have been almost universally specified as bad to some extent, it supports the importance of the belief measure in guiding future behaviour.

In accordance with the Theory of Reasoned Action, the evaluation of the outcomes as a result of behaviour is measured.

The means and standard deviations for the evaluation of the outcomes specified in questions 7 to 12 are as follows.

Table 5: Descriptive statistics for the evaluation of privacy and security outcome questions

N=195	Mean	Std. Deviation
Question 13 (e_1) Not at all bad (3) to Very bad (-3)	-2.56	.97
Question 14 (e_2) Not at all bad (3) to Very bad (-3)	-2.69	.86
Question 15 (e_3) Not at all bad (3) to Very bad (-3)	-2.83	.71
Question 16 (e_4) Not at all bad (3) to Very bad (-3)	-2.36	1.15
Question 17 (e_5) Not at all bad (3) to Very bad (-3)	-2.44	1.00
Question 18 (e_6) Not at all bad (3) to Very bad (-3)	-2.03	1.27

Considering the means of the evaluation questions, generally the respondents indicated all outcomes to be negative. This can be expected as the outcomes referred to undesirable and in some cases illegal activities such as obtainment without permission and misuse of credit card or personal information.

The means and standard deviations for the normative belief and motivation to comply measures are specified in questions 19 to 21 are as follows:

Table 6: Descriptive statistics for the Subjective Norm questions

N=195	Mean	Std. Deviation
Question 19 (n_{1c}) Very likely (3) to Very unlikely (-3)	-.71	1.76
Question 20 (n_{1p}) Very likely (3) to Very unlikely (-3)	-.66	1.68
Question 21 (m_1) Always (7) to Never (1)	3.05	1.37

The majority of the respondents indicated that referent groups important to them think that they, to some extent, should not purchase on the Internet. Taking into consideration that most of the respondent in the sample have provided information, and that slightly over half intend to do so in the future, it should indicate that the respondents are less likely to behave in line with referent group expectations. This possibility is supported when the mean on the motivation to comply measure, which is low, is considered. The mean value on Questionnaire item 21 (m_1) indicates that the majority of the respondents specified that they do not often do what the referent groups think they should do.

6.2 Significance interpretation using correlation and regression

6.2.1 Hypothesis 1

$H0_1$ is tested by interpretation of the correlation results for past credit card information provision and the security related Attitude-Towards-Behaviour score. The following table presents the results of the correlations between past history of providing credit card and personal information and the two A_{beh} scores.

Table 7: Correlation results for the past information provision behaviour and Attitude-Towards-Behaviour measures

N=195	B_{credit}	B_{person}	$A_{beh(s)}$	$A_{beh(p)}$
B_{credit}	1.000	.784**	.360**	.163*
Sig.	.	.000	.000	.023
B_{person}	.784**	1.000	.324**	.224**
Sig.	.000	.	.000	.002
$A_{beh(s)}$	.360**	.324**	1.000	.659**
Sig.	.000	.000	.	.000
$A_{beh(p)}$	.163*	.224**	.659**	1.000
Sig.	.023	.002	.000	.

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

As can be seen in Table 7 above the correlation between $A_{beh(s)}$ and B_{credit} is statistically significant ($p < 0.01$). The correlation coefficient itself is of moderate strength (.360) and

indicates a positive relationship. The significance of the above results indicates that the null hypothesis is rejected. Hypothesis 1 (H1) is thus supported.

There are indications of a strong relationship between the two past behavioural measures. If a person has provided credit card information in the past there is a strong likelihood that they provided personal information as well and vice versa. The Attitude-Towards-Behaviour measures themselves also correlate significantly (r = .659) indicating that the A_{beh} measures for security and privacy are related, and co-vary to a large extent.

Examination of Table 7 reveals that the correlation between the privacy A_{beh} measure and both past information provision behaviour variables is notably weaker (r = .163 and r = .224) than for the security A_{beh} measure (r = .360 and r = .324). It is therefore important to note that there is a stronger relationship between perceived security risk and history of providing personal information than between perceived privacy risk and history of providing personal information. Perceived security risk better explains past provision of both types of information. If the high Means for the privacy belief questionnaire items 11 (b_5, mean = 5.47) and 12 (b_6, mean = 5.71) on Table 2 are taken into account, it indicates that perception of a privacy risk has not affected the past information decisions of respondents, and that they have provided personal information despite a perception of privacy risk. There appears to be an element of risk taking in purchasing behaviour as some respondents are aware of a strong possibility of negative outcomes, but it seems that information is provided despite this awareness.

6.2.2 Hypothesis 2

$H0_2$ is tested by interpretation of the correlation results for past personal information provision and the privacy related Attitude-Towards-Behaviour score. Table 7 contains the correlation results for the A_{beh} and past behaviour measures.

As can be seen in Table 7 the correlation between $A_{beh(p)}$ and B_{person} is statistically significant ($p < 0.01$). The correlation coefficient is of moderate strength (r = .224) and

indicates a positive relationship. The significance of the results indicates that the null hypothesis is rejected. Hypothesis 2 (H2) is thus supported.

6.2.3 Hypothesis 3

$H0_3$ is tested by interpretation of the correlation results for past credit card information provision and the credit card information related Subjective Norm score. The following table presents the results of the correlations between past history of providing credit card and personal information and the two SN scores.

Table 8: Correlation results for the past information provision behaviour and Subjective Norm measures

N=195	B_{credit}	B_{person}	SN_{credit}	SN_{person}
B_{credit}	1.000	.784**	.454**	.449 **
Sig.	.	.000	.000	.000
B_{person}	. 784**	1.000	.336**	.417**
Sig.	.000	.	.000	.000
SN_{credit}	. 454**	.336**	1.000	.893**
Sig.	.000	.000	.	.000
SN_{person}	. 449**	.417**	.893**	1.000
Sig.	.000	.000	.000	.

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 8 above the correlation between SN_{credit} and B_{credit} is statistically significant ($p < 0.01$). The correlation coefficient is of considerable strength ($r = .454$) and indicates a positive relationship. The significance of the above results indicates that the null hypothesis is rejected. Hypothesis 3 (H3) is thus supported.

Table 8 further reveals that the Subjective Norm measures show strong positive relationships with both past information provision measures. The correlation coefficients (r) range from .454 to .336. It appears that, although Internet purchasing behaviour does not normally occur in social interaction contexts, the social acceptability of Internet purchasing behaviour is of likely importance. Also, the SN measures themselves

correlate strongly (r = .893), providing evidence to the possibility that respondents view normative pressures regarding security and privacy as integrated.

6.2.4 Hypothesis 4

$H0_4$ is tested by interpretation of the correlation results for past personal information provision and the privacy related Subjective Norm score. Table 8 contains the correlation results for the SN and past behaviour measures.

As can be seen in Table 8 the correlation between SN_{person} and B_{person} is statistically significant ($p < 0.01$). The correlation coefficient is of considerable strength (r = .417) and indicates a positive relationship. The significance of the results indicates that the null hypothesis is rejected. Hypothesis 3 (H3) is thus supported.

6.2.5 Hypothesis 5

$H0_5$ is tested by interpretation of the correlation results for the intention to provide credit card information and the Attitude-Towards-Behaviour measure for security. The following table presents the results of the correlations between the intention to provide credit card and personal information and the two A_{beh} scores.

Table 9: Correlation results for the Intention and Attitude-Towards-Behaviour measures

N=195	I_{credit}	I_{person}	$A_{beh(s)}$	$A_{beh(p)}$
I_{credit}	1.000	.876**	.465**	.302**
Sig.	.	.000	.000	.000
I_{person}	.876**	1.000	.415**	.325**
Sig.	.000	.	.000	.000
$A_{beh(s)}$	.465**	.415**	1.000	.659**
Sig.	.000	.000	.	.000
$A_{beh(p)}$	.302**	.325**	.659**	1.000
Sig.	.000	.000	.000	.

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 9 above the correlation between $A_{beh(s)}$ and I_{credit} is statistically significant ($p < 0.01$). The correlation coefficient is of considerable strength ($r = .465$) and indicates a positive relationship. The significance of the above results indicates that the null hypothesis is rejected. Hypothesis 5 (H5) is thus supported.

Table 9 indicates that, as with the correlations with past information provision behaviour, again the Attitude-Towards-Behaviour measure for security shows a stronger relationship with both intention measures ($r = .465$ and $r = .415$), where the Attitude-Towards-Behaviour measure for privacy indicated weaker relationships ($r = .302$ and $r = .325$) with both intention measures. This provides further evidence to the possibility that security is the main consideration when evaluating the privacy and security integrity of the Internet as a possible purchase medium. Furthermore, if the decreasing Mean scores for all the belief questions in Tables 3 (b_{1-3}) and 4 (b_{4-6}) are considered here there is a strong probability that both A_{beh} measures account for a notable amount of variance in the value of the intention measures. Also, the correlation coefficient (r) for the two intention measures is .876, indicating that the intention to provide credit card information and personal information most likely goes hand in hand.

6.2.6 Hypothesis 6

$H0_6$ is tested by interpretation of the correlation results for the intention to provide personal information and the Attitude-Towards-Behaviour measure for privacy. Table 9 contains the correlation results for the A_{beh} and intention measures.

As can be seen in Table 9 the correlation between $A_{beh(p)}$ and I_{person} is statistically significant ($p < 0.01$). The correlation coefficient is of moderate strength ($r = .325$) and indicates a positive relationship. The significance of the results indicates that the null hypothesis is rejected. Hypothesis 6 (H6) is thus supported.

6.2.7 Hypothesis 7

$H0_7$ is tested by interpretation of the correlation results for the intention to provide credit card information and the credit card information related Subjective Norm score. The following table presents the results of the correlations between intention to provide credit card and personal information and the two SN scores.

Table 10: Correlation results for the Intention and Subjective Norm measures

N=195	I_{credit}	I_{person}	SN_{credit}	SN_{person}
I_{credit}	1.000	.876**	.486**	.503**
Sig.	.	.000	.000	.000
I_{person}	.876**	1.000	.410**	.502**
Sig.	.000	.	.000	.000
SN_{credit}	.486**	.410**	1.000	.893**
Sig.	.000	.000	.	.000
SN_{person}	.503**	.502**	.893**	1.000
Sig.	.000	.000	.000	.

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 10 above the correlation between SN_{credit} and I_{credit} is statistically significant ($p < 0.01$). The correlation coefficient is of considerable strength ($r = .486$) and indicates a positive relationship. The significance of the above results indicates that the null hypothesis is rejected. Hypothesis 7 (H7) is thus supported.

Table 10 specifies that the correlation coefficients (r) of the SN and intention measures vary between .410 and .503. In the case of the SN measure for personal information, the variable shows equally strong relationships with both intention measures ($r = .503$ and $r = .502$) and stronger relationships than the A_{beh} measure for privacy discussed previously. The above holds true also for the SN measure for credit card information, which shows stronger relationships than the A_{beh} measure for security discussed previously.

The correlation values for the SN measures and intention discussed indicates there is a strong possibility that the intention to provide information is related to the perception of normative pressure from other persons to display or not to display information provision behaviour. When the correlation results of intention and the factors as specified in the Theory of Reasoned Action (A_{beh} and SN) in Tables 8 and 9 are taken into account, there are indications that the role of Subjective Norm considerations is even more important in determining Intention to provide information than the Attitude-Towards-Behaviour measures.

6.2.8 Hypothesis 8

$H0_8$ is tested by interpretation of the correlation results for the intention to provide personal information and the personal information related Subjective Norm score. Table 10 contains the correlation results for the SN and intention measures.

As can be seen in Table 10 the correlation between SN_{person} and I_{person} is statistically significant ($p < 0.01$). The correlation coefficient is of considerable strength ($r = .502$) and indicates a positive relationship. The significance of the results indicates that the null hypothesis is rejected. Hypothesis 7 (H7) is thus supported.

6.2.9 Hypothesis 9

$H0_9$ is tested by interpretation of the linear regression results for intention to provide credit card information and the security related Attitude-Towards-Behaviour score within the Theory of Reasoned Action. Results for the theoretical model for security are as follows.

Table 11: Regression results for the Theory of Reasoned Action for security.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.565	.319	.312	2.01

a Predictors: (Constant), $A_{beh(s)}$, SN_{credit}

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.974	.349		5.665	.000
	$A_{beh(s)}$	.043	.009	.317	4.827	.000
	SN_{credit}	.135	.025	.353	5.382	.000

a Dependent Variable: I_{credit} (Question 5)

The beta value of .317 on the A_{beh} measure in Table 11 above provides additional evidence of a relationship between A_{beh} and I_{credit}. The significance of the A_{beh} measure (.000) in the above table further indicates that the relationship is statistically significant, and explains unique variance in the Theory of Reasoned action model for security. Subsequent to consideration of the above values the null hypothesis is rejected, and Hypothesis 9 (H9) is therefore supported.

6.3.10 Hypothesis 10

$H0_{10}$ is tested by interpretation of the linear regression results for intention to provide credit card information and the security related Subjective Norm score within the Theory of Reasoned Action. The results for the theoretical model for security are found on Table 11.

The beta value of .353 on the SN measure in Table 11 provides additional evidence of a relationship between SN and I_{credit}. The significance of the SN measure (.000) in Table 11 further indicates that the relationship is statistically significant, and explains unique

variance in the Theory of Reasoned Action model for security. Subsequent to consideration of the above values the null hypothesis is rejected, and Hypothesis 10 (H10) is therefore supported.

Further consideration of the beta values of the SN and A_{beh} measures within the model in Table 11 indicates that the beta value of the SN measure (.353) is higher than the beta value of the A_{beh} measure (.317). Accordingly, there the results suggest that the relative importance of the SN measure in explaining variance in the Intention measure is higher than the A_{beh} measure.

6.3.11 Hypothesis 11

$H0_{11}$ is tested by interpretation of the linear regression results for intention to provide personal information and the privacy related Attitude-Towards-Behaviour score within the Theory of Reasoned Action. The results for the theoretical model for privacy are as follows.

Table 12: Regression results for the Theory of Reasoned Action for privacy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.532	.283	.276	1.99

a Predictors: (Constant), $A_{beh(p)}$, SN_{person}

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.440	.319		4.516	.000
	$A_{beh(p)}$	.023	.008	.186	2.888	.004
	SN_{person}	.172	.025	.444	6.902	.000

a Dependent Variable: I_{person}(Question 5)

The beta value of .186 on the A_{beh} measure in Table 12 above provides additional evidence of a relationship between A_{beh} and I_{person}. The significance of the A_{beh} measure (.004) in the above table further indicates that the relationship is statistically significant, and explains unique variance in the Theory of Reasoned Action model for privacy. Subsequent to consideration of the above values the null hypothesis is rejected, and Hypothesis 11 (H11) is therefore supported.

6.3.12 Hypothesis 12

$H0_{12}$ is tested by interpretation of the linear regression results for intention to provide personal information and the privacy related Subjective Norm score within the Theory of Reasoned Action. The results for the theoretical model for privacy are found on Table 12.

The beta value of .444 on the SN measure in Table 12 provides additional evidence of a relationship between SN and I_{person}. The significance of the SN measure (.000) in Table 12 further indicates that the relationship is statistically significant, and explains unique variance in the Theory of Reasoned action model for privacy. Subsequent to consideration of the above values the null hypothesis is rejected, and Hypothesis 12 (H12) is therefore supported.

Further consideration of the beta values of the SN and A_{beh} measures within the model in Table 11 indicate that the beta value of the SN measure (.444) is higher than the beta value of the A_{beh} measure (.186). Accordingly, the results suggest that the relative importance of the SN measure in explaining variance in the Intention measure is higher than the A_{beh} measure.

7. Conclusions and Recommendations

Considering the above and previous findings, there are strong indications that Internet based purchasing will only become universal after a number critical issues have been resolved. Clearly, attitude as a function of risk perception plays an important role in determining whether individuals have purchased and intend to purchase online. It is likely that the perception of risk by Internet users is due to the possibility of loss or violation, and this perception is likely to remain until the financial institutions (that supply payment means such as credit cards) carry full risk for all negative outcomes of providing information.

Also, it seems that individuals face definite pressure from referent groups in terms of their purchasing behaviour. The continued media coverage regarding security and privacy of Internet purchasing have possibly created and enforced strong opinions on the matter of online purchasing, and individuals are likely to be influenced by these opinions. It is clear from this study that further investigation is necessary to build a complete picture of the attitude and normative aspects that may play a role in determining intention. The role of normative pressure is considerably larger than first anticipated in this study and requires intensive further investigation. Other types of risk, including delivery risk relating to the possibility of non-delivery of products, also need to be investigated.

Possibly, there are questions regarding the level of convenience associated with the Internet shopping experience that require investigation. Relevant factors such as technology optimism specified by Modahl (2000) and the Technology Acceptance Model indicated to be pertinent to the Internet purchasing situation by Crisp et al. (1997) need to be examined, particularly because the Technology Acceptance Model also measures attitude within a behavioural context.

List of References

ACNielsen (2000). ACNielsen Survey Finds Nearly Two Thirds of U.S. Population Age 12 or Older Are Online. World Wide Web (http://www.acnielsen.com): ACNielsen.

Agarwal, R., Ahuja, M., Carter, P. E. & Gans, M. (1998). Early and Late Adopters of IT Innovations: Extensions to Innovation Diffusion Theory. Paper presented at the Diffusion Interest Group in IT Conference, Helsinki.

Aizen, I. & Fishbein, M. (1980). Understanding Attitudes and Predicting Social Behaviour. Englewood Cliffs: Prentice-Hall.

Allport, G.W. (1967). Attitudes. In M. Fishbein (Ed.), Attitude theory and measurement. New York: John Wiley.

Ben-Ur, J. & Winfield, C. (2000). Perceived Risk in the E-Commerce Environment. Paper presented at the South-Western Marketing Association Conference, San Antonio.

Bhatnagar, A., Misra, S. & Rao, H.R. (2000). On Risk, Convenience and Internet Shopping Behaviour. Communications of the ACM, 43(11), 98-105.

Business Wire (1999, November 20). E-Commerce Emerges as Fastest-growing Online Activity and Becomes More Central to Internet Consumer Experience, According to 1999 America Online/Roper Starch Cyberstudy. World Wide Web (http://www.businesswire.com): Business Wire.

Business Wire (2000a, May 31). ECommerce Bustles as the PC Era Finally Yields to the Internet-Savvy Population: Predicts Forrester Research. World Wide Web (http://www.businesswire.com): Business Wire.

Business Wire (2000b, June 19). New Nationwide Poll Shows Two-Thirds of Americans Worry About Cybercrime; Online Criminals Seen as Less Likely to be Caught. World Wide Web (http://www.businesswire.com): Business Wire.

CNN.com (2001). Gates's Viagra Hacker Sentenced. World Wide Web (http://www.cnn.com/2001/TECH/internet/07/06/hacker.fbi/index.html): Cable News Network.

Crisp, B.C., Javenpaa, S.L. & Todd, P.A. (1997). Individual Differences and Internet Shopping Attitudes and Intentions. Austin: University of Texas.

Dahlèn, M. (1999). Closing in on the Web Consumer: A Study in Internet Shopping. In E. Bohlin, K. Brodin, A. Lundgren & B. Thorngren (Eds), Convergence in Communications and Beyond. World Wide Web (http://www.hhs.se/fdr/research/Internet/closingin.pdf): Elsevier Science.

Ernst & Young (2001). Information Security Survey 2001. World Wide Web (http://www.ey.com/global/gcr-nsf/us/publications_-_eRisk_solutions): Ernst & Young.

Forrester Research (1999). Europe: The Sleeping Giant Awakens. World Wide Web (http://www.forrester.com): Forrester Research.

Foxall, G.R. & Goldsmith, R.E. (1990). Consumer Psychology for Marketing. London: Routledge.

Georgia Institute of Technology - Graphics, Visualisation and Usability Center (GVU) (1998). 10th Internet Survey. World Wide Web (http://www.gvu.gatech.edu/user_surveys/survey-1998-10/graphs/graphs.html): GVU.

Hawkins, D.I., Best, R.J. & Coney, A.C. (2001). Consumer Behavior: Building Market Strategy (8th ed.). New York: McGraw-Hill.

Javenpaa, S. L. & Tractinsky, N. (1999). Consumer Trust in an Internet Store: A Cross-Cultural Validation. World Wide Web (http://www.ascusc.org/jcmc/vol5/issue2/jarvenpaa.html): Journal of Computer Mediated Communication.

Kerlinger, F.N. (1992). Foundations of Behavioral Research (3rd ed.). Orlando: Harcourt Brace.

Lee, K.S., Tan, J.T. & Lim, G.H. (1999). E-Tailing: Understanding and Overcoming Consumer's Perceived Purchase Risk in Internet Shopping. Singapore: NUS Faculty of Business Administration.

Modahl, M. (2000). Now or Never: How Companies Must Change to Win the Battle for Internet Consumers. New York: HarperBusiness.

Palfini, J. (2001). Is Net Coverage a Fraud? World Wide Web (http://www.cnn.com/2001/TECH/internet/06/15/net.fraud.coverage.idg/index.html): Cable News Network.

Paraschiv, C. & Zaharia, C. (2000) Risk Perception, Risk Attitude and Demand for Risk Reduction: An Empirical Analysis of Consumers' Purchasing Behaviour on the Internet. Paper presented at the Third Berlin Internet Economics Workshop, Berlin.

Renwick, J. (2000, October 9). Clinching the Holiday E-Sale. The Wall Street Journal.

Rosnow, R.L. & Rosenthal, R. (1996). Beginning Behavioural Research (2nd ed.). Englewood Cliffs: Prentice-Hall.

Schiffman, L.G. & Kanuk, L.L. (1994). Consumer Behavior (7th ed.). Englewood Cliffs: Prentice-Hall.

Spoelstra, M. (1999). In P.J. du Plessis & G.G. Rosseau. Buyer Behaviour: a Multi-Cultural Approach. Johannesburg: Thomson International.

Swaminathan, V., Lepowska-White, E. & Rao, B. (1999). Browsers or Buyers in Cyberspace? An Investigation of Factors Influencing Electronic Exchange. World Wide Web (http://www.ascusc.org/jcmc/vol5/issue2/swaminathan.htm): Journal of Computer Mediated Communication.

Watson, R.T., Berthon, P., Pitt, L.F. & Zinkhan, G.M. (2000). Electronic Commerce: The Strategic Perspective. Orlando: Dryden Press.

Webchek (2000). Internet User Survey 2000. Cape Town: Webchek.

Westland, C.J. & Chalk, T.H.K. (2000). Global Electronic Commerce. Cambridge: MIT Press.

Appendix A: Online questionnaire

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Internet Security and Privacy survey

*The questionnaire you are about to complete is part of a project by researchers at the Department of Industrial Psychology, University of Stellenbosch to investigate people's feelings regarding security and privacy of the Internet as a medium as well as web sites. There is a total of **21** questions on the form. This form should take about **3** minutes to complete. All persons completing the questionnaire will remain anonymous.*
Please complete this questionnaire only if you:

- ***reside inside the national boundaries of South Africa***
- ***access the Internet with a web browser at least once a month***
- ***and have access to use of a credit card.***

Section 1

In this section you will be asked if you have done certain things, and how likely you are to do them in the future. Click the button that is appropriate. In the last two questions you will see two phrases separated by a series of buttons. Read each sentence carefully, and then click the button that most accurately describes your point of view. One example is provided for you to see how to indicate an answer.
Please answer all the questions.

Have you ever done any of the following things?

1. Accessed a website where goods or services where offered for sale?	Yes ○ No ○
2. Submitted a credit card number in order to purchase through the Internet?	Yes ○ No ○
3. Submitted personal information (Name, adress, e-mail, etc.) in order to purchase through the Internet?	Yes ○ No ○
4. Submitted a debit card or bank account details in order to purchase on the internet	Yes ○ No ○

How likely are you to do the following things in the future?

Example: Submit a credit card number in order to purchase goods or services through the Internet in the next 6 months?	Very Likely ○ ◉ ○ ○ ○ ○ ○ Very Unlikely
5. Submit a credit card number in order to purchase goods or services through the Internet in the next 6 months?	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
6. Submit personal information (Name, address, e-mail, etc.) in order to purchase goods or services through the Internet in the next 6 months?	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely

Section 2

In this section you are going to be asked questions on how likely you think it is that a specific thing could happen if you purchase through the Internet, and how bad you think it is if it does happen. Read each sentence carefully, and then click the button that shows how likely you think a specific thing is going to happen, or how bad you think it is. One example is provided for you to see how to indicate an answer.
Please answer all the questions.

How likely do you think the following things could happen during a transaction if you submit either a credit card number or personal information?

Example: Unintended persons could obtain the credit card number by intercepting it while it is in transit through the Internet.	Very Likely ○ ○ ○ ○ ◉ ○ ○ Very Unlikely
7. Unintended persons could obtain the credit card number by intercepting it while it is in transit through the Internet.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
8. Unintended persons could obtain the credit card number by hacking into the computers of intended recipients.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
9. Persons could use the credit card number to subtract amounts from the credit card account without my permission.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
10. Unintended persons could obtain my personal information by intercepting it while it is in transit through the Internet.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
11. Intended persons or organisations could distribute my personal information to others without my permission.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely
12. Persons or organisations could use my personal information to contact me unnecessarily.	Very Likely ○ ○ ○ ○ ○ ○ ○ Very Unlikely

How bad do you think it is if the above things happen?

13. Obtaining of credit card information by intercepting it while in transit is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.
14. Obtaining of credit card information by hacking into computers is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.
15. Subtraction of amounts from a credit card without my permission is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.
16. Obtaining of my personal information by intercepting it while in transit is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.
17. Distribution of my personal information without my permission is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.
18. Unnecessary contact by an unintended person or organisation is	not at all bad ○ ○ ○ ○ ○ ○ ○ very bad.

Section 3

In this section you will be asked questions about what other people would think about certain things you do to purchase on the Internet, and how you respond to them. As before, read each sentence carefully and then choose and click one button between the two words that most accurately describes your view of what others think, and how likely you are to be influenced by them.
Please answer all the questions.

In general, to what extend do close friends or family think you should do the following things?

19. Submit a credit card number in order to purchase through the Internet.	I definitely should ○ ○ ○ ○ ○ ○ ○ I definitely should not
20. Submit my personal information order to purchase through the Internet.	I definitely should ○ ○ ○ ○ ○ ○ ○ I definitely should not

21. Typically, I do what my close friends and family thinks I should do.	Always ○ ○ ○ ○ ○ ○ ○ Never

Please click the "submit" button when you have finished the questionnaire. The your responses will be sent back to the University. Thank you for your participation in this study.

Submit | Reset