




Online grocery shopping e-service quality: A generational comparison



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Background: Online grocery shopping has increased due to the convenience it offers; however, consumers from different generational cohorts hold different expectations, shaping their perceptions of e-service (e-SQ) quality.

Aim: This study investigates how e-SQ perceptions differ between Generation X and Y within the South African grocery industry.

Setting: The study was conducted in the South African grocery retail sector, with data collected online from consumers across the country.

Method: A quantitative study was executed, resulting in 622 respondents. SmartPLS 4.0 was used to evaluate the measurement and structural models.

Results: Perceived risk had a significant negative impact on e-SQ for both cohorts, suggesting that this does not differ according to age. Platform content, ease of use, and service convenience all have significant positive effects on e-SQ for both cohorts. Service convenience was the strongest predictor of e-SQ for Generation X, while platform content was the strongest predictor for Generation Y.

Conclusion: Both cohorts value similar factors. Generation Y regards platform content, ease of use, and service convenience as important, while Generation X views service convenience, ease of use, and then platform content as important factors. These key differences allow online grocery retailers to ensure their platforms are designed to ensure the highest e-SQ levels, depending on the cohort they target.

Contribution: This study highlights specific differences between generational cohorts and whether differences in their e-SQ exist. Thus, online grocery retailers have the opportunity to develop tailored marketing strategies focusing on different factors (e.g., platform content, ease of use, and service convenience for Generation Y and service convenience, ease of use, and platform content for Generation X) to improve the e-SQ perceptions.

Keywords: e-service quality; e-SQ; generation X; generation Y; perceived risk; platform content; ease-of-use; service convenience.

Introduction

Background

Globally, post-coronavirus disease 2019 (COVID-19) pandemic, online shopping has steadily increased with consumers becoming more comfortable in purchasing items online (Shaw, Eschenbrenner & Baier 2022). This has also been evident in South Africa, where, according to Statista (2025), the e-commerce sector is projected to reach \$7.32 billion in 2025, with an annual growth rate of 9.49% predicted between 2025 and 2029. While all categories are expected to grow, the grocery category is expected to grow significantly. According to Ligaraba et al. (2023), shopping online for groceries consists of purchasing drinks, food, cleaning products, daily necessities and fast-moving consumer goods using an online platform like a mobile app. In South Africa, grocery retailers like Checkers, Pick n Pay, Woolworths and Spar have developed online shopping platforms that sell groceries online directly to end-user consumers (Musikavanhu & Musakuro 2023; Njomane & Telukdarie 2022).

Mobile applications (apps) have been found to be the most popular choice of platform, particularly among Generation X and Generation Y consumers who are currently driving the online grocery shopping industry in South Africa. This is because of the continued growth of smartphone adoption, which is propelled by increased mobile infrastructure, more affordable prices and

declining data charges (Bruwer, Madinga & Bundwini 2022). In addition, behaviourally, according to Statista (2023), these cohorts are comfortable with using mobile apps to make purchases, and Maduku and Thusi (2023) add that Generation X and Generation Y consumers prefer shopping via apps because of the attractive discounts they can enjoy on their purchases. However, according to Arora, Malik and Chawla (2019), while these cohorts both use mobile apps more than other generational cohorts, they differ significantly in terms of their perceptions. This is supported by other authors (e.g. Moodley & Buthelezi 2023; Suhartanto et al. 2023) who argue the importance of understanding the consumer's perceptions of e-service quality (e-SQ) across these cohorts. E-service quality is especially important as it facilitates the efficient and effective purchasing of products. However, the challenge arises in the factors that affect the e-SQ perceptions are expected to differ according to the cohorts because of their varied expectations (Suhartanto et al. 2023).

Although previous research on online grocery shopping exists and has addressed several issues – such as pre- and post-COVID-19 behaviour (Meister et al. 2023); underlying demands on online grocery shopping in the future (Eriksson & Stenius 2023); barriers to online grocery shopping among millennials (Jha 2024) and revealing the gaps, trends and major topics in online grocery shopping (Monoarfa et al. 2024) – these studies have not devoted attention to exploring the differences between the generational cohorts in an emerging country, such as South Africa, which offers lucrative opportunities for retailers. As Generation X and Generation Y consumers are the predominant cohorts shopping online for groceries, understanding what drives their e-SQ perceptions will allow theoretical and practical contributions. This study makes a key academic contribution by advancing understanding of how generational differences shape e-SQ perceptions in an emerging market, using South Africa's growing online grocery sector as context. It extends Generational Cohort Theory (GCT), Expectation Disconfirmation Theory (EDT) and Online Relationship Marketing (ORM) by applying them in a digitally evolving African market. From a practical perspective, it offers valuable insights to online retailers by showing that Generation X values service convenience, while Generation Y prioritises platform content. This challenges universal digital strategies and emphasises the need for targeted approaches based on generational expectations. With South Africa's e-commerce sector projected to reach \$7.32 billion by 2025 (Statista 2025), these findings help local retailers better align their platforms with consumer needs to enhance satisfaction, trust and loyalty in a competitive environment. Therefore, the aim of this study is to investigate how e-SQ perceptions differ among generations (X and Y) within the South African retail grocery industry.

The paper next outlines the theoretical frameworks that underpin the research, followed by a detailed discussion of the proposed hypotheses and the conceptual model. Thereafter, the research methodology is explained, leading to an overview of the key findings and the study's contributions.

The section concludes with practical recommendations based on the results.

Objectives of the study

To support the aim of the study, the following objectives have been developed:

- To determine the influence of perceived risk on e-SQ when Generations X and Y are shopping online for groceries through mobile apps.
- To determine the influence of platform content on e-SQ when Generations X and Y are shopping online for groceries through mobile apps.
- To determine the influence of ease of use on e-SQ when Generations X and Y are shopping online for groceries through mobile apps.
- To determine the influence of service convenience on e-SQ when Generations X and Y are shopping online for groceries through mobile apps.

Theoretical framework

The study is grounded in three theoretical frameworks: generational cohort theory (GCT), online reputation management (ORM) and EDT. The concept of generational differences was introduced by social scientist Karl Mannheim in 1952, who described GCT as the idea that individuals born within a particular period or place perceive themselves as part of a cohort who share unique patterns and experiences that significantly shape their outlook on life. Expanding upon the Mannheim (1952) notion of age location, Strauss and Howe (1991) proposed that analysing how historical events influence the characteristics of different age groups provides insight into their development. Similarly, McKercher et al. (2020) suggested that a collective consciousness and shared values or beliefs among individuals of a specific age group contribute to their unified experiences. Generation X consists of individuals born between 1961 and 1979, whereas Generation Y comprises people born between 1980 and 1999 (Jang & Sung 2021; Lissitsa & Kol 2016, 2021). Because of age differences, Generation X tends to be more hesitant in embracing new technology, compared to younger cohorts like Generation Y. This reluctance stems from Generation X's introduction to the digital realm during its adulthood stages, which reinforces their inclination towards privacy (Arachchi & Samarasinghe 2024). In a study conducted by Zhuang et al. (2021), focusing on food delivery apps, Generation X and Generation Y consumers differed in their perceptions of e-SQ when age was used as a moderator towards overall service quality. This highlights the role that GCT plays in understanding and explaining the distinctions in online shopping behaviour between Generation X and Generation Y consumers (Arachchi & Samarasinghe 2024).

Online reputation management originates from traditional relationship marketing theory established by Berry in the early 1980s, concentrating on cultivating and sustaining long-term relationships within an online setting (Hunt,

Arnett & Madhavaram 2006:74). Utilised as a strategic approach, ORM aims to cultivate consumer e-trust, enhance experiences and boost e-satisfaction, thereby fostering profitable relationships and enhancing e-SQ (Boateng 2019; Thaichon et al. 2020). This notion is reinforced by Steinhoff et al. (2019), who asserted that seamlessly providing online services reduces uncertainty and enhances the establishment of positive online relationships with consumers. The adept application of ORM theory is indispensable for enhancing business performance and forging enduring consumer relationships (Boateng 2019:227). This is supported by Ribbink et al. (2020), who indicate that through the management of online relationships, retailers can directly influence loyalty indirectly by ensuring satisfaction.

Finally, EDT (Oliver 1977, 1980) has been instrumental in shaping much of marketing literature in terms of exploring consumer satisfaction. According to Oliver (1977), consumers enter interactions with firms' products or services with preconceived expectations. After purchasing a product or service, consumers then form perceptions based on its actual performance (Sinha et al. 2020). Spreng and Mackoy (1996) further explained that if a product or service surpasses a customer's initial expectations, it creates a positive disconfirmation, leading to satisfaction after purchase. Conversely, if it falls short of expectations, it results in negative disconfirmation, reducing post-purchase satisfaction. Essentially, EDT centres on assessing perceived expectations, performance and the resultant levels of satisfaction or dissatisfaction (Wong, Huang & Lin 2024). Within an e-SQ context, different e-SQ dimensions (such as perceived risk, platform content, ease-of-use and service convenience) can act as the basis for expectation (AlSokkar et al. 2024). This is confirmed by Liao et al. (2017), who state that consumers compare their perceptions of e-SQ after experiencing the service and determine whether they have positive or negative perceptions of the e-SQ received, which, ultimately, impacts their satisfaction.

Therefore, within the context of this study, the EDT is utilised to evaluate the e-SQ dimensions and whether the dimensions lead to positive perceptions of e-SQ, as supported by AlSokkar et al. (2024). This is important for online retailers to understand because of online retailers striving to build relationships with consumers to secure enduring customer relationships by securing satisfaction (Ribbink et al. 2020) through the ORM framework. Lastly, the GCT provides support for evaluating whether differences in e-SQ exist according to age, as supported by Zhuang et al. (2021).

Relevance of the selected theories to the study

This study is guided by three key theoretical frameworks: ORM, EDT and GCT. Each framework contributes uniquely to understanding the differences in e-SQ perceptions between Generation X and Generation Y consumers within South Africa's growing online grocery market. For example, ORM is crucial as it emphasises building long-term relationships with consumers in digital environments (Thaichon et al. 2020).

Post-pandemic, where online grocery shopping via mobile apps has become the norm (Shaw et al. 2022), ORM theory helps explain how factors such as platform content, ease of use and service convenience foster e-trust and satisfaction. As digital touchpoints replace physical interactions, ORM offers a lens through which to explore how service elements influence consumers' perceptions of e-SQ and their continued engagement with online platforms (Boateng 2019; Butt & Umair 2023).

Expectation Disconfirmation Theory, originally developed by Oliver (1977), is equally relevant as it provides a framework for assessing customer satisfaction by comparing expectations with perceived performance. In this context, e-SQ dimensions such as perceived risk or platform content serve as expectation anchors. If the experience exceeds expectations, satisfaction is achieved; if not, dissatisfaction occurs (Hien et al. 2024). Expectation Disconfirmation Theory allows this study to measure whether different e-SQ dimensions produce positive or negative disconfirmation among the generational cohorts. Lastly, GCT helps segment consumers based on their shared experiences and values shaped during formative years. Generational traits impact how consumers perceive and interact with technology (Omoniyi et al. 2025). In this study, GCT supports the hypothesis that Generation X and Generation Y perceive online grocery experiences differently, necessitating tailored e-SQ strategies for each cohort.

Together, these theories offer a comprehensive framework where ORM explains the relational and strategic impact of online service elements, EDT evaluates satisfaction outcomes, and GCT highlights demographic differences. This integrated approach enables a deeper understanding of the drivers behind e-SQ perceptions among South Africa's most active online grocery shoppers, thereby grounding the problem statement and hypotheses effectively.

Hypotheses and model development

Globalisation, greatly spurred by the information technology era, has fundamentally transformed how businesses cater to their consumers. Demir et al. (2021) explained that e-retail offers consumers an unprecedented array of shopping options, with e-SQ emerging as a key distinguishing factor. To stay competitive in an online environment, retailers must grasp the significance of e-SQ and its underlying factors, as it profoundly influences consumer segmentation and decision-making (Mamakou, Zaharias & Milesi 2024). Previous studies indicate that the relationships between e-SQ and its antecedents, such as perceived risk, platform content, ease of use and service convenience, impact consumers' evaluations of their online shopping experiences, making it important to evaluate (Arilaha, Fahri & Buamonabot 2021; Saha et al. 2023; Syah & Olivia 2022; Udo, Bagchi & Kirs 2010).

Perceived risk and its relationship with e-service quality

According to Rosillo-Díaz, Blanco-Encomienda and Crespo-Almendros (2020), perceived risk is a set of uncertainties and

potential negative outcomes deterring consumers from engaging in online shopping. These risks span product, security, financial, time, delivery, social and psychological risk, posing barriers to current and prospective online consumers (Alrawad et al. 2023; Yuniarti et al. 2022). Previous research, such as Panjaitan et al. (2019) and Silva et al. (2023), has explored various dimensions of perceived risk, including product, security, financial, time, delivery, social and psychological risk, a unidimensional construct. Similarly, this study investigates these factors as a unidimensional construct to discern disparities between Generation X and Generation Y in their online grocery shopping behaviours. Jain et al. (2023) and Lissitsa and Kol (2021) indicated that Generation X tends to exhibit a higher degree of risk aversion, relying on extensive information-seeking behaviours, such as reading site reviews and utilising social media platforms to ensure e-SQ before making purchases. In contrast, having been immersed in online commerce from a young age, Generation Y tends to overlook perceived risk, considering online shopping a norm. This generational disparity in risk perception is evident, with Generation X showing a greater inclination to invest in safety measures to mitigate perceived risk, compared to Generation Y consumers. Research also highlights the importance of considering various risk factors, including product, security, financial, time, delivery, social and psychological risk, in understanding the differences in online shopping behaviours between Generation X and Generation Y (Alrawad et al. 2023; Yuniarti et al. 2022). Consequently, drawing from previous studies, the following hypotheses and sub-hypotheses are proposed:

H1: There is a significant difference in how perceived risk affects e-SQ for Generation X and Y consumers when purchasing groceries online through mobile apps.

H1a: Perceived risk has a significant and negative impact on the e-SQ of Generation X consumers purchasing groceries online through mobile apps.

H1b: Perceived risk has a significant and negative impact on the e-SQ of Generation Y consumers purchasing groceries online through mobile apps.

Platform content and its relationship with e-service quality

Platform content encompasses factors like information accessibility, aesthetics, content accuracy and visual appeal (Nia & Shokouhyar 2020; Wang & Li 2021). Serving as the initial touchpoint, platform content accessibility, presentation and interactivity play pivotal roles in enhancing consumer engagement and reducing bounce rates, potentially leading to purchases (Begkos & Antonopoulou 2020). Research indicates that easy access to product information and a seamless online experience increase the likelihood of Generation X making purchases (Lissitsa & Kol 2021). Conversely, the integration of artificial intelligence (AI) tools like augmented reality and chatbots enhances the shopping experience for Generation Y consumers, who prefer more interactive content compared to Generation X consumers (Murtarelli, Collina & Romenti 2023). Dissimilarly, Generation

Y consumers show a preference for extensive platform content over Generation X consumers, who prioritise product details (Bento, Martinez & Martinez 2018). Moreover, Generation Y's dissatisfaction with platform content can prompt them to switch platforms (Lin et al. 2021). These varied perceptions of online platforms and their content influence how Generation X and Generation Y evaluate overall e-SQ as Generation X focuses on the usability of the platform, its reliability and value (Liu et al. 2023) while Generation Y focuses on interactivity, entertainment and authenticity (García-Jurado et al. 2019). Thus, if the platform content does not resonate with the generational cohort, it will lead to decreased perceptions of e-SQ. Therefore, drawing from previous studies, the following hypotheses and sub-hypotheses are proposed:

H2: There is a significant difference in how platform content affects e-SQ for Generation X and Y consumers when purchasing groceries online through mobile apps.

H2a: Platform content has a significant and positive impact on the e-SQ of Generation X consumers purchasing groceries online through mobile apps.

H2b: Platform content has a significant and positive impact on the e-SQ of Generation Y consumers purchasing groceries online through mobile apps.

Ease of use and its relationship with e-service quality

Ease of use in online shopping or technology adoption denotes the perceived effortlessness anticipated by consumers (Murtarelli et al. 2023). It enables users to navigate online platforms smoothly and comfortably (Mofokeng 2023), playing a pivotal role in enhancing the overall e-SQ (Rita, Oliveira & Farisa 2019) and predicting future online purchases (Zhuang et al. 2021). For Generation X consumers, especially, perceived ease of use aids in overcoming distractions and uncertainties during online transactions (García-Jurado et al. 2019). Ease of use, particularly concerning mobile app access to product information, is more critical for developing e-trust among Generation X compared to Generation Y (Zhuang et al. 2021). While Generation Y may be more accustomed to technology, making them more discerning about e-SQ (Mkedder, Jain & Salunke 2024), ease of use seems to have a more pronounced positive impact on Generation X's online shopping experience and trust in e-retailers (Alkire et al. 2020; Trabelsi-Zoghalmi, Berraies & Yahia 2020), impacting the perceptions of e-SQ. Accordingly, drawing from previous studies, the following hypotheses and sub-hypotheses are proposed:

H3: There is a significant difference in how ease of use affects e-SQ for Generation X and Y consumers when purchasing groceries online through mobile apps.

H3a: Ease of use has a significant and positive impact on the e-SQ of Generation X consumers purchasing groceries online through mobile apps.

H3b: Ease of use has a significant and positive impact on the e-SQ of Generation Y consumers purchasing groceries online through mobile apps.

Service convenience and its relationship with e-service quality

Almarashdeh et al. (2019) defined service convenience as consumers' perceptions regarding the time and effort involved in the quality of service when making online purchases, and it consists of five dimensions: access, search, evaluation, transaction and possession or post-purchase convenience. Research suggests that online consumers prioritise convenience more than traditional buyers (Raman 2019). Service convenience encourages frequent and impulsive purchases among Generation Y in the online shopping context (Lissitsa & Kol 2021). The convenience of online shopping is a major reason for different generational cohorts preferring it (Chakraborty & Balakrishnan 2017). Although service convenience tends to be higher among Generation Y (Soares et al. 2017), Generation X consumers value home delivery services because of their convenience (Bauerová 2021; Ponte & Sergi 2024). Therefore, Eryiğit and Fan (2021) and Khan and Khan (2018) emphasised the significant impact of service convenience on e-SQ, leading to increased customer satisfaction and positive post-purchase behaviour. Hence, drawing from previous studies, the following hypotheses and sub-hypotheses are proposed:

H4: There is a significant difference in how service convenience affects e-SQ for Generation X and Y consumers when purchasing groceries online through mobile apps.

H4a: Service convenience has a significant and positive impact on the e-SQ of Generation X consumers purchasing groceries online through mobile apps.

H4b: Service convenience has a significant and positive impact on the e-SQ of Generation Y consumers purchasing groceries online through mobile apps.

Methods

Partial least squares structural equation modelling with the aid of SMART PLS 4.0 was used in this study to analyse the gathered data, as it enables the simultaneous examination of the interconnections among multiple latent variables without being constrained by sample size limitations (Hair et al. 2022).

Data collection and sampling procedure

The main purpose of this study was to investigate how e-SQ perceptions among different generational cohorts (X and Y) vary in the South African online grocery industry. A self-administered online survey was employed across the Gauteng province of South Africa. Before undertaking the survey, the target population was clearly defined, which consisted of Generation X (born between 1961 and 1979) and Generation Y (born between 1980 and 1999; Jang & Sung 2021) who had purchased groceries online via the mobile apps using Checkers 60, SPAR2U, Woolies Dash or Pick n Pay asap! within the past three months. The data were collected using convenience sampling through a reputable research agency that had a panel of potential respondents who opted in to participating in research studies.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of Johannesburg and CBE Research Ethics Committee (No. 2023SCiiS018).

The questionnaire was pre-tested to ensure that the questionnaire was clear and unambiguous. The pre-test was conducted on 20 respondents per cohort, and there were minor errors identified, such as a coding error and the positioning of certain images within the questionnaire. Once corrections were made, the questionnaires were sent to respondents. Electronic consent was obtained from the respondents, and they were informed about their voluntary participation, the confidentiality and privacy of their personal information and their ability to withdraw from the online survey without any risks or harm.

Measures

A questionnaire was used to collect the study's demographic information, and all the constructs' items were on a five-point Likert-type scale. The scales were adopted from prior research studies: perceived risk factors (financial risk, product risk, time risk, delivery risk, social risk, security risk and psychological risk consisting of 27 items) were adapted from Ariffin, Mohan and Goh (2018). The platform content construct, consisting of five items, and the service convenience construct, consisting of four items, were adapted from Udo et al. (2010). The ease-of-use construct, consisting of four items, was adapted from Tabaeian et al. (2023). The 18 items measuring e-SQ were adapted from the study conducted by Zia et al. (2023). When adapting the items, they were adapted by contextualising the items to the context of this study, focusing on online grocery apps.

Sample and non-response bias

The research sample for this study was derived from a heterogeneous population of Generation X and Generation Y consumers who had purchased groceries online via mobile apps. Potential respondents were sent emails inviting them to partake in the survey, with an embedded URL link leading them to the survey platform. Initially, respondents were asked three screening questions, having to confirm whether they resided in Gauteng, if they were born between 1961 and 1999 (belonging to Generation X and Generation Y cohorts) and if they had purchased groceries using mobile apps, such as Checkers Sixty60, Woolies Dash app, Pick n Pay asap! or SPAR2U. Respondents had to answer 'yes' to all three screening questions to proceed to the next phase of the questionnaire. To avoid non-response bias, the aim of this study was to obtain 600 responses, evenly split between Generation X (50%) and Generation Y (50%) consumers. However, the sample exceeded expectations, totalling 622 questionnaires, with 295 (47%) responses successfully collected from Generation X and 327 (53%) from Generation Y.

Data analysis

SmartPLS 4.0 was utilised to analyse the study's data. Firstly, the measurement model was used to assess the reliability and validity of each construct presented in Figure 1. Secondly, a structural model was analysed to examine the proposed hypotheses developed for the study.

Measurement model

In this study, reliability and validity techniques were used to assess the measurement model's suitability. To examine reliability, composite reliability (CR) and Cronbach's alpha were assessed. A threshold of 0.7 or above is deemed satisfactory for both Cronbach's alpha and CR, as recommended by Hair et al. (2022) and Page, Higgins and Sterne (2019). The results revealed that the Cronbach's alpha values for various constructs examined in the study were above 0.7, suggesting a satisfactory level of internal consistency. Specifically, financial risk had a Cronbach's alpha score of 0.729 and a CR score of 0.729, product risk had a Cronbach's alpha score of 0.848 and a CR score was 0.848, time risk had a Cronbach's alpha score of 0.869 and a CR score was 0.871, delivery risk had a Cronbach's alpha score of 0.877 and a CR score of 0.887, social risk had a Cronbach's alpha score of 0.888 and a CR score of 0.889, security risk had a Cronbach's alpha score of 0.863 and a CR score of 0.869, psychological risk had a Cronbach's alpha score of 0.820 and a CR score 0.821, platform content had a Cronbach's alpha score of 0.868 and a CR score of 0.880, ease of use had a Cronbach's alpha score of 0.897 and a CR score of 0.898, service convenience had a Cronbach's alpha score and CR score of 0.901 and e-SQ had a Cronbach alpha's score of 0.949 and a CR score of 0.952 (refer Table 1).

Structural model assessment

To evaluate the hypotheses, the regression coefficient (β) was utilised to gauge the strength of the relationships,

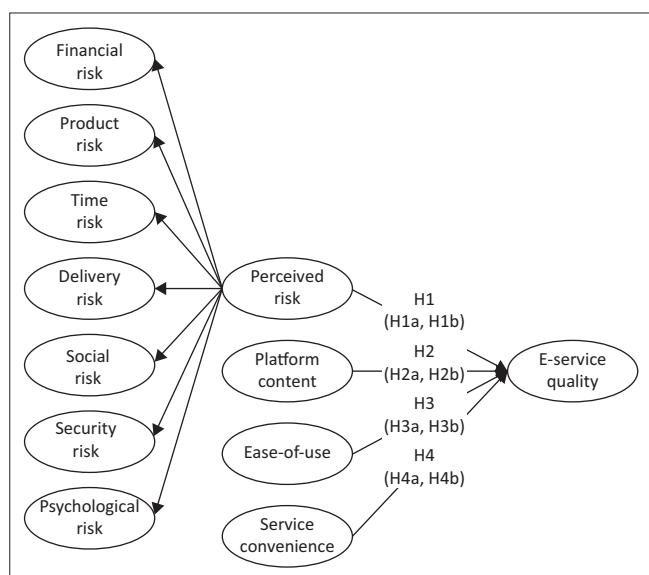


FIGURE 1: Developed research model.

while the p -value was utilised to ascertain the significance of these relationships. Statistical significance was determined using bootstrap resampling with 5000 subsamples at the 5% significance level. The path coefficients (β) and significance levels for Generation X and Generation Y are shown in Table 3 and Table 4, respectively. However, before hypothesis testing, multicollinearity was assessed using the variance inflation factor (VIF) values. All VIF values were below the threshold of 5.0 as recommended by Hair et al. (2022), ranging from 1.205 to 2.007 (perceived risk = 1.205, platform content = 1.781, ease of use = 2.007 and service convenience = 2.002) for Generation X and ranging from 1.218 to 2.722 (perceived risk = 1.218, platform content = 1.634, ease of use = 2.722 and service convenience = 2.309) for Generation Y.

According to Table 3, in terms of Generation X, perceived risk has a negative ($\beta = -0.109$) and small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. A similar result was found for Generation Y (refer to Table 3), whereby perceived risk had a negative ($\beta = -0.088$) but small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. For Generation X, platform content was found to have a positive ($\beta = 0.215$) but small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. For Generation Y, as shown in Table 4, platform content has a positive ($\beta = 0.313$) but medium ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. However, the relationship for Generation Y was found to have a stronger effect compared to Generation X. Ease of use for Generation X consumers was found to have a positive ($\beta = 0.271$) but small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. This effect was stronger for Generation X consumers, compared to Generation Y, as ease of use was found to have a positive ($\beta = 0.308$) but small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ. Lastly, service convenience was found to have a positive ($\beta = 0.379$), medium ($f^2 \geq 0.15$) and significant ($p < 0.05$) effect on e-SQ for Generation X consumers, yet a positive ($\beta = 0.253$) but small ($f^2 \leq 0.15$) significant ($p < 0.05$) effect on e-SQ for Generation Y consumers. Therefore, in summary, the strongest relationship and effect on e-SQ for Generation X was service convenience, while the strongest relationship and effect on e-SQ for Generation Y was platform content – as shown in Table 3 and Table 4. The structural model demonstrated substantial explanatory power for both cohorts. For Generation X, the model explained 65% of the variance in e-SQ ($R^2 = 0.65$), and for Generation Y, the model explained 63% of the variance in e-SQ ($R^2 = 0.63$). According to Hair et al. (2022), these values explain substantial explanatory power as they are greater than 0.50 demonstrating that the proposed model explains e-SQ perceptions adequately across both cohorts.

Discussion

This study offers a substantial contribution to the evolving literature on e-SQ by distinctly focusing on generational differences between Generation X and Generation Y consumers in the South African online grocery market, a sector that has seen rapid growth yet remains underexplored

TABLE 1 : Reliability and validity of the measurement model.

| Construct and items | Factor loadings | α | CR | AVE |
|---|-----------------|----------|-------|-------|
| Financial risk | - | 0.729 | 0.729 | 0.787 |
| After utilising the app, I tend to exceed my intended budget for groceries. | 0.333* | - | - | - |
| I may be overcharged after using the app. | 0.778 | - | - | - |
| The groceries may not be worth the money I spent. | 0.883 | - | - | - |
| Using the app to shop for groceries may result in wasting money. | 0.881 | - | - | - |
| Product risk | - | 0.848 | 0.848 | 0.686 |
| I may not receive the exact quality of groceries that I purchased on the app. | 0.815 | - | - | - |
| The size description of groceries may not be accurate on the app. | 0.829 | - | - | - |
| It is difficult for me to compare the quality of similar grocery products on the app. | 0.829 | - | - | - |
| The fact that I cannot touch the groceries on the app presents a risk. | 0.841 | - | - | - |
| Time risk | - | 0.869 | 0.871 | 0.793 |
| Buying groceries using the app is a waste of time. | 0.887 | - | - | - |
| It is difficult to open this app, which takes a lot of my time. | 0.922 | - | - | - |
| Finding the right product on the app is difficult. | 0.861 | - | - | - |
| Delivery risk | - | 0.877 | 0.887 | 0.803 |
| The groceries purchased using the app are likely to be lost during the delivery process. | 0.919 | - | - | - |
| The groceries purchased using the app are likely to be delivered to the wrong place. | 0.917 | - | - | - |
| The groceries purchased on the app are not likely to be delivered on time. | 0.824 | - | - | - |
| The groceries purchased on the app are likely to be damaged during the delivery process. | 0.851 | - | - | - |
| Social risk | - | 0.888 | 0.889 | 0.816 |
| Using the app to purchase groceries may result in disapproval by family or friends. | 0.904 | - | - | - |
| Using the app to purchase groceries may affect the image of people around me. | 0.902 | - | - | - |
| Buying groceries on the app may not be accepted by family or friends. | 0.905 | - | - | - |
| Buying groceries using the app may make others to undervalue me (consider me as lazy or anti-social). | 0.825 | - | - | - |
| Security risk | - | 0.863 | 0.869 | 0.710 |
| I feel that my credit or debit card details are not secured on the app. | 0.840 | - | - | - |
| The app can be insecure. | 0.836 | - | - | - |
| The app may disclose my personal information. | 0.889 | - | - | - |
| My data may be shared with third parties without my consent. | 0.802 | - | - | - |
| Psychological risk | - | 0.820 | 0.821 | 0.848 |
| I cannot trust the app when grocery shopping. | 0.923 | - | - | - |
| I fear that the groceries purchased through the app will not be delivered as requested. | 0.919 | - | - | - |
| I could be frustrated if I am dissatisfied with the quality of the groceries purchased through the app. | 0.721 | - | - | - |
| I may get addicted to online grocery shopping using the app. | 0.499* | - | - | - |
| Platform content | - | 0.868 | 0.880 | 0.655 |
| The app has an ideal number of images. | 0.718 | - | - | - |
| The images on this app are appealing. | 0.829 | - | - | - |
| The contents of this app are useful for my purpose. | 0.856 | - | - | - |
| I am kept well informed of the developments of this app. | 0.803 | - | - | - |
| The information on the app is sufficient (there is more than enough) to make a purchase decision. | 0.833 | - | - | - |
| Ease of use | - | 0.897 | 0.898 | 0.764 |
| The app is straightforward to use when purchasing groceries online. | 0.862 | - | - | - |
| The layout of the app is very clear and simple. | 0.873 | - | - | - |
| It is easy to understand the buying process when using the app (e.g. selecting products, adding selected products to the cart, etc.). | 0.885 | - | - | - |
| The interface (i.e. the ability to connect and interact) of the app is user-friendly. | 0.876 | - | - | - |
| Service convenience | - | 0.901 | 0.901 | 0.770 |
| Convenient for me | 0.870 | - | - | - |
| Makes my life easier | 0.883 | - | - | - |
| Saves me time | 0.903 | - | - | - |
| Saves me a lot of effort compared to going to traditional stores or using an online website to purchase groceries | 0.854 | - | - | - |
| e-SQ | - | 0.949 | 0.952 | 0.540 |
| This app makes it effortless to find what I need. | 0.622* | - | - | - |
| The app makes it effortless to navigate anywhere on the platform. | 0.596* | - | - | - |
| The app enables me to complete the payment quickly. | 0.767 | - | - | - |
| The app loads its pages fast when I search for products. | 0.806 | - | - | - |
| This app is always available. | 0.715 | - | - | - |
| This app runs instantly after logging in. | 0.716 | - | - | - |
| The online retailer's grocery mobile app does not crash. | 0.624* | - | - | - |
| Pages on this app do not freeze after I enter my order information. | 0.746 | - | - | - |
| The app delivers orders when promised. | 0.754 | - | - | - |

Table 1 continues on the next page →

TABLE 1 (Continues...): Reliability and validity of the measurement model.

| Construct and items | Factor loadings | α | CR | AVE |
|---|-----------------|----------|----|-----|
| The app makes items available for delivery within a suitable time frame. | 0.757 | - | - | - |
| The app quickly delivers what I order. | 0.756 | - | - | - |
| The app sends out the items ordered. | 0.756 | - | - | - |
| The app has in stock the items the company claims to have. | 0.739 | - | - | - |
| The app is truthful about its offerings. | 0.832 | - | - | - |
| The app makes accurate promises about the delivery of products. | 0.813 | - | - | - |
| The app protects my personal or card information, which makes me feel secure. | 0.760 | - | - | - |
| The app does not share my personal information with other apps. | 0.706 | - | - | - |
| The app protects information about my credit card. | 0.719 | - | - | - |

Note: Regarding construct validity, convergent validity was evaluated. In evaluating convergent validity, the factor loadings, average variance extracted (AVE) values and CR values are considered. Average variance extracted is defined as the average of the squared loadings, representing the shared variance among items associated with a construct (Alt, Raichel & Naamati-Schneider 2022), with an estimated threshold of 0.65 for factor loadings and 0.5 for AVE values, as advised by Hair et al. (2022). Based on the factor loadings of five items (one in financial risk, one in psychological risk and three in e-SQ) as shown in Table 1, these items were removed from the study. In addition, the Fornell and Larcker method was used to determine discriminant validity. Using this approach, the square root of the AVE is compared with the AVE values. If the square root of the AVE surpasses the AVE values (Hair et al. 2022), discriminant validity is confirmed. Refer Table 2, demonstrating that the square root of the AVE surpasses the AVE values for each construct. Following the evaluation of reliability and validity, the data were confirmed to be reliable and valid. Consequently, the structural model was assessed.

AVE, average variance extracted; CR, composite reliability; e-SQ, e-service quality.

* These items were removed from the measurement model because they did not meet the 0.65 threshold.

TABLE 2: Discriminant validity assessment.

| Variable | DR | ESQ | EOU | FR | PC | PRO | PSR | SER | SC | SR | TR |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| DR | 0.887 | - | - | - | - | - | - | - | - | - | - |
| ESQ | -0.295 | 0.735 | - | - | - | - | - | - | - | - | - |
| EOU | -0.325 | 0.726 | 0.874 | - | - | - | - | - | - | - | - |
| FR | 0.560 | -0.278 | -0.295 | 0.887 | - | - | - | - | - | - | - |
| PC | -0.118 | 0.658 | 0.611 | -0.156 | 0.809 | - | - | - | - | - | - |
| PRO | 0.655 | -0.365 | -0.377 | 0.724 | -0.221 | 0.828 | - | - | - | - | - |
| PSR | 0.743 | -0.380 | -0.390 | 0.606 | -0.237 | 0.742 | 0.921 | - | - | - | - |
| SER | 0.634 | -0.368 | -0.341 | 0.622 | -0.193 | 0.706 | 0.682 | 0.843 | - | - | - |
| SC | -0.277 | 0.686 | 0.745 | -0.299 | 0.541 | -0.307 | -0.306 | -0.325 | 0.878 | - | - |
| SR | 0.569 | -0.255 | -0.341 | 0.536 | -0.177 | 0.580 | 0.686 | 0.580 | -0.343 | 0.903 | - |
| TR | 0.629 | -0.317 | -0.417 | 0.623 | -0.207 | 0.694 | 0.728 | 0.700 | -0.371 | 0.685 | 0.890 |

DR, delivery risk; ESQ, E-service quality; EOU, ease of use; FR, financial risk; PC, platform content; PRO, product risk; PSR, psychological risk; SER, security risk, SC, service convenience; SR, social risk, TR, time risk.

Note: Bold values on the diagonal represent the square root of the Average Variance Extracted (vAVE) for each construct.

TABLE 3: Standardised regression weights for Generation X.

| Path coefficient | Beta value | f^2 | p | Conclusion |
|----------------------------------|------------|-------|-------|------------|
| H1a: Perceived risk -> e-SQ | -0.109 | 0.027 | 0.025 | Accepted |
| H2a: Platform content -> e-SQ | 0.215 | 0.073 | 0.001 | Accepted |
| H3a: Ease of use -> e-SQ | 0.271 | 0.104 | 0.002 | Accepted |
| H4a: Service convenience -> e-SQ | 0.379 | 0.202 | 0.000 | Accepted |

e-SQ, e-service quality.

Note: e-SQ $R^2 = 0.65$ (65% of variance explained).

TABLE 4: Standardised regression weights for Generation Y.

| Path coefficient | Beta value | f^2 | p | Conclusion |
|----------------------------------|------------|-------|-------|------------|
| H1b: Perceived risk -> e-SQ | -0.088 | 0.017 | 0.008 | Accepted |
| H2b: Platform content -> e-SQ | 0.313 | 0.164 | 0.000 | Accepted |
| H3b: Ease of use -> e-SQ | 0.308 | 0.095 | 0.000 | Accepted |
| H4b: Service convenience -> e-SQ | 0.253 | 0.075 | 0.000 | Accepted |

e-SQ, e-service quality.

Note: e-SQ $R^2 = 0.63$ (63% of variance explained).

in emerging markets. South Africa’s e-commerce sector is projected to reach \$7.32 billion by 2025, growing at an annual rate of 9.49% between 2025 and 2029 (Statista 2025). This growth underscores the critical importance of understanding the nuanced drivers of e-SQ to optimise consumer satisfaction and loyalty in such dynamic markets.

While prior research in developed economies often treats digital consumer experiences as relatively homogeneous (Shaw et al. 2022), this study emphasises the contextual

uniqueness of South Africa’s socio-digital landscape. It highlights how digital infrastructure, consumer behaviour and economic realities in emerging markets create a differentiated environment for online retailing (Moodley & Buthelezi 2023). The study empirically shows (see Table 3 and Table 4) that Generation X consumers prioritise service convenience, valuing efficiency, reliability and time-saving features ($\beta = 0.379$). In contrast, Generation Y consumers emphasise rich platform content, such as visual appeal and interactivity ($\beta = 0.313$), thereby supporting and extending GCT within the South African context. This finding challenges the one-size-fits-all digital marketing strategies and reinforces the need for segmented approaches, particularly in markets characterised by diverse digital maturity and consumer expectations (Masoma & Maduku 2025).

Furthermore, the study corroborates EDT by confirming that perceived risk negatively influences e-SQ perceptions among both cohorts, emphasising the ongoing importance of trust and safety in online transactions (Adejumo & Ogburie 2025). However, the relatively modest effect sizes may signal increasing consumer confidence in South African retail brands, which have matured technologically and enhanced their digital service quality over recent years (Musikavanhu & Musakuro 2023). This insight addresses a

gap in the literature where emerging markets' digital maturity and its impact on consumer risk perceptions remain underexamined.

Furthermore, the study highlights the value of ORM as a theoretical framework, with the structural model explaining 65% and 63% of the variance in e-SQ for Generation X and Generation Y, respectively. This indicates that functional service features, such as ease of use, platform content and service convenience, also serve as relational mechanisms fostering trust, satisfaction and loyalty. These findings are particularly relevant for South African retailers seeking to build sustainable digital relationships amid increasing competition (Boateng 2019; Kim & Yum 2024). As such, by focusing on generational dynamics within the emerging South African market, this study fills a notable gap, moving beyond universalist assumptions prevalent in prior research. It offers robust, context-sensitive insights for academics and practitioners alike, encouraging more nuanced segmentation and tailored digital strategies that reflect the realities of African e-commerce consumers.

Recommendations

Based on the study's findings, online grocery retailers should aim to implement prioritised, generation-specific approaches to enhancing e-SQ. Firstly, the priority should be optimising platform content, particularly for Generation Y consumers, as this was found to be the strongest factor influencing e-SQ. Therefore, retailers should prioritise improving the quality and richness of the content presented on their mobile apps. Generation Y consumers place a high value on appealing visuals, detailed product descriptions and authentic peer reviews. To address this need of the Generation Y cohort, grocery apps must ensure that product listings include high-resolution images, comprehensive nutritional information and user-generated content such as ratings and written reviews. Dynamic content updates and personalisation features that reflect browsing history and past purchases will further enhance engagement and increase perceptions of relevance and reliability, particularly among younger consumers. Although platform content was not as important for Generation X consumers, online grocery retailers should ensure that the content remains factual and clearly organised.

Secondly, the priority relates to service convenience, with a particular focus on Generation X, as this was found to be the strongest factor influencing e-SQ. This group values the practicality and time-saving potential that online grocery apps offer. To meet their expectations, retailers should focus on improving service efficiency by offering flexible delivery slots, accurate delivery tracking and responsive customer support. Features such as scheduled deliveries, real-time driver updates and the ability to edit or cancel orders after checkout can significantly enhance convenience. Additionally, clear communication channels and short response times in resolving queries or complaints are vital to maintaining the trust and satisfaction of this cohort.

Thirdly, the priority focuses on perceived risk, where a unified approach is required across both cohorts. Given that perceived risk negatively influences e-SQ, although minimally, it is imperative for retailers to minimise these risks to build consumer trust. This can be achieved by reinforcing the security of mobile applications through visible and reliable security features such as secure payment methods, encryption and privacy guarantees. Furthermore, transparency regarding refund and return policies, as well as consistent communication on order status and delivery timelines, can reduce uncertainty and improve customer confidence, thereby lessening the impact of perceived risk on e-SQ.

Fourthly, ease of use, while only minimally significant, remains a critical factor for both generational cohorts and demonstrates a slightly stronger influence for Generation Y. This finding suggests the need for intuitive app designs that facilitate seamless navigation and transaction processes. As such, retailers should ensure that their platforms offer user-friendly interfaces, streamlined shopping journeys and accessible features such as saved shopping lists, product search filters and quick reorder options. Generation Y, accustomed to digital interfaces, expects technology that is not only functional but also frictionless. Simplifying registration processes, enabling one-click purchases and integrating chatbot assistance can contribute positively to perceptions of ease of use across both groups but particularly for the younger cohort.

Fifthly, given the generational differences in e-SQ drivers, retailers should also consider segmenting their strategies to deliver tailored experiences that align with each group's preferences. For Generation Y, who are more tech-savvy and visually driven, the focus should be on immersive, customisable and interactive app features that reflect a modern digital lifestyle. For Generation X, who value efficiency and reliability, emphasis should be placed on consistent service delivery and simplified processes that save time and reduce friction. By aligning platform strategies with the specific expectations of Generation X and Generation Y consumers, online grocery retailers in South Africa can significantly enhance perceived e-SQ, foster long-term customer satisfaction and strengthen their competitive advantage in the growing e-commerce market.

Conclusion

The study focused on understanding consumers' perceptions of e-SQ of online grocery shopping apps and comparing whether differences exist between Generation X and Generation Y consumers. The findings demonstrate that perceived risk, platform content, ease of use and service convenience all influence e-SQ. However, key differences exist among Generation X and Generation Y consumers, where the relationships platform content and ease of use have with e-SQ are stronger for Generation Y consumers, while service convenience is more influential towards e-SQ.

for Generation X consumers. The study provides theoretical and practical findings, offering a more comprehensive understanding of how Generation X and Generation Y consumers differ, which online grocery retailers can use to enhance their offerings.

This study makes both academic and industry contributions. Theoretically, it advances GCT by empirically examining the perceptual differences in e-SQ between Generation X and Generation Y consumers in the context of online grocery shopping in South Africa. It deepens understanding of how cohort-based expectations shape e-SQ perceptions, offering new insights into an underexplored area in emerging markets. The study further extends e-SQ literature by identifying cohort-specific drivers within the mobile app-based retail environment. From an industry perspective, the study offers practical guidance to South African online grocery retailers – such as Checkers, Pick n Pay, SPAR and Woolworths – on how to tailor their mobile app experiences to better meet the needs of different generational segments. For instance, for Generation X consumers, service convenience was the most important driver shaping e-SQ perceptions. This requires that online grocery retailers focus on convenience for this cohort, ensuring that the app saves them time and effort and makes the shopping process easier. On the other hand, for Generation Y consumers, the platform content was the most important driver shaping their e-SQ perceptions. This signals that online grocery retailers should ensure that their apps have an adequate number of images, that the content is useful for its purpose (e.g. images of the correct groceries), and that the information is sufficient to make an informed purchase decision.

Limitations

However, the study has its limitations, having focused on the Gauteng region and no other provinces in South Africa – this may be an opportunity for further research where additional provinces can be included to allow for a comparative analysis. In addition, this study centres on Generation X and Generation Y consumers, while other cohorts like baby boomers and Generation Alpha may also demonstrate differences in their perceptions of e-SQ. Lastly, the study only focuses on e-SQ as the outcome variable, and although e-SQ is important to understand and influence, additional aspects like customer satisfaction and loyalty may also be prevalent and perceptions of differences could be evident.

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Competing interests

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Authors' contributions

N.C. was responsible for conceptualisation, methodology, writing the original draft, visualisation, project administration, reviewing, and editing. M.R-L. carried out conceptualisation, methodology, writing the original draft, visualisation, reviewing, and editing. S.M. carried out the formal analysis, investigation, and writing the original draft.

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Data availability

The data for the study are available from the corresponding author, N.C., on reasonable request.

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