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Technology readiness and self-service check-in technologies at South African airports

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Technology readiness and self-service check-in technologies at South African airports

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

A central goal of this research was to better understand what makes self-service check-in technologies different from one another and how passengers related to each of these check-in modes. This is to enable airports and airlines to anticipate passenger behaviours and attributes in respect to their *technology readiness* factors critical to the successful implementation of self-service check-in technologies.

The *technology readiness* of passengers to adopt and use self-service check-in technologies within the South African aviation environment remains relatively unknown. The research problem set out to assess the effects of *technology readiness* on passengers' attitudes toward, adoption of, and responses to the use of self-service check-in technologies in South Africa.

In attempting to answer the research questions, mainly moderated regression and mediation analyses were conducted to statistically analyse the relations between passengers' attitudes, adoption, responses and technology readiness dimensions.

The key outcomes of this study confirm there is evidence and support in that passenger overall *technology readiness* is positively associated with their attitudes toward, adoption of and response to self-service check-in technologies. Passenger attitude was found to mostly dominate the attitude to adoption relationship in respect to passengers' response to self-service check-in technologies.

This study demonstrates that customer attitudes must be considered when introducing self-service check-in technologies and that their *technology readiness* may not be consistent across all types of self-service check-in modes.

DECLARATION

I, Sumeshin Naidoo, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Sumeshin Naidoo

Signed at ……

On the …….. day of …… 2012

DEDICATION

I dedicate this work to my wife, Lizelle and my children Amrusha and Arushen for allowing me time to complete this study.

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My sincerest and deepest thanks go to the following people:

- My wife, Lizelle for all her support in the duration of my studies;
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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to assess the effects of *technology readiness (TR)* on passengers' attitudes toward, adoption of, and responses to self-service check-in technologies (SSCIT's) in South Africa. Currently global trends lean toward the use of SSCIT's at major airports world-wide (Jarrell 2007) and according to the 2010 Passenger Self-Service Survey (Air Transport World and SITA 2010), 71% of global passengers made use of self-service kiosks; 60% used internet check-in and 23% made use of mobile telephone check-in options in 2010. Similarly, the readiness of attitudes toward and adoption of SSCIT's of South African passengers for SSCIT's needs to be assessed.

This report aims to provide further insight into the evaluation and adoption of SSCIT's by South African passengers.

1.2 Context of the study

Airports Company South Africa (ACSA 2011) provides world-class, safe and secure infrastructure and technology for efficient movement of large numbers of passengers and cargo, through domestic and international airlines. ACSA owns and operates South Africa's nine principal airports, comprising of three major international gateways, at Johannesburg, Durban and Cape Town, as well as six domestic airports at Bloemfontein, Port Elizabeth, East London, George, Kimberley and Upington (ACSA 2011). In 2006 ACSA entered into a joint venture with a company based in India and succeeded in securing the 25 year operating concession of Mumbai International Airport (ACSA 2011).

All ACSA airports operate as individual business units with their own unique macro and micro environmental forces (ACSA 2007). A diverse customer base exists that extends from within the organisation (government, airlines, ground handlers,

shareholders, etc.) and externally to the general flying population and general airport users (ACSA 2011).

ACSA experiences year-on-year passenger growth and over the 2010/11 financial year posted a return on equity (ROE) of 2.47 percent and a return on capital employed (ROCE) of 5.72 percent (ACSA 2011). This increased growth will, in time, require adequate infrastructure and capacity provision.

ACSA continuously invests in capital expenditure, to meet these demands and maintain passenger service levels. At the end of the 2010/11 financial year, ACSA's asset base was estimated at R26,1 billion, compared to R25,3 billion at the end of the 2009/10 financial year (ACSA 2011). Thus, innovative ways of optimising on capital expenditure are necessitated.

Airlines compete aggressively for passengers, market share and revenue generation. In South Africa, over recent years, there has been an influx of domestic low cost category airlines (1 Time Airlines, Mango, Kulula.com and recently Velvet Sky) that directly compete with full service category airlines (SAA, Comair, Airlink, and SA Express), resulting in competitive pricing and attention to increased customer service initiatives.

In meeting stakeholder demands and commitments, airlines and airports globally, have turned to self-service technologies as an alternate solution to conventional customer contact methods (Jarrell 2007). The International Air Transport Association (IATA), the body that regulates, benchmarks and audits airlines, adopted self-service check-in technologies as a strategic thrust for the airline industry and sets global benchmarks and target dates for when airlines are to meet compliance or benchmarks (IATA 2008). Airlines have to offer a menu of self-service choices to capture the broad spectrum of passengers, as passengers become more selective in their travel choices (Karp 2007).

Customers literate in leading edge technology may prefer using technology to conduct their business and work activities over conventional methods of delivering service (Goldenberg 2004). Although the introduction of SSCIT's may not

automatically lead to its usage (Parasuraman 2001), a need exists for in depth understanding of the effects that *TR* has on attitudes, adoption and responses to SSCIT's within the South African aviation environment.

The results and findings of this study will be beneficial to ACSA and the global aviation industry.

1.3 Problem statement

1.3.1 Main problem

The *TR* of passengers to adopt and use SSCIT's within the South African aviation environment remains relatively unknown.

The research problem is to assess the effects of *TR* on passengers' attitudes toward, adoption of, and responses to the use of SSCIT's in South Africa.

1.3.2 Sub-problems

The first problem is to assess the effects of *TR* on passengers' attitudes toward the use of SSCIT's in South Africa.

The second problem is to assess the effects of *TR* on passengers' adoption of the use of SSCIT's in South Africa.

The third problem is to assess the effects of *TR* on passengers' responses to the use of SSCIT's in South Africa.

The fourth problem is to assess the effects of passengers' attitudes on passengers' adoption of the use of SSCIT's in South Africa.

The fifth problem is to assess the effects of passengers' adoption on passengers' responses to the use of SSCIT's in South Africa.

The research hypotheses that follow empirically test if, and to what extent, *TR* demonstrates the variance in passengers' attitudes toward, adoption of, and responses to the use of SSCIT's in South Africa. The research hypotheses further assess the relationships between the constructs of attitudes and adoption on responses to SSCIT's.

1.4 Significance of the study

This study fills a gap in that to date limited research on the *TR* construct has been published (Taylor, Celuch and Goodwin 2002). Evidence of research, specific to the aviation environment was sourced, however; the study took place in 2006 and was limited to a specific European airline (Liljander, Gillberg, Gummerus and van Riel 2006). IATA (2008) set global targets for the airline industry in meeting deployment of self-service technologies to simplify passenger travel (Jarrell 2007). These targets and forecasts may not necessarily or easily be achieved.

This study is an initial assessment to allow future in-depth analysis of passenger *TR* in South Africa and how this compares to other global studies conducted. To date, no documented and recorded evidence is available to confirm that a study of the *TR* of aviation passengers in South Africa has ever been undertaken. Industry role players will benefit from the study by understanding the *TR* of passengers for SSCIT's. This research will guide ACSA and the broader aviation community in:

- Focusing on the relevant SSCIT's that are suitable to the South African environment;
- Understanding the readiness of passengers to use SSCIT's;
- Meeting passenger demand for growth and choice of SSCIT's; and
- Planning the rollout of adequate and appropriate airport infrastructure for passenger check-in facilitation.

Airlines will benefit from the study by understanding the readiness of passengers for SSCIT's. This research will guide the airlines in:

- Understanding the readiness of passengers to use SSCIT's;
- Marketing of SSCIT's to the airlines' passengers;
- Projecting adequate capacity and correct staffing requirements in future; and
- Forecasting savings, cost benefits and/or other benefits to be achieved by correct implementation of SSCIT's.

The Technology Readiness Index (TRI), consisting of multiple item scale measures, was developed after reviewing extant literature and conducting qualitative research on customer behaviour to technology (Parasuraman 2000). Parasuraman (2000) called for comparative studies of the TRI across different countries and cultures. This study will contribute to the broader academic significance of studies in *TR* and the constructs of attitudes, adoption and responses in respect to self-service check-in technologies.

1.5 Delimitations of the study

The scope of this research is limited to:

- Passengers using commercial airlines as a means of travel within South Africa;
- Passengers flying predominantly out of ACSA owned airports; and
- Passengers' use of self-service technologies, as defined by IATA (2008), provided on a common use basis by ACSA and other airlines operating in South Africa.

1.6 Definition of terms

The *technology readiness* (TR) construct refers to people's propensity to embrace and use new technologies for accomplishing goals in home-life and at work (Parasuraman 2000).

Self-service technologies are technologies that customers use independently, without interaction or assistance from employees (Meuter, Ostrom, Roundtree and Bitner 2000). Thus, for the purposes of this study, self-service check-in technologies

(SSCIT's) are check-in technologies that passengers use to check-in for their flights and relate to common use self-service kiosks, internet check-in and mobile telephone check-in.

An attitude is defined as 'a psychological tendency' that is expressed when one evaluates a particular object /unit and shows some level of approval or disapproval (Chaiken and Eagerly 1993). This definition has been widely used in previous literature (Bobbitt and Dabholkar 2001; Curran, Meuter and Surprenant 2003).

Adoption is defined as the frequent use of (and likelihood of using) a specific self-service check-in technology.

Responses to self-service technologies are defined as the perceived sense of service quality, satisfaction and loyalty (Liljander, et al. 2006). For the purpose of this study, response refers to the overall satisfaction and quality of service experienced when using SSCIT's on a common use basis.

1.7 Assumptions

The study assumed the following:

- Passengers had some knowledge of SSCIT's. This was a fairly reasonable assumption as SCCIT's have been introduced in South Africa in some way or form over the last 5 years. There has been growth and uptake in the use of SSCIT's by passengers. However, it should be noted that mobile telephone check-in procedures were only recently launched (in 2010) in South Africa and therefore passengers may not necessarily be knowledgeable about this form of SSCIT.

- English was relevant to a large variety of the general flying public. The reasonableness, of this assumption can be accepted as English is an official language in South Africa and regarded as the official language of communication.

- Passengers at OR Tambo International Airport were reasonably representative of the general flying public of South Africa.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The global airline industry adopts SSCIT's in some way or form. Although not consistent across the globe, airlines use SSCIT's that add value to their business and link technology to check-in having started with kiosks (Arnoult 2008).

A recent survey by Airports Council International, forecast global passenger air travel to exceed 9 billion passengers by 2025 (Jarrell 2007). Increasingly this demand will exceed the resources available at airports, as the capacity for building new terminals decreases, the result is that the industry will have to rely more on technology to solve these challenges (Jarrell 2007).

Self-service technology was introduced in the global aviation industry in the 1990's and has since become a common method of check-in (SITA 2007).

During a case study of McCarran International Airport, in the United States it became apparent that in respect to self-service technologies a new way in the thinking, working relationships and infrastructure deployment needs to take place (Ingalls 2007). A growing number of passengers, not only expect, but demand more opportunities to take control of their travel experience (Arnoult 2008). On the contrary, airlines rushing to adopt self-service strategies, however, may not be practicable and therefore not implemented successfully (Nairn 1999).

As part of IATA's strategic business initiative to simplify passenger travel, IATA foresees the following self-service initiatives to drive the future aviation industry (IATA 2008):

- Common-use self-service (CUSS) kiosks;
- Internet check-in; and
- Mobile telephone check-in.

CUSS kiosks are shared kiosks, by multiple airlines, offering convenient passenger check-in, whilst allowing airlines to maintain branding and functionality (IATA 2008).

Internet check-in moves passengers away from physical site check-in and allows passengers to check-in on-line, via the World Wide Web, at home, work or any place of convenience (IATA 2008).

Mobile telephone check-in enables airlines to send a boarding pass in the form of 2D barcodes directly to passenger's mobile telephones. Passengers simply register their mobile telephone number with their airline when booking to receive a text message with a 2D barcode (IATA 2008). The 2D barcode then becomes the passengers boarding pass, thus eliminating paper from the check-in process (Concil 2007).

After contextualising the global aviation environment in respect to SSCIT's, the next section shall aim to contextualise the South African aviation environment.

2.2. The South African aviation environment

The previous section focused on the global environment and how the aviation industry is moulding with regards to SSCIT's. This section shall focus on the South African environment and provide some insight into the local aviation industry and the adoption of SSCIT's by airlines.

South African Airways (SAA) is the home base (national flag) carrier. There are other airlines competing for the domestic market as well. SAA competes with Comair, SA Express and Airlink in the full service airline category. In the low cost airline category, the competitor airlines are Mango, 1 Time Airlines, Kulula and newly launched Santago.

At the time of writing there were 55 foreign based airlines operating in South Africa and the aviation business contributes to an estimated 300 000 direct and indirect jobs in the country (ACSA 2011). The airlines all operate international flights in the

full service airline category, there are no low cost international flights operating to and from South Africa (ACSA 2011).

There is a general move by all local airlines to adopt SSCIT's, with all major commercial airlines providing at least one method of SSCIT's to passengers.

On average counter facilitated check-in costs about $3.62 per transaction, while using a self-service kiosks reduces that to $0.52 (Croft 2006). These costs vary per country depending on local taxes, legislation, etc. that contribute to labour and infrastructure costs.

Having discussed both global and South African aviation environments, the discussion will now be narrowed and focussed. In the following section, general theory on *TR* will be explained further and followed by contextualisation of the South African aviation environment in respect to self-service technologies.

2.3 Effects of *Technology Readiness* (TR) on passengers' attitudes toward the use of SSCIT's

The role of technology in customer-company interactions, as well as the number of technology-based products and services is growing rapidly (Parasuraman 2000). However, there is evidence of increasing customer frustration in dealing with technology-based systems (Parasuraman 2000). Parasuraman (2000) went on to propose the construct of *TR* of people.

2.3.1 Technology Readiness Index (TRI)

The TRI was developed and proposed to address and answer the following questions (Parasuraman 2000):

- "How ready are people to embrace and effectively use new technologies?";
- "What are the primary determinants of TR?";

- “Is it possible to group people into distinct segments on the basis of their TR?”;
- “Do these segments differ meaningfully on demographic, lifestyle and other criteria?”; and
- What are the managerial implications for marketing to and serving customer segments that differ on TR?”

The above questions, although with a different focus to the aviation industry, are applicable and require to be researched. The constraint is to find a suitable instrument to test the above questions.

Parasuraman (2000) drew on various literatures to develop the scale to measure readiness using a sample in the United States. The scale to measure readiness was replicated and extended with some success in the United Kingdom by Tsikriktsis (2004). The United Kingdom study found that the four segments (clusters) identified in the United Kingdom population have similar *TR* characteristics with four of the five segments identified in the population of United States study (Tsikriktsis 2004). Research has found that TR is an important driver of self-service technologies, service quality and behavioural intentions (Lin and Hsieh 2006). This also echoes the propositions and findings in a website case study (Zeithaml, Parasuraman and Malhotra 2002). Based on the findings of the replication and extension study by Tsikriktsis (2004); Lin and Hsieh (2006) and Liljander et al. (2006), it can be assumed that the scale is reliable as a measure of *TR*. The TRI (Parasuraman 2000) shall be replicated and used to measure *TR* in this study.

The appropriateness of using this measure of TR for the South African population shall be dealt with in forthcoming sections.

2.3.2 TR and attitudes towards the use of SSCIT’s

An attitude is defined as ‘a psychological tendency’ that is expressed when evaluating a particular object/unit and showing some level of approval or disapproval (Chaiken and Eagerly 1993). Due to significant investment in both time and money

to design, implement and manage self-service technologies, it is important for companies to better understand customers' decisions of whether or not to use self-service technologies (Curran et al. 2003). Attitudes or beliefs about various technologies are found to be associated with technology-based behaviours (Lin and Hsieh 2006).

Favourable attitudes toward using technology can generally be expected to result in favourable attitudes toward using technology-based self-service (Dabholkar 1996). In further research, a generalised attitude based choice model was tested and utilised for specific technology based self-service technologies (Dabholkar 1994). However, as service customers participate actively and freely, any change in the service, for example incorporation of technology, should be implemented with customers' needs in mind, else there may be a withdrawal of their business (Curran et al. 2003).

Technology-based service delivery options, may be seen as a threat and may cause anxiety and stress for customers who are unfamiliar or uncomfortable with technology and its use (Mick and Fournier 1998). Certain customers will consider the costs of learning the new technology and switching over to be far greater and not worthwhile (Gatignon and Robert 1991).

Although extant research has been undertaken to examine self-service technologies, no broad comprehensive theoretical framework exists for understanding and/or predicting customers decisions for use of self-service technologies (Bobbitt and Dabholkar 2001). A greater understanding of forces that motivate current and potential users of technology based self-service needs to be prioritised (Dabholkar 2000).

The question of interest then is whether there is a generalised attitude toward self-service technologies, irrespective of whether technology is involved or not (Bobbitt and Dabholkar 2001).

The next section will discuss research of TR and attitudes in the South African context.

2.3.3 TR and attitudes towards the use of SSCIT's in South Africa

A new social contract may promote ICT-enabled environments, thus requiring a binding contract between partners in civil, private and public sectors that deliver social inclusion and social cohesion (Erwin and Taylor 2004). There is indication that South African technology has made strides into the future as it seeks to inculcate technological discipline and awareness to its citizens (Langmia 2005).

A study was conducted on ATM usage in South Africa. It was a comparative analysis of a sample literate group of ATM users, versus a sample of a semi–literate group of ATM users. The semi-literate sample group showed generally more positive attitudes toward ATM usage than the sample literate group (Thatcher, Shaik and Zimmerman 2005). In this instance, it was possibly due to the literate group having higher expectations from the service than the semi-literate group (Thatcher et al. 2005).

There is no documented evidence available that any formal research was conducted based on passengers' attitudes towards the use of SSCIT's in South Africa.

This leads to the following hypothesis:

Hypothesis 1: Passengers' overall *technology readiness* is positively associated with their attitudes towards the use of self-service check-in technologies.

2.4 The effects of TR on passenger's adoption of the use of SSCIT's

The service landscape has been revolutionised by the development of new technologies, with companies using technology to improve service operations, increase service efficiency, and provide functional benefits to customers (Lin and Hsieh 2005). Customers' TR should be taken into account to predict their perception and behaviour (Parasuraman 2000). There is limited research examining customers'

readiness to adopt, and willingness to use, self- service technologies, as well as of the consequent influence on customers' behaviour (Lin and Hsieh 2006).

2.4.1 TR and adoption of the use of SSCIT's

TR construct is the end state of mind where mental enablers and inhibitors collectively determine a person's stance towards technologies (Parasuraman 2000). Customer segments with differing TR profiles vary in terms of Internet related behaviours, however, not all users are equally ready to embrace technology-assisted services (Parasuraman 2001). In a teleshopping research study, it is shown that people's attitudes and beliefs about interactive shopping influenced their propensity to adopt such modes of shopping (Eastlick 1996).

In alternate research, individual capacity and willingness is found to be the underlying factors of a customer's decision to adopt or reject technological modes of service delivery (Walker and Craig-Lees 2002). Research proves that optimism and innovativeness are positive drivers of TR and that they promote positive attitudes and encourage customers to use technological products/services, whereas discomfort and insecurity are negative drivers that inhibit customers to use technology (Parasuraman 2000; Tsikriktsis 2004; Liljander et al. 2006).

TR plays a vital role in the resulting perceptions and behaviours of customers and thus cannot be ignored in assessing customers' adoption of self-service technologies (Lin and Hsieh 2006). As self-service becomes more accessible and provides benefits to both companies and customers, understanding of perceptions and use of these technologies has not been fully undertaken (Lin and Hsieh 2006).

2.4.2 TR and adoption of the use of SSCIT's in South Africa

The Network Readiness Index (NRI) is a yearly measure, conducted by the World Economic Forum, of the degree to which developed and developing countries across the world leverage information and communication technologies (ICT) for enhanced competitiveness (Dutta and Mia 2010).

In the 2010-11 readiness measurement (Dutta and Mia 2010) the following came to light:

- South Africa boasts strengths in the 1st class quality of its market (25th) and regulatory (23rd) environments, having a well-developed financial market (6th) and venture capital (39th), favourable laws relating to ICT (32nd), strong intellectual property standards, amongst others.

- However, on a less positive note individual preparation and uptake of ICT remains weak at 113th and 95th respectively.

An annual commercial survey is conducted by aviation company SITA and from the sample of passengers interviewed at OR Tambo Airport in May-June 2010, only 46% used online check-in, 49% used kiosk check-in and 2% used mobile check-in (Air Transport World and SITA 2010).

The reason for the overall slow uptake of ICT in South Africa and in particular that of SSCIT's needs to be further investigated.

There is no documented evidence available of any formal research conducted of adoption of SSCIT's in South Africa.

This leads to the following hypothesis:

Hypothesis 2: Passengers overall *technology readiness* is positively associated with their adoption of the use of self-service check-in technologies.

2.5 The effects of TR on passenger's responses to the use of SSCIT's

Responses to SSCIT's are categorised in terms of service quality, satisfaction and loyalty (Liljander et al. 2006) and testing for loyalty is relevant in their study as customer loyalty to the focal airline needed to be assessed.

Customer loyalty to a particular airline is not the main focus of this study and further, the provision of SSCIT's at ACSA airports is based on common use infrastructure principles and not airline dedicated infrastructure. For the purpose of this research, passengers' responses to the use of SSCIT's will be limited to overall satisfaction and quality of service.

Satisfaction is claimed to be an emotional evaluation, where a customer is of the belief that with the use of a service, positive feelings are evoked (Cronin, Joseph, Brady and Hult 2000). Academic research has recognised the importance of technology in the delivery of services (Meuter et al. 2000). Customer satisfaction can affect customer retention and profitability (Mano and Oliver 1993), thus understanding the underlying factors have important managerial implications (Meuter et al. 2000). Self- service technologies increase the efficiency and effectiveness of companies, yet at the same time increase customer satisfaction (Meuter et al. 2000; Van der Wal, Pampallis and Bond 2002). Service quality, has different levels of meaning to different individuals and is therefore claimed to be a multi-dimensional concept (Mersha and Adlakha 1992). It is generally accepted that service quality comprises both tangible components such as: appearance of physical facilities, equipment, staff, communication materials and other customers in the facility (Gronroos, 1984; Parasuraman, Zeithaml and Berry 1988) as well as intangible components such as cleanliness and tidiness, comfort of use and functionality of service (Johnston 1995).

For the purpose of this study, the components of satisfactions and service quality will not be studied in depth. However, the effect of TR on passengers' overall responses to use of SSCIT's will be assessed.

2.5.1 TR and responses to the use of SSCIT's

The study of service quality, satisfaction and value add has started to dominate services literature due to the assumption that improvement in quality, satisfaction and value add may lead to favourable service outcomes (Cronin et al. 2000). Although the recent domination of studying these factors, there is still limited

research conducted on self-service technologies and very little is known about factors influencing customers evaluation of self-service technologies (Lin and Hsieh 2005).

Liljander et al. (2006) in their study found that TR has a significant positive effect on service quality, satisfaction and loyalty. Whereas, Taylor et al. (2002) collected data on perceived Internet quality and loyalty towards using the Internet but the TR effects on these constructs were not reported on.

Lin and Hsieh (2005) using the American Customer Satisfaction Index scale, found a positive relationship between TR and self-service technology satisfaction and that TR is one of the drivers of self-service technology satisfaction.

2.5.2 TR and responses to the use of SSCIT's in South Africa

In 2002, a study of the South African digital economy was undertaken and it was found that insufficient information and communication infrastructure, especially in semi-rural and rural areas, remain a barrier to digital growth (Cogburn and Adeya 2002).

However, almost a decade later South Africa boasts an ICT leveraged business sector producing innovative products (Dutta and Mia 2010). In recent commercial studies, 46% of passengers used internet check-in, 49% of passengers used kiosk check-in and 2% of passengers used mobile telephone check-in on the day of the study undertaken at OR Tambo Airport (Air Transport World and SITA 2010). However the factors influencing their decisions were not studied.

There is no documented evidence available of any formal research having been conducted of TR and the associated response to the use of SSCIT's in South Africa.

This leads to the following hypothesis:

Hypothesis 3: Passengers overall *technology readiness* is positively associated with their responses to the use of self-service check-in technologies.

In previous sections relevant literature was investigated and discussed concluding with proposed hypotheses for attitudes, adoption and responses in relation to *TR*. The next section aims to discuss literature and propose some possible relationships between the variables of attitudes towards, adoption of and responses to SSCIT's.

2.6 Theory of Reasoned Action in relation to TR, attitudes, adoption and responses to SSCIT's

The theory of reasoned action is a model that was developed to study consciously intended behaviours (Ajzen and Fishbein 1980). Most human behaviours can be accurately predicted from an appropriate measure of an individual's intention to perform that specific behaviour (Fishbein and Ajzen 1975).

In respect to technology, people tend to have a generalised attitude toward self-service technologies (Bobbitt and Dabholkar 2001). Favourable attitudes toward using technology in general may result in favourable attitudes toward using self-service technologies (Dabholkar 1996).

2.6.1 Attitudes and responses to SSCIT's

Attitudes are found to be associated with technological behavioural intentions (Eastlick 1996; Lin and Hsieh 2006). Direct links are found between service quality, value, satisfaction and behavioural intentions (Cronin et al. 2000; Zeithaml, Berry and Parasuraman 2002). Positive attitudes have been found to positively influence behavioural intentions and thus adoption of self-service technologies (Allen, Machleit and Kleine 1992; Dabholkar 1996; Bobbitt and Dabholkar 2001).

Generally, customers who prefer self-service also expect greater control and service quality (Dabholkar 1990; Kelley, Donnelly Jr and Skinner 1990). If customers experience bad service quality and overall dissatisfaction, this may affect customers' attitudes toward that particular service (Bobbitt and Dabholkar 2001).

While attitudinal research has been extant and findings recommending that positive attitudes result in positive behavioural intentions and adoption (Allen et al. 1992; Dabholkar 1996; Bobbitt and Dabholkar 2001) there has been no clear link on the contribution these constructs have made to informing positive adoption of self-service technologies.

This leads to the following hypothesis:

Hypothesis 4: Passengers attitude is positively associated with their adoption of self-service check-in technologies.

2.6.2 Adoption and responses to SSCIT's

Early studies have supported the relationship between service quality and behavioural intentions concluding that providing good quality of service leads to greater adoption of that particular service (Zeithaml 1988). In relation to the use of internet services, it was found that retention (frequent use and adoption) of e-customers is generally due to the provision of superior quality of service (Reichheld and Schefter 2000). For technology based communications between sellers and customers, a significant correlation existed between customer's satisfaction and future adoption (MacDonald and Smith 2004). This was supported in alternate research where positive customer satisfaction resulted in an increase in technology behavioural intentions (Taylor et al. 2002).

However, in later research the preceding findings were not supported. In Taiwan using a sample frame of the general public in densely populated/frequently used areas, it was found that positive attitudes of customers increases their ability and willingness to use technology thus resulting in higher perception of service quality (Lin and Hsieh 2006).

Lin and Hsieh (2006) requested that this finding require further research as the studies of Liljander et al. (2006) and others did not conduct causal relationship analyses between the constructs of attitudes, adoption and responses.

This leads to the following hypothesis:

Hypothesis 5: Passengers adoption are positively associated with their responses to self-service check-in technologies.

2.6.3 Attitudes, adoption and responses to SSCIT's

Thus, from the above literature, it can be summarised that human behaviour is intended and measurable (Fishbein and Ajzen 1975; Ajzen and Fishbein 1980) and for self-service technologies, positive attitudes may result in positive adoption and positive responses to self-service technologies (Allen et al. 1992; Dabholkar 1996; Bobbitt and Dabholkar 2001).

2.7 Contextual and demographic variables

Airports Council International is a worldwide association representing airports globally in respect to common interests and promoting cooperation (Airports Council International 2011). Airports Council International, together with ACSA, conducts an in-house quarterly survey of the passenger profile at each of its major airports. From the last in-house survey conducted at OR Tambo Airport, the following snapshot results were obtained from a sample of foreign and South African flying passengers participating in the study at OR Tambo on a specific day (Airports Council International and ACSA 2011):

- 51 % of passengers were South African citizens;
- 53 % of passengers were male;
- 58 % of passengers were travelling for business purposes;
- 95 % of passengers travel on economy class travel, 4% business class travel and approximately 1% travelled on a first class ticket;

- 40 % were within the age group of below 35 year old;
- 22 % were within the age group of 35-44 year old;
- 17%were within the age group of 45-54 year old;
- 14 % were within the age group of 55-64 year old; and
- 7 % were above the 65 year old age group.

These demographic baseline statistics will be used as a benchmark when considering the sample frame.

The next section will provide a summary of the literature review discussed.

2.8 Conclusion of literature review

This section summarises the main conclusions from research literature reviewed and presents the proposed research hypotheses.

The material reviewed suggests that there is extant research globally on *TR* and attitudes towards adopting technology. There is substantive research conducted using the TRI and replication studies using the TRI were conducted globally (Tsikriktsis 2004; Liljander et al. 2006; Lin and Hsieh 2006). Parasuraman (2000), after considering various literature and previous studies, developed the *TR* scale using a sample in the United States. Tsikriktsis (2004) replicated and extended the scale with success in the United Kingdom. Lin and Hsieh (2006) used the model in their study in Taiwan and Zeithaml et al. (2002) used the scale in their website case study of *TR*. Thus, based on the repeatability of the TRI scale in the various studies, it can be assumed that the TRI scale is reliable as a measure of *TR*.

There is only one record of evidence of the application of the TRI scale in the Finnish aviation study conducted by Liljander et al. (2006). However, in this study it was not possible to ascertain causal relationships between all TR constructs (Liljander et al. 2006). In their recommendations, the authors suggested further research is investigated to validate the constructs of Discomfort and Insecurity.

Favourable attitudes toward using technology can generally be expected to result in favourable attitudes toward using self-service technologies, positively influence behavioural intentions and thus result in adoption of self-service technologies (Allen et al. 1992; Dabholkar 1996; Bobbitt and Dabholkar 2001).

In South Africa there is no evidence of such a study been undertaken in the aviation environment. Thus, replicating the study to adapt to the South African context will contribute to scholarly research in this area. Passenger profile baseline statistics, from the last in-house survey conducted at OR Tambo International Airport (Airports Council International and ACSA 2011), were obtained and will be considered for use in the sampling framework.

The South African aviation environment will benefit from the study as it will provide more insight into the TR constructs and attitudes of the South African flying population.

Therefore, the effects of *TR* on passengers' attitudes toward, adoption of, and responses to SSCIT's in South Africa need further investigation.

This leads in summary to the following proposed hypotheses to address the research problem:

- **Hypothesis 1:** Passengers overall *TR* is positively associated with their attitudes towards the use of SSCIT's;
- **Hypothesis 2:** Passengers overall *TR* is positively associated with their adoption of the use of SSCIT's;
- **Hypothesis 3:** Passengers overall *TR* is positively associated with their response to the use of SSCIT's;
- **Hypothesis 4:** Passengers attitude is positively associated with their adoption of SSCIT's; and
- **Hypothesis 5:** Passengers adoption is positively associated with their responses to SSCIT's.

CHAPTER 3: RESEARCH METHODOLOGY

This section describes the methodology employed to conduct this research. Firstly, the literature around quantitative research is discussed, followed by a detailed discussion on the research design and research instrument used.

The data collection method is discussed briefly, followed by addressing the external and internal validity concerns that have arisen.

3.1 Research methodology /paradigm

The study used quantitative approaches to determine the effects of *TR* on passengers' attitudes toward, adoption of, and responses to SSCIT's in South Africa.

The quantitative approach amongst others, comprises the use of strategies of enquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data (Cresswell 2003).

For example, the strengths of peoples' personal preferences and opinions are summarised and interpreted using statistics to provide better understanding into their nature and interrelationships (Leedy and Ormrod 2010).

Thus the quantitative approach was better suited to achieve the objectives of this study.

The research took the form of a structured questionnaire that was electronically distributed to airlines' passengers. In depth detail on the questionnaire and the process followed is provided in the following section.

3.2 Research design

The research design consists of statistical analysis in the form of a structured questionnaire that was electronically distributed via e-mail to airline databases of flying passengers using ACSA airports.

Contextualisation of the study and its application in the South African environment has been taken into consideration, which is appropriate and in line with previous global research (Parasuraman 2000; Tsikriktsis 2004; and Liljander et al. 2006).

The advantages of the questionnaire method for the collection of passenger data were:

- The responses are controlled and focussed; and
- The questionnaire is less time consuming than conducting interviews.

The disadvantages of the questionnaire method for the collection of passenger data were:

- The respondents are limited in their responses to the questions that have been structured.

Having briefly discussed the adopted research design approach, the following section will provide deeper insight into the sampling methodology used.

3.3 Population and sample

3.3.1 Population

The population is the flying South African population using the services of commercial airlines operating in South Africa.

An online survey was developed and surveys were distributed to databases of airline passengers. 770 responses were received within a 3 week period. The response rate could not be calculated, as information relating to the list of airline databases was not shared and held confidential by respective airlines.

None of the respondents were requested to provide names on the questionnaires, guaranteeing confidentiality. The e-mail addresses of respondents that completed the survey were blocked to prevent more than one questionnaire being completed by

any respondent. This was deemed adequate defence against obtaining biased results.

3.3.2 Sample and sampling method

Baseline statistics from the in-house survey conducted at OR Tambo International Airport in 2011, was used as a guide to determine a fairly representative sample of the flying population (Airports Council International and ACSA 2011).

For this study, the sample was based on convenience samples taken by electronic distribution of questionnaires via e-mail to flying passengers using ACSA airports.

A mix in the type of passenger for example business or leisure, age, gender and race was representative of the flying population by ensuring that the physical questionnaires were distributed randomly to domestic airlines' passengers as well as some big corporate companies that were willing to distribute the survey. The number of sample data obtained was 770 responses.

"Sampling error reflects the difference between a result based on a sample and that which would have been obtained if the entire population in question had been studied" (Diamantopoulos and Schelgelmilch 2000:13). In this instance, caution was taken to acknowledge and minimise the negative impact of sampling error on the proposed findings.

Participation in the electronic questionnaire was self-encouraged as these individuals elected to be part of the known database of airlines' and generally participate in initiatives for improving their passenger experience.

After discussing the sampling methodology, the next section will lead onto the constructs of the research instrument intended for use.

3.4 The research instrument

The research instrument used as the basis of the questionnaire for this study is the replication study conducted by Liljander et al. (2006). However, the focus and objective will differ slightly:

- The focus is that from an airport perspective and not airline perspective. Thus any passenger from any airline participated in the study;
- The SSCIT's are all airport common use infrastructure based instead of airline specific initiatives;
- There are no comparison of adoption rates of SSCIT's between the airlines; and
- The questions for testing attitudes, adoption and responses are amended and thus the statistical analyses may differ slightly.

A copy of the research instrument is appended in Appendix A.

3.4.1 Demographic data

Section 1 of the questionnaire contains 4 questions that relate to passengers' demographic profile. The choice for this demographic criteria is to ensure a fairly representative sample in line with baseline statistics gathered in the ACSA passenger profile study (Airports Council International and ACSA 2011). Questions related to gender, age group, reason of travel and class of ticket purchased require a single choice response and were categorised in relation to the specified criteria.

A sample item: "What is your gender?" and a single choice of response is required to one of the following category of answers: "Male" (1), "Female" (2).

Passenger demographic details (gender, class of ticket purchased, frequent mode of travel and age) were collected as control measures.

These control measures provided interesting insight into the studied passenger profile. Male respondents made up 76% of the sample. Travelling for business

purposes was the main reason of travel. 69% of respondents made use of counter check-in. 85% of respondents travelled mainly economy class.

While sample data obtained did not necessarily follow the statistics obtained in the control benchmark of ACSA, the sample data gathered did follow normal distribution characteristics. The Pearson Chi-Square Test confirmed that there is statistical significant association between the variables when gender is compared to class of ticket purchased (9.20, p=.01), frequent mode of travel (66.33, p= 0) and age of passengers (68.38, p= 0). The chi-square statistic is used to test if any patterns of outcomes exist in random variables of a population (Wegner 2002).

A fairly representative sample was obtained between the ages of 18 to 65+ years spread as follows:

- Below 35 years old: 8.8%;
- 35 years old to 44 years old: 14%;
- 45 years old to 54 years old: 26.9%;
- 55 years old to 64 years old: 34.8%; and
- Above 64 years old: 15.6%.

Table 1 below provides a breakdown of the demographic profile of the sample population against the control benchmark study of ACSA (Airports Council International and ACSA 2011) . It is acknowledged that there is a variance between this study and the ACSA study however no sample data from the ACSA study was available to conduct any further comparative studies between samples.

Table 1: Demographic profile comparison to ACSA benchmark study

Description of Variable	ACSA benchmark	Sample Collected
Male	53%	76%
Business Travel	58%	69%
Economy Class of ticket	95%	85%
Age Under 35	40%	8.8%
Age 35 – 44	22%	14%
Age 45 – 54	17%	26.9%
Age 55 – 64	14%	34.8%
Age above 64	7%	15.6%

3.4.2 Measure of attitude

Attitude towards SSCIT's is measured using nine items in total garnered from Curran and Meuter (2005) to measure respondents' attitudes towards each type of SSCIT on the 1-7 point Likert scale with end points "Very Bad "(1) to "Very Good" (7) for attitude feelings, "Very Unpleasant "(1) to "Very Pleasant" (7) for attitudes towards use of, "Strongly Dislike "(1) to "Strongly Like" (7) for feelings of like towards each type of service. Section 2 of the questionnaire contains 12 questions that gather passengers' level of attitude towards each type of SSCIT. A sample item: "When using counter check-in, I generally feel:"

The attitude construct consists of the dimensions of passenger liking, passenger feeling and passenger experience (pleasant/unpleasant) toward each check-in mode. In each check-in mode group, the data was first tested for internal reliability (consistency) using the Cronbach Alpha test (Christmann and Van Aelst 2006).

The three dimensions, when aggregated under the attitude construct reported adequate reliabilities for each of the check-in modes and thus can be concluded that they fully explain the attitude construct. Table 2 below shows the reported Cronbach Alpha scores per check-in mode.

Table 2: Cronbach Alpha scores of attitude constructs per check-in mode

	Cronbach's Alpha scores	Cronbach's Alpha scores based on standardized items	No. of Items
Attitude-counter	.95	.95	3
Attitude-kiosk	.93	.93	3
Attitude-internet	.95	.95	3
Attitude –mobile telephone	.96	.96	3

The mean score of passengers' attitude toward internet check-in was 5.46, compared to kiosk check-in of 5.20, mobile telephone check-in 4.3 and counter check-in 4.07. There is a statistically significant difference between these results,

with internet check-in sharing more of the willingness by passengers to check-in for their flight.

Interestingly, according to these results, internet check-in scores the highest means in each of the individual attitude constructs. This translates in respect to internet check-in that passengers generally enjoy using the most (5.50); have the most pleasant check-in experience (5.42) and feel good about using (5.45) that specific check-in mode.

Kiosk check-in trails very close behind internet check-in and is consistently strong on all the individual attitude constructs. Generally passengers also enjoy using (5.28); have a pleasant check-in experience (5.16) and feel good about using (5.16) that specific check-in mode.

Mobile telephone check-in presents different results were passengers also enjoy using (5.28); but do not necessarily have a pleasant (3.9) check-in experience and do not feel good about (3.92) using that specific check-in mode.

Counter check-in is consistently weak on all the individual attitude constructs. It seems as if passengers do not enjoy using (3.92); do not have a pleasant check-in experience (4.08) and do not feel good (5.16) about using that specific check-in mode.

Interestingly the mean scores for pleasant use of a specific check-in mode and the feelings experienced by the passenger follow each other. This may mean that passengers' feelings towards a specific check-in mode are replicated in their evaluation of the service which may result in unfounded and underused technology (Curran and Meuter 2005).

3.4.3 Adoption

Adoption of SSCIT's is measured in 2 parts. Part 1 consists of 4 items garnered from Curran, Meuter and Surprenant (2003) to measure respondents' frequent use of, and intention to use, SSCIT's on the 1-7 point Likert scale from "Very Unlikely "(1)

to “Very Likely” (7). Section 3, of the questionnaire contains 4 questions that gather passengers’ level of likeliness to adopt each type of SSCIT. A sample item: “I frequently use and intend making use of the self-service kiosk:”.

Part 2 measures passengers’ preference of adoption for a particular type of SSCIT on a rank order response from “1st preferred choice“ to “3rd preferred choice”. Section 3, of the questionnaire contains 3 questions that require passengers to choose their level of preference to use each type of SSCIT. A sample item: “My 1st order of preference when checking in for my flight is:”

The adoption construct remained as single measure in its original form as garnered from Curran, Meuter and Surprenant (2003).

The median adoption score of passengers toward kiosk and internet check-in was 6, compared to counter check-in of 4, mobile telephone check-in 2. There is a statistically significant difference between these results where on average 50% of passengers are very likely to make use of both kiosk and internet check-in in future, followed by 50% likely to use counter check-in and 50% unlikely to use mobile telephone check-in.

Not surprisingly, internet check-in dominated as the most preferred SSCIT by 56.5% of the respondents, followed by kiosk check-in (37.4%) and mobile telephone check-in by 6.1%. As second most preferred SSCIT; respondents chose kiosk check-in (44.3%) followed closely by internet check-in (36.8%) and mobile telephone check-in (18.8%).

It can be deduced from the analysis that internet check-in dominates as the preferred adoption check-in method followed by kiosk check-in. It is important to note that in the second most preferred category, there was a significant rise in the preference for mobile telephone check-in adoption.

3.4.4 Responses

Responses to SSCIT's are measured using 4 items garnered from Lin and Hsieh (2005) to measure respondents' overall satisfaction and quality of service experience on the 1-7 point Likert scale from "Strongly Disagree "(1) to "Strongly Agree" (7). Section 4, of the questionnaire contains 4 questions that require passengers' to choose their level of satisfaction when making use of a specific type of SSCIT. A sample item: "I am overall satisfied and enjoy the quality of service when using the self-service kiosk:".

The response construct remained as a single measure in its original form as garnered from Lin and Hsieh (2005).

The median response score of passengers with kiosk and internet check-in was 6, compared to counter check-in of 4, mobile telephone check-in 1. There is a statistically significant difference between these results where on average 50% of passengers are generally more satisfied when making use of both kiosk and internet check-in, followed by 50% likely to be satisfied using counter check-in and 50% unsatisfied with use of mobile telephone check-in.

It is interesting that 2.9% of respondents never used counter check-in; 8.7% never used kiosk check-in; 12.2% never used internet check-in and 46.6% never used mobile telephone check-in. (Mobile telephone check-in was only recently launched in South Africa and this could explain the low adoption rate.)

The next sections will present the analyses for each of the hypotheses.

3.4.5 Measurement of TR construct

TRI consists of qualitative and empirical studies with the main aim of understanding customers' technology related attitudes and behaviours (Parasuraman 2000). The TRI scale (Parasuraman 2000) best describes the *TR* construct and thus is best suited for this type of study (Lin and Hsieh 2005). Liljander et al. (2006), in her replication study of the Finnish aviation environment, used only 12 of the 36 TR

constructs proposed in the TRI. This decision was based on the reported factor loadings and the applicability to the relevant market (Liljander et al. 2006). For this study the shortened TRI scale (Parasuraman 2000) was used.

Section 5 of the questionnaire contains 12 TR related items on the 7 point Likert scale proposed to measure respondents TR to each of the 12 TR items on a scale from “Strongly Disagree “(1) to “Strongly Agree” (7).

The 12 TR items consist of:

- Optimism – consisting of 3 items in the category;
- Innovativeness - consisting of 3 items in the category;
- Discomfort - consisting of 3 items in the category; and
- Insecurity - consisting of 3 items in the category.

A sample item: “Technology gives me more freedom of mobility”.

The TR data was first tested for internal reliability (consistency) using the Cronbach Alpha test. The value of 0.7 is often used as the cut off value for Cronbach Alpha tests and thus the minimum value for use as the reliability of the test (Christmann and Van Aelst, 2006).

Only innovativeness and optimism had adequate reliabilities of $\alpha = .84$ and $\alpha = .85$ respectively. The reliabilities of insecurity and discomfort were not reliable as individual dimensions of TR with reported inadequate reliabilities of $\alpha = .53$ and $\alpha = .51$ respectively. However, when TR dimensions of insecurity and discomfort are grouped together, the resultant provides a stronger reliability score $\alpha = .66$. As the main aim of this study was not solely intended to investigate the particular quality dimensions of TR, TR was grouped into innovativeness, optimism and negativity quality dimensions.

Table 3 below shows the Cronbach Alpha scores calculated for each of the TR quality dimensions noting that innovativeness ($\alpha = .84$) and optimism ($\alpha = .85$) are highly reliable, whereas negativity ($\alpha = .66$) merely meets the minimum cut off value.

Table 3: Cronbach Alpha scores per TR quality dimension

	Cronbach's Alpha scores	Cronbach's Alpha scores based on standardized items	No. of Items
Innovativeness	.84	.84	3
Optimism	.85	.85	3
Insecurity	.53	.53	3
Discomfort	.51	.51	3
Negativity	.66	.66	6

Thus it can be concluded that for the purposes of this study innovativeness, optimism and negativity (α = .7 rounded off) fully explains overall TR construct.

3.4.6 Benefits of the research instrument

The benefits of using the instrument for this study are:

- The instrument was used before and results can be compared to other studies; and
- There was some contribution to knowledge in this area of study.

The disadvantages of using the instrument for this study are:

- The implications of amending and shortening the original TRI Index have not been identified and quantified; and
- Any South African cultural specific attributes will not be able to be captured and measured.

Having framed the research instrument and provided substantiation for the re-use of the instrument in this replication study, the following sections are focussed on data collection and data analysis and then leads on to address potential limitation concerns of validity and reliability of this study.

3.5 Procedure for data collection

Data was collected by electronically distributing questionnaires via e-mail to a known database of flying passengers using ACSA airports.

To ensure a fairly representative sample, the electronic questionnaires were distributed to all passengers on the database.

3.6 Data analysis and interpretation

An electronic questionnaire, designed on a proprietary company's software was used for distributing and aggregating data.

The IBM SPSS Software V19 is a statistical tool that was employed to conduct the analysis and provide suitable reports for interpretation of data for this research.

The questionnaire consists of 5 sections:

- Section 1 – Questions 1.1 to 1.4 are associated with qualitative type data and solicit nominal scaled data responses. Where numbers are used to identify different categories of people, objects etc., and can be classified as nominal data (Leedy and Ormrod 2010). The data received was compared with baseline statistics received in the ACSA in-house passenger profile survey to confirm the fairly representative sample used in this survey.

- Section 2 – These set of questions target the respondents' attitude towards use of SSCIT's. Questions 2.1 to 2.4 are associated with quantitative variables and solicit interval-scaled data responses. Interval-scaled data reflect quality or characteristic differences with standard units of measurement (Leedy and Ormrod 2010).

- Section 3 - These set of questions target the respondents adoption of use of SSCIT's. Questions 3.1 to 3.4 are associated with quantitative variables and

solicit interval-scaled data responses. Questions 3.5 to 3.7 are associated with qualitative variables and solicit ordinal data responses. Ordinal data describes the degree to which entities have a certain quality or characteristic (Leedy and Ormrod 2010).

- Section 4 – These set of questions target the respondents overall satisfaction with and quality of service experienced in the use of SSCIT's. Questions 4.1 to 4.4 are associated with quantitative variables and solicit interval-scaled data responses.

- Section 5 - These set of questions target the respondents perception of use of technology in general using the shortened TRI scale (Parasuraman 2000). Questions 5.1 to 5.12 are associated with quantitative variables and solicit interval-scaled data responses.

  The questions in section 5 are both positively and negatively framed. As these are the original questions in the TRI scale (Parasuraman 2000), and to maintain consistency, these questions were not changed. However, it is acknowledged that reverse coding of these data points were to be taken into consideration in the statistical analysis.

The following data analysis tests were carried out:

- A frequency analysis was first carried out on all questions to determine the data integrity of the received responses.

- Questions 2.1 to 2.4, and 5.1 to 5.12, multi item scale measures exist, tests for reliability were done to ensure that there is internal consistency in the measurements taken. The negatively posed items/questions in section 5 were first reverse coded for consistency prior to testing for reliability. The Cronbach's Alpha Index was used to test for repeatability. The concepts of reliability and the Cronbach Alpha Index are explained in more detail in the forthcoming section.

- Multiple regression analysis techniques were applied to test the underlying relationships between attitudes, adoption and responses to specific TR dimensions and other variables as control variables. Multiple Regression is the analysis of relationships between a dependent variable and a number of independent variables (Diamantopoulos and Schelgelmilch 2000). Passenger attitude towards each type of SSCIT (question 2.1 to 2.12) is regressed on overall TR (question 5.1 to 5.12) and on specific TR dimensions (innovativeness, optimism and negativity) based on the outcome of data analysed. Similarly passenger adoption (question 3.1 to 3.4) and passenger response (question 4.1 to 4.4), in terms of satisfaction and service quality, towards each type of SSCIT is regressed on overall TR and on specific TR dimensions.

- Correlation analysis, between the constructs was investigated to test the research propositions. Many variables are related to some extent, and correlation analysis aims to quantify, describe and examine the strength of these relationships (Wegner 2002).

- Finally, mediation analysis regression techniques were applied to assess whether passenger attitudes promote the use and adoption of SSCIT's which then leads to overall positive responses to SSCIT's.

The risk of an incorrect conclusion of statistical significance increases if wrong statistical techniques are used (Jamieson 2004). Thus assuming an interval scale for Likert type response formats is premature because descriptive and inferential statistics differ for ordinal and interval data (Cohen, Manion and Morrison 2000). However the assumption that Likert type response formats constitute interval type data measurement has become a common practise in research (Blaikie 2003). This practise was not well received by some researchers. Carifio and Perla (2007), in their article highly criticised the abuse of such Likert type response formats and

associated data analysis assumptions. For the purposes of this study it shall be reliably assumed that ordinal level categorical data behave as interval level data.

Figure 1 illustrates the relationships tested. Please refer to Appendix B for a summary consistency matrix of the analyses conducted for each of the sub problems.

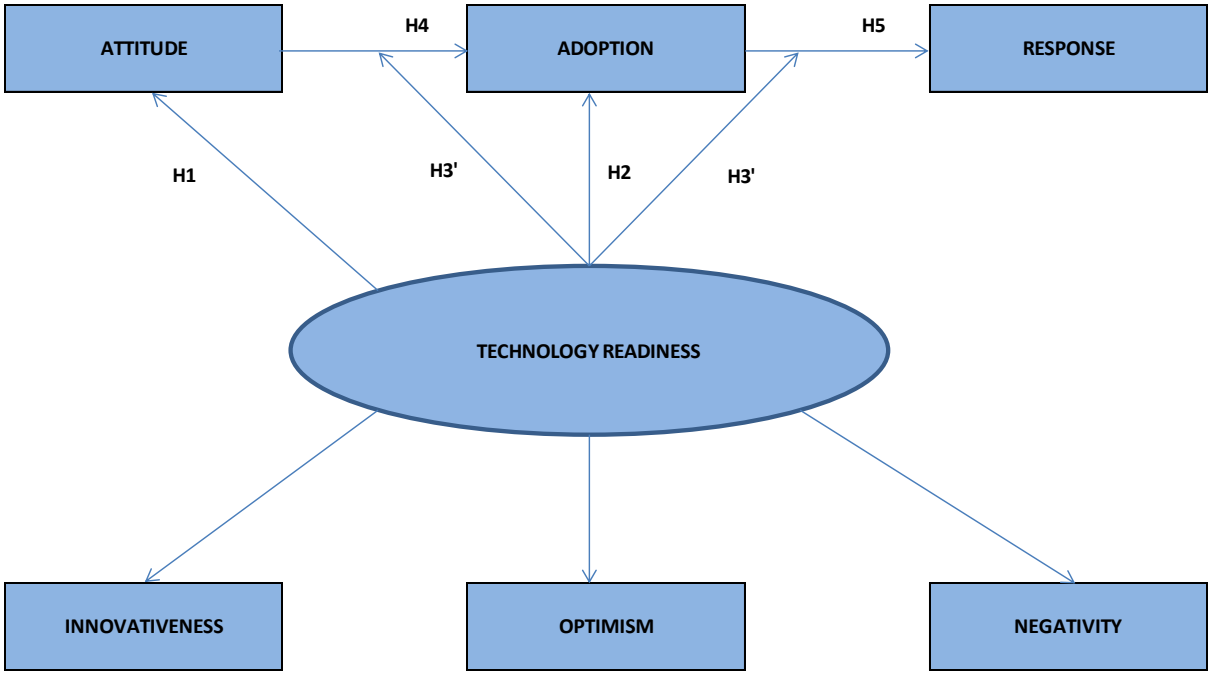

Figure 1: Relationships between TR, attitudes, adoption and response (Parasuraman 2000; Liljander et al. 2006; Lin and Hsieh 2006)

3.7 Limitations of the study

The study has a number of potential limitations:

- In the methodology, only 12 (Liljander et al. 2006) of the 36 (Parasuraman 2000) TR items are included. Liljander et al. (2006) based the reduced TR items on the reported factor loadings of Parasuraman (2000) and relevance to the Finnish aviation environment. The impact of this decision has not been quantified. Since the aim of this study is to investigate the relationship between *TR* and overall attitude, adoption and response to SSCIT's, rather

than particular quality dimensions, there should be minimal if any, impact to the outcome of this study;

- A convenience sample of passengers departing out of OR Tambo International Airport and the known passenger database may not necessarily be representative of the South African commercial flying population. However, the sample frame was compared to the baseline passenger profile internal study conducted and no significant omissions or deviations existed that could impact the outcome;

- Previous studies (Taylor et al. 2002; Liljander et al. 2006) did not fully validate dimensions of Insecurity and Discomfort in the TR construct. The outcome of this recommends progressive groupings or categorisation which is discussed in further chapters

- Variables for TR, attitudes, adoption and responses used in alternate and previous research was not be included in this study as this was too broad, diluted statistical focus and impractical for the purpose of this study.

3.8 Validity and reliability

Leedy and Ormrod (2001:28) define validity of a measurement instrument as “the extent to which the instrument measures what it is intended to measure.” This simply means that the measurements taken are correct (Mellville and Goddard 1996).

Leedy and Ormrod (2001:29) also define reliability as “the consistency with which a measuring instrument yields a certain result when the entity being measured has not changed.” This simply means that measurements are consistent if the experiment is repeated under the same conditions (Mellville and Goddard 1996).

Validity and reliability of research instruments are important as they influence the following (Leedy and Ormrod 2010):

- New information obtained about the phenomenon under study;
- The probability that statistical significance were obtained in data analysis; and
- The extent to which meaningful conclusions can be drawn.

3.8.1 External validity

External validity is the extent to which results of a research study can apply to situations beyond the study itself and where conclusions are drawn that can be generalised (Leedy and Ormrod 2010).

Aviation travel is a global phenomenon that consists of global passengers representing the flying population using relatively standard airport infrastructure, processing methods and in particular self-service technologies. ACSA airports compete annually in global Airports Council International benchmarks and are part of the global network of airports that attract the global population to South Africa.

In context of this study, considering the global aviation environment and the research instrument used, it can be assumed that the external validity of this study is reasonably high.

3.8.2 Internal validity

The ability to draw accurate conclusions about cause-and-effect and other relationships within data in a research study is yielded by the extent of its design and data. (Leedy and Ormrod 2010).

The study of *TR* and relationships to attitudes using the TRI scale (Parasuraman 2000) was researched by Taylor et al. (2002) and further applied in research by a variety of scholars (Tsikriktsis 2004; Liljander et al. 2006; Lin and Hsieh 2006). Each study drew on previous literature findings and recommendations which was applied in their specific research. Liljander et al. (2006) applied the TR constructs to the aviation environment in particular that supported previous findings using the TRI scale.

It is of concern that a number of the previous studies (Taylor et al. 2002; Lin and Hsieh 2005; Liljander et al. 2006) were unable to extract the four TR dimensions and this raises concerns regarding the validity of some the TR constructs. However, as more than one study has proven similar outcomes, there can be some level of confidence that internal validity criteria is met and warranted conclusions can be drawn.

3.8.3 Reliability

The extent to which all items in a measurement instrument provides similar results is defined as reliability (Leedy and Ormrod 2010). As stated before Liljander et al. (2006) replicated the study; however they only used 12 of the original 36 TR constructs. The shortened TR constructs delivered similar results as previous research (Tsikriktsis 2004; Lin and Hsieh 2006).

However, the study of Liljander et al. (2006) has not been replicated and the reliability of the shortened instrument has not been tested.

To maximise reliability (Leedy and Ormrod 2010):

- The research instrument for this study was kept consistent not changed materially from the study of Liljander et al. (2006);
- The instrument does not allow for any subjectivity in the evaluation of responses.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents and describes the findings and the analyses conducted, which aims to support the hypotheses tested. It begins with presentation of descriptive statistics of the relationships identified between the main variables.

The analyses are structured by firstly establishing the relationships between the main variables, then establishing the relationships (if any) between the independent variables, followed by mediation analysis between the independent variables and finally concluded with moderated regression analysis.

Each set of analyses is presented and discussed separately followed by a short description of the method of analysis used.

Data was exported to IBM SPSS v19 and analysed for descriptive statistics using the calculations of first quartile; median, mode, third quartile, inter quartile range; mean; mode; standard deviation; frequency; minimum and maximum. Attitude and TR constructs consist of multi item scales and their validities were tested using the Cronbach Alpha reliability analysis. The data was prepared and formatted into the required data sets prior to analysis. The main analyses conducted used hierarchical regression (hypotheses 1, 2, and 3) and mediation (hypotheses 4 and 5) to test each of the identified hypotheses. The detailed analyses conducted and related IBM SPSS graphs are not attached due to their magnitude and are available upon request.

4.2 Descriptive statistics

Descriptive statistics of the main variables are presented in Table 4 overleaf. While all relationships are shown, only those worthy of mention will be discussed.

Strong positive relationships exist between innovativeness and optimism whereas weak negative relationships exist between innovativeness and negativity. Weak positive relationships generally exist for passengers' attitudes towards and adoption of self-service check-in modes whereas weak negative relationships exist for counter check-in. Weak positive relationships can be seen to exist between innovativeness and passengers response levels to the various self-service modes of check-in, whereas weak negative relationships exist for counter check-in.

Weak negative relationships exist between optimism and negativity. Weak positive relationships generally exist for passengers' attitudes towards and adoption of self-service check-in modes whereas weak negative relationships exist for counter check-in. Weak positive relationships can be seen to exist between optimism and passengers' response levels to the various self-service modes of check-in, whereas weak negative relationships exist for counter check-in.

Weak positive relationships exist between negativity and passengers' attitudes towards, adoption of and their response levels with counter check-in. Weak negative relationships exist between negativity and passengers' attitudes towards, adoption of and their response levels with self-service check-in modes.

Strong positive relationships exist between passengers' adoption of counter check-in; their attitudes towards counter check-in and their reported levels of response to counter check-in. Generally weak negative relationships exist between adoption of counter check-in and all other main variables.

Very strong positive relationships exist between passengers' adoption of self-service check-in modes; their attitudes towards that specific check-in option and their reported levels of response to the use of that specific check-in option. Generally weak negative relationships exist between adoption of self-service counter check-in and all other main variables.

In summary, strong relationships can be seen to exist between attitude and adoption constructs. The next section will analyse the relationships between these two constructs further and the reported relationships will be presented.

Table 4: Correlations and descriptive statistics for regression variables

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	**Innovativeness**	0.01	0.91	(.84)														
2	**Optimism**	-0.01	0.94	.67***	(.85)													
3	**Negativity**	0.01	0.83	-.42***	-.55***	(.66)												
4	**Adoption of Counter**	4.20	1.89	-.19***	-.35***	.32***	1.00											
5	**Attitude towards Counter**	4.07	1.70	-.19***	-.35***	.30**	.76***	(.95)										
6	**Adoption of Kiosk**	5.02	1.96	.31**	.47**	-.33**	-.41**	-.35**	1.00									
7	**Attitude towards Kiosk**	5.19	1.51	.36***	.58***	-.41***	-.40***	-.34***	.81***	(.93)								
8	**Adoption of Internet**	5.27	1.97	.31***	.47***	-.33***	-.33***	-.28***	.24***	.26***	1.00							
9	**Attitude towards Internet**	5.44	1.52	.39***	.57***	-.41***	-.34***	-.31***	.29***	.47***	.79***	(.95)						
10	**Adoption of Mobile Telephone**	3.02	2.08	.36***	.38***	-.26***	-.27***	-.25***	.30***	.28***	.43***	.34***	1.00					
11	**Attitude towards Mobile Telephone**	3.81	1.84	.43***	.50***	-.38***	-.33***	-.32***	.30***	.44***	.39***	.52***	.77***	(.96)				
12	**Counter Response**	4.08	1.80	-.14***	-.28***	.21***	.66***	.84***	-.31***	-.28***	-.24***	-.24***	-.23***	-.30***	1.00			
13	**Kiosk Response**	5.01	1.63	.23***	.46***	-.36***	-.32***	-.23***	.67***	.81***	.15***	.31***	.19***	.28***	-.15***	1.00		
14	**Internet Response**	5.32	1.54	.27***	.47***	-.30***	-.30***	-.22***	.20***	.35***	.72***	.81***	.21***	.35***	-.10**	.41***	1.00	
15	**Mobile Telephone Response**	3.75	1.79	.33***	.46***	-.34***	-.29***	-.18***	.26***	.36***	.40***	.47***	.74***	.81***	-.11**	.37***	.49***	1.00

*Note: N =761, *** = p <.01, ** = p <.05, * = p <.1*

4.3 Regression analysis between attitude and adoption

In further analysing attitude and adoption constructs, multiple regression analysis techniques were applied to test the underlying relationships (if any) between these constructs. Firstly passengers' attitude is regressed on adoption of each type of SSCIT's. Secondly passenger's attitude towards and their adoption of each type of SSCIT's is regressed on their reported response levels.

4.3.1 Regression model: Attitude on adoption

The order of variables entered is: (1) passenger demographics as a set of control variables; (2) each of the TR quality dimensions; (3) passenger's attitude towards that specific check-in mode; (4) the moderated value of TR multiplied by passengers' attitude towards that specific check-in mode; (5) passenger's adoption of that specific check-in mode (dependent variable).

The results obtained for each of the check-in modes are discussed separately.

Table 5 on the next page presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes on their adoption of counter check-in.

The percentage of the variance in counter check-in adoption obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .61), optimism (R^2 = .61) and negativity (R^2 = .61) is a good measure and fairly representative of a linear data fit for this study compared to the results obtained by Liljander et al. (2006) for innovativeness and optimism (R^2 = .061) and overall TR (R^2 = .046). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .60), optimism (Adj R^2 = .60), negativity (Adj R^2 = .60).

A. Counter check-in

Table 5: Hierarchical regression: Main effects of attitude on adoption of counter check-in

COUNTER ADOPTION						
	Attitude Path					
	Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β
Intercept	4.40***		4.40***		4.40***	
Male	-.01	.00	-.02	.00	-.01	.00
Leisure	-.04	-.01	-.04	-.01	-.04	-.01
Economy	-.31**	-.10	-.30**	-.10	-.31**	-.10
Age						
Age_Under35	.60***	.10	.54***	.10	.60***	.10
Age_35to44	.24*	.04	.30*	.10	.24*	.04
Age_45to54	.10	.01	.10	.01	.10	.01
Age_Above64	-.04	-.01	-.02	.00	-.04	-.01
Innovativeness	.01	.01	.03	.01	.01	.01
Optimism	.13*	-.10	-.20**	-.10	-.14**	-.10
Negative	.20***	.10	.20***	.10	.20***	.10
Attitude towards	.80***	.72	.80***	.71	.80***	.72
Counter X TR	-.01	-.01	.04	.04	.00	.00
R^2	.61		.61		.61	
Adj R^2	.60		.60		.60	
F	89.00***		89.15***		89.00***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Counter X TR" = the relationship of each TR dimension regressed on attitude towards counter check-in*

Attitude fully explains counter adoption in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .80 p <.01), optimism (B = .79 p <.01) and negativity (B= .80 p <.01).

When attitude increases by 1 unit, counter adoption increases by .80 units when regressed by innovativeness; .79 units when regressed by optimism and .80 units when regressed by negativity.

Of important note is that overall TR has minimal to no effect (with exception of optimism) on attitude towards counter check-in. This is prevalent for all types of TR

quality dimensions where the slopes are non-existent; innovativeness (B = .00), and negativity (B = .00) and fairly weak for optimism (B = .04).

B. Kiosk check-in

Table 6: Hierarchical regression: Main effects of attitude on adoption of kiosk check-in

KIOSK ADOPTION						
	Attitude Path					
	Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β
Intercept	4.82***		4.82***		4.81***	
Male	.13	.03	.14	.03	.14	.03
Leisure	-.30***	-.10	-.30***	-.10	-.23***	-.10
Economy	.20	.03	.20	.03	.20	.03
Age						
Age_Under35	.20	.02	.20	.02	.20	.02
Age_35to44	-.10	-.01	-.10	-.01	-.10	-.01
Age_45to54	.11	.02	.11	.02	.11	.02
Age_Above64	-.20	-.03	-.20	-.03	-.20	-.03
Innovativeness	.02	.01	.02	.01	.02	.01
Optimism	.01	.00	.01	.00	.01	.01
Negative	.03	.01	.03	.01	.03	.01
Attitude towards	1.02***	.80	1.02***	.80	1.03***	.80
Kiosk X TR	.00	-.00	.00	.00	-.02	-.02
R^2	.70		.70		.70	
Adj R^2	.70		.70		.70	
F	111.93***		111.93***		112.03***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Kiosk X TR" = the relationship of each TR dimension regressed on attitude towards kiosk check-in*

Table 6 above presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes on their adoption of kiosk check-in.

The percentage of the variance in kiosk check-in adoption obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .66), optimism (R^2 = .66) and negativity (R^2 = .66) is a good measure and fairly representative of a linear data fit for this study, compared to the results obtained by

Liljander et al. (2006) for innovativeness and optimism (R^2 = .102) and overall TR (R^2 = .291). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .66), optimism (Adj R^2 = .66) and negativity (Adj R^2 = .66).

Attitude fully explains kiosk adoption in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .82 p<.01), optimism (B = .82 p<.01) and negativity (B= .83 p<.01).

When attitude increases by 1 unit, kiosk response increases by 1 unit when regressed by innovativeness; 1 unit when regressed by optimism and 1 unit when regressed by negativity.

Of important note is that overall TR has no effect on attitude towards kiosk check-in. This is prevalent for all types of TR quality dimensions where the slopes are non-existent.

C. Internet check-in

Table 7: Hierarchical regression: Main effects of attitude on adoption of internet check-in

INTERNET ADOPTION						
	Attitude Path					
	Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β
Intercept	5.30***		5.30***		5.30***	
Male	-.02	.00	-.02	-.01	-.02	-.01
Leisure	.11	.03	.12	.03	.11	.03
Economy	.10	.01	.10	.01	.10	.01
Age						
Age_Under35	-.30	-.04	-.30	-.04	-.30	-.04
Age_35to44	-.30*	-.10	-.30*	-.10	-.30*	-.10
Age_45to54	-.11	-.03	-.11	-.02	-.11	-.02
Age_Above64	.01	.00	.02	.00	.02	.00
Innovativeness	-.02	-.01	-.02	-.01	-.02	-.01
Optimism	.11	.10	.10	.10	.11	.10
Negative	-.02	-.01	-.03	-.01	-.03	-.01
Attitude towards	1.00***	.80	1.00***	.80	1.00***	.80
Internet X TR	.02	.02	-.01	-.01	.01	.00
R^2	.63		.63		.63	
Adj R^2	.62		.62		.62	
F	92.62***		92.54***		92.53***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Internet X TR" = the relationship of each TR dimension regressed on attitude towards internet check-in*

Table 7 above presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes on their adoption of internet check-in.

The percentage of the variance in internet check-in adoption obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .63), optimism (R^2 = .63) and negativity (R^2 = .63) is a good measure and fairly representative of a linear data fit for this study compared to the results obtained by Liljander, et al (2006) for innovativeness and optimism (R^2 = .061) and overall TR (R^2 = .046). The quantity of the control independent variables added are reasonably

high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .62), optimism (Adj R^2 = .62), negativity (Adj R^2 = .62).

Attitude fully explains internet check-in adoption in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .99 p <.01), optimism (B = .98 p <.01) and negativity (B= .98 p <.01).

When attitude increases by 1 unit, internet check-in adoption increases by .99 units when regressed by innovativeness; .98 units when regressed by optimism and .98 units when regressed by negativity.

Of important note is that overall TR has minimal to no effect on attitude towards internet check-in. This is prevalent for all types of TR quality dimensions where the slopes are non-existent; innovativeness (B = .02), optimism (B = -.01) and negativity (B = .01).

D. Mobile telephone check-in

Table 8 Hierarchical regression: Main effects of attitude on adoption of mobile telephone check-in

MOBILE TELEPHONE ADOPTION						
	Attitude Path					
	Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β
Intercept	2.60***		2.61***		2.61***	
Male	.20	.04	.20	.04	.20	.04
Leisure	.10	.01	.10	.01	.10	.02
Economy	.30*	.10	.30*	.10	.30*	.10
Age						
Age_Under35	-.03	.00	-.03	.00	-.04	-.01
Age_35to44	-.13	-.02	-.12	-.02	-.10	-.02
Age_45to54	.03	.01	.03	.01	.03	.01
Age_Above64	-.26	-.05	-.24	-.04	-.22	-.04
Innovativeness	.16*	.07	.13	.06	.14*	.10
Optimism	-.03	-.01	.03	.01	-.05	-.02
Negative	.13	.05	.14*	.06	.13	.10
Attitude towards	.85***	.76	.85***	.76	.87***	.80
Mobile Telephone X TR	.08***	.07	.06*	.06	-0.03	-0.03
R^2	.60		.60		.60	
Adj R^2	.60		.60		.60	
F	69.30***		69.30***		68.90***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Mobile Telephone X TR" = the relationship of each TR dimension regressed on attitude towards mobile telephone check-in*

Table 8 above presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes on their adoption of mobile telephone check-in.

The percentage of the variance in mobile telephone check-in adoption obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .60), optimism (R^2 = .60) and negativity (R^2 = .60) is a good measure and fairly representative of a linear data fit for this study compared to the results obtained by Liljander, et al (2006) for innovativeness and optimism (R^2 = .061) and overall TR (R^2 = .046). The quantity of the control independent variables added are reasonably

high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .59), optimism (Adj R^2 = .59), negativity (Adj R^2 = .59).

Attitude fully explains mobile telephone check-in adoption in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .85 p <.01), optimism (B = .85 p <.01) and negativity (B= .87 p <.01).

When attitude increases by 1 unit, internet check-in adoption increases by .85 units when regressed by innovativeness; .85 units when regressed by optimism and .87 units when regressed by negativity.

Of important note is that overall TR has weak to moderate effects on attitude towards mobile telephone check-in. This is prevalent for all types of TR quality dimensions where the slopes are moderate; innovativeness (B = .08), optimism (B = -.06) and weak for negativity (B = -.03).

4.3.2 Attitude and adoption regression on response model

The order of variables entered is: (1) passenger demographics as a set of control variables; (2) each of the TR quality dimensions; (3) passenger's attitude towards that specific check-in mode; (4) passenger's adoption of that specific check-in mode; (5) the moderated value of TR multiplied by passengers' attitude towards that specific check-in mode; followed by (6) passengers' response toward that specific check-in mode (dependent variable).

The results obtained for each of the check-in modes are discussed separately.

A. Counter check-in

Table 9: Hierarchical regression: Main effects of attitude and adoption on counter response

	COUNTER RESPONSE											
	Attitude Path						Adoption Path					
	Innovativeness		Optimism		Negativity		Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β	B	β	B	β	B	β
Intercept	3.90***		3.83***		3.90***		3.90***		3.80***		3.90***	
Male	-.03		-.01	.0	-.02	-.01	-.03	-.01	-.01		-.03	-.01
Leisure	.10	-.01	.10	.01	.10	.01	.10	.01	.10	.02	.10	.01
Economy	.24**	.10	.23**	.04	.22**	.04	.23**	.05	.23**	.05	.22**	.04
Age												
Age_Under35	-.13	-.02	-.10	-.02	-.11	-.02	-.12	-.02	-.10	-.02	-.11	-.02
Age_35to44	-.10	-.02	-.10	-.02	-.10	-.02	-.10	-.02	-.12	-.02	-.10	-.02
Age_45to54	.03	.10	.03	.01	.03	.01	.03	.01	.03	.01	.03	.01
Age_Above64	.21*	.04	.20	.04	.20*	.04	.20*	.04	.20	.04	.21*	.04
Innovativeness	.10	.03	.10	.02	.06	.03	.10	.03	.05	.03	.10	.03
Optimism	-.03	-.02	.03	.02	-.01	-.00	-.03	-.01	.07	.04	-.01	-.01
Negative	-.10	-.04	-.20	-.03	-.08	-.04	-.10	-.04	-.06	-.03	-.10	-.04
Attitude towards	.84***	.80	.90***	.80	.90***	.80	.90***	.80	.90***	.80	.90***	.80
Adoption of	.10**	.10	.10**	.10	.10**	.10	.10**	.10	.10**	.10	.10**	.10
Counter X TR	.03	.03	-.05**	-.05	.03	.03	.01	.01	-.08***	-.09	.04*	.04
R^2	.72		.72		.72		.72		.72		.72	
Adj R^2	.71		.71		.71		.71		.71		.71	
F	128.40***		129.10***		128.41***		128.40***		132.10***		129.17***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Counter X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of counter check-in*

Table 9 presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes towards and their adoption on reported response levels for counter check-in.

i. Attitude path

The percentage of the variance in counter response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .72), optimism (R^2 = .72) and negativity (R^2 = .72) is a good measure and fairly representative of a linear data fit for this study compared to the results obtained by Liljander, et al (2006) for innovativeness and optimism (R^2 = .061) and overall TR (R^2 = .046). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .71), optimism (Adj R^2 = .71), negativity (Adj R^2 = .71).

Attitude fully explains counter response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .84 p <.01), optimism (B = .85 p <.01) and negativity (B= .85 p <.01).

When attitude increases by 1 unit, counter response increases by .84 units when regressed by innovativeness; .85 units when regressed by optimism and .85 units when regressed by negativity.

Of important note is that overall TR has minimal to no effect (with exception of optimism) attitude towards counter check-in. This is prevalent for all types of TR quality dimensions where the slopes are negligible; innovativeness (B = .03), and negativity (B = .03) and fairly moderate for optimism (B = -.05 $p < .05$).

ii. Adoption path

The percentage of the variance in counter response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .72), optimism (R^2 = .72) and negativity (R^2 = .72) is a good measure and fairly representative of a linear data fit for this study. Liljander et al. (2006) in her analysis of TR regressed on loyalty (repeated use and retention) found for innovativeness and optimism (R^2 = .145) and overall TR (R^2 = .129). The quantity of the control independent variables added are reasonably high impact predictors, due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .71), optimism (Adj R^2 = .72) and negativity (Adj R^2 = .71).

Attitude fully explains counter response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .85 $p<.01$), optimism (B = .85 $p<.01$) and negativity (B= .85 $p<.01$).

When attitude increases by 1 unit, counter response increases by .85 units, when regressed by innovativeness; .85 units, when regressed by optimism and .85 units, when regressed by negativity.

Of important note is that overall TR has varied low to moderate effects on adoption of counter check-in. This is prevalent for all types of TR quality dimensions where the slopes are almost negligible for innovativeness (B = .01) and moderate for optimism (B = -.08 $p<.01$) and weak for negativity (B = .04 $p < .1$).

B. Kiosk check-in

Table 10: Hierarchical regression: Main effects of attitude and adoption on kiosk response

	KIOSK RESPONSE											
	Attitude Path						Adoption Path					
	Innovativeness		Optimism		Negativity		Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β	B	β	B	β	B	β
Intercept	5.00***		5.00***		5.00***		5.00***		4.90***		5.00***	
Male	-.01		-.02		-.02	-.01	-.01	-.00	-.01		-.03	-.01
Leisure	.12	.03	.13	.04	.20*	.04	.13	.04	.12	.03	.15	.04
Economy	-.10	-.02	-.10	-.02	-.10	-.02	-.10	-.02	-.07	-.02	-.10	-.02
Age												
Age_Under35	.04	.01	.05	.01	.10	.01	.05	.01	.06	.01	.04	.01
Age_35to44	.05	.01	.03	.01	.11	.02	.10	.02	.04	.01	.11	.02
Age_45to54	.10	.02	.10	.02	.10	.03	.10	.03	.08	.02	.11	.03
Age_Above64	.01		-.02		.10	.02	.10	.01	.01		.07	.02
Innovativeness	-.20***	-.11	-.30***	-.14	-.21***	-.12	-.20***	-.11	-.23***	-.13	-.20***	-.11
Optimism	.20**	.10	.30***	.20	.10*	.10	.11*	.10	.30***	.14	.10	.10
Negative	-.10*	-.10	-.10	-.04	-.10*	-.10	-.10*	-.10	-.08	-.04	-.10*	-.10
Attitude towards	.82***	.80	.82***	.80	.83***	.80	.82***	.80	.84***	.80	.83***	.80
Adoption of	.10**	.10	.10*	.10	.10*	.10	.10*	.10	.05	.10	.06*	.07
Kiosk X TR	.14***	.20	.14***	.20	-.10***	-.10	.10***	.10	.12***	.18	-.06***	-.07
R^2	.70		.70		.10		.70		.70		.70	
Adj R^2	.70		.70		.70		.70		.70		.70	
F	102.91***		103.64***		96.60***		97.54***		104.90***		96.70***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Kiosk X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of kiosk check-in*

Table 10 presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes towards and their adoption on reported response levels for kiosk check-in.

i. Attitude path

The percentage of the variance in kiosk response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .69), optimism (R^2 = .69) and negativity (R^2 = .67) is a good measure and fairly representative of a linear data fit for this study, compared to the results obtained by Liljander et al. (2006) for innovativeness and optimism (R^2 = .102) and overall TR (R^2 = .291). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .68), optimism (Adj R^2 = .68) and negativity (Adj R^2 = .66).

Attitude fully explains kiosk response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .82 p<.01), optimism (B = .82 p<.01) and negativity (B= .83 p<.01).

When attitude increases by 1 unit, kiosk response increases by .82 units - when regressed by innovativeness; .82 units - when regressed by optimism and .83 units - when regressed by negativity.

Of important note is that overall TR has a moderate to strong effect on attitude towards kiosk check-in. This is prevalent for all types of TR quality dimensions where the slopes are strong for innovativeness (B = .14 p < .01) and optimism (B = .14 p < .01) and moderate for negativity (B = -.08).

ii. Adoption path

The percentage of the variance in kiosk response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .67), optimism (R^2 = .69) and negativity (R^2 = .67) is a good measure and fairly representative of a linear data fit for this study, compared to the study of Liljander et al. (2006) for loyalty. The quantity of the control independent variables added are reasonably high impact predictors, due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .67), optimism (Adj R^2 = .68) and negativity (Adj R^2 = .66).

Attitude fully explains kiosk response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .82 p < .01), optimism (B = .84 p < .01) and negativity (B= .83 p < .01).

When attitude increases by 1 unit, kiosk response increases by .82 units, when regressed by innovativeness; .84 units, when regressed by optimism and .83 units, when regressed by negativity.

Of important note is that overall TR has moderate to strong effects on adoption of kiosk check-in. This is prevalent for all types of TR quality dimensions where the slopes are strong for optimism (B = .12 p < .01) and moderate for innovativeness (B = .06 p < .01) and negativity (B = -.06 p < .01).

C Internet check-in

Table 11: Hierarchical regression: Main effects of attitude and adoption on internet response

INTERNET RESPONSE												
	Attitude Path						Adoption Path					
	Innovativeness		Optimism		Negativity		Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β	B	β	B	β	B	β
Intercept	5.10***		5.10***		5.10***		5.02***		5.01***		5.10***	
Male	.10	.02	.10	.01	.10	.02	.10	.02	.10	.02	.10	.02
Leisure	.20**	.10	.20**	.10	.20**	.10	.20**	.10	.20**	.10	.10**	.10
Economy	.10	.02	.10	.02	.10	.02	.11	.03	.11	.03	.10	.02
Age												
Age_Under35	.14	.03	.14	.03	.20	.03	.20	.03	.20	.03	.14	.03
Age_35to44	-.10	-.02	-.10	-.02	-.10	-.01	-.10	-.01	-.10	-.02	-.04	-.01
Age_45to54	.10	.03	-.10	.03	.11	.03	.11	.03	.11	.03	.11	.03
Age_Above64	-.10	-.01	-.10	-.02	-.04	-.01	-.03	-.01	-.10	-.01	-.04	.01
Innovativeness	-.12**	-.10	-.14***	-.10	-.13**	-.10	-.13**	-.10	-.20***	-.10	-.13**	-.10
Optimism	.20**	.10	.21***	.13	.13**	.10	.20***	.10	.23***	.14	.13**	.10
Negative	.10*	.10	.10**	.10	.10	.04	.10*	.10	.11**	.10	.10*	.10
Attitude towards	.70***	.70	.70***	.70	.70***	.70	.70***	.70	.70***	.70	.70***	.70
Adoption of	.20***	.20	.20***	.20	.20**	.20	.20***	.20	.20***	.20	.20***	.21
Internet X TR	.10***	.10	.10***	.10	-.10**	-.10	.10***	.13	.20***	.14	-.10***	-.10
R^2	.70		.70		.70		.70		.70		.70	
Adj R^2	.70		.70		.70		.70		.70		.70	
F	99.54***		99.50***		97.64***		103.40***		103.60***		99.50***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Internet X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of internet check-in*

Table 11 above presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes towards and their adoption on reported response levels for internet check-in.

i. Attitude path

The percentage of the variance in internet response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .69), optimism (R^2 = .69) and negativity (R^2 = .69) is a good measure and fairly representative of a linear data fit for this study, compared to the results obtained by Liljander et al. (2006) for innovativeness and optimism (R^2 = .275) and overall TR (R^2 = .261). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .69), optimism (Adj R^2 = .69), negativity (Adj R^2 = .68).

Attitude mostly explains internet response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .70 p<.01), optimism (B = .69 p<.01) and negativity (B= .69 p<.01.

When attitude increases by 1 unit, internet response increases by .70 units when regressed by innovativeness; .69 units when regressed by optimism and .69 units when regressed by negativity.

Of important note is that overall TR has moderate effects on attitude towards internet check-in. This is prevalent for all types of TR quality dimensions where the slopes are moderate; innovativeness (B = .08 p < .01), optimism (B = .07 p < .01) and negativity (B = -.06 p < .05).

ii. Adoption path

The percentage of the variance in internet response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .70), optimism (R^2 = .70) and negativity (R^2 = .69) is a good measure and fairly representative of a linear data fit for this study, compared to the study of Liljander et al. (2006) for loyalty. The quantity of the control independent variables added are reasonably high impact predictors, due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .69), optimism (Adj R^2 = .69), negativity (Adj R^2 = .69).

Attitude fully explains internet response in each of the relationships and this can be seen by the large slopes obtained in each of the regressions of innovativeness (B = .70 p < .01), optimism (B = .70 p < .01) and negativity (B= .68 p < .01).

When attitude increases by 1 unit, internet response increases by .70 units, when regressed by innovativeness; .70 units, when regressed by optimism and .68 units, when regressed by negativity.

Of important note is that overall TR has a moderate to strong effect on adoption of internet check-in. This is prevalent for all types of TR quality dimensions where the

slopes are strong for innovativeness (B = .10 p < .01), optimism (B = .09 p < .01) and moderate for negativity (B = -.07 p < .01).

D Mobile telephone check-in

Table 12: Hierarchical regression: Main effects of attitude and adoption on mobile telephone response

MOBILE TELEPHONE RESPONSE												
	Attitude Path						Adoption Path					
	Innovativeness		Optimism		Negativity		Innovativeness		Optimism		Negativity	
	B	β	B	β	B	β	B	β	B	β	B	β
Intercept	3.60***		3.52***		3.60***		3.60***		3.44***		3.54***	
Male			-.03	-.01	.03	.01	.01		.03	.01	.01	
Leisure	.20	.04	.20	.04	.20	.10	.20	.10	.13	.03	.20	.10
Economy	.10	.01	.02		.07	.01	.07	.01	.10	.01	.12	.02
Age												
Age_Under35	.24	.04	.33	.10	.30	.04	.22	.04	.40*	.10	.20	.03
Age_35to44	-.30*	-.10	-.33**	-.10	-.30	-.10	-.30	-.10	-.30*	-.10	-.22	-.04
Age_45to54			-.02		-.02		.02	.01	.03	.01	.01	
Age_Above64	-.34**	-.10	-.40**	-.10	-.30*	-.10	-.30*	-.10	-.30*	-.10	-.30	-.10
Innovativeness	-.20*	-.10	-.30***	-.13	-.20***	-.10	-.20**	-.10	-.24***	-.12	-.20**	-.10
Optimism	.30***	.14	.62***	.33	.30***	.20	.23***	.12	.52***	.30	.30***	.14
Negative	-.10	-.03	.02	-.01	-.04	-.02	-.10	-.03	-.02	-.01	-.02	-.01
Attitude towards	.54***	.60	.50***	.51	.60***	.60	.60***	.60	.60***	.60	.60***	.60
Adoption of	.22***	.30	.22***	.30	.23***	.30	.20***	.24	.11***	.13	.21***	.30
Mobile Telephone X TR	.20***	.20	.30***	.31	-.21***	-.20	.10***	.10	.30***	.31	-.20***	-.30
R^2	.73		.80		.74		.72		.80		.74	
Adj R^2	.72		.80		.73		.70		.80		.73	
F	62.34***		77.90***		66.70***		59.00***		81.00***		67.30***	

*Note: N =761, B = unstandardised effect, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables. "Mobile Telephone X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of mobile telephone check-in*

Table 12 presents the relationship (beta co-efficients) of the main variables obtained from the hierarchical regression analysis of passengers' attitudes towards and their adoption on reported response levels for mobile telephone check-in.

i. *Attitude path*

The percentage of the variance in mobile telephone response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .73), optimism (R^2 = .77) and negativity (R^2 = .74) is a good measure and fairly representative of a linear data fit for this study, compared to the results obtained by Liljander et al. (2006) for innovativeness and optimism (R^2 = .165) as well as overall TR (R^2 = .118). The quantity of the control independent variables added are reasonably high impact predictors due to the level of the adjusted R^2 values obtained

for innovativeness (Adj R^2 = .72), optimism (Adj R^2 = .76) and negativity (Adj R^2 = .73).

Attitude fairly explains mobile telephone response in each of the relationships and this can be seen by the reasonably moderate slopes obtained in each of the regressions of innovativeness (B = .54 p<.01), optimism (B = .49 p<.01) and negativity (B= .56 p<.01).

When attitude increases by 1 unit, mobile telephone response increases by .54 units, when regressed by innovativeness; .49 units, when regressed by optimism and .56 units, when regressed by negativity.

Of important note is that overall TR has strong effects on attitude towards mobile telephone check-in. This is prevalent for all types of TR quality dimensions where the slopes are strong; innovativeness (B = .16 p < .01), optimism (B = .29 p < .01) and negativity (B = -.21 p < .05).

ii. *Adoption path*

The percentage of the variance in mobile telephone response obtained from the linear regression analysis of each of the TR quality dimensions of innovativeness (R^2 = .72), optimism (R^2 = .78) and negativity (R^2 = .74) is a good measure and fairly representative of a linear data fit for this study, compared to the study of Liljander et al. (2006) for loyalty. The quantity of the control independent variables added are reasonably high impact predictors, due to the level of the adjusted R^2 values obtained for innovativeness (Adj R^2 = .70), optimism (Adj R^2 = .77) and negativity (Adj R^2 = .73).

Attitude fairly explains mobile response in each of the relationships and this can be seen by the reasonably large slopes obtained in each of the regressions of innovativeness (B = .57 p < .01), optimism (B = .58 p < .01) and negativity (B= .57 p < .01).

When attitude increases by 1 unit, mobile telephone response increases by .57 units, when regressed by innovativeness; .58 units, when regressed by optimism and .57 units, when regressed by negativity.

Of important note is that overall TR has a strong effect on adoption of mobile telephone check-in. This is prevalent for all types of TR quality dimensions where the slopes are strong for innovativeness ($B = .09$ $p < .01$), optimism ($B = .30$ $p < .01$) and negativity ($B = -.19$ $p < .01$).

4.4.3 Summary of Regression Analysis

A. Regression model: Attitude on adoption

The findings of this study show that attitude fully explains adoption for each type check-in mode.

Further, the analysis clearly demonstrates that TR dimensions have no effect on the attitude to adoption path for any of the check-in modes.

B. Regression model: Attitude and adoption on response

The analysis clearly demonstrates that there are differences in respondents' attitudes towards and adoption of the various check-in modes. In summary, the analysis reported that:

Attitude Path

- Attitude construct dominates the adoption construct in the relationship
- Generally, no effect exists of innovativeness and negativity on attitude towards use of counter check-in, however, optimism shows a fairly moderate negative relationship;
- There are moderate positive effects of negativity on attitude towards the use of kiosk check-in, while strong positive effects exist for innovativeness and optimism;

- There are moderate positive effects of innovativeness and optimism on attitude towards the use of internet check-in, while moderate negative effects exist for the negativity TR dimension; and
- There are strong positive effects of innovativeness and optimism on attitude towards the use of mobile telephone check-in, while positive negative effects exist for the negativity TR dimension.

Adoption path

- Attitude construct dominates the adoption construct in the relationship
- There are varied effects where no effect of innovativeness on adoption of counter check-in exists. However, optimism shows a moderate negative relationship and negativity shows a weak positive relationship;
- There are varied effects where moderate positive effects of innovativeness and moderate negative effects of negativity on adoption of kiosk check-in, while strong positive effects exist for optimism;
- There are strong positive effects of innovativeness and optimism on adoption of internet check-in, while moderate negative effects exist for the negativity TR dimension; and
- There are strong positive effects of innovativeness and optimism on adoption of mobile telephone check-in, while strong negative effects exist for the negativity TR dimension.

Having reported the regression analyses, the next step is to establish if there are any mediating effects between attitude and adoption on response of each of the check-in modes.

4.5 Mediation effect between attitude, adoption and response

The mediation paths of passengers' attitudes towards and adoption of the different check-in modes were assessed using the Baron and Kenny (1986) method.

The relationships for all check-in modes were investigated and analysed in detail to articulate the results. The results obtained for each of the check-in modes are discussed separately.

The order of variables entered is: (1) passengers' demographics as a set of control variables; (2) passengers' attitude towards that specific check-in mode; followed by (3) passengers' adoption of that specific check-in mode.

To test the full mediation analysis and report on the extent that attitude (independent variable) predicts adoption (mediator) and response (dependent variable), the following links were tested for each check-in mode:

- The link between attitude and response;
- The link between attitude and adoption; and
- The link between attitude and response mediated with adoption.

Table 13 below shows the direct and indirect effects of attitude, adoption and response. The results obtained for each of the check-in modes are discussed separately.

Table 13: Mediation effects of attitude and adoption on check-in modes

Path to Response	CHECK-IN MODES											
	Counter			Kiosk			Internet			Mobile Telephone		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Direct effect	.90***	.03	.8	.82***	.04	.80	.70***	.04	.70	.60***	.10	.61
Indirect effect	.04*	.03	.04	.06*	.03	.05	.20***	.03	.20	.20***	.04	.20
Total effects	.90		.84	.90		.82	.82		.81	.80		.81
Total Effect	4.80%			6.60%			19.31%			25.00%		

Note: N =761, B = unstandardised effect, SE = standard errors, β = standardised effect, *** = p <.01, ** = p <.05, * = p <.1

4.5.1 Counter check-in

As shown in Table 13 for counter check-in, attitude predicts adoption (B = .85) and response (B = .89). Adoption predicts the outcome, response to a small extent (B= .04). This relationship between attitude and response decreases (B= .85) when adoption is controlled in the analysis.

For counter check-in, adoption only partially mediates attitude with a mediation effect of 4.78% (p <.1), thus attitude towards counter check-in dominates the relationship.

4.5.2 Kiosk check-in

As shown in Table 13 for kiosk check-in, attitude predicts adoption (B = 1.03) and response (B = .88). Adoption predicts the outcome, response to a small extent (B= .06). This relationship between attitude and response decreases (B= .82) when adoption is controlled in the analysis.

For kiosk check-in, adoption only partially mediates attitude with a mediation effect of 6.57% (p <.1), thus attitude towards kiosk check-in dominates the relationship.

4.5.3 Internet check-in

As shown in Table 13 for internet check-in, attitude predicts adoption (B = 1.03) and response (B = .82). Adoption predicts the outcome, response to a small extent (B= .16). This relationship between attitude and response decreases (B= .66) when adoption is controlled in the analysis.

For internet check-in, adoption only partially mediates attitude with a mediation effect of 19.31% (p <.01), thus attitude towards kiosk check-in dominates the relationship.

4.5.4 Mobile telephone check-in

As shown in Table 13 for mobile telephone check-in, attitude predicts adoption (B = .87) and response (B = .79). Adoption predicts the outcome response to a small

extent (B= .23). This relationship between attitude and response decreases (B= .59) when adoption is controlled in the analysis.

For mobile telephone check-in, adoption only moderately mediates attitude with a mediation effect of 24.96% (p <.01), thus attitude towards mobile telephone check-in dominates the relationship.

4.5.5 Summary of mediation effect

In summary, the tested models demonstrate that adoption only partially mediates attitude for each of the check-in modes. No evidence of full mediation exists for any of the check-in modes. Strong partial mediation effects were found to exist for mobile telephone check-in, followed by internet check-in, kiosk check-in and counter check-in respectively.

The next section proceeds to describe the moderation effects of TR dimensions on attitudes towards and adoption of each of the check-in modes.

4.6 Interaction effects of TR dimensions on attitude and adoption

Analysis of the data revealed that no data criteria assumptions were violated. The data was verified against the following data criteria assumptions:

- Multi-collinearity effect using VIF's and condition numbers;
- Autocorrelation using the Durbin Watson Test;
- Non-linearity of data using partial residual plots; and
- Endogeneity effect of the independent variables using correlation analysis

However, it is important to note that some influential outliers may exist as evidence of some high Cook's Ds and DF Betas with some possibility of heteroskedasticity. Mild Non-normality of residuals may exist as evidence in somewhat non-regular residual, histogram and residual probability plots. During data verification, 9 data records (influential outliers) of the 770 data records were deleted and removed due

to their randomness, unusual magnitude and influential outlier effect created on the data. Bootstrapping was not necessary and was not exploited further.

As noticed in previous sections, no strong relationships were found to exist between TR and attitude on the adoption path. Thus the moderating effect of *technology readiness* of passengers is assessed in relation to their attitude towards, adoption of and response to each of the specific check-in modes, using hierarchical regression methods.

While all relationships were investigated and analysed in detail only some significant relationships were found to exist. To articulate the results only significant relationships will be presented and discussed. The results obtained for each of the check-in modes are discussed separately. Each of the significant relationships is reported with a short description and presented with an illustrated figure.

The order of variables entered is: (1) passenger demographics as a set of control variables; (2) each of the TR quality dimensions; (3) passenger's attitude towards that specific check-in mode; (4) passenger's adoption of that specific check-in mode; (5) the moderated value of TR multiplied by passengers' attitude towards or adoption of that specific check-in mode; followed by (6) passenger's response with that specific check-in mode.

4.6.1 Counter check-in

Table 14: Interaction output: Effects of attitude and adoption paths on counter check-in response

	Counter						
	Base Model	Attitude Moderated			Adoption Moderated		
		Innovativeness	Optimism	Negativity	Innovativeness	Optimism	Negativity
Intercept	3.90***	3.90***	3.83***	3.90***	3.90***	3.80***	3.90***
Male	-.02	-.03	-.01	-.02	-.03	-.01	-.03
Leisure	.10	.10	.10	.10	.10	.10	.10
Economy	.23***	.24**	.23**	.22**	.23**	.23**	.22**
Age							
Age_Under35	-.11	-.13	-.10	-.11	-.12	-.10	-.11
Age_35to44	-.10	-.10	-.10	-.10	-.10	-.12	-.10
Age_45to54	.03	.03	.03	.03	.03	.03	.03
Age_Above64	.20*	.21*	.20	.20*	.20*	.20	.21*
Innovativeness	.10	.10	.10	.10	.10	.10	.10
Optimism	-.02	-.03	.03	-.01	-.03	.10	-.01
Negative	-.10	-.10	-.10	-.10	-.10	-.10	-.10
Attitude towards	.90***	.84***	.90***	.90***	.90***	.90***	.90***
Adoption of	.10***	.10**	.10**	.10**	.10**	.10**	.10**
Counter X TR		.03	-.10**	.03	.01	-.10***	.04*
R^2	.72	.72	.72	.72	.72	.72	.72
ΔR^2						.01	
F	139.70***	128.40***	129.10***	128.41***	128.40***	132.10***	129.20***

*Note: N =761, unstandardised effects reported, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables."Counter X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of counter check-in*

Table 14 presents the moderated regression results compared to the baseline regression results of attitude towards and adoption of counter check-in. The regression results were then plotted and graphed to depict the moderation effects.

No moderation effects were found to exist of any of the TR dimensions on attitude towards counter check-in.

Some significant moderation effects were found to exist between some TR dimensions and adoption of counter check-in. The results for the significant relationships are presented in the figures below for discussion.

A. Interaction effect of optimism on adoption and response towards the use of counter check-in

The interaction term between optimism and adoption explains the significant increase in counter response, ΔR^2 increases by a small amount of .01, F = 132.10, p <.01. Thus optimism is a significant moderator of the relationship between counter

adoption and counter response. This means that passengers who are less optimistic have a stronger positive effect on the relationship between adoption and response to the use of counter check-in. However, at high levels of optimism a weak negative relationship exists between adoption and response to the use of counter check-in.

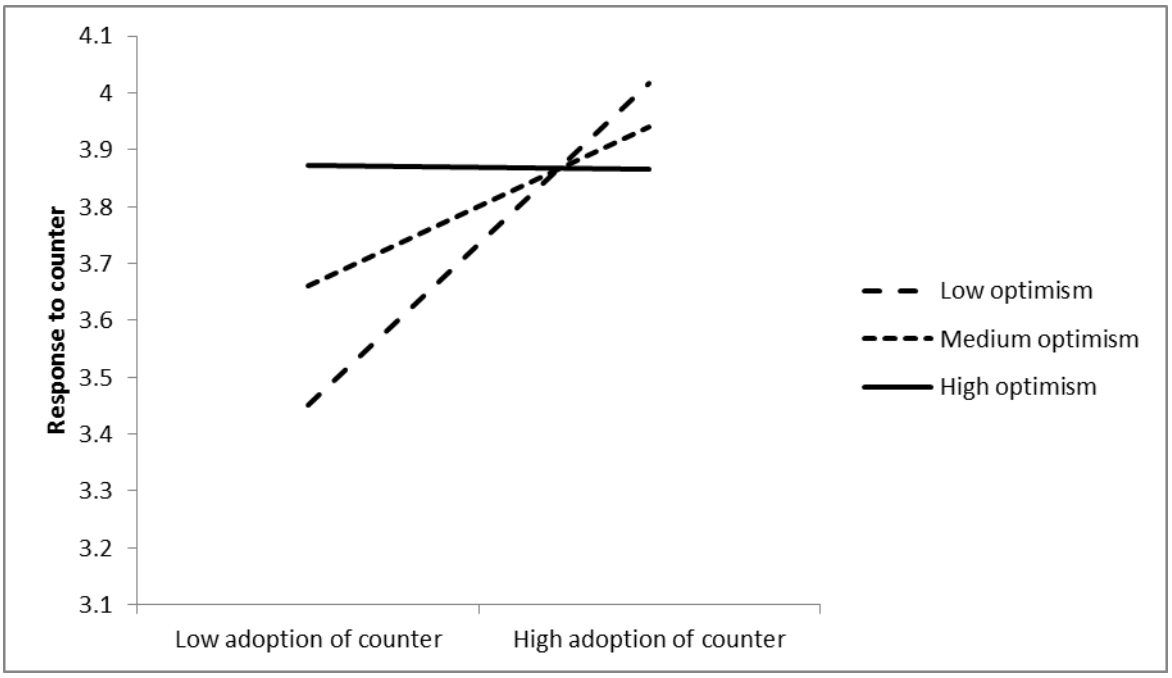

Figure 2: Slopes of counter adoption predicting counter response moderated by optimism

B. Interaction effect of negativity on adoption and response towards the use of counter check-in

The interaction term between negativity and adoption explains the significant increase in counter response, ΔR^2 remains constant at zero (0), F = 129.17, p <.01. Thus negativity is a significant moderator of the relationship between counter adoption and counter response. This means that passengers who have high levels of negativity have a stronger positive effect on the relationship between adoption and response to the use of counter check-in.

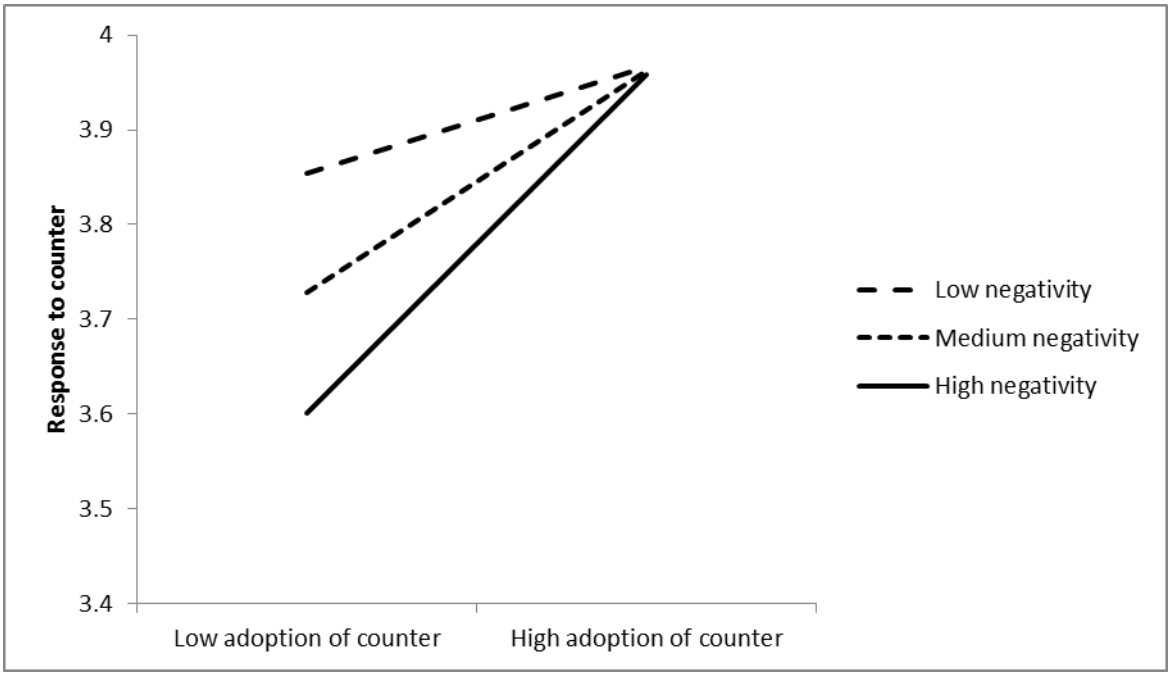

Figure 3 Slopes of counter adoption predicting counter response moderated by negativity

4.6.2 Kiosk check-in

Table 15 overleaf presents the moderated regression results compared to the baseline regression results of attitude towards and adoption of kiosk check-in. The regression results were then plotted and graphed to depict the moderation effects.

No moderation effects were found to exist of any of the TR dimensions on attitude towards kiosk check-in.

Some significant moderation effects were found to exist between some TR dimensions and adoption of kiosk check-in. The results for the significant relationships are presented in the figures below for discussion.

Table 15: Interaction output: Effects of attitude and adoption paths on kiosk check-in response

	Kiosk						
	Base Model	Attitude Moderated			Adoption Moderated		
		Innovativeness	Optimism	Negativity	Innovativeness	Optimism	Negativity
Intercept	5.02***	5.00***	5.00***	5.00***	5.00***	5.00***	5.00***
Male	-.04	-.01	-.02	-.02	-.01	-.01	-.03
Leisure	.14	.12	.13	.20*	.13	.20	.15
Economy	-.10	-.10	-.10	-.10	-.10	-.10	-.10
Age							
Age_Under35	.03	.04	.10	.10	.05	.10	.04
Age_35to44	.11	.10	.03	.11	.10	.04	.11
Age_45to54	.10	.10	.10	.10	.10	.10	.11
Age_Above64	.10	.01	-.02	.10	.10	.01	.10
Innovativeness	-.21***	-.20***	-.30***	-.21***	-.20***	-.23***	-.20***
Optimism	.10	.20**	.30***	.10*	.11*	.30***	.10
Negative	-.11**	-.10*	-.10	-.10*	-.10*	-.10	-.10*
Attitude towards	.81***	.82***	.82***	.83***	.82***	.84***	.83***
Adoption of	.10*	.10**	.10*	.10*	.06*	.10	.10*
Kiosk X TR		.14***	.14***	-.10***	.06***	.12***	-.10***
R^2	.70	.70	.70	.70	.70	.70	.70
ΔR^2		.02*	.02*		.01*	.02*	
F	103.10***	102.91***	103.64***	97.00***	97.54***	105.00**	96.70***

*Note: N =761, unstandardised effects reported, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables."Kiosk X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of kiosk check-in*

A. Interaction effect of innovativeness on adoption and response to use of kiosk check-in

The interaction term between innovativeness and adoption explains the significant increase in kiosk response, $\Delta R^2 = .01$, $p<.1$, $F = 97.54$, $p <.01$. Thus, innovativeness is a significant moderator of the relationship between kiosk adoption and kiosk response. This means that passengers who are highly innovative have a stronger positive effect on the relationship between adoption and response to the use of kiosk check-in.

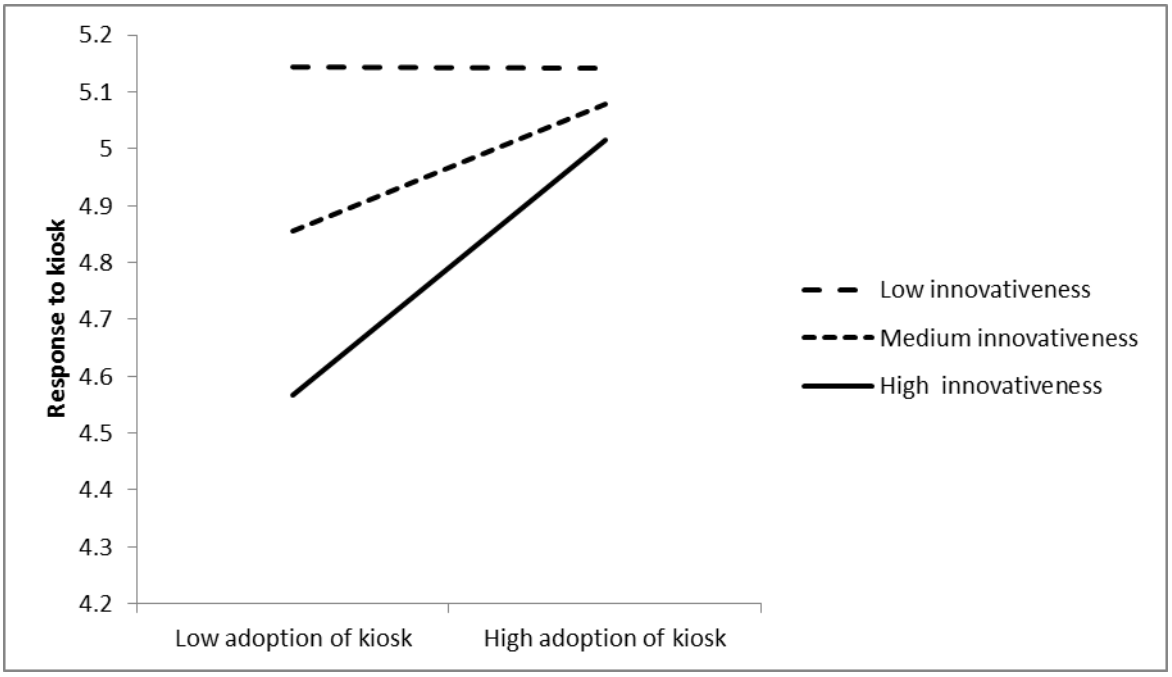

Figure 4: Slopes of kiosk adoption predicting kiosk response moderated by innovativeness

B. Interaction effect of optimism on adoption and response to the use of kiosk check-in

The interaction term between optimism and adoption explains the significant increase in kiosk response, $\Delta R^2 = .02$, $p<.1$, $F = 104.85$, $p< .01$. Thus, optimism is a significant moderator of the relationship between kiosk adoption and kiosk response. This means that passengers who are highly optimistic have a strong positive effect on the relationship between adoption and response with the use of kiosk check-in. However at low levels of optimism a strong negative relationship exists between adoption and response with the use of kiosk check-in.

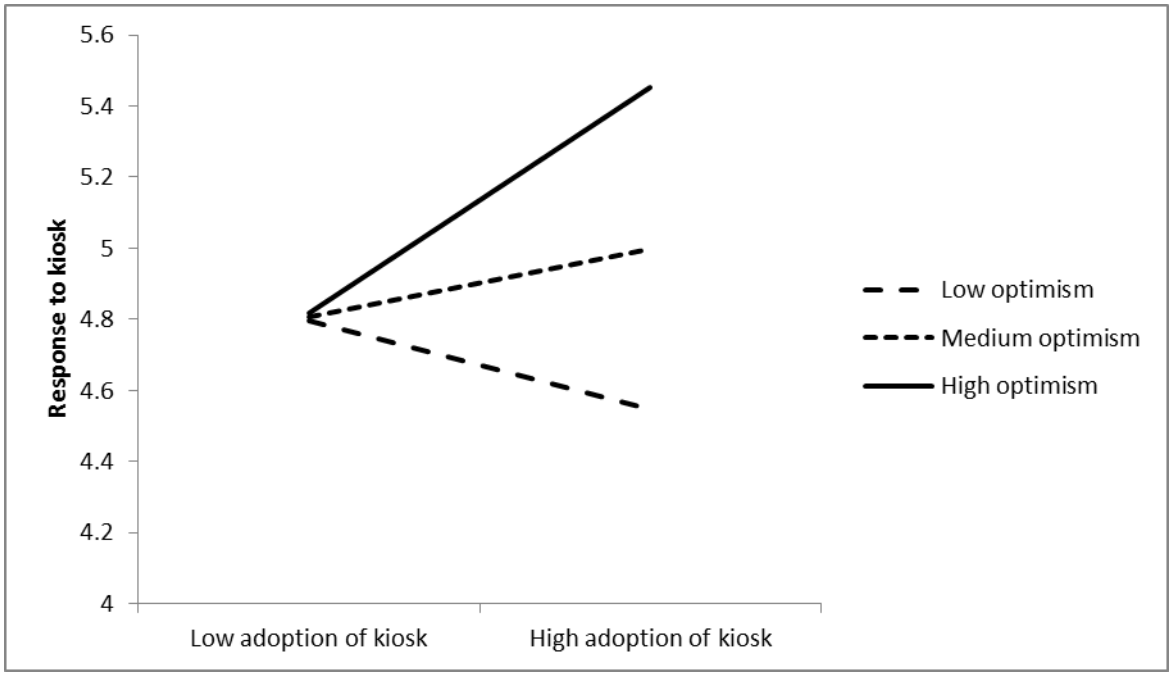

Figure 5: Slopes of kiosk adoption predicting kiosk response moderated by optimism

C. Interaction effect of negativity on adoption and response towards the use of kiosk check-in

The interaction term between negativity and adoption explains the significant increase in kiosk response, ΔR^2 remains constant at zero (0), $F = 96.70$, $p < .01$.

This means that passengers who have low levels of negativity have a strong positive effect on the relationship between adoption and response to the use of kiosk check-in. However at high levels of negativity there is no effect on the relationship between adoption and response to the use of kiosk check-in.

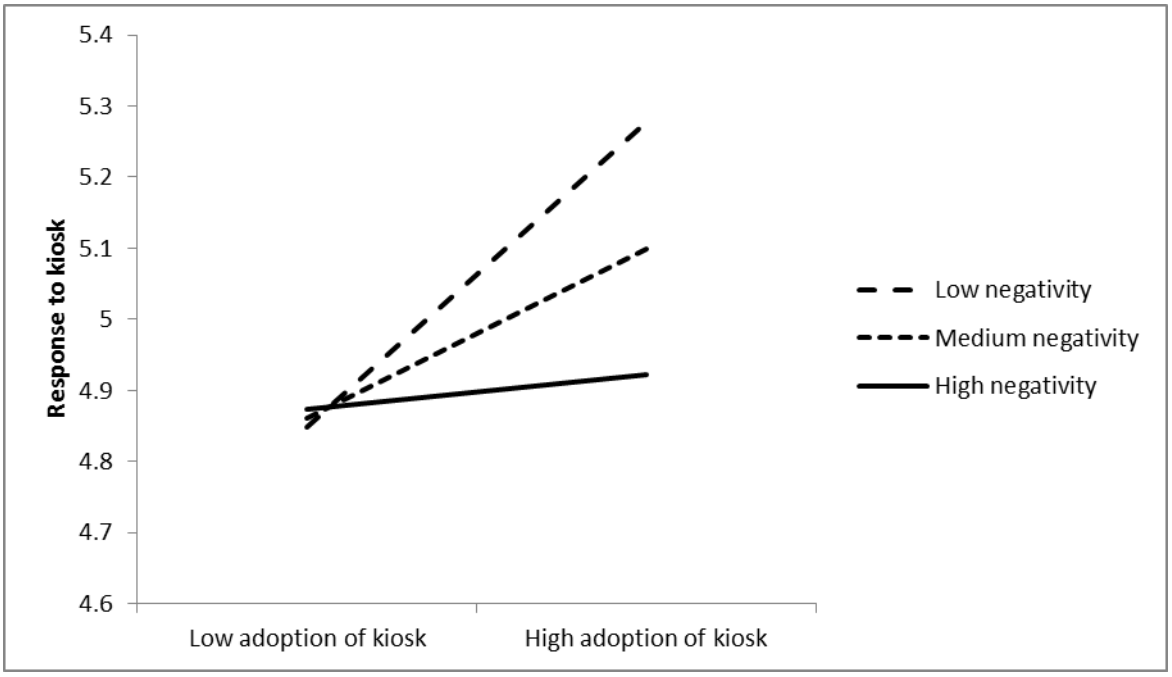

Figure 6: Slopes of kiosk adoption predicting kiosk response moderated by negativity

4.6.3 Internet check-in

Table 16: Interaction output: Effects of attitude and adoption paths on internet check-in response

	Internet						
	Base Model	Attitude Moderated			Adoption Moderated		
		Innovativeness	Optimism	Negativity	Innovativeness	Optimism	Negativity
Intercept	5.12***	5.10***	5.10***	5.10***	5.02***	5.01***	5.10***
Male	.10	.10	.10	.10	.10	.10	.10
Leisure	.20**	.20**	.10**	.20**	.20**	.20**	.20**
Economy	.10	.10	.10	.10	.11	.11	.10
Age							
Age_Under35	.13	.14	.14	.20	.20	.20	.14
Age_35to44	-.10	-.10	-.10	-.10	-.10	-.10	-.04
Age_45to54	.11	.10	.10	.11	.11	.11	.11
Age_Above64	-.03	-.10	-.10	-.04	-.03	-.10	-.04
Innovativeness	-.13**	-.12**	-.14***	-.13**	-.13**	-.20***	-.13**
Optimism	.12**	.20**	.21***	.13**	.20***	.23***	.13**
Negative	.10	.10*	.10**	.10	.10*	.11**	.10*
Attitude towards	.70***	.70***	.70***	.70***	.70***	.70***	.10***
Adoption of	.20***	.20***	.20***	.16***	.20***	.20***	.20***
Internet X TR		.10***	.07***	-.10**	.10***	.10***	-.10***
R^2	.70	.70	.70	.70	.70	.70	.70
ΔR^2		.01*	.01*		.01*	.01*	.01*
F	104.90***	99.54***	99.50***	97.64***	103.40***	103.60***	99.50***

*Note: N =761, unstandardised effects reported, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables."Internet X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of Internet check-in*

Table 16 presents the moderated regression results compared to the baseline regression results of attitude towards and adoption of internet check-in. The regression results were then plotted and graphed to depict the moderation effects.

No moderation effects were found to exist of any of the TR dimensions on attitude towards interaction check-in.

Significant moderation effects were found to exist between negativity and adoption of internet check-in. The result is presented in the figures below for discussion.

A. Interaction effect of negativity on adoption and response towards the use of internet check-in

The interaction term between negativity and adoption explains the small increase in internet response, $\Delta R^2 = .01$, $p<.1$, $F = 99.45$, $p <.01$. Thus, negativity is a significant moderator of the relationship between internet adoption and internet response. This means that passengers who have low levels of negativity have a stronger positive effect between adoption and response to the use of internet check-in.

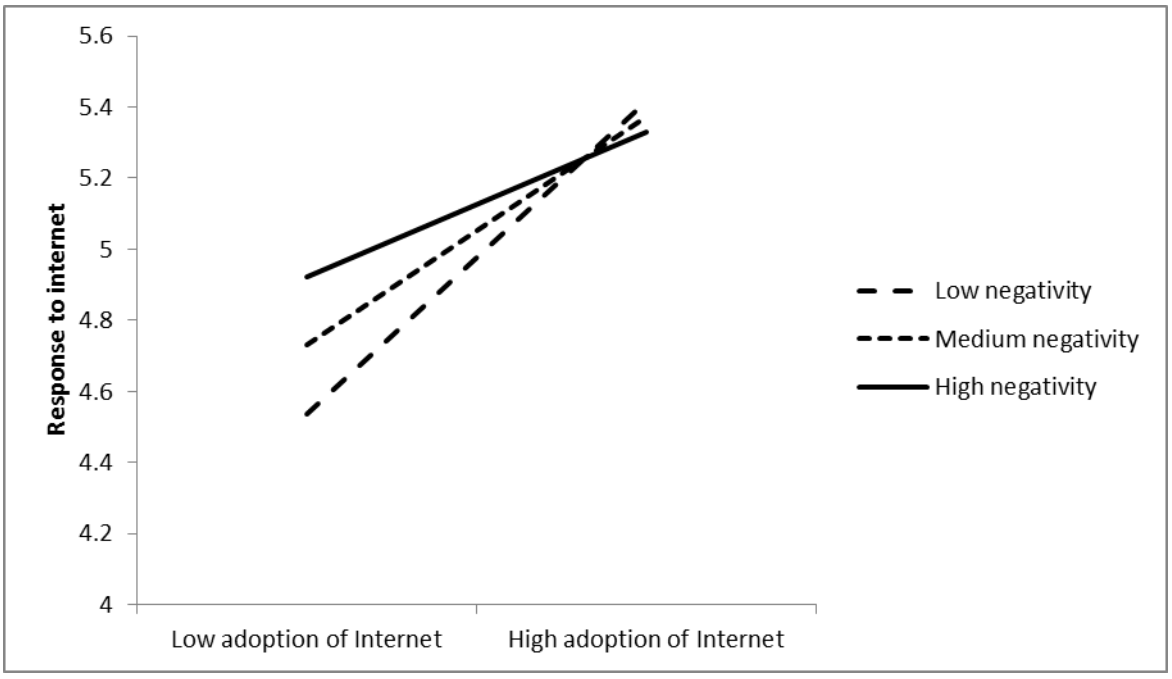

Figure 7: Slopes of internet adoption predicting internet response moderated by negativity

4.6.3 Mobile telephone check-in

Table 17: Interaction output: Effects of attitude and adoption paths on mobile telephone check-in

	Mobile Telephone						
	Base Model	Attitude Moderated			Adoption Moderated		
		Innovativeness	Optimism	Negativity	Innovativeness	Optimism	Negativity
Intercept	3.70***	3.60***	3.52***	3.60***	3.60***	3.44***	3.54***
Male	-.02		-.03	.03	.01	.03	.01
Leisure	.20	.20	.20	.20	.20	.13	.17
Economy	.11	.10	.02	.10	.10	.10	.12
Age							
Age_Under35	.20	.24	.33	.30	.22	.40*	.20
Age_35to44	-.22	-.30*	-.33**	-.30	-.30	-.30*	-.22
Age_45to54			-.02	-.02	.02	.03	.01
Age_Above64	-.30	-.34**	-.40**	-.30*	-.30*	-.30*	-.30
Innovativeness	-.20	-.20*	-.30***	-.20***	-.20**	-.24***	-.20**
Optimism	.20	.30***	.62***	.30***	.23***	.52***	.30***
Negative	-.10	-.10	.02	-.04	-.10	-.02	-.02
Attitude towards	.60	.54***	.50***	.60***	.60***	.60***	.60***
Adoption of	.24	.22***	.22***	.23***	.20***	.11***	.21***
Mobile Telephone X TR		.20***	.30***	-.21***	.10***	.30***	-.20***
R^2	.71	.73	.80	.74	.72	.80	.74
ΔR^2		.02*	.10*	.04*	.01*	.10*	.03*
F	61.54***	62.34***	78.00***	67.00***	59.00***	81.00***	67.30***

*Note: N =761, unstandardised effects reported, *** = p <.01, ** = p <.05, * = p <.1, "Age_55to64" is the reference variable for "Age" dummy variables."Mobile Telephone X TR" = the relationship of each TR dimension regressed on attitude towards and adoption of Mobile Telephone check-in*

Table 17 presents the moderated regression results compared to the baseline regression results of attitude towards and adoption of mobile telephone check-in. The regression results were then plotted and graphed to depict the moderation effects.

Significant moderation effects were found to exist between optimism and attitude towards as well as adoption of mobile telephone check-in. These results are presented in figures below for discussion.

A. *Interaction effect of optimism on attitude and response towards the use of mobile telephone check-in*

The interaction term between optimism and attitude explains the significant increase in mobile telephone response, $\Delta R^2 = .06$, $p<.1$, $F = 77.89$, $p <.01$. Thus, optimism is a significant moderator of the relationship between attitude and response to the use of mobile telephone check-in. This means that passengers who are highly optimistic have a stronger positive effect on the relationship between attitude and response to the use of mobile telephone check-in.

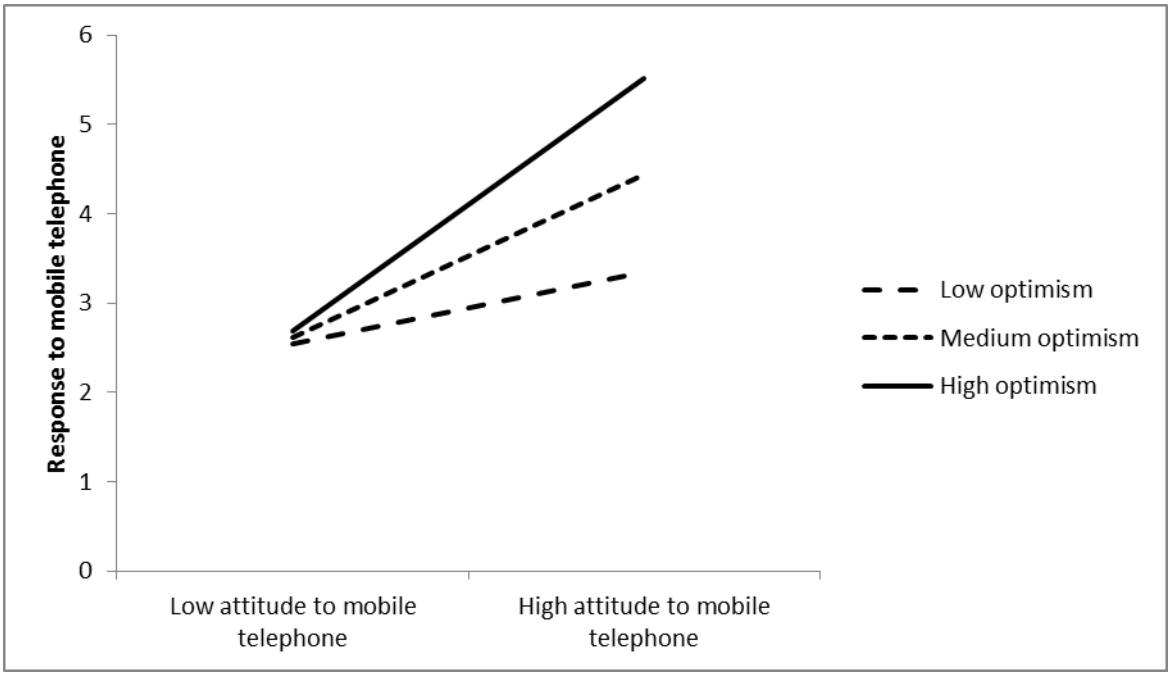

Figure 8: Slopes of mobile telephone attitude predicting mobile telephone response moderated by optimism

A. *Interaction effect of optimism on adoption and response towards the use of mobile telephone check-in*

The interaction term between optimism and adoption explains the significant increase in mobile response, $\Delta R^2 = .07$, $p<.1$, $F = 81$, $p <.1$. Thus, optimism is a significant moderator of the relationship between mobile telephone adoption and

mobile telephone response. This means that passengers who have high levels of optimism have a strong positive effect on the relationship between adoption and response to the use of mobile telephone check-in. However at low levels of optimism a strong negative relationship exists between adoption and response to the use of mobile telephone check-in.

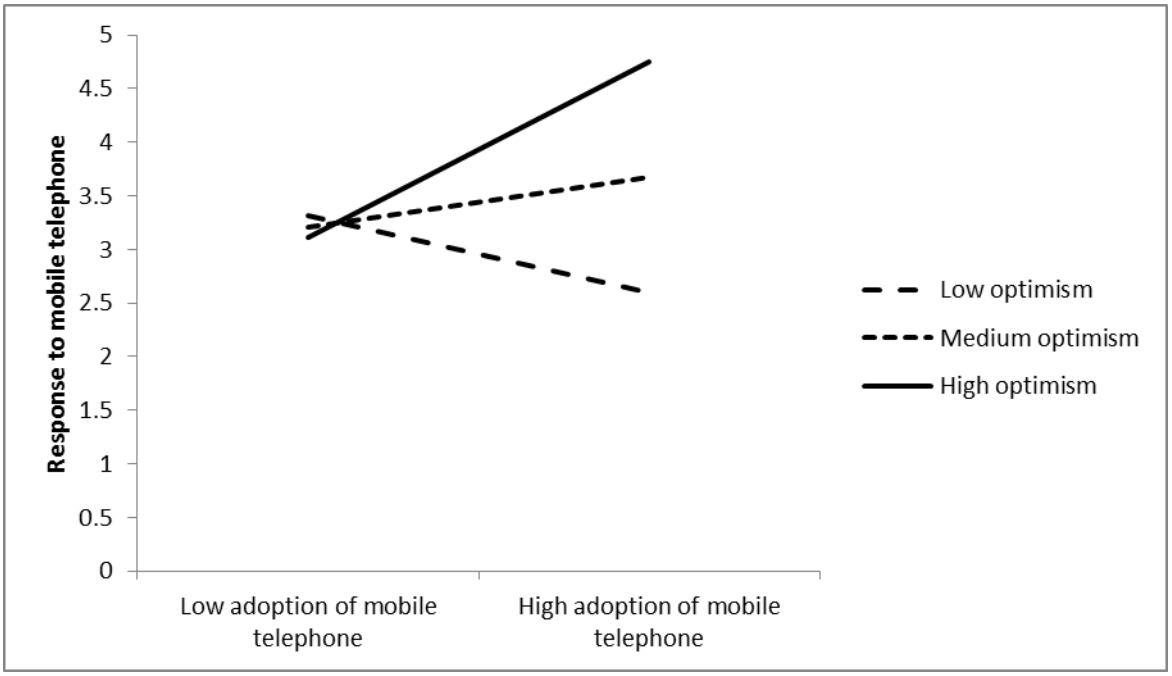

Figure 9: Slopes of mobile telephone adoption predicting mobile response moderated by optimism

4.6.4 Summary of interaction effects of TR dimensions on attitude and adoption

In summary, the moderation analyses can be interpreted for each of the check-in modes.

A. Attitude path:

- *Counter check-in: No moderating effects were found to exist*
- *Kiosk check-in: No moderating effects were found to exist*
- *Internet check-in: No moderating effects were found to exist*
- *Mobile telephone check-in: Significant moderating effect of optimism only*

B. Adoption path:

- *Counter check-in: Significant moderating effects of optimism and negativity*
- *Kiosk check-in: Significant moderating effects of all TR dimensions*
- *Internet check-in: Significant moderating effect of negativity only*
- *Mobile telephone check-in: Significant moderating effect of optimism only*

4.7 Summary of analyses

This chapter presented and described the findings of this research in line with sequence of the analyses conducted.

The research demonstrates the varied effects of each of independent variables (attitude and adoption) on each other as well as each of the TR dimensions on passengers' attitudes towards and adoption of the various check-in modes.

The next chapter will aim to provide discussion and some explanation to the obtained results.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

This chapter discusses and explains the theory cited in the literature, in relation to the findings from the research study in terms of the five stated hypotheses. The discussion of the results, with explanations where appropriate, will follow the order of stated sub-problems and tested hypotheses.

5.2 Demographic profile of respondents

A total of 770 survey responses were received. The ACSA in-house survey conducted at OR Tambo International Airport in 2011, was used as a guide to determine a fairly representative sample of the flying population (Airports Council International and ACSA 2011).

The material differences between the ACSA in-house survey benchmark study and the sample received were in the percentage responses received in the areas of: gender and variations in the age categories.

The differences have no material effect on the outcome of this study.

5.3 Discussion pertaining to Hypothesis 1

This study aimed to test the hypothesis that passengers' overall TR is positively associated with their attitudes towards the use of SSCIT's**.**

The results obtained assist in better understanding passengers' attitudes towards the various modes of check-in. The resultant model obtained, is depicted in Table 18 overleaf.

Table 18: Relationship between TR and attitude

	TR AND ATTITUDE			
		Innovativeness	**Optimism**	**Negativity**
Counter		Weak ⊕	Moderate ⊖	Weak ⊕
Kiosk		Strong ⊕	Strong ⊕	Moderate ⊖
Internet		Moderate ⊕	Moderate ⊕	Moderate ⊖
Mobile telephone		Strong ⊕	Strong ⊕	Strong ⊖

Weak positive effects (negligible) were found to exist for innovativeness and negativity TR dimensions on passengers' *attitude* towards the use of counter check-in. However, moderate negative effects remain for optimism of passengers' *attitude* towards the use of counter check-in. An interpretation of these findings, demonstrate that less optimistic passengers are more likely to have favourable attitudes towards the use of counter check-in. A plausible explanation for the inverse relationship is that counter check-in appeals to those passengers not necessarily wanting to take control of the experience, preferring repeatability and consistency, with not necessarily a dire need for an efficient check-in process (Parasuraman 2000). Liljander et al. (2006) found similar results for attitude where positive relationships were reported for innovativeness and negative relationships for optimism towards counter check-in.

Moderate negative effects were found to exist for the negativity TR dimension of passengers' *attitude* towards the use of kiosk check-in. However, strong positive effects remain for the innovativeness and optimism TR dimensions of passengers' *attitude* towards the use of kiosk check-in. These findings clearly demonstrate that highly innovative and optimistic passengers have highly favourable attitudes towards the use of kiosk check-in, while passengers who are insecure and uncomfortable towards the use of technology, show moderate apprehensiveness towards kiosks. These findings echo the findings of Liljander et al. (2006) where the relationship of optimism was found to be strong towards kiosk check-in. However, these studies are contradictory in respect of innovativeness where Liljander et al. (2006) reported that innovativeness has no effect on attitude towards kiosk check-in.

Moderate positive effects were found to exist for the innovativeness and optimism TR dimensions of passengers' attitude towards the use of internet check-in.

However, strong negative effects remain for the negativity TR dimension of attitude towards the use of internet check-in. These findings clearly demonstrate that innovative and optimistic passengers tend to have moderate favourable attitudes towards the use of internet check-in, while passengers who are insecure and uncomfortable towards the use of technology, show moderate apprehensiveness towards internet check-in. Liljander et al. (2006) reported similar results for optimism, but weak relationships were reported for innovativeness.

Strong positive effects were found to exist for the innovativeness and optimism dimensions of passengers' attitude towards the use of mobile telephone check-in. However, strong negative effects remained for negativity TR dimension on attitude towards the use of mobile telephone check-in. These findings clearly demonstrate that highly innovative and optimistic passengers have highly favourable attitudes towards the use of mobile telephone check-in, while passengers who are insecure and uncomfortable towards the use of technology show strong apprehensiveness towards mobile telephone check-in. The study by Liljander et al. (2006) reports similar results for optimism but weak relationships were reported for innovativeness.

In summary, the results provide support for the hypothesis that passengers overall TR is associated with their attitudes towards the use of SSCIT's. This is most supported by their attitudes towards the use of mobile telephone check-in, followed by internet check-in and then finally kiosk check-in. The results also provide support that TR is not associated with passengers' attitudes towards the use of traditional counter check-in.

Other studies, Liljander et al. (2006), show similar results where there were stronger positive associations for the self-service check-in modes, than when compared to no effect (negligible) on attitudes towards the use of traditional counter check-in. In the South African ATM study, a semi-literate sample group of ATM users had more positive attitudes toward ATM usage than the sample literate group (Thatcher et al. 2005).

Thus, this study has found evidence and support for Hypothesis 1: Passengers overall TR is positively associated with their attitudes towards the use of SSCIT's.

5.4 Discussion pertaining to Hypothesis 2

This study aimed to test the hypothesis that passengers' overall TR is positively associated with their adoption of SSCIT's**.**

The results obtained assist in better understanding passengers' adoption of the various modes of check-in. The resultant model obtained is depicted in Table 19.

Table 19: Relationship between TR and adoption

TR AND ADOPTION			
	Innovativeness	**Optimism**	**Negativity**
Counter	Weak ⊕	Strong ⊖	Weak ⊕
Kiosk	Moderate ⊕	Strong ⊕	Moderate ⊖
Internet	Strong ⊕	Strong ⊕	Moderate ⊖
Mobile telephone	Strong ⊕	Strong ⊕	Strong ⊖

Weak positive effects (negligible) were found to exist for innovativeness and negativity TR dimensions on adoption of counter check-in. However, strong negative effects remain for optimism on adoption of counter check-in. These findings can be interpreted that highly optimistic passengers are not likely to use counter check-in. A plausible explanation for the inverse relationship is that counter check-in does not give these passengers the sense that they can take control of the experience; it does not provide them with a flexible or efficient check-in process (Parasuraman 2000).

Moderate positive and strong positive effects of innovativeness and optimism were respectively found to exist on the adoption of kiosk check-in. However, moderate negative effects remain for negativity TR dimension. These findings clearly demonstrate that while innovative and optimistic passengers are more likely to make use of kiosk check-in, optimistic passengers have higher likelihood to adopt kiosk check-in. Passengers who are insecure and uncomfortable towards the use of technology show moderate apprehensiveness in adopting kiosk check-in. Liljander et

al. (2006) contradict this where the innovativeness and optimism TR dimensions of their study reports that innovativeness and optimism has no effect on adoption of kiosk check-in.

Strong positive effects of innovativeness and optimism were found to exist on the adoption of internet check-in. However, moderate negative effects remain for the negativity TR dimension. These findings clearly demonstrate that highly innovative and optimistic passengers are more likely to make use of internet check-in. Passengers who are insecure and uncomfortable towards the use of technology, show moderate apprehensiveness in adopting internet check-in. These findings show similar results to the findings of Liljander et al. (2006) where innovativeness and optimism showed positive relationships, but in their study these relationships were found to be weak.

Strong positive effects of innovativeness and optimism were found to exist on the adoption of mobile telephone check-in. However, strong negative effects remained for the negativity TR dimension. These findings clearly demonstrate that highly innovative and optimistic passengers are more likely to make use of mobile telephone check-in. Passengers who are insecure and uncomfortable towards the use of technology, show high apprehensiveness in adopting mobile telephone check-in.

In summary, the results provide support to the hypothesis that passengers' overall TR is associated with their adoption of SSCIT's. This is most supported by their adoption of mobile telephone check-in, followed by internet check-in and then kiosk check-in. The results also provide support that TR is not associated with passengers' adoption of traditional counter check-in, noting that there is a fairly moderate relationship with the optimism TR quality dimension only.

Thus, this study has found evidence and support for Hypothesis 2: Passengers overall TR is positively associated with their adoption of the use of SSCIT's**.**

5.5 Discussion pertaining to Hypothesis 3

This study aimed to test the hypothesis that passengers overall TR is positively associated with their response to the use of SSCIT's.

The results obtained assist in better understanding passengers' response to the various modes of check-in.

Each check-in mode is analysed for the attitude path and adoption path and the resultant model obtained is represented for each check-in mode.

5.5.1 Counter check-in

A. Attitude path

No significant statistical interactions were found to exist that clearly demonstrate that any of the TR dimensions moderate the attitude to response relationship with regards to counter check-in.

B. Adoption Path

No significant statistical interactions were found to exist that clearly demonstrate that innovativeness moderates the adoption to response relationship with regards to counter check-in.

Optimism significantly moderates the adoption to response relationship with regards to counter check-in. The adoption to response relationship is strongest in the case of low optimism and weakest in the case of high optimism. Maximum dispersal of means occurred at low levels of counter adoption. This means that passengers of different levels of optimism did not differ in self-reported levels of response to counter check-in under conditions of high counter adoption, but large differences were noted under conditions of low counter adoption.

Negativity significantly moderates the adoption to response relationship with regards to counter check-in. The adoption to response relationship is strongest in the case

of high negativity and weakest in the case of low negativity. Maximum dispersal of means occurred at low levels of counter adoption. This means that passengers of different levels of negativity did not differ in self-reported levels of response under conditions of high counter adoption, but large differences were noted under conditions of low counter adoption.

The summarised model the moderation effect of TR dimensions for counter check-in is presented in Figure 10.

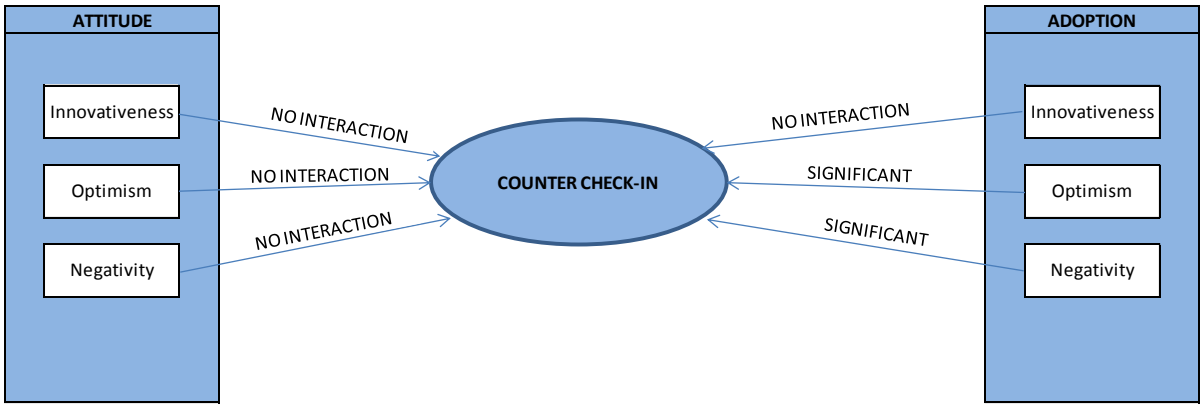

Figure 10: Moderation effect of TR dimensions on counter attitude

5.5.2 Kiosk check-in

A. Attitude path

No significant statistical interactions were found to exist that clearly demonstrate that any of the TR dimensions moderate the attitude to response relationship with regards to kiosk check-in.

B. Adoption path

Innovativeness significantly moderates the adoption to response relationship with regards to kiosk check-in. The adoption of the response relationship is strongest in the case of high innovativeness and weaker in the case of low innovativeness. Maximum dispersal of means occurred at low levels of adoption for the kiosk check-in option. This means that passengers of different levels of innovativeness did not differ in self-reported levels of response under conditions of high adoption towards

kiosk check-in, but large differences were noted under conditions of low adoption of kiosk check-in.

Optimism significantly moderates the adoption to response relationship with regards to kiosk check-in. The adoption to response relationship is strongest in the case of high optimism and weaker in the case of low optimism. Maximum dispersal of means occurred at high levels of adoption of kiosk check-in. This means that passengers of different levels of optimism did not differ in self-reported levels of response under conditions of low adoption towards kiosk check-in, but large differences were noted under conditions of high adoption of kiosk check-in. Passengers with low levels of optimism reported the lowest levels of response levels under conditions of high adoption of kiosk check-in.

Negativity significantly moderates the adoption to response relationship with regards to kiosk check-in. The adoption to response relationship is strongest in the case of low negativity and weaker in the case of high negativity. Maximum dispersal of means occurred at high levels of adoption of kiosk check-in. This means that passengers of different levels of negativity did not differ in self-reported levels of response under conditions of low adoption of kiosk check-in, but large differences were noted under conditions of high adoption of kiosk check-in.

The summarised model of the moderation effect of TR dimensions for kiosk check-in is presented in Fig 11.

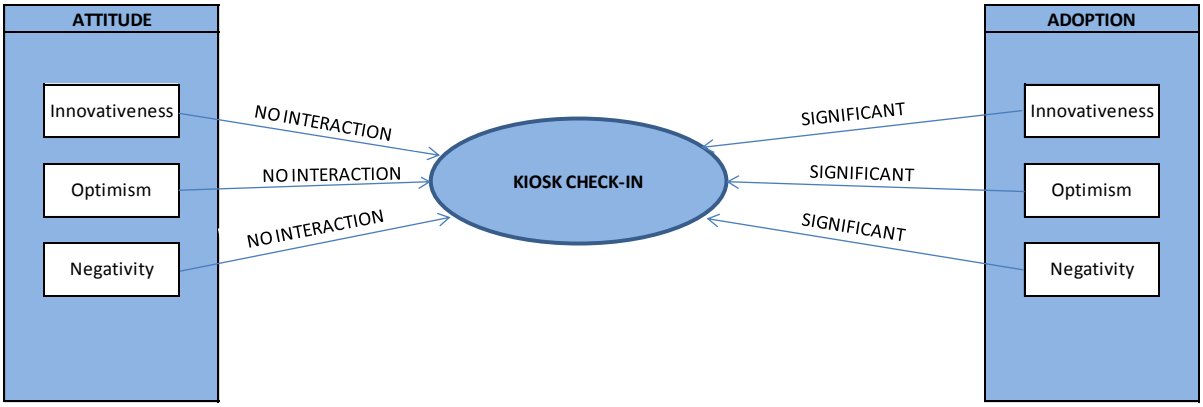

Figure 11: Moderation effect of TR dimensions on kiosk check-in

5.5.3 Internet check-in

A. Attitude path

No significant statistical interactions were found to exist that clearly demonstrate that any of the TR dimensions moderate the attitude to response relationship with regards to internet check-in.

B. Adoption path

No significant statistical interactions were found to exist that clearly demonstrate that innovativeness and optimism moderates the adoption to response relationship with regards to internet check-in.

Negativity significantly moderates the adoption to response relationship with regards to internet check-in. The adoption to response relationship is strongest in the case of low negativity and weaker in the case of high negativity. Maximum dispersal of means occurred at low levels of adoption of internet check-in. This means that passengers of different levels of negativity did not differ in self-reported levels of response under conditions of high adoption of internet check-in, but large differences were noted under conditions of low adoption of internet check-in.

The summarised model of the moderation effect of TR dimensions for internet check-in is presented in Fig 12.

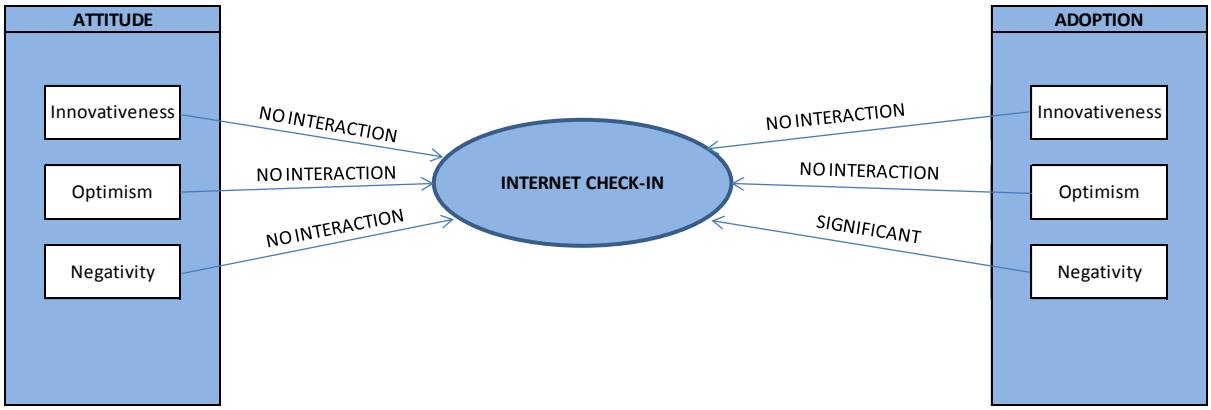

Figure 12: Moderation effect of TR dimensions on internet check-in

5.5.4 Mobile telephone check-in

A. Attitude path

No significant statistical interactions were found to exist that clearly demonstrate that innovativeness and negativity moderates the attitude to response relationship with regards to mobile telephone check-in.

Optimism significantly moderates the attitude to response relationship with regards to mobile telephone check-in. The attitude to response relationship is stronger in the case of high optimism and weaker in the case of low optimism. Maximum dispersal of means occurred at low levels of attitude towards mobile telephone check-in. This means that passengers of different levels of optimism did not differ in self-reported levels of response under conditions of low attitude towards mobile telephone check-in, but marginal differences were noted under conditions of high attitude towards mobile telephone check-in.

B. Adoption path

No significant statistical interactions were found to exist that clearly demonstrate that innovativeness and negativity moderates the adoption to response relationship with regards to mobile telephone check-in.

Optimism significantly moderates the adoption to response relationship with regards to mobile telephone check-in. The adoption to response relationship is strongest in the case of high optimism and weaker in the case of low optimism. Maximum dispersal of means occurred at low levels of adoption of mobile telephone check-in. This means that passengers of different levels of optimism did not differ in self-reported levels of response under conditions of low adoption of mobile telephone check-in, but large differences were noted under conditions of high adoption of mobile telephone check-in.

The summarised model of the moderation effect of TR dimensions for mobile telephone check-in is presented in Figure 13.

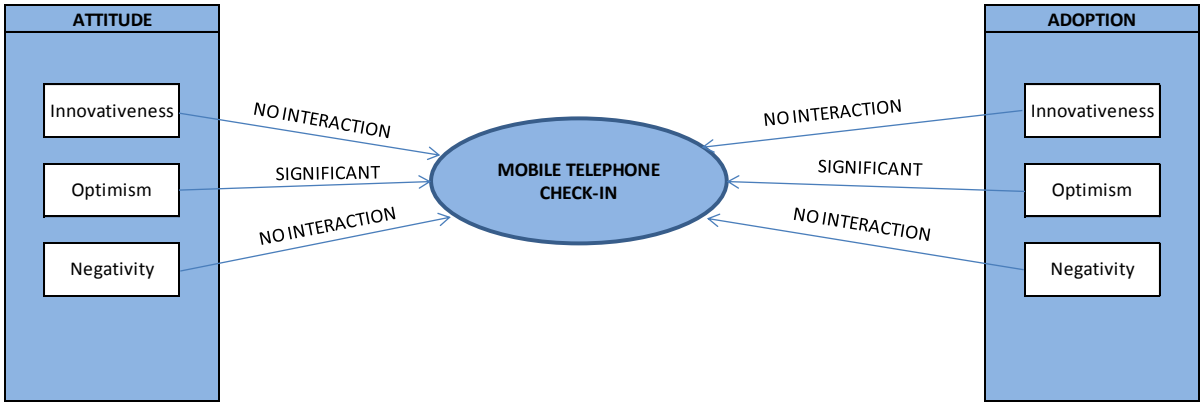

Figure 13: Moderation effects of TR dimensions on mobile telephone check-in

5.5.5 Summary of Hypothesis 3

In summary, the results provide support to the hypothesis that passengers' overall TR is associated with their response to SSCIT's. This is most supported by their adoption of kiosk check-in for all TR dimensions. Evidence did show support for adoption of internet check-in for negativity whereas support was shown for optimism in respect to attitude towards and adoption of mobile telephone check-in

Based on the findings, his study found evidence and support for **Hypothesis 3**; Passengers overall TR is positively associated with their response to SSCIT's.

The summarised results of TR and the relationship per check-in mode are presented overleaf in Table 20. In summary:

Table 20: Summary of Interaction effects of TR per check-in mode

CHECK-IN MODE	Innovativeness		Optimism		Negativity	
	Attitude	Adoption	Attitude	Adoption	Attitude	Adoption
Counter	No interaction	No interaction	No interaction	Significant	No interaction	Significant
Kiosk	No interaction	Significant	No interaction	Significant	No interaction	Significant
Internet	No interaction	No interaction	No interaction	No interaction	No interaction	Significant
Mobile telephone	No interaction	No interaction	Significant	Significant	No interaction	No interaction

5.6 Discussion pertaining to Hypotheses 4 and 5

This study aimed to test the hypotheses that passengers' attitude is positively associated with their adoption of SSCIT's and that their adoption is positively associated with their response to SSCIT's.

The results obtained assist in better understanding the relationship between passengers' attitudes, adoption and response and the various modes of check-in. The resultant models obtained are depicted hereunder.

5.6.1 Counter check-in

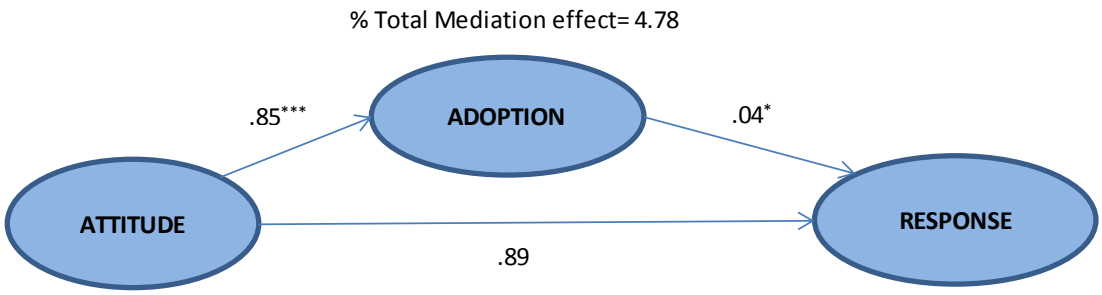

Figure 14: Mediation output for counter check-in

Figure 14 depicts the results of the mediation model for counter check-in. The results mean that on average, 89% of the passengers with high attitude are more likely to experience increased levels of response to counter check-in. Alternatively, only 4.78% of the passengers that frequently make use of counter check-in option have increased levels of response to counter check-in. This is evident in the total mediation effect of 4.78%, $p<.1$ of adoption on attitude and response.

5.6.2 Kiosk check-in

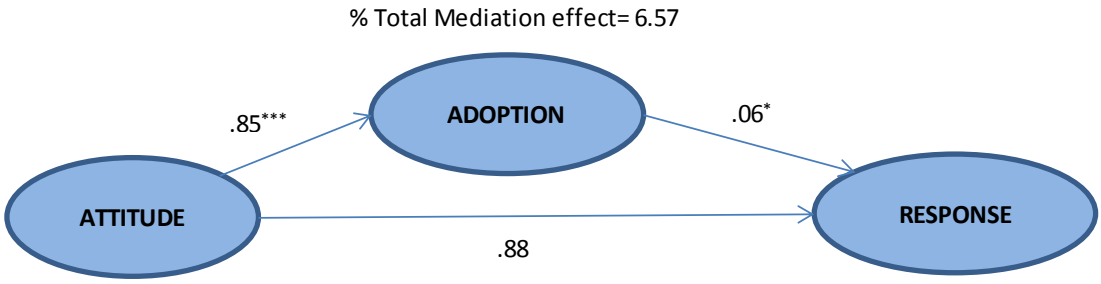

Figure 15: Mediation output for kiosk check-in

Figure 15 depicts the results of the mediation model for kiosk check-in. The results mean that on average, 88% of the passengers with high attitude are more likely to experience increased levels of response to kiosk check-in. Alternatively, only 6.57% of the passengers that frequently make use of the kiosk check-in option have increased levels of response to kiosk check-in. This is evident in the total mediation effect of 6.57%, p<.1 of adoption on attitude and response.

5.6.3 Internet check-in

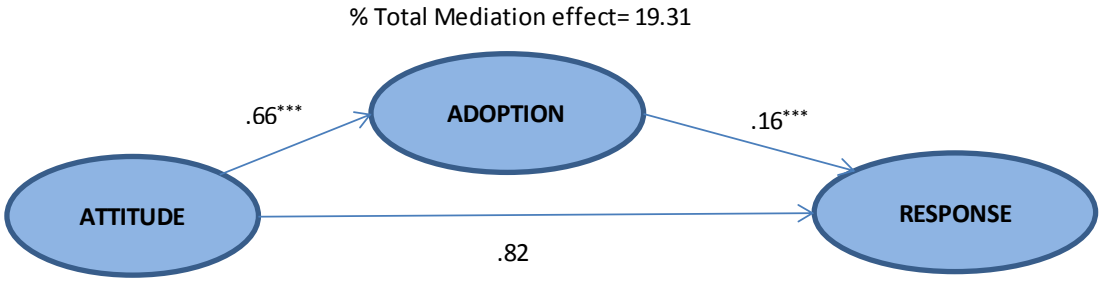

Figure 16: Mediation output for internet check-in

Figure 16 depicts the results of the mediation model for internet check-in. The results mean that on average, 82% of the passengers with high attitude are more likely to experience increased levels of response to internet check-in. Alternatively 19.31% of the passengers that frequently make use of internet check-in option, have

increased levels of response to internet check-in. This is evident in the total mediation effect of 19.37%, p<.01 of adoption on attitude and response.

5.6.4 Mobile telephone check-in

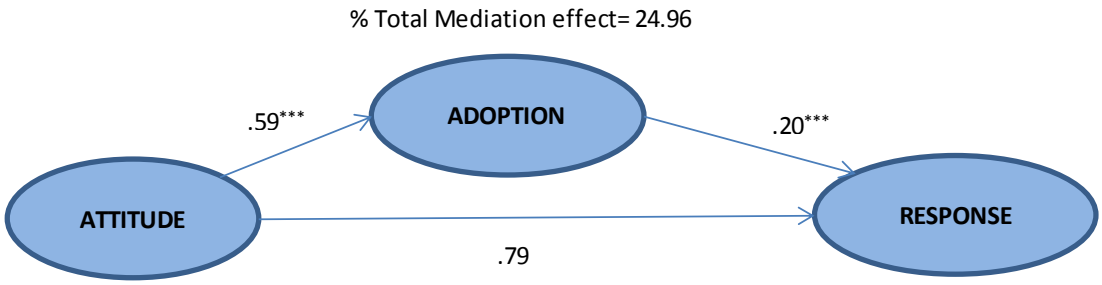

Figure 17: Mediation output for mobile telephone check-in

Figure 17 depicts the results of the mediation model for mobile telephone check-in. The results mean that on average, 79% of the passengers with high attitude are more likely to experience increased levels of response to mobile telephone check-in. Alternatively, 24.96% of the passengers that frequently make use of the mobile telephone check-in option have increased levels of response to mobile telephone check-in. This is evident in the total mediation effect of 24.96%, p<.01 of adoption on attitude and response.

5.6.5 Summary of Hypotheses 4 and 5

The results provide support for **Hypothesis 4:** Passengers attitude is positively associated with their adoption of SSCIT's. Evidence supports this hypothesis for all modes of check-in

However partial support for **Hypothesis 5:** Passengers attitude is positively associated with their adoption of SSCIT's. Evidence supports this hypothesis for mobile telephone check-in and internet check-in where partial mediation occurs.

5.7 Conclusion

This study found that the various TR dimensions work synchronously with attitude, adoption and response to SSCIT's. The respondents' provided much insight into the behaviours and attributes of the flying South African public. While caution is exercised not to make "blanket" assumptions from this study, the study has provided evidence in support of the tested hypotheses. The Table 21 overleaf provides a summary breakdown of the results per stated hypothesis.

Table 21: Summary breakdown of Results of Hypotheses tested

	Hypothesis	Conclusion		
H1	*Hypothesis 1:* Passengers' overall TR is positively associated with their attitude towards the use of SSCIT's.	Counter check-in		not supported
		Kiosk check-in		supported for innovativeness and optimism only
		Internet check-in		supported for innovativeness and optimism only
		Mobile telephone check-in		supported for innovativeness and optimism only
H2	*Hypothesis 2:* Passengers' overall TR is positively associated with their adoption of the use of SSCIT's.	Counter check-in		supported for negativity only
		Kiosk check-in		supported for innovativeness and optimism only
		Internet check-in		supported for innovativeness and optimism only
		Mobile telephone check-in		supported for innovativeness and optimism only
H3	Hypothesis 3: Passengers' overall TR is positively associated with their response to the use of SSCIT's.	Attitude Path	• counter check-in	not supported
			• kiosk check-in	not supported
			• Internet check-in	not supported
			• Mobile telephone check-in	supported for optimism only
		Adoption Path:	• Counter check-in	supported for optimism and negativity only
			• Kiosk check-in	supported for all TR dimensions
			• Internet check-in	supported for negativity only
			• Mobile telephone check-in	supported for optimism only
H4	*Hypothesis 4:* Passengers' attitude is positively associated with their adoption of self-service check-in technologies.	Counter check-in		supported
		Kiosk check-in		supported
		Internet check-in		supported
		Mobile telephone check-in		supported
H5	*Hypothesis 5:* Passengers adoption is positively associated with their response to self-service check-in technologies	Counter check-in		not supported
		Kiosk check-in		supported-partial mediation
		Internet check-in		supported-partial mediation
		Mobile telephone check-in		supported-partial mediation

6. CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter reinforces the conclusions, provides key recommendations and suggests future strategies for key stakeholders to consider. Some alternate theories, not mentioned in this study previously, may be mentioned briefly. The researcher also provides some of his own interpretations and recommendations in the discussion of the conclusion and recommendations.

6.2 Conclusions of the study

The main research problem was to assess the effects of *TR* on passengers' attitudes towards, adoption of, and response to the use of SSCIT's in South Africa. This study investigated and found evidence, either in support of or non-support, in relation to each of the sub-problems identified.

This study clearly demonstrated the differences among the different SSCIT's that must be carefully considered in implementation of SSCIT's.

Evidence provided support of passengers' innovativeness and optimism being positively associated with their attitudes towards and adoption of SSCIT's. However, negativity was found to be negatively associated with their attitudes towards and adoption of SSCIT's. These results echo the statements of Meuter et al. (2003) that customers may avoid use of self-service technologies should they be uncomfortable with or not ready to use technology.

In respect to passengers' attitude towards mobile telephone check-in, significant positive relationships were found to exist between optimism and passengers' response to mobile telephone check-in. No significant relationships existed between the remaining TR dimensions and passengers' response to other types of SSCIT's.

However, in respect to passenger's adoption of kiosk check-in, all TR dimensions showed significant positive relationships with passengers' response to kiosk check-in. Whereas for passenger's adoption of mobile telephone check-in only significant positive relationships were found to exist between optimism and passengers' response to mobile telephone check-in.

The results of the association of TR and passengers' response to SSCIT's echoes the statements of Lin and Hsieh (2005), where customers' adoption of technology varied in relation to individual characteristics. However, Lin and Hsieh (2005) further confirmed in their study that TR is an important driver of self-service technology response and behavioural intentions (loyalty and repeated use) where more satisfied customers are more likely to re-use and recommend the self-service technology to others. In alternate studies Mick and Fournier (1998) identified 8 paradoxes of *technology readiness*: control/chaos, freedom/enslavement, new/obsolete, competence/incompetence, efficiency/inefficiency, fulfils/creates needs, assimilation/isolation, engaging/disengaging, technology that may spark positive and negative feelings. Passengers' anxiety levels must also be taken into consideration such as computer anxiety, the fear of apprehension and expectations people experience when using computer technology (Igbaria and Parasuraman 1989; Kay 1993). Key factors that lead to satisfaction/dissatisfaction usefulness, ease of use, availability, and convenience play a significant role in customer response with SST's (Meuter, et al. 2000)

The results of this study unanimously support that passenger's attitude is positively associated with passengers' adoption levels for all SSCIT modes. However, partial support was found for passengers' adoption being positively associated with their response to kiosk and internet check-in. Other attitudinal, behavioural and psychographic factors, considered in this study, may potentially have an impact such as cost, value, and corporate image (DeRuyter, Moorman, Lemmick 2001; Urban, Sultan, Qualls 2000; Taylor et al. 2002). Technology Acceptance Model (TAM) purports that ease of use and perceived usefulness of the technology are key constructs that influence an individuals' attitude towards technology (Curran et al.

2003), whereas Dabholkar (1994 , 1996) identified control performance, ease of use, need for human interaction, reliability and speed as key constructs of usage. Alternatively, other factors more appropriate to these types of technologies may be important contributors in technology usage for example support, accuracy, performance and recovery from error (Meuter and Bitner 1998).

Kiosk and internet check-in have been available SSCIT's to the flying public in SA for a considerable time, but their respective adoption rates show that there is a fundamental difference in their appeal. It is still to be seen whether mobile telephone adoption will reach the adoption levels of the other SSCIT's or the expected levels of the service providers. There are other technical considerations that may contribute to the reasons relating to use of SSCIT's that have not been considered in this study such as speed of machinery (Seybold 1998), ease of use of technology-based interface (Sindell 2000), download problems (Zemke and Connellan 2001), technophobia (Hagen 1999) and the impact of technology on customer's service experience (Seybold 2001).

ACSA and airlines should attempt to raise *TR* levels of all passengers, resulting in lower levels of customer dissatisfaction and or frustration, target increase in repeat usage and improve positive word of mouth recommendations which will promote loyal customers.

Thus concluding the reporting of outcomes of this study, in relation to initial stated sub-problems, a summary is provided below:

- In assessing the first problem, evidence in support of innovativeness and optimism TR dimensions were found to have effects on passengers' attitudes toward the use of all modes of SSCIT's.
- In assessing the second problem, evidence in support of innovativeness and optimism TR dimensions were found to have effects on passengers' adoption of the use of all modes SSCIT's.
- In assessing the third problem, when considering passenger attitude there was no evidence to support TR dimensions to have any effects on passengers'

response to the use of any mode of SSCIT. However, when considering passenger adoption each TR dimension affects passengers' responses differently for each mode of SSCIT.

- In assessing the fourth problem, evidence was found to support that passengers' attitudes do have an effect on passengers' adoption for all modes of SSCIT's.
- In assessing the fifth problem partial evidence was found to support that passengers' adoption do have an effect on passengers' responses to the use of all modes of SSCIT's.

6.3 Recommendations

Strategy focussed primarily on technology based services may not realise profitability unless bundled with other customer benefits (Radas and Shugan 1998). Thus, technology must be combined with personal attributes of service delivery (Berry 1999) for successful implementations.

Contrary to service provider belief, SSCIT's must benefit the passenger and marketing strategies must adequately address the concerns and perceived benefits in passengers' minds (Curran and Meuter 2005). Marketing strategies and marketing hype must build positive drivers (innovativeness and optimism) to encourage use of SSCITs, address negative inhibitors (discomfort and insecurity) to gain passengers' trust of SSCIT options (Lin and Hsieh 2006). Marketing campaigns, focused and targeted on unique advantages of specific SSCIT's for repeat users may be more effective whereas to gain new users, focusing on the general benefits of SSCIT's may seem more appropriate (Curran et al. 2003).

Airlines and ACSA must provide simple and user friendly equipment, provide better education and guidance, set realistic goals of adoption in line with customers' TR and support passengers through the self-service journey (Lin and Hsieh 2006). Consistency should also play a role in ensuring that passengers are exposed to the same technology, equipment, location, ambience etc. when travelling the various airports in South Africa. This consistency should not be limited to type of check-in

technologies, airports used or is possible airline travelled. ACSA and airlines should offer reliable services that allow prompt and clear interaction yet easy to understand and operate (Lin and Hsieh 2006).

Situational factors of where passengers check-in needs due consideration as these situational factors include crowding at airports, if passengers are travelling alone or accompanied, or waiting time (Silpakit and Fisk 1985). Passengers unfamiliar with SSCIT's may be less likely to make use in crowded situations or those passengers who are uncomfortable speaking and interacting may be more likely to use in crowded situations (Dabholkar 1996). Alternatively passengers travelling alone may choose to use SSCIT's so that they may have something to do and try at the airport (Maister 1985) or less likely to use as they may need some human interaction (Forman and Sriram 1991).

Product designs should be state of the art technology, aesthetically appealing and possibly with visual and audio effects, interactive voice response systems giving consumers increased choice as to place and comfort (Lin and Hsieh 2006).

In addressing passengers' negativity fears and concerns, full understanding of their personal preference and not forcing adoption of specific type of SSCIT may lead to decrease in negative perception (Lin and Hsieh 2006). System manufacturers can provide more reliable operating systems, reduce frequency of service failure, provide stringent security measures to prevent personal data leakage, and check-in bookings should be accurately reconfirmed to reduce fears passengers may have about discomfort and insecurity (Lin and Hsieh 2006).

Frequent flying passengers should be consulted and involved in the design of SSCIT's to ensure that passengers' needs are addressed and greater acceptance and adoption will take place (Lin and Hsieh 2005).

These results reinforce the role TR plays in customer SSCIT interaction and is expected fundamental for long-term business success (Lin and Hsieh 2005).

6.4 Suggestions for further research

This study focussed on the *technology readiness* model developed by Parasuraman (2000) and the associated relationships between attitudes, adoption and response.

However further research is recommended:

- The relationship between passengers' attitudes towards airline check-in staff compared to attitudes towards SSCIT's. Curran et al. (2003) found evidence of two forces of customer attitudes; attitudes towards service employees and attitudes towards SST's. The impact that either of these service experiences will have on overall preference for a particular method should be better understood. Further, service providers should better understand what will retain their current customer base. Possible research problem to be investigated: Passenger overall satisfaction levels compared when using airline check-in counter versus SSCIT.

- The relationship between the constructs of response i.e. satisfaction and service quality. Lin and Hsieh (2006) found the influence of *technology readiness* on SST satisfaction is mediated through SST service quality and they too called for further theoretical and empirical assessments for further research. In this study, there was only evidence to support partial mediation of passengers' response levels when adopting SSCIT's. The individual dimensions that constitute passenger response levels in terms of satisfaction and service quality were not studied. It will be of interest to further contribute to the work of Lin and Hsieh (2006) and this study to determine the extent of the influence of *technology readiness* on SSCIT satisfaction and service quality. Possible research problem to be investigated: the effects of technology readiness on passenger satisfaction levels when making use of SSCIT's.

- Response in this study was measured as a single overall measure of satisfaction and quality of service. Other service quality dimensions exist and

it will be interesting to test those service quality constructs and compare the outcomes with this study. Dabholkar (1996) developed a conceptual framework to integrate service quality and customer participation in the technology service. It will be of interest to both ACSA and the airlines to test the model in the airport environment and better understand which attributes have more importance to the travelling public. Other service quality models for example SERVQUAL (Parasuraman, et al. 1998) or customer expectations/perceptions models (Gronroos 1984) may also be of interest. Possible research problem to be investigated: Comparison of alternate service quality models in passenger use of SSCIT's.

- Future research should investigate possible influence of some situational factors may have on SST attributes, time pressures, presence of other customers, waiting time. Dabholkar (1996) and Dabholkar and Bagozzi (2002) also called for further research in this area. The situational factors within the airport precinct and offsite environments where passengers may have the opportunity to make use of SSCIT's must be investigated. The impact of these factors on passenger satisfaction and service quality levels needs to be studied further. Possible research problem to be investigated: The moderating effect of situational factors on passenger satisfaction and service quality levels.

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APPENDIX A

Copy of Research Instrument

Self Service Technologies	AIRPORTS COMPANY SOUTH AFRICA

Demographic

Demographic Data. Please select one of the appropriate boxes, against the number, that best describes you and your most frequent mode of travel.

Questions	Gender	
	Male	Female
1.1. What is your gender? ☐ Not Applicable	○	○

Questions	Age						
	16-21	22-25	26-34	35-44	45-54	55-64	65+
1.2. What was your age in years at last birthday? ☐ Not Applicable	○	○	○	○	○	○	○

Questions	Reason for Aviation	
	Leisure	Business
1.3. My primary reason for aviation travel is : ☐ Not Applicable	○	○

Questions	Ticket Class		
	Economy	Business	First/Upper
1.4. The primary class of ticket I purchase when I travel : ☐ Not Applicable	○	○	○

Self Service Technologies



AIRPORTS COMPANY
SOUTH AFRICA

Self-Service

Attitudes toward self-service check-in technologies are generally accepted as a psychological tendency by evaluating a specific type of self-service technology with a degree of preference or non preference. Please indicate on the scale below for each of the sets of questions :

Questions	1 - Very Bad	2	3	4	5	6	7 - Very Good
2.1. When using Self-service kiosk to check-in, I generally feel : ☐ Not Applicable	○	○	○	○	○	○	○
2.2. When using Web/Online to check-in, I generally feel : ☐ Not Applicable	○	○	○	○	○	○	○
2.3. When using Mobile Phone to check-in, I generally feel : ☐ Not Applicable	○	○	○	○	○	○	○
2.4. When using Counter to check-in, I generally feel : ☐ Not Applicable	○	○	○	○	○	○	○

Questions	1 - Very Unpleasant	2	3	4	5	6	7 - Very Pleasant
2.5. It is generally pleasant/unpleasant to use Self-service kiosk check-in : ☐ Not Applicable	○	○	○	○	○	○	○
2.6. It is generally pleasant/unpleasant to use Web/Online check-in : ☐ Not Applicable	○	○	○	○	○	○	○
2.7. It is generally pleasant/unpleasant to use Mobile Phone check-in : ☐ Not Applicable	○	○	○	○	○	○	○
2.8. It is generally pleasant/unpleasant to use Counter check-in : ☐ Not Applicable	○	○	○	○	○	○	○

Questions	1 - Strongly Dislike	2	3	4	5	6	7 - Strongly Like
2.9. I Like/Dislike using the Self-service kiosk : ☐ Not Applicable	○	○	○	○	○	○	○
2.10. I Like/Dislike using the Web/Online check-in : ☐ Not Applicable	○	○	○	○	○	○	○
2.11. I Like/Dislike using the Mobile Phone check-in : ☐ Not Applicable	○	○	○	○	○	○	○
2.12. I Like/Dislike using the Counter check-in : ☐ Not Applicable	○	○	○	○	○	○	○

Self Service Technologies

AIRPORTS COMPANY SOUTH AFRICA

Self-Service Frequency

Adoption of SSCIT's is generally accepted as the frequent use of self-service check-in technologies. Please indicate on the scale below how frequently you use and intend making use of each type of check-in technology.

Questions	1 - Very Unlikely	2	3	4	5	6	7 - Very Likely
3.1. I frequently make use and intend making use of the Self-service kiosk : ☐ Not Applicable	○	○	○	○	○	○	○
3.2. I frequently make use and intend making use of the Web/Online check-in : ☐ Not Applicable	○	○	○	○	○	○	○
3.3. I frequently make use and intend making use of the Mobile Phone check-in : ☐ Not Applicable	○	○	○	○	○	○	○
3.4. I frequently make use and intend making use of the Counter check-in : ☐ Not Applicable	○	○	○	○	○	○	○

Questions	Kiosk	Web/Online	Mobile Phone
3.5. My 1st order of preference when checking in for my flight is : ☐ Not Applicable	○	○	○
3.6. My 2nd order of preference when checking in for my flight is : ☐ Not Applicable	○	○	○
3.7. My 3rd order of preference when checking in for my flight is : ☐ Not Applicable	○	○	○

Self Service Technologies

AIRPORTS COMPANY SOUTH AFRICA

Quality of Self Service technologies

Responses to self-service check-in technologies is generally accepted as the overall satisfaction with and quality of service experienced in the use of a particular type of self-service check-in technology. Please indicate on the scale below how satisfied/dissatisfied you have been in the past with each type of check-in technology or if you have never used this service before.

Questions	0 - Never Used	1 - Strongly Disagree	2	3	4	5	6	7 - Strongly Agree
4.1. I am overall satisfied and enjoy the quality of service when using the Self-service kiosk : ☐ Not Applicable	○	○	○	○	○	○	○	○
4.2. I am overall satisfied and enjoy the quality of service when using the Web/Online check-in : ☐ Not Applicable	○	○	○	○	○	○	○	○
4.3. I am overall satisfied and enjoy the quality of service when using the Mobile Phone check-in : ☐ Not Applicable	○	○	○	○	○	○	○	○
4.4. I am overall satisfied and enjoy the quality of service when using the Counter check-in : ☐ Not Applicable	○	○	○	○	○	○	○	○

Self Service Technologies



AIRPORTS COMPANY
SOUTH AFRICA

Technology

Technology Readiness is generally accepted as the propensity to embrace and use new technology for accomplishing goals. Please indicate on the scale below how your feelings to each of the statements below.

Questions	1 - Strongly Disagree	2	3	4	5	6	7 - Strongly Agree
5.1. Technology gives me more freedom of mobility. ☐ Not Applicable	○	○	○	○	○	○	○
5.2. Technical support lines are not helpful because they don't explain things in terms that I understand. ☐ Not Applicable	○	○	○	○	○	○	○
5.3. Products and services that use the newest technologies are much more convenient for me to use. ☐ Not Applicable	○	○	○	○	○	○	○
5.4. I do not feel confident doing business with a place that can only be reached online. ☐ Not Applicable	○	○	○	○	○	○	○
5.5. Generally I am among the first in my circle of friends to acquire new technology when it appears. ☐ Not Applicable	○	○	○	○	○	○	○
5.6. I can usually figure out new high-tech products and services without help from others. ☐ Not Applicable	○	○	○	○	○	○	○
5.7. Technology gives people more control over their daily lives. ☐ Not Applicable	○	○	○	○	○	○	○
5.8. It is embarrassing when I have trouble with a high-tech gadget while people are watching. ☐ Not Applicable	○	○	○	○	○	○	○
5.9. Other people come to me for advice on new technologies. ☐ Not Applicable	○	○	○	○	○	○	○
5.10. I do not consider it safe giving out a credit card number over a computer. ☐ Not Applicable	○	○	○	○	○	○	○
5.11. Any business transaction I do electronically should be confirmed later with something in writing. ☐ Not Applicable	○	○	○	○	○	○	○
5.12. When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do. ☐ Not Applicable	○	○	○	○	○	○	○

APPENDIX B

The effects of *technology readiness* on passengers' attitudes toward, adoption of and responses to the use of SSCIT are in South Africa.					
Sub-problem	**Literature Review**	**Hypotheses or Propositions or Research questions**	**Source of data**	**Type of data**	**Analysis**
The first problem is to assess the effects of *TR* on passengers' attitudes towards the use of SSCIT's in South Africa.	Parasuraman 2000) Chaiken and Eagerly (1993) Lin and Hsieh (2006) Liljander et al. (2006)	***Hypothesis 1:*** Passengers overall TR is positively associated with their attitudes towards the use of SSCITS.	Questions 2.1 to 2.12 Questions 5.1 to 2.12 Questions 2.1 to 2.12 Questions 5.1 to 5.12	Interval scaled data Interval scaled data	Regression Analysis of passenger attitudes against TR Correlation Analysis between the TR constructs and passengers' attitude towards the use of SSCIT's
The second problem is to assess the effects of TR on passengers' adoption of the use of SSCIT's in South Africa.	Parasuraman (2000) Walker (2002) Lin and Hsieh (2006) Liljander et al. (2006)	***Hypothesis 2***: Passengers overall TR is positively associated with their adoption of the use of SSCITS.	Questions 3.1 to 3.4 Questions 5.1 to 5.12 Questions 3.1 to 3.4 Questions 5.1 to 5.12	Interval scaled data Interval scaled data	Regression Analysis of passenger adoption against TR Correlation Analysis between the TR constructs and passengers' adoption of the use of SSCIT's.

The effects of *TR* on passengers' attitudes toward, adoption of and responses to the use of SSCIT are in South Africa.					
Sub-problem	**Literature Review**	**Hypotheses or Propositions or Research questions**	**Source of data**	**Type of data**	**Analysis**
The third problem is to assess the effects of *TR* on passengers' responses to the use of SSCIT's in South Africa.	Parasuraman (2000) Walker (2002) Lin and Hsieh (2006) Liljander et al. (2006)	***Hypothesis 3***: Passengers overall TR is positively associated with their response to the use of SSCITS.	Questions 4.1 to 4.4 Questions 5.1 to 5.12 Questions 4.1 to 4.4 Questions 5.1 to 5.12	Interval scaled data Interval scaled data	Moderated Regression Analysis using attitudes and adoption of passenger responses against TR.
The fourth problem is to assess the effects of passengers' attitude on passengers' responses to the use of SSCIT's in South Africa.	Eastlick (1996) Cronin, et al. (2002) Allen, Machleit and Kleine (1992)	***Hypothesis 4***: Passengers' attitude is positively associated with their response to the use of SSCITS.	Questions 2.1 to 2.12 Questions 4.1 to 4.4	Interval scaled data	Mediation Analysis of passengers' attitudes against passengers' response.
The fifth problem is to assess the effects of passengers' adoption on passengers' response to the use of SSCIT's in South Africa.	MacDonald and Smith (2004) Taylor et al. (2002) Lin and Hsieh (2006)	***Hypothesis 5***: Passengers' response is positively associated with their adoption of the use of SSCITS.	Questions 2.1 to 2.12 Questions 3.1 to 3.4	Interval scaled data	Mediation Analysis of passengers' response against passengers' adoption.