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Consumer adoption of online grocery shopping in South Africa

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Background: The remarkable proliferation and utilisation of information and communication technologies (ICTs), such as the Internet, has enabled businesses and customers to transact online seamlessly. Increasingly, studies have started paying attention to online shopping. However, there are limited studies with an online grocery shopping (OGS) perspective in developing nations.

Objectives: This study aimed to determine the factors influencing consumers' behavioural intention to adopt OGS in the Cape Metropolitan area of South Africa.

Method: This study employed quantitative research methods within a positivist research paradigm. It then utilised convenience sampling techniques to collect data ($n = 391$) in shopping malls in the Cape Metropolitan area using self-administered questionnaires pre-coronavirus disease 2019 (COVID-19). Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 23.

Results: The results showed that only perceived cost (PCo) had a significant influence on consumers' behavioural intention to adopt OGS, while perceived usefulness (PU), visibility (VIS), perceived ease of use (PEOU), perceived image barrier (PIB), perceived risk (PR) and social attractiveness (SAT) had an indirect influence on consumers' behavioural intention to adopt OGS.

Conclusion: In this study, PCo was found to influence consumers' behavioural intention to adopt OGS significantly. However, other factors such as PEOU, PU, PR, PIB and SAT indirectly influenced consumers' intention to shop for groceries online.

Contribution: As there are limited studies on OGS from a developing nation's perspective, this study makes a theoretical contribution by focusing on the pre-COVID-19 OGS in South Africa. Moreover, the results of this study can help to draw a comparison between the pre-pandemic and post-pandemic shopping experiences of customers, which is important to understand the effects of the pandemic on consumer behaviour.

Keywords: online grocery retailer; e-commerce; online grocery shopping; consumers; South Africa.

Introduction

The growth and use of information and communication technologies (ICTs) are unprecedented across the globe. Consumers and businesses can now seamlessly communicate and transact online (Haji 2021; Salehi 2012; Uwemi & Khan 2018). In concurrence, Al-nawayseh et al. (2013) denoted that technology-mediated environments have made business transactions possible between companies and consumers. Notably, this phenomenon of trading on the Internet emerged in the year 2000 (Khoo, Ahmi & Saad 2018), and presently, there are vast e-commerce ventures (Al-Nawayseh et al. 2013; Haji 2021). The ubiquitous growth of e-commerce is underpinned by the increase in digital consumers (Changchit 2006; Thusi et al. 2022) and the proliferation of internet-enabled devices such as smartphones and tablets (Adam, Alhassan & Afriyie 2020). In this era, for organisations of different sizes to remain competitive, they need to take advantage of e-commerce opportunities (Adam et al. 2020; Irwan Hariandi, Gumanti & Wahyudi 2019).

Evidence from the surveyed literature shows that most South African consumers still purchase groceries from brick-and-mortar grocery stores (Cloete & Mugobo 2021; Thusi et al. 2022). Although South Africa has a competitive and well-developed retail market, it appears to lag in online grocery retailing (Cloete & Mugobo 2021; Loate, Niemann & Kotze 2017). Even though it is close to two decades since the inception of the first online grocery retailing business, the overall

online channel contributions to the overall grocery sales are below acceptable levels (Loate et al. 2017).

With the high uncertainty about consumer preferences and technology adoption Keh & Sheih (2001) and Dereratu et. al (2000) suggested a need to understand computer-mediated shipping platforms. Furthermore, Lin (2007) affirmed that the increase in digital consumers calls for studies to understand their online shopping behaviours. Previously, non-grocery merchandise constituted most online shopping carts, but there is growing evidence of consumers shopping for groceries online (Cloete & Mugobo 2021). Unsurprisingly, developed nations have well-developed online grocery markets compared with developing countries such as South Africa (Johnson & Iyamu 2019; Mkansi et al. 2019). Moreover, most research about OGS has been conducted in developed nations, and there are limited studies from a developing nation's perspective.

In view of the given research problem, the study's primary aim was to determine the factors influencing consumers' behavioural intention to adopt OGS in the Cape Metropolitan area of South Africa. The secondary aim of the study was to ascertain the relative importance of factors influencing consumers' behavioural intention to adopt OGS in the Cape Metropolitan area. In the light of the objectives of the study, the researchers were able to conduct this investigation before coronavirus disease 2019 (COVID-19).

Literature review and hypothesis development

This section explores the notion of e-commerce and offers context for OGS pertaining to many countries worldwide, including South Africa. It also includes a theoretical framework for consumer technology and the conceptual framework used to fulfil the purpose of the study.

E-commerce

E-commerce is the online sale and purchase of goods and services between businesses, individuals, and governments, in which payment transactions are completed either online or offline (Adam et al. 2020; Johnson & Iyamu 2019). In concurrence, Kurnia (2008) also elucidated that e-commerce transactions can be carried out on the extranet and intranet. Furthermore, Schneider (2013) denoted that e-commerce is a broad term that involves communication, exchange and transactions between various entities and individuals, for example, business to consumer, business to business, consumer to consumer and business to government. Evidently, the proliferation of e-commerce has opened vast market opportunities for entrepreneurs and existing businesses (Haji 2021; Irwan Hariandi et al. 2019; Li, Frederick & Gereffi 2019).

Schneider (2013) suggested that e-commerce emerged in the 1990s, while Khoo et al. (2018) posited that e-commerce only became more prominent in the year 2000. Notwithstanding

the contradiction, e-commerce has become ubiquitous. There is wide adoption of e-commerce in both developed and developing nations (Adam et al., 2020; Khoo et al. 2018). Moreover, the founder of Amazon.com in the United States in 1994, Jeff Bezos, is attributed as one of the e-commerce pioneers worldwide. What started as an internet bookstore now has a wide variety of product categories such as electronics, toys and games, home and kitchen, sport and outdoors and many other categories (Levy et al. 2014). In China, e-commerce became prominent in 1998 after Jack Ma launched Alibaba.com (Clemes, Gan & Zhang 2014). By 2010, China outpaced the United States regarding the number of hours consumers spent online (Moriset 2018), although the US e-commerce market is more developed than China's.

In both the developed and developing world, e-commerce sales are expected to continue to increase. However, developing countries such as South Africa face many challenges that limit the pace of e-commerce adoption. Unlike in developed nations, in developing countries internet is not universally accessible (Haji 2021; Lawrence & Tar 2010). Furthermore, most developing nations' inadequacy of basic infrastructure, socio-economic upheaval and a lack of enough government support are significant e-commerce barriers (Cloete & Mugobo 2021; Johnson & Iyamu 2019; Lawrence & Tar 2010). Seemingly, developing nations such as South Africa have a long way to go to achieve ICT maturity.

Online grocery shopping

Online grocery shopping, also known as electronic grocery shopping or internet grocery shopping, is the purchase of grocery products in online stores by consumers (Alnawayseh, Alnabhan & Balachandran 2013; Cloete & Mugobo 2021; Thusi et al. 2022). Raijas (2002) postulated that consumers carry out shopping activities. Instead of buying groceries from traditional grocery stores, there has been an increase in consumers buying groceries online. Once a consumer orders groceries online from an online grocery retailer, the retailer is responsible for home delivery. The most prominent online grocery retailers in developed nations are Ocado and Tesco in the United Kingdom and Amazon and Walmart in the United States. In developing nations such as South Africa, Takealot.com, Sixty by Checkers, Pick n Pay ASAP by Pick 'n Pay and Woolworths exist. Moreover, over the past years, there has been an increase in the number of grocery retailers offering online options in South Africa (Mkansi & Nsakanda 2019; Mkansi et al. 2019).

Grocery merchandise is an everyday necessity (Delaney-klinger, Boyer & Frohlich 2001; Singh 2019; Singh & Rosengren 2020). Grocery shopping is an automatic and unthinking habit (Raijas 2002). On the contrary, Goethals et al. (2012) highlighted that this activity is tedious and stressful to consumers. Likewise, Huang and Oppewal (2006) denoted that consumers dislike shopping for groceries. For instance, consumers visit stores at least four times a week (Raijas 2002). In Finland, a study found that consumers patronise retail stores on average 4.3 times a week, spending 48 min per visit. Fifty-seven per

cent is spent in traffic, while 43% is spent in-store shopping (Yrjola 2001). Also, Tanskanen, Yrjola and Holmstrom (2002) posited that consumers spend about 200 h per year on grocery shopping. With online shopping, consumers can order groceries and get that delivered to their homes.

Consumers now understand the value of shopping for groceries online, such as saving money and time, broader product selection, competitive pricing and increased access to product information (Lin 2007; Tanskanen et al. 2002). Surprisingly, the adoption of OGS has been slower than anticipated (Al-Nawayseh et al. 2013; Cloete & Mugobo 2021; Huang & Oppewal 2006; Thusi et al. 2022). Studies show that consumers are still hesitant to shop for groceries online (Al-Nawayseh et al. 2013; Lin 2007). Research is ongoing to fully understand why consumers adopt or choose not to adopt online shopping (Cloete & Mugobo 2021; Paelo & Goga 2019; Thusi et al. 2022; Weber & Badenhorst-Weiss 2018; Weber-Snyman & Badenhorst-Weiss 2016). As most consumers have experience buying non-grocery merchandise online, it is hoped the same experience will be transferred to OGS (Johnson & Iyamu 2019; Mkansi et al. 2019).

Notably, most OGS studies have the perspective of a developing nation (Goethals et al. 2012; Kurnia et al. 2009; Morganosky & Cude 2000), and there are limited studies with the perspective of a developing nation such as South Africa. Developed nations have well-developed online grocery markets compared with developing nations such as South Africa (Johnson & Iyamu 2019). Hence, there is a need to understand South African consumers in their context to contribute to a developing nation's perspective on OGS.

Theoretical framework for consumer technology adoption

The concept of technology adoption is widely researched and various models have been promulgated to understand this phenomenon. This study focuses on determining the factors that influence consumer adoption of OGS. Online grocery shopping falls in the service innovation category (Khan & Khan 2020; López-Nicolás et al. 2008). Consumers are accustomed to shopping groceries from traditional brick-and-mortar grocery stores, in which they have to visit the store and select grocery merchandise. However, with the emergence of OGS, consumers can now order groceries from the comfort of their homes. It is now accepted that OGS is a mere an evolution rather than a revolution. Online grocery shopping will complement the traditional shopping and not replace it (Levy, Weitz & Grewal 2014). As this is a new phenomenon, augmented by technology, it is necessary to understand what influences consumers to adopt it.

As stated earlier, this study was conducted prior to the COVID-19 pandemic, and it was assumed that many South African consumers were still purchasing groceries from brick-and-mortar grocery stores. This assumption enabled the researcher to use a modified technology acceptance model (TAM) as the theoretical framework to achieve the

study objectives. Moreover, this process also helped to form the basis for the design of the questionnaire survey used to collect empirical data. Technology acceptance model is widely accepted and proven to be a good framework to explore technology adoption (Lee 2009; López-Nicolás et al. 2008; Moon & Kim 2001; Shareef et al. 2013; Yu et al. 2005). The model has been used to explain the adoption and use of various new technologies. According to Hernandez, Jimenez and José Martín (2009), TAM has '… high exploratory power in technology behaviour and e-commerce perceptions …' Other researchers who have used the TAM in related studies include Fayad and Paper (2015); Islam, Hoque and Sorwar (2017); Jamshidi and Hussin (2016); Moon and Kim (2001); Syarifudin, Abbas and Heriyati (2019); and Venkatesh and Davis (2000). However, new constructs supported by literature have been added to strengthen their robustness in exploring factors that influence OGS adoption.

The research model in Figure 1 represents the theoretical framework for the study. In this study, perceived usefulness (PU), perceived ease of use (PEOU), perceived cost (PCo), perceived risk (PR), perceived image barrier (PIB), visibility (VIS) and social attractiveness (SAT) are independent variables, while the behavioural intention to adopt OGS is a dependent variable.

Perceived usefulness

Perceived usefulness is a factor that influences the adoption of new technologies (Davies 1989; Awa et al. 2015). According to Vijayasarathy (2003), PU represents an extent consumers believe that online shopping provides useful information for decision-making, facilitates product and price comparison, and enables quicker shopping. It is also associated with the ability of technology to enhance consumers' shopping processes (Davies 1989). With OGS, consumers are seeking convenience benefits. Instead of visiting a grocery store and spending hours on the road and selecting merchandise, consumers prefer buying options that improve their buying productivity, which saves them money and time, like OGS. Therefore, in this study, it is hypothesised that:
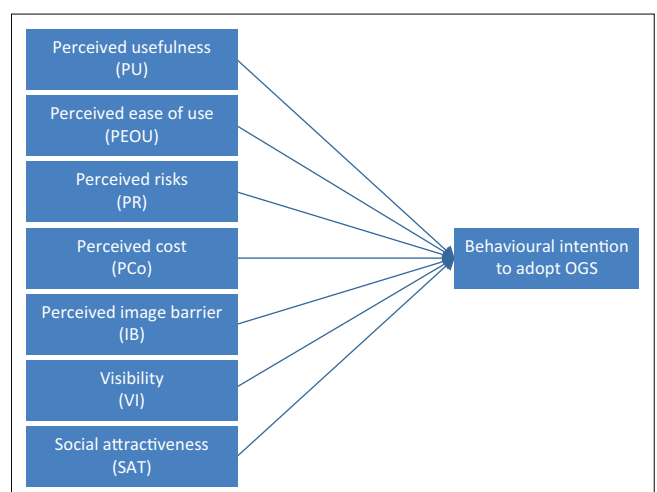

FIGURE 1: Theoretical framework for consumer technology adoption.

H1: PU has a positive influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Perceived ease of use

Perceived ease of use is considered as the extent consumers perceive that online shopping does not require a lot of effort (Vijayasarathy 2003). Elements such as website interface design play an important role in influencing the ease of use perception. A poor user interface breeds a negative perception towards technology adoption (Lee & Chang 2011). Furthermore, Lee and Chang (2011) also mentioned that websites should be user friendly, enabling easiness of navigation. Perceived ease of use entails ease of finding information and ordering (Gong, Stump & Maddox 2013). Online grocery shopping websites should enable the ease of use, so it is hypothesised that:

H2: PEOU has a positive influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Perceived risk

Perceived risks significantly influence consumers' decisions (Clemes et al. 2014). According to Schiffman and Kanuk (1997), PR is the uncertainty that consumers face when they cannot foresee the consequences of their purchase decisions. An adverse consequence of purchasing a product online is considered a risk (Huang & Oppewal 2006). Whether the risk is real or not, it has an impact on how consumers behave (Schiffman & Kanuk 1997). As PR plays a role in consumer decision-making, it also influences their intention to buy groceries online. Clemes et al. (2014) suggested that consumers perceive more risk while buying online as compared with offline. This might be the reason why consumers opt for traditional brick-and-mortar grocery shopping instead of OGS. The need to satisfy sensory stimuli before purchasing is absent in OGS (Huang & Oppewal 2006; Salehi 2012). It is therefore hypothesised that:

H3: PR has a negative influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Perceived cost

Consumers' perceptions of the costs associated with using new technology are considered to be PCo (Gao & Deng 2012; Pantano & Pietro 2012). Huang and Oppewal (2006) cited that delivery fees, for example, are a deterrent to OGS. Other costs such as data and the cost of acquiring software to ensure online safety can also hinder consumers' intention to buy online (Aqwu & Murray 2014). Consumers' desire to save money has increased (Clemes et al. 2014), but if OGS does not provide savings advantages, consumers will opt for traditional grocery shopping methods. Therefore, it is hypothesised that:

H4: PCo has a negative influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Visibility

The degree to which an innovation is apparent to consumers is considered VIS (Kurnia & Chien 2003). The OGS is a relatively novel method (Morganosky & Cude 2000) and a lot of consumers are not yet familiar with it. Online grocery retailers have the task of advertising OGS in various media to inform and persuade consumers to use it. Generally, an innovation that has not been widely marketed will not be able to gain market share. In this study, VIS signifies the level of consumers' awareness about OGS. When consumers see other people in their community, school or organisations using OGS, it increases their intention to adopt it (Kurnia & Chien 2003). It is therefore hypothesised that:

H6: VIS has a positive influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Perceived image barrier

Perceived image barrier represents a psychologically related barrier to how an individual uses technology (Ram 1987). Suppose consumers regard new technology to be effortful to use. In that case, they are most likely to be unmotivated to use it, which can cause consumers to be disinclined to adopt any innovation that enables them to shop online (Lian & Yen 2014). In this study, two PIB aspects will be considered, that is, the perception consumers have towards online shopping services and their overall impression of new technology.

Social attractiveness

This study refers to the attractiveness of the shopping experience in enhancing social interactions. Like shopping malls, they provide a one-stop shopping experience for consumers (Ahmad 2012; Rajagopal 2009). At malls, consumers can also shop and socialise. While with OGS, it fails to connect consumers physically and interact with each other. However, it is assumed that as consumers spend time travelling and selecting grocery merchandise, with OGS they can shop from the comfort of their homes giving them more time to socialise with their family. And with current ICTs, they can still chat with their colleagues seamlessly and cost-effectively. It is hoped that OGS is more socially attractive than shopping at malls. Therefore, it is hypothesised that:

H7: SAT has a positive influence towards consumers' behavioural intention to adopt OGS in the Cape Metropolitan area.

Research methodology

This study employed quantitative research methods within a positivist research paradigm. It then utilised a survey research design. As supported by Cooper and Schindler (2011), the motive was to fulfil the aim of this study through numerical measurements and analysis to acquire exact measurements of customer behaviour, knowledge, views and attitudes on OGS.

The population for this study are people who reside in the Cape Metropolitan area, South Africa. The Cape Metropolitan is an area in the southern peninsula of the Western Cape Province, which is the province's capital city and South Africa's legislative capital. Seven shopping malls were purposively chosen within the Cape Metropole area, where the surveys were conducted. These malls were in the following

areas: Strand Street, Central Business District (CBD), Rondebosch, Parow, Observatory, Goodwood, Brackenfell and Kuils River. The selected malls represent community centres where most people within the Cape Metropole do their shopping. And the malls were also chosen because they were accessible to the researchers; 455 surveys were equally distributed among the seven malls, that is, 65 surveys per mall.

Because of the congestion of shopping malls, the researchers utilised convenience sampling techniques to collect data in shopping malls in the Cape Metropolitan area using self-administered questionnaires. The researcher recruited three research assistants who stood at the entrance of the main grocery retailer requesting participants to complete the survey. Data collection for the study was carried out in February 2017 prior to the COVID-19 pandemic.

The questionnaire used in the study contained Likert scale items that indicated participants' level of agreement or disagreement. To ensure that the survey instrument is valid and trustworthy, the questions were taken primarily from previous research (Kurnia & Chien 2003; Lee 2009; Syarifudin et al. 2019; Yu et al. 2005), with some questions customised to this study. The use of previously used questions by other researchers is supported by Kurnia and Chien (2003) and Zikmund et al. (2013). On the contrary, some questions asked respondents to rank aspects in order of significance, which contributed to identifying characteristics that impact customers' behavioural intention to use OGS as a grocery shopping channel. In total, 391 questionnaires were answered correctly and were useful for data analysis.

Before the data collection, a pilot test was carried out with 20 people. The motive was to assess mistakes, calculate the average time each person takes to complete the questionnaire and identify other potential issues with the research instrument. The pilot test included postgraduate students and general customers. Postgraduate students were randomly chosen from the Cape Peninsula University of Technology District 6 Library. In contrast, ordinary customers were randomly selected from the Strand Street Mall, near the researchers' residences. The feedback aided in the revision of the questionnaire.

The Statistical Package for Social Sciences (SPSS) version 23 was utilised to analyse data in this study. The statistical software allowed the gathered data to be reduced to a manageable size, allowing for the development of summaries, the observation of trends and the use of statistical techniques (Cooper & Schindler 2003).

Ethical considerations

Throughout the study, all ethical concerns and protocols were followed. These include ethical approval, informed consent, voluntary participation, the right to privacy, confidentiality and honesty in data presentation. Ethical approval for the study was sought and granted from the Ethics Committee of the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology (Ethics reference number: 2015FBREC263).

Results

Demographic profiles of respondents

Table 1 represents the demographic characteristics of respondents, such as gender, age, marital status, race and level of education, and the number of respondents ($n = 391$).

As shown in Table 1, the majority of respondents were females (60.4%) with 39.6% of males. In terms of age, respondents between the ages of 26 years and 45 years constituted the majority (48.3%), followed by respondents between the ages of 18–25 years (41.7%). Moreover, most respondents were single (65%), followed by married (19.4%). The majority of respondents had a diploma (40.7%), which was followed by respondents with a bachelor's degree (30.4%). Table 1 also shows that black people constituted the majority of respondents (51.7%), followed by 22.5% of mixed race respondents.

Moving on, to determine the impact of each construct relative to the dependent variable, a regression analysis formula was employed, rather than a straight average. This helps to compensate for individuals' items that make up the construct that does not have an equal impact on the items. As a result, each construct ranges in values around 0, where positive values indicate agreement while negative values represent disagreement and are numerical values.

In this study, the dependent variable is categorical; therefore, the normality assumption cannot be met. Hence, a generalised

TABLE 1: Demographic profiles of respondents.

Item	Frequency	%
Gender		
Males	155	39.0
Females	236	60.4
Age (years)		
Under 18	15	3.8
18–25	163	41.7
26–45	189	48.3
46–60	20	5.1
Older than 60	4	1.0
Marital status		
Single	254	65
Married	76	19.4
Single parent	46	11.8
Other	15	3.8
Educational qualifications		
High school and less	71	18.2
Diploma	159	40.7
Bachelor's degree	119	30.4
Master's degree	30	7.7
Doctorate degree	16	4.1
Race		
Black people	202	51.7
White people	58	14.8
Mixed people	88	22.5
Asian people	30	7.7
Other	14	3.7

linear model for categorical, non-normal or binary data (Agresti 2007; Simonoff 2003) was utilised. The generalised linear model is a member of the same family of linear models as variance analysis and regression models. It is a generalised form of the classic linear regression model.

The classic linear model has the form:

$$E(Y) = a + bx \text{ or } Y = \mu + \varepsilon \qquad \text{[Eqn 1]}$$

where a = the intercept
           b = the slope
           x = independent variable
           Y = dependent variable

All classic linear models make the assumption that all observations are normally distributed and are independent of each other. In this study, the proposed factors that determine consumer adoption of OGS had sub-factors aggregated from Likert-scale questions in a survey, meaning one cannot safely assume that relationships cannot be found using the classic linear model and that the construct will be normally distributed.

The generalised linear model consists of a random component, a systematic component and a link function (McCullagh & Nelder 1989). The following are the assumptions of the *classic* linear model, as outlined by McCullagh and Nelder (1989):

1. Each component of the dependent variable, Y, is independent and normally distributed, having a common variance (random component).
2. The covariates are combined to give the linear predictor (systematic component):

$$\eta_i = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_k X_{ik.} \qquad \text{[Eqn 2]}$$

i. A link function, g(·), which specifies the relationship between the random component and the systematic component:

$$g(p_i) = \eta_i = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_k X_{ik} \qquad \text{[Eqn 3]}$$

From a generalised linear model standpoint, the first assumption is relaxed meaning the dependent variable does not have to be normally distributed. The variance does not have to be common, and the link function mentioned in the third assumption is monotonic and differentiable. Link functions are chosen according to the data type and the context of the data. The dependent variable in this study is binary, and thus, a logit link function $g(p) = \ln \dfrac{p}{1-p}$ is selected, where p, for example, is the probability (p) of a specific profile making a specific selection (Simonoff 2003).

The logistic regression model relating the predictors (independent variables, i.e., $x_1, x_2 ..., x_k$) to a specific p is written as:

$$\log \frac{p}{1-p} = \alpha + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k (0-1) \qquad \text{[Eqn 4]}$$

The researcher can calculate the probability (p) of a specific profile making a specific selection as shown below:

$$p = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k}} (0-2) \qquad \text{[Eqn 5]}$$

The generalised linear model was applied to determine which constructs impact consumers' behavioural intention to adopt OGS.

Statistical significance was expressed as a p-value to measure each construct's significance level. The p-value of each construct should be within the range of 0.001 > and < 0.05 for it to be considered to have a significant influence or positive influence on the dependent variable (behavioural intention to adopt OGS).

Perceived usefulness

To ascertain consumer perception of the usefulness of OGS, the researchers used the following questions to make up the construct:

- OGS (will) provide me with a broader selection of grocery products.
- OGS online (will) save me money.
- OGS (will) save me time.
- OGS (will) enable me to compare products and prices of grocery merchandise.
- The internet (will) give me access to useful OGS information

Table 2 shows responses from the survey highlighting respondents' PU of OGS.

The following are the main inferences that may be made from the results:

Firstly, based on the general linear regression model, a p-value of 0.05 indicates that the PU does not have a significant contributing factor to OGS adoption. Secondly, the majority (58.4%) of respondents agreed or strongly agreed that OGS is useful in terms of grocery shopping

TABLE 2: Perceived usefulness.

Variable	Behavioural intention to adopt OGS			N = 391	%	p
	No	Yes	Undecided			
(PU)						0.05
Strongly Disagree	0	2	2	4	1	
Disagree	17	14	10	41	10.5	
Not sure or uncertain	25	43	50	118	30.2	
Agree	20	109	55	184	47.1	
Strongly agree	4	36	4	44	11.3	
Total	**66**	**204**	**121**	**391**	**100**	

OGS, online grocery shopping; PU, Perceived usefulness.
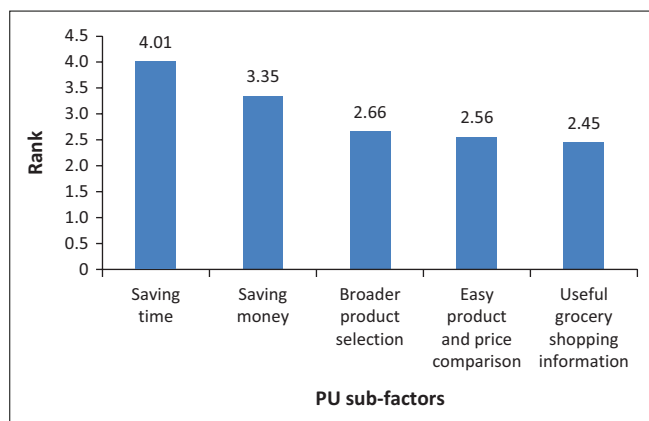
FIGURE 2: Perceived usefulness sub-factors.

FIGURE 3: Respondents' perception of saving money using online grocery shopping.

needs. However, 11.5% of respondents disagreed or strongly disagreed that OGS is useful, while 30.2% of respondents neither agreed nor disagreed that OGS is useful.

As the respondent sees PU as a non-significant factor, a full analysis of the sub-factors in order of importance is detailed in Figure 2. Figure 2 shows the PU sub-factors ranked in the order of importance.

As mentioned before, the PU construct is made up of five sub-factors. Figure 2 shows these sub-factors are ranked in order of importance. Saving time (4.01) and money (3.35) have a higher ranking. These were considered the two most important factors than others. The least important factor in the ranking was the usefulness of grocery shopping information online (2.45). A previous study conducted by Kurnia and Chien (2003) also identified time saving as an important aspect of OGS. Also, OGS saves consumers money according to Murphy (2007). Usually, consumers want to avoid incurring unnecessary, hence the value of OGS. This study's findings show that saving time and money are more important factors of the PU construct.

The sub-factor 'OGS saves money' had the highest ranking of 4.01. Still, to further understand how many respondents agreed or disagreed with the assertion that OGS saves money, Figure 3 illustrates these findings.

Figure 3 shows that the majority of respondents agree that OGS saves them money; 30.7% agreed and 15.9% strongly agreed.

Perceived ease of use

The following questions were used to ascertain respondents' perceptions of the ease of OGS.

- It is (It will be) easy for me to do OGS.
- It is (It will be) easy for me to learn how to do OGS.
- Browsing and searching for OGS products is (will be) understandable and easy for me.
- It is (It will be) easy for me to use my banking details while doing OGS (such as using a credit card).
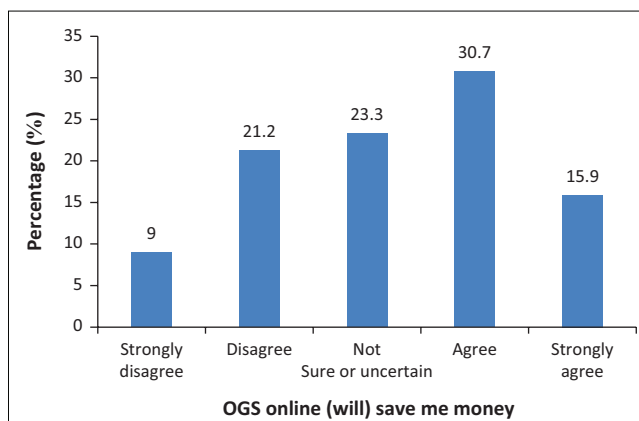
TABLE 3: Perceived ease of use.

Variable	Behavioural intention to adopt OGS			$N = 391$	%	p
	No	Yes	Undecided			
(PEOU)						0.191
Strongly Disagree	3	4	1	8	2	
Disagree	10	10	19	39	10	
Not sure or uncertain	32	72	56	160	40.9	
Agree	17	97	42	156	39.9	
Strongly agree	4	21	3	28	7.2	
Total	**66**	**204**	**121**	**391**	**100**	

OGS, online grocery shopping; PEOU, perceived ease of use.

Table 3 shows respondents' perception of the easiness of using OGS.

As derived from the linear regression model, PEOU's p-value is 0.191, which indicates no significant influence on OGS adoption. In addition, although PEOU does not have a direct positive influence on OGS adoption, most respondents agreed (47.1%) that OGS is (will be) easy to use. Also, other respondents neither agreed nor disagreed that OGS is easy to use (40.9%).

Figure 4 shows PEOU sub-factors.

Perceived ease of use sub-factors were ranked in importance, as shown in Figure 4. 'Easy to browse or search for groceries online' was the most important factor, followed by 'Easy to buy groceries online'. 'Easy to do online transactions' (2.45) and 'Easy to learn how to do OGS' (2.43) were the least important sub-factors.

As highlighted in Figure 5, the majority of respondents agree that it is easy to browse and search for grocery products online (61.9%). Only 17.2% disagree and 21% were not sure. In a previous study by Changchit (2006), the author postulated that some consumers browse for grocery products online and complete their purchases in physical grocery stores. This could substantiate that most respondents agreed that it is easy to browse and search for products online.
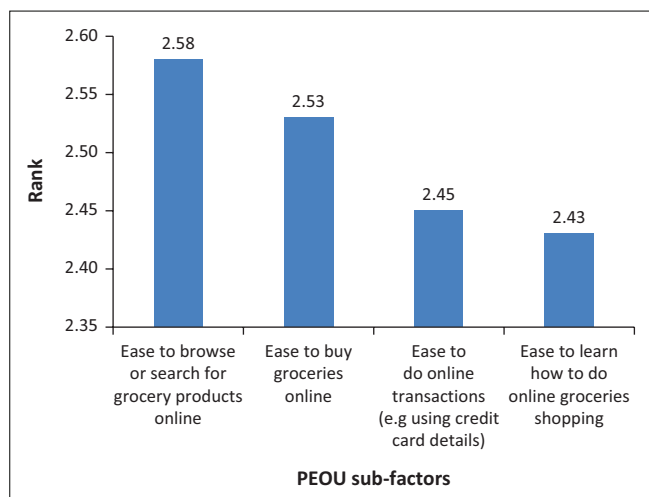
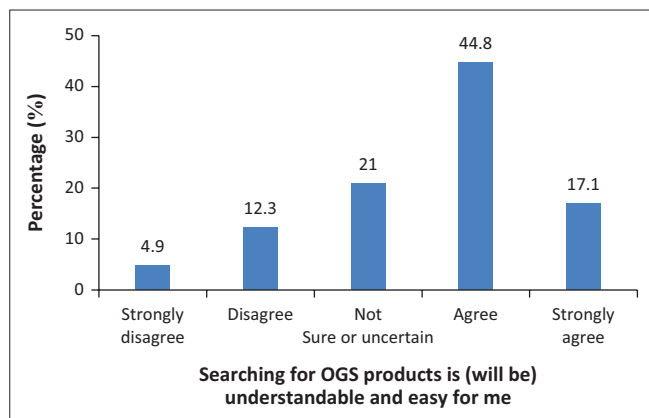FIGURE 4: Perceived ease of use sub-factors.

FIGURE 5: Ease to browse and search for groceries.

Perceived risk

To ascertain whether PR had a significant influence on behavioural intention to adopt OGS, the following questions were used:

- I am concerned with the payment security aspects of my OGS.
- I am concerned with the privacy of my information I provide while using OGS.
- I am concerned with the quality of the products delivered while doing OGS.
- I am concerned about the order delivery time of my OGS.

The linear regression model shows that PR's p-value is 0.197, which represents a negative significant influence to adopt OGS (dependent variable). Furthermore, as illustrated in Table 4, most respondents agreed (65.5%) that they perceive some risk when they want to buy online. Only 12.8% of respondents indicated that they perceive no risk while doing OGS. Notably, previous studies indicated that consumers are influenced by the risk they perceive, even if the risk exists or not (Chu & Li 2008; Schiffman & Kanuk 1997). The findings of this study confirm the results of previous studies concerning PR while shopping online.

TABLE 4: Perceived risk.

Variable	Behavioural intention to adopt OGS			$N = 391$	%	p
	No	Yes	Undecided			
(PR)						0.197
Strongly Disagree	0	5	4	9	2.3	
Disagree	8	21	12	41	10.5	
Not sure or uncertain	16	43	26	85	21.7	
Agree	26	106	54	186	47.6	
Strongly agree	16	29	25	70	17.9	
Total	66	204	121	391	100	

OGS, online grocery shopping; PR, perceived risk.
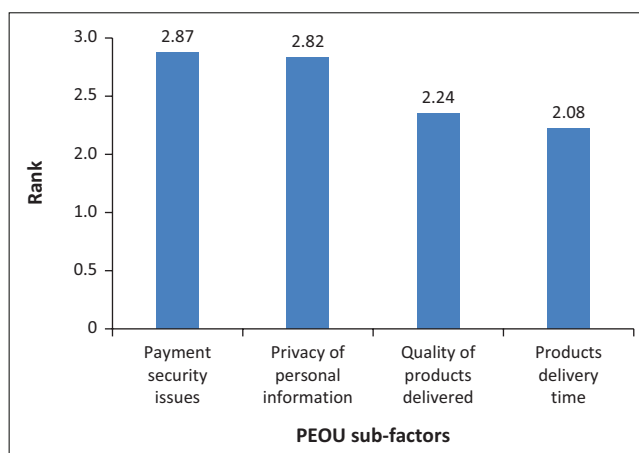
PEOU, Perceived ease of use.

FIGURE 6: Perceived risk sub-factors.

Figure 6 shows the ranking of PR sub-factors.

Respondents show great concern over online payment and security over their private details (as shown in Figure 6). Issues such as delivery time and product quality seem to have a lower negative influence on OGS as compared with other PR concerns. Moreover, it is evident that respondents feel more vulnerable when shopping online as compared with shopping in a physical store. A study conducted by The South African Banking Risk Information Centre (SABRIC) in 2013 pointed out that South Africa has the second highest rate of fraudulent activities online worldwide (Writer 2014). Hence, concerns that consumers have over PR are a challenge for online grocery retailers to overcome.

Most respondents agree that payment securities (70.4%) are a major concern to their OGS adoption as shown in Figure 7. Only 16.4% of respondents disagreed, while 13.3% were uncertain. Accordingly, online grocery retailers should adopt a model that permits consumers to pay for products on delivery, since respondents were most concerned with the security of their payments. This will likely eliminate the risk of paying online.
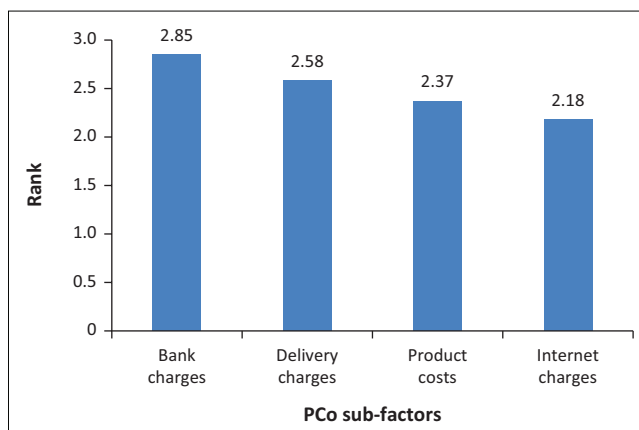
Perceived costs

The following questions were used to determine respondents' perceptions of the cost of doing OGS:
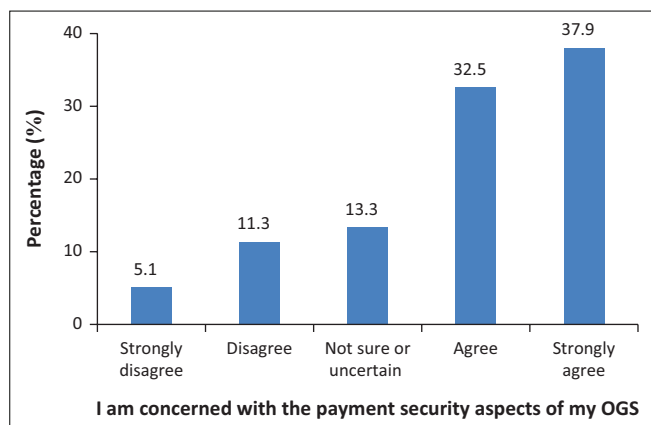
OGS, online grocery shopping.

FIGURE 7: Payment security issues.

TABLE 5: Perceived cost.

PCo influence	Behavioural intention to adopt OGS			N = 391	%	p-value
	No	Yes	Undecided			
(PCo)						0.025
Strongly Disagree	0	7	2	9	2.3	
Disagree	15	67	24	106	27.1	
Not sure or uncertain	35	97	75	207	52.9	
Agree	13	31	19	63	16.1	
Strongly agree	3	2	1	6	1.5	
Total	66	204	121	391	100	

PCo, perceived cost; OGS, online grocery shopping.

- It is costly for me to access the Internet for my OGS.
- OGS delivery charges are high.
- OGS products are expensive.
- If I buy groceries online, bank charges are high.

Although most respondents indicated uncertainty over the cost of OGS in Table 5, PCo actually has a *p*-value of 0.025, which shows a significant influence on OGS adoption. Only 17.6% of respondents agreed that PCos impact their decision to shop online, while 29.4% disagreed.

Figure 8 shows a further analysis of PCo construct sub-factors. The results show that respondents ranked bank charges as their major concern while shopping and/or intending to shop groceries online. Furthermore, delivery charges were ranked second with 2.58, and OGS products' costs were ranked third. Internet costs were ranked least as a concern to do OGS.

Even though bank charges were ranked as the most significant concern, Figure 9 shows that most respondents (42.2%) were uncertain about bank charges as related to their intention to shop groceries online; 29% of respondents agreed with the statement that bank charges are/or might be high when purchasing groceries online, whereas those who disagreed were 27.9%. Notably, banks play the role of financial transaction intermediaries between retailers and consumers.
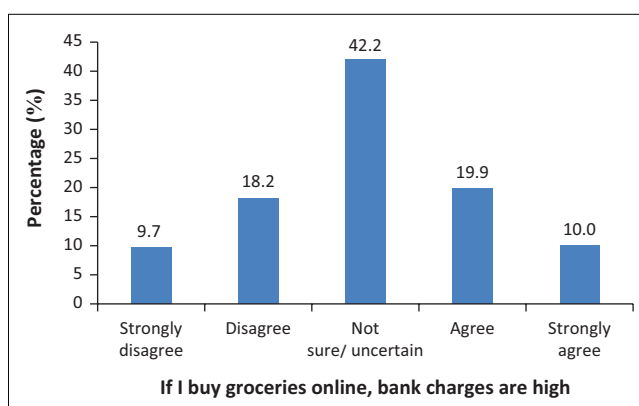

PCo, perceived cost.

FIGURE 8: Perceived cost sub-factors.

FIGURE 9: Bank charges.

TABLE 6: Visibility.

VIS influence	Behavioural intention to adopt OGS			N = 391	%	p
	No	Yes	Undecided			
(VIS)						0.17
Strongly Disagree	7	12	14	33	8.4	
Disagree	19	44	42	105	26.9	
Not sure or uncertain	28	87	41	156	39.9	
Agree	12	52	23	87	22.3	
Strongly agree	0	9	1	10	2.6	
Total	66	204	121	391	100	

OGS, online grocery shopping; VIS, visibility.

Visibility

The following statements were used in the Likert scale to determine VIS:

- I have seen friends using OGS.
- I have seen my workmates and/or schoolmates doing OGS.
- I have seen people in my community using OGS.
- I have seen my role models doing OGS.

The results from the survey about VIS are shown in Table 6.

The *p*-value of VIS is 0.17, which indicates no significant influence to consumer OGS adoption. However, in Table 6,
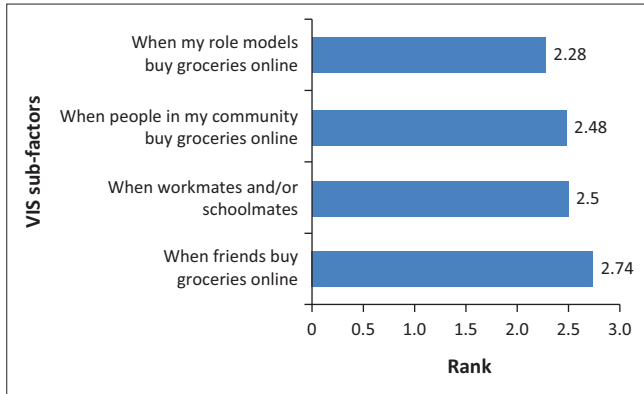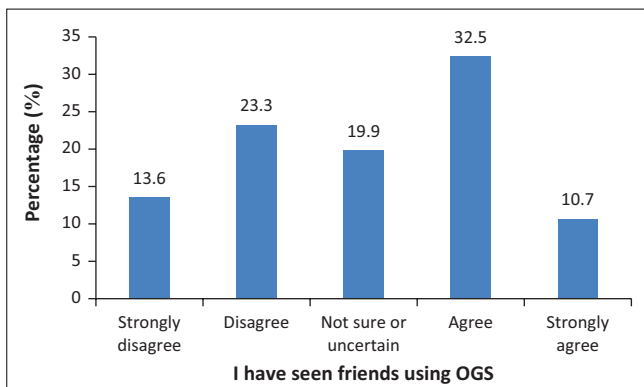
FIGURE 10: Visibility sub-factors.

FIGURE 11: The influence of friendship when buying online groceries.

TABLE 7: Perceived image barrier.

PIB influence	Behavioural intention to adopt OGS			N = 391	%	p-value
	No	Yes	Undecided			
(PIB)						0.533
Strongly Disagree	10	31	10	51	8.4	
Disagree	20	66	42	128	26.9	
Not sure or uncertain	20	62	39	121	39.9	
Agree	12	36	25	73	22.3	
Strongly agree	4	9	5	18	2.6	
Total	**66**	**204**	**121**	**391**	**100**	

PIB, Perceived image barrier; OGS, online grocery shopping.
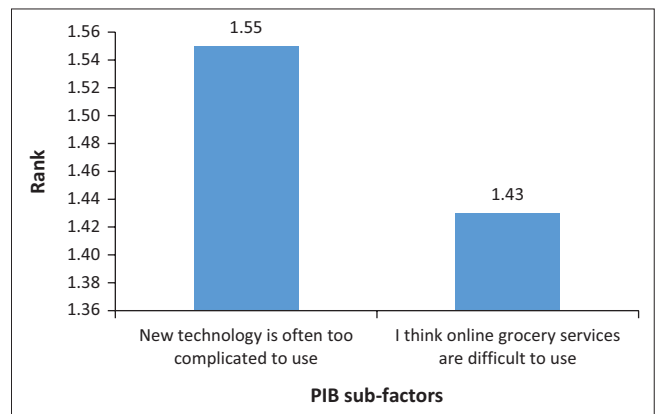
FIGURE 12: Perceived image barrier sub-factors.

most respondents (39.9%) were uncertain about the OGS visibility. Some respondents (35.3%) indicated that OGS was visible, while 24.9% disagreed. Figure 10 shows VIS sub-factors analysis.

Visibility sub-factors were ranked in their order of importance in Figure 10. Evidently, seeing friends doing OGS seems to be one of the biggest motivations for using OGS adoption. Also, workmates and/or schoolmates play an important role in influencing consumers' intention to shop groceries online. Some sub-factors that are deemed necessary are 'When people in my community buy groceries' and 'When my role models buy groceries online'. These factors have some level of influence on the intention to adopt OGS even though they ranked lower than other factors. Generally, friends are credible sources of information; hence, respondents ranked them higher than other factors.

Furthermore, Figure 11 shows that most respondents agreed (43.2%) that friends influence their OGS adoption. In comparison, some respondents disagreed (36.9%), and only 19.9% were uncertain. This shows that friends influence a consumer's intention to shop groceries online (which is an innovation).

Perceived image barrier

Perceived image barrier has an impact on consumer OGS adoption. Two-factor statements were used to determine PIB influence on the adoption of the OGS:

- New technology is often too complicated to use.
- I have the impression that OGS services are difficult to use.

Table 7 illustrates survey results about PIB.

As shown in Table 7, PIB's *p*-value is 0.533, which indicates that it does not have a significant influence on consumers' intention to adopt OGS. Furthermore, the results show that most respondents (39.9%) were uncertain about PIB's influence on their intention to shop groceries online. Other respondents (35.3%) disagreed that they perceived any difficulty with OGS, while only 24.9% agreed that PIB has an influence on their OGS adoption intentions. Figure 12 shows the PIB sub-factors.

Most respondents perceive that new technology is often too difficult to use (1.55), while the difficulty in using online grocery services is ranked lower (1.43).

Figure 13 zoomed in the sub-factor that 'New technology is often too complicated to understand' as respondents consider it the most crucial obstacle in their intention to adopt OGS. However, further analysis indicates that most respondents disagreed (45.8%), while 32.2% agreed with the statement. This suggests that, to a larger extent, respondents consider new technology less complicated to use. However, simplifying the overall online buying processes is important for retailers.
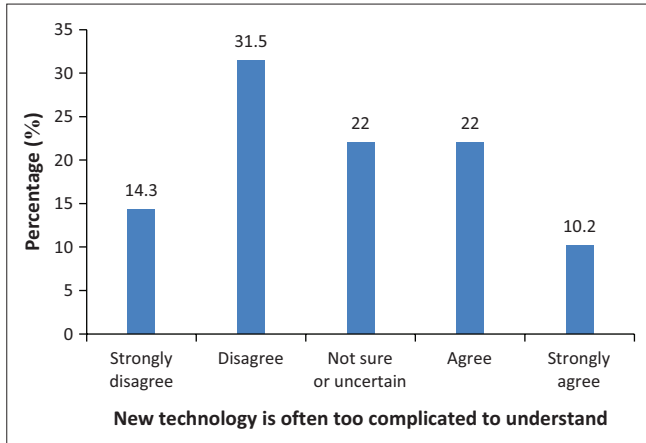
FIGURE 13: New technology is often too complicated to understand.

TABLE 8: Social attractiveness.

SAT influence	Behavioural intention to adopt OGS			N = 391	%	p-value
	No	Yes	Undecided			
(SAT)						0.275
Strongly Disagree	1	7	1	9	2.3	
Disagree	2	34	8	44	11.3	
Not sure or uncertain	13	53	28	94	24	
Agree	25	75	58	158	40.4	
Strongly agree	25	35	26	86	22	
Total	66	204	121	391	100	

OGS, online grocery shopping; SAT, social attractiveness.

Social attractiveness

The SAT construct had the following questions:

- I prefer to shop groceries at shopping malls than online because there is more entertainment.
- Buying groceries at shopping malls is more convenient than OGS.
- Shopping groceries at shopping malls is more appealing to me than OGS.
- I feel more secure to shop groceries at shopping malls than online.

Table 8 highlights SAT results from the survey.

From the general linear regression model, SAT does not have a significant influence on consumer OGS adoption (p = 0.275). Furthermore, Table 8 shows that most respondents (62.4%) agreed that shopping in malls appeals more than online shopping, while 13.6% disagreed. Other respondents (24%) were uncertain about their choice for online or offline.

In Figure 14, respondents consider malls to be more secure than online retail stores (ranked higher, 2.83). Moreover, consumers cited that they prefer to shop at malls than online (ranking this factor 2.56). The sub-factor, 'shopping malls are more convenient than online grocery stores', was the second least important factor, while, 'shopping malls are more appealing to me than online grocery stores', was the least important sub-factor.
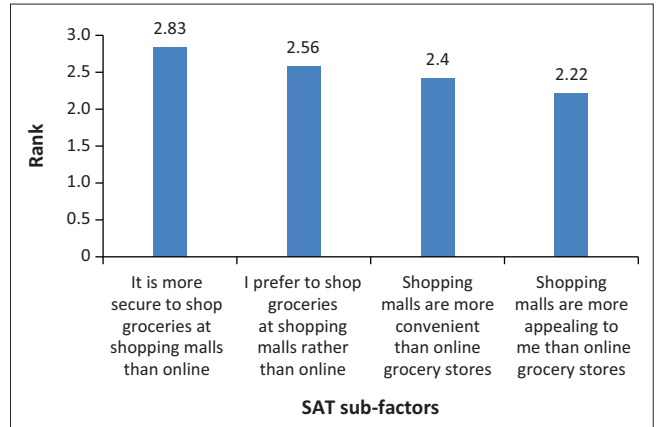

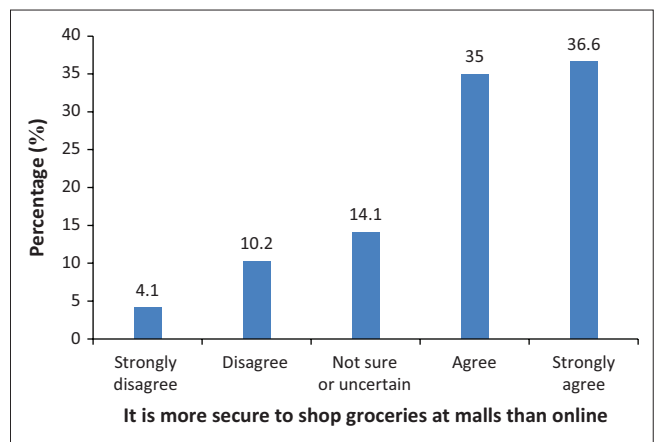**FIGURE 14:** Social attractiveness (SAT) sub-factors.

FIGURE 15: It is more secure to shop groceries at malls than online.

In addition, Figure 15 highlights that an overwhelming majority of respondents indicated that they agreed with the statement that shopping groceries at shopping malls is more secure than online (71.6%), while only 14.3% disagreed. In concurrence, Rajagopal (2009) previously posited that mostly in developing nations, consumers prefer to shop at malls that provide one stop shop and being able to physically interact with friends, rather than shop online.

Table 9 only shows the factors that have an indirect influence on consumers' behavioural intention to adopt OGS. It shows the highest correlation between PU and PEOU of 0.562, p < 0.001. It also shows that PU is negatively correlated with PCo, while PCo is negatively correlated with PEOU. A negative correlation shows an inverse relationship between the two constructs. To clarify, there are factors that indirectly influence consumers' behavioural intention to adopt OGS. Perceived ease of use, PCo and VIS have a direct impact on PU, whereas PEOU, PR, VIS, PIB and SAT have a direct impact on PCo.

Conclusions

This study's primary aim was to determine the factors influencing consumers' behavioural intention to adopt OGS in the Cape Metropolitan area of South Africa. The secondary aim of the study was to ascertain the relative importance of

TABLE 9: Correlation of factors that influence consumers' behavioural intention to adopt online grocery shopping.

Correlation of factors influencing consumers' behavioural intention to adopt OGS	PU	PEOU	PR	PCo	VIS	PIB	SAT
PU							
Pearson correlation	-	0.562**	-	-0.162**	0.159**	-	-
p-value (2-tailed)	-	0.000	-	0.001	0.002	-	-
PCo							
Pearson correlation	-0.162**	-0.122*	0.209**	-	0.158**	0.225**	0.259**
p-value (2-tailed)	0.001	0.027	0.000	-	0.002	0.000	0.000

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

PCo, perceived cost; PU, perceived usefulness; VIS, visibility; PEOU, perceived ease of use; PIB, perceived image barrier; PR, perceived risk; SAT, social attractiveness.

factors influencing consumers' behavioural intention to adopt OGS in the Cape Metropolitan area. The study employed the modified TAM to determine the factors. Understanding consumer behaviours in technology-mediated environments is vital in decision-making. In this study, PCo was found to influence consumers' behavioural intention to adopt OGS significantly. However, other factors such as PEOU, PU, PR, PIB and SAT indirectly influenced consumers' intention to shop for groceries online. The OGS is still evolving, especially in developing nations such as South Africa, despite signals of future expansion. As there are limited studies on OGS from a developing nation's perspective, this study makes a theoretical contribution by focusing on pre-COVID-19 OGS in South Africa. Moreover, the results of this study can help to draw a comparison between the pre-pandemic and post-pandemic shopping experiences of customers, which is important to understand the effects of the pandemic on consumer behaviour. In doing so, the study also makes a significant contribution to the field of ICT. In conclusion, the results of this study can further assist e-marketers and online grocery retail managers to develop marketing communication strategies that can increase the adoption of OGS.

The following suggestions are recommended to increase consumer acceptance of OGS based on the study's findings. Firstly, online grocery managers and e-marketers should promote OGS by highlighting its usefulness and cost-effectiveness while simultaneously including elements such as PU, PEOU, VIS, PR, VIS, PIB and SAT in the promotional efforts. Secondly, further study may be conducted to identify strategies that grocery merchants can utilise to keep their online grocery customers motivated to shop online and, more specifically, to emphasise how easy it is to shop groceries online and the benefits of home delivery.

Limitations and recommendations

The methodology for this study was quantitative. A qualitative approach to future research will enable a thorough analysis of why consumers do not embrace OGS. Interviews or focus groups can be used for this.

This research was limited to the South African Cape Metropolitan area. More research might be conducted in different regions of South Africa to confirm and generalise findings. Additional research might concentrate on the OGS prospects or the aspirations of online grocery stores and shoppers.

This study solely addressed a consumer-perspective gap, leaving room for future research to examine the viewpoints of online grocery retailers with qualitative approaches. The issues online grocery retailers face and potential solutions might be the subject of prospective studies.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

T.B.M. and R.N.M. contributed equally to this work.

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Data availability

Data availability is not applicable to this article as no new data were created or analysed in this study.

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References

Adam, I.O., Alhassan, M.D. & Afriyie, Y., 2020, 'What drives global B2C E-commerce? An analysis of the effect of ICT access, human resource development and regulatory environment', *Technology Analysis and Strategic Management* 32(7), 835–850. https://doi.org/10.1080/09537325.2020.1714579

Agresti, A., 2007, *An introduction to categorical data analysis*, 2nd edn., Wiley, New York, NY.

Ahmad, A.E.M.K., 2012, 'Attractiveness factors influencing shoppers' satisfaction, loyalty, and word of mouth: An empirical investigation of Saudi Arabia shopping malls', *International Journal of Business Administration* 3(6), 101–112. https://doi.org/10.5430/ijba.v3n6p101

Alnawayseh, M., Alnabhan, M. & Balachandran, W., 2013, 'Online grocery retailing in Jordan: Future perspectives', in *Proceedings of the European, Mediterranean and Middle Eastern Conference on Information Systems, EMCIS 2013*, 2013, pp. 1–7, viewed 30 August 2022, from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85084022384&partnerID=40&md5=a447ca771b4a0076915264ba71a08971.

Al-Nawayseh, M.K., Alnabhan, M.M., Al-Debei, M.M. & Balachandran, W., 2013, 'An adaptive decision support system for last mile logistics in e-commerce: A study on online grocery shopping', *International Journal of Decision Support System Technology* 5(1), 40–65, viewed 30 August 2022, from https://www.scopus.com/inward/record.uri?eid=2-s2.0-84891769052&doi=10.4018%2fjdsst.2013010103&partnerID=40&md5=41a2d652418f6344995617d3a98d668e.

Awa, H.O., Ojiabo, O.U. & Emecheta, B.C., 2015, 'Integrating TAM, TPB and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs', *Journal of Science & Technology Policy Management* 6(1), 76–94. https://doi.org/10.1108/JSTPM-04-2014-0012

Changchit, C., 2006, 'Consumer perceptions of online shopping', *Issues in Information systems* VII(2), 177–181.

Chu, K.K. & Li, C.H., 2008, 'A study of the effect of risk-reduction strategies on purchase intentions in online shopping', *International Journal of Electronic Business Management* 6(4), 213–226.

Clemes, M.D., Gan, C. & Zhang, J., 2014, 'An empirical analysis of online shopping adoption in Beijing, China', *Journal of Retailing and Consumer Services* 21(3), 364–375. https://doi.org/10.1016/j.jretconser.2013.08.003

Cloete, G. & Mugobo, V.V., 2021, 'A theoretical perspective of personality traits as drivers of online grocery shopping and consumer behaviour', *Reshaping Sustainable DeProceeding of 7th International Conference on Business and Management Dynamics*, pp. 183–199, Cape Town, 31 December 2021.

Cooper, D.R. & Schindler, P.S., 2011, *Business research methods*, 11th edn., McGraw-Hill, New York, NY.

Davies, F.D., 1989, 'Perceived usefulness, perceived ease of use and user acceptance of information technology', *MIS Quarterly* 13(3), 319–340, viewed 30 August 2022, from https://doi.org/10.2307/249008

Delaney-Klinger, K., Boyer, K.K. & Frohlich, M., 2001, 'The return of online grocery shopping: A comparative analysis of Webvan and Tesco's operational methods', *The TQM Magazine* 15(3), 187–196, https://doi.org/10.1108/09544780310469334

Dereratu, A.M., Rangaswamy, A. & Wu, J., 2000, 'Consumer choice behaviour in online and traditional supermarkets: The effects of brand name, price, and other search attributes', *International Journal of Research in Marketing* 17(1), 55–78. https://doi.org/10.1016/S0167-8116(00)00005-7

Fayad, R. & Paper, D., 2015, 'The technology acceptance model e-commerce extension: A conceptual framework', *Procedia Economics and Finance* 26, 1000–1006. https://doi.org/10.1016/s2212-5671(15)00922-3

Gao, T. & Deng, Y., 2012, 'A study on users' acceptance behavior to mobile e-books application based on UTAUT model', *IEEE International Conference on Computer Science and Automation Engineering*, pp. 376–379, Beijing, 22–24 June 2012.

Goethals, F., Leclercq-Vandelannoitte, A., Tütüncü, Y. & Tutuncu, Y., 2012, 'Journal of Retailing and Consumer Services French consumers' perceptions of the unattended delivery model for e-grocery retailing', *Journal of Retailing and Consumer Services* 19(1), 133–139. https://doi.org/10.1016/j.jretconser.2011.11.002

Gong, W., Stump, R.L. & Maddox, L.M., 2013, 'Factors influencing consumers' online shopping in China', *Journal of Asia Business Studies* 7(3), 214–230. https://doi.org/10.1108/JABS-02-2013-0006

Haji, K., 2021, 'E-commerce development in rural and remote areas of BRICS countries', *Journal of Integrative Agriculture* 20(4), 979–997. https://doi.org/10.1016/S2095-3119(20)63451-7

Huang, Y. & Oppewal, H., 2006, 'Why consumers hesitate to shop online an experimental choice analysis of grocery', *International Journal of Retail & Distribution Management* 34(4/5), 334–353. https://doi.org/10.1108/09590550610660260

Hernandez, B., Jimenez, J. & José Martín, M., 2009, 'Adoption vs acceptance of e-commerce: Two different decisions', *European Journal of Marketing* 43(9/10), 1232–1245. https://doi.org/10.1108/03090560910976465

Irwan Hariandi, M.S., Gumanti, T.A. & Wahyudi, E., 2019, 'E-commerce, competitive advantage and business performance of Banyuwangi small and medium-sized enterprises', *International Journal of Scientific & Technology Research* 8, 8, viewed 30 August 2022, from www.ijstr.org.

Islam, M.T., Hoque, M.R. & Sorwar, G., 2017, 'Understanding customers' intention to use ecommerce in Bangladesh: An application of the technology acceptance model (TAM)', *19th International Conference on Computer and Information Technology, ICCIT 2016*, pp. 512–516, Dhaka, Bangladesh, December 18–20, 2016.

Jamshidi, D. & Hussin, N., 2016, 'Forecasting patronage factors of Islamic credit card as a new e-commerce banking service: An integration of TAM with perceived religiosity and trust', *Journal of Islamic Marketing* 7(4), 378–404. https://doi.org/10.1108/JIMA-07-2014-0050

Johnson, O. & Iyamu, T., 2019, 'Framework for the adoption of e-commerce: A case of South African retail grocery sector', *Electronic Journal of Information Systems in Developing Countries* 85(5), 1–12. https://doi.org/10.1002/isd2.12095

Keh, H.T. & Shieh, E., 2001, 'Online grocery retailing: Success factors and potential pitfalls', *Business Horizons* 44(4), 73–83, viewed 30 August 2022, from https://www.scopus.com/inward/record.uri?eid=2-s2.0-0041490575&doi=10.1016%2fS0007-6813%2801%2980050-1&partnerID=40&md5=4b6deb52d3bfe8a349dda9610503c58d.

Khan, S. & Khan, A., 2020, 'Consumer e-loyalty for e-grocery shopping in a Metro City of India: Role of flow and TAM antecedents', *International Journal of E-Adoption* 12(2), 16–33. https://doi.org/10.4018/IJEA.2020070102

Khoo, V., Ahmi, A. & Saad, R.A.J., 2018, 'A comprehensive review on e-commerce research', *AIP Conference Proceedings*, 2016, Penang, Malaysia, April 10–12, 2018.

Kurnia, S., Alzougool, B., Ali, M. & Alhashmi, S.M., 2009, 'Adoption of electronic commerce technologies by SMEs in Malaysia', in *Proceedings of the 42nd Annual Hawaii International Conference on System Sciences, HICSS*, pp. 19–21, Waikoloa, HI, 05–08 January 2009.

Kurnia, S., 2008, 'Exploring e-commerce readiness in China: The case of the grocery industry', in *Proceedings of the 41st Hawaii international conference on system sciences*, pp. 413–413, Waikoloa, HI, IEE January 22, 2008.

Kurnia, S. & Chien, A.-W.J., 2003, 'The acceptance of online grocery shopping', in *16th Bled ECommerce Conference: ETransformation*, pp. 219–233, Bled, Slovenia, 9–11 June 2003.

Lawrence, J.E. & Tar, U.A., 2010, 'Barriers to ecommerce in developing countries', *Information, Society and Justice* 3(1), 23–35.

Lee, H.H. & Chang, E., 2011, 'Consumer attitudes toward online mass customization: An application of extended technology acceptance model', *Journal of Computer-Mediated Communication* 16(2), 171–200. https://doi.org/10.1111/j.1083-6101.2010.01530.x

Lee, M.C., 2009, 'Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit', *Electronic Commerce Research and Applications* 8(3), 130–141. https://doi.org/10.1016/j.elerap.2008.11.006

Levy, M., Weitz, B.A. & Grewal, D., 2014, *Retail business management*, 9th edn., McGraw-Hill, New York, NY.

Li, F., Frederick, S. & Gereffi, G., 2019, 'E-commerce and industrial upgrading in the Chinese apparel value chain', *Journal of Contemporary Asia* 49(1), 24–53. https://doi.org/10.1080/00472336.2018.1481220

Lian, J. & Yen, D.C., 2014, 'Online shopping drivers and barriers for older adults: Age and gender differences', *Computers in Human Behaviour* 37, 133–143. https://doi.org/10.1016/j.chb.2014.04.028

Lin, H.-F., 2007, 'Predicting consumer intentions to shop online: An empirical test of competing theories', *Electronic Commerce Research and Applications* 6(4), 433–442. https://doi.org/10.1016/j.elerap.2007.02.002

Loate, T., Niemann, W. & Kotze, T., 2017, 'A Case study analysis of the order fulfilment model adopted by a South African online grocery retailer', *Proceedings of the 1st African Operations Management Conference*, pp. 1–14, Misty Hills, Johannesburg, 2–4 October 2017.

López-Nicolás, C., Molina-Castillo, F.J. & Bouwman, H., 2008, 'An assessment of advanced mobile services acceptance: Contributions from TAM and diffusion theory models', *Information & Management* 45(6), 359–364. https://doi.org/10.1016/j.im.2008.05.001

McCullagh, P. & Nelder, J.A., 1989, *Generalized linear model*, 2nd edn., Chapman & Hall, London.

Mkansi, M., De Leeuw, S., De Leeuw, S. & Amosun, O., 2019, 'Mobile application supported urban-township e-grocery distribution', *International Journal of Physical Distribution & Logistics Management* 50(2016), 26–53. https://doi.org/10.1108/IJPDLM-10-2018-0358

Mkansi, M. & Nsakanda, A.L., 2019, 'Leveraging the physical network of stores in e-grocery order fulfilment for sustainable competitive advantage', *Research in Transportation Economics* 87, 1–13. https://doi.org/10.1016/j.retrec.2019.100786

Moon, J.-W. & Kim, Y.-G., 2001, 'Extending the TAM for a World-Wide-Web context', *Information & Management* 38(4), 217–230. https://doi.org/10.1016/S0378-7206(00)00061-6

Morganosky, M.A. & Cude, B.J., 2000, 'Consumer response to online grocery shopping', *International Journal of Retail & Distribution Management* 28(1), 17–26, viewed 30 August 2022, from https://www.scopus.com/inward/record.uri?eid=2-s2.0-84986042634&doi=10.1108%2f09590550010306737&partnerID=40&md5=613f8cae53a44b4c5c54b1b7110403c9.

Moriset, B., 2018, 'e-business and e-commerce', *International Encyclopedia of Human Geography*, pp. 1–18, viewed 30 August 2022, from https://halshs.archives-ouvertes.fr/halshs-01764594.

Murphy, A.J., 2007, 'Grounding the virtual: The material effects of electronic grocery shopping', *Geoforum* 38(5), 941–953. https://doi.org/10.1016/j.geoforum.2006.12.012

Paelo, A. & Goga, S., 2019, *Strategies for adapting to online entry: The case of retailers in South Africa*, viewed 30 August 2022, from https://www.researchgate.net/publication/333080209.

Pantano, E. & Pietro, L.D., 2012, 'Understanding consumer's acceptance of technology-based innovations in retailing', *Journal of Technology Management and Innovation* 7(4), 1–19. https://doi.org/10.4067/S0718-27242012000400001

Raijas, A., 2002, 'The consumer benefits and problems in the electronic grocery store', *Journal of Retailing and Consumer Services* 9(2), 107–113. https://doi.org/10.1016/S0969-6989(01)00024-8

Rajagopal, 2009, 'Growing shopping malls and behavior of urban shoppers', *Journal of Retail & Leisure Property* 8(2), 99–118. https://doi.org/10.1057/rlp.2009.3

Ram, S., 1987, 'A model of innovation resistance', in *Advances in consumer research*, vol. 14, pp. 208–212, Association of Consumer Research, viewed 12 August 2014, from http://www.acrwebsite.org/search/view-conference-proceedings.aspx?Id=6688.

Salehi, M., 2012, 'Consumer buying behavior towards online shopping stores in Malaysia', *International Journal of Academic Research in Business and Social Science* 2(1), 393–403.

Schiffman, L.G. & Kanuk, L.L., 1997, *Consumer behaviour*, 6th edn., Prentice Hall, Pennyslavia, PA.

Schneider, G., 2013, *E-business*, 10th edn., South-Western Cengage Learning, New York, NY.

Shareef, M.A., Archer, N., Fong, W., Rahman, M.O. & Mann, I.J., 2013, 'Online buying behavior and perceived trustworthiness', Current Journal of Applied Science and Technology 3(4), 662–683. https://doi.org/10.9734/BJAST/2013/2394

Simonoff, J.S., 2003, *Analyzing categorical data*, Springer, New York, NY.

Singh, R., 2019, 'Why do online grocery shoppers switch or stay? An exploratory analysis of consumers' response to online grocery shopping experience', *International Journal of Retail and Distribution Management* 47(12), 1300–1317, viewed 30 August 2022, from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85069874141&doi=10.1108%2fIJRDM-10-2018-0224&partnerID=40&md5=d04cc6b8556b6f5f6fdf73667ca82a12.

Singh, R. & Rosengren, S., 2020, 'Why do online grocery shoppers switch? An empirical investigation of drivers of switching in online grocery', *Journal of Retailing and Consumer Services* 53, 101962. https://doi.org/10.1016/j.jretconser.2019.101962

Syarifudin, G., Abbas, B.S. & Heriyati, P., 2019, 'TAM approach on e-commerce of Aircraft ticket sales on consumer purchase intention', in *2018 6th international conference on cyber and IT service management, CITSM 2018*, Parapat, Indonesia, 25 March and August, 07–09, 2018.

Tanskanen, K., Yrjola, H. & Holmstrom, J., 2002, 'The way to profitable Internet grocery retailing ± six lessons learned', *International Journal of Retail & Distribution Management* 30(4), 169–178. https://doi.org/10.1108/09590550210423645

Thusi, P., Khumalo, P., Zulu, H. & Molokomme, R., 2022, 'Examining South African consumers' online grocery shopping behaviour', in *Social sciences international research conference*, pp. 1050-1064, Balaclava Fort, Mauritius, October 19-21 2022.

Uwemi, S. & Khan, H.U., 2018, 'Possible impact of e-commerce strategies on the utilisation of e-commerce in Nigeria', *International Journal of Business Innovation and Research* 15(2), 231. https://doi.org/10.1504/ijbir.2018.10009762

Venkatesh, V. & Davis, F.D., 2000, 'A theoretical extension of the technology acceptance model: Four longitudinal field studies', *Management Science* 46(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Vijayasarathy, L.R., 2003, 'Predicting consumer intentions to use online shopping the case for an augmented technology acceptance model', *Information and Management* 41(6), 747–762. https://doi.org/10.1016/j.im.2003.08.011

Weber, A.N. & Badenhorst-Weiss, J.A., 2018, 'The "new" bricks-and-mortar store: An evaluation of website quality of online grocery retailers in BRICS countries', *African Journal of Science, Technology, Innovation and Development* 10(1), 85–97. https://doi.org/10.1080/20421338.2017.1394957

Weber-Snyman, A. & Badenhorst-Weiss, J.A., 2016, *Challenges in last mile logistics of e-grocery retailers: A developing country perspective Supply chain relationships in automotive supply chains view project Investigating challenges in public procurement view project*, viewed 30 August 2022, from https://www.researchgate.net/publication/316686603.

Writer, S., 2014, 'Internet fraud and phishing cost SA R2.2 billion', *Businesstech*, viewed 16 November 2015, from http://businesstech.co.za/news/general/68212/sa-internet-fraud-and-phishing-costs-r2-2-billion/.

Yrjola, H., 2001, 'Physical distribution considerations for electronic grocery shopping', *International Journal of Physical Distribution & Logistics Management* 31(10), 960–995. https://doi.org/10.1108/09600030110411419

Yu, J., Ha, I., Choi, M. & Rho, J., 2005, 'Extending the TAM for a t-commerce', *Information & Management* 42(7), 965–976. https://doi.org/10.1016/j.im.2004.11.001

Zikmund, W., Babin, B., Carr, J. & Griffin, M., 2013, *Business research methods*, 8th edn., Southern-Western Cengage Learning, Boston.